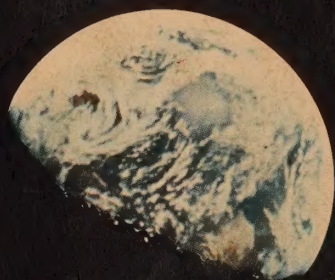


WHOLE EARTH CATALOG

access to tools



Spring 1969
\$4

WHOLE EARTH CATALOG

FUNCTION

The WHOLE EARTH CATALOG functions as an evaluation and access device. With it, the user should know better what is worth getting and where and how to do the getting.

An item is listed in the CATALOG if it is deemed:

- 1) Useful as a tool,*
- 2) Relevant to independent education,*
- 3) High quality or low cost,*
- 4) Easily available by mail.*

CATALOG listings are continually revised according to the experience and suggestions of CATALOG users and staff.

PURPOSE

We are as gods and might as well get good at it. So far, remotely done power and glory--as via government, big business, formal education, church--has succeeded to the point where gross defects obscure actual gains. In response to this dilemma and to these gains a realm of intimate, personal power is developing--power of the individual to conduct his own education, find his own inspiration, shape his own environment, and share his adventure with whoever is interested. Tools that aid this process are sought and promoted by the WHOLE EARTH CATALOG.

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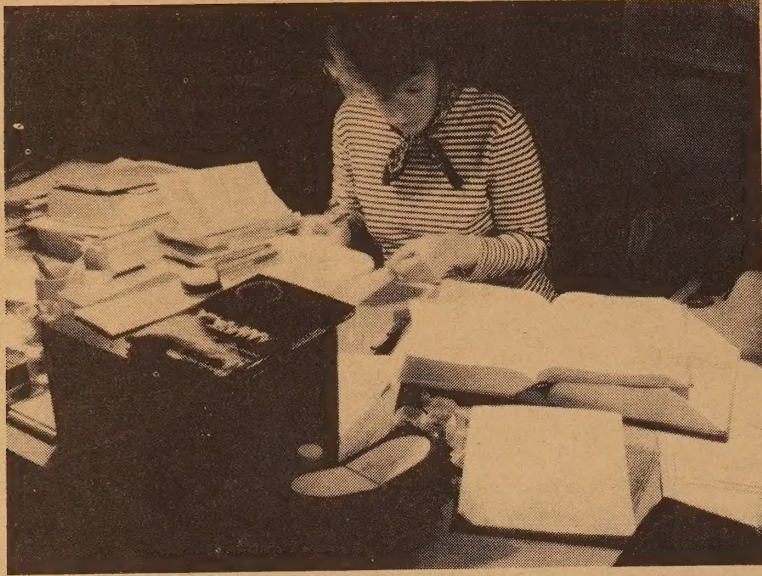
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CATALOG procedure



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Our obligation is to CATALOG users and to ourselves to be good tools for one another.

This issue

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Whole Systems

Buckminster Fuller

The insights of Buckminster Fuller initiated this Catalog.

Among his books listed here, his most recent is probably the best introduction—it's a succinct summary of what's been on his mind for many a year and what's on his mind now: how mankind may hatch and survive the hatching. An Operating Manual for Spaceship Earth.

Of the other, larger, books, Nine Chains to the Moon is his earliest and most openly metaphysical, The Unfinished Epic of Industrialization the most beautiful, Ideas and Integrities his most personal, No More Secondhand God the most generalized, World Design Science Decade (co-authored with John McHale) the most programmatic.

People who beef about Fuller mainly complain about his repetition — the same ideas again and again, it's embarrassing. It is embarrassing, also illuminating, because the same notions take on different uses when re-approached from different angles or with different contexts. Fuller's lectures have a raga quality of rich nonlinear endless improvisation full of convergent surprises.

Some are put off by his language, which makes demands on your head like suddenly discovering an extra engine in your car — if you don't let it drive you faster, it'll drag you. Fuller won't wait. He spent two years silent after illusive language got him in trouble, and he returned to human communication with a redesigned instrument.

I see God in the instruments and the mechanisms that work reliably, more reliably than the limited sensory departments of the human mechanism.

And God says observe the paradox of man's creative potentials and his destructive tactics. He could have his new world through sufficient love for "all's fair" in love as well as in war which means you can junk as much rubbish, skip as many stupid agreements by love, spontaneous unselfishness radiant.

The revolution has come—set on fire from the top. Let it burn swiftly. Neither the branches, trunk, nor roots will be endangered. Only last year's leaves and the parasite-bearded moss and orchids will not be there when the next spring brings fresh growth and free standing flowers.

Here is God's purpose—for God, to me, it seems, is a verb not a noun, proper or improper; is the articulation not the art, objective or subjective; is loving, not the abstraction "love" commanded or entreated; is knowledge dynamic, not legislative code, not proclamation law, not academic dogma, not ecclesiastic canon. Yes, God is a verb, the most active, connoting the vast harmonic reordering of the universe from unleashed chaos of energy. And there is born unheralded a great natural peace, not out of exclusive pseudo-static security but out of including, refining, dynamic balancing. Naught is lost. Only the false and nonexistent are dispelled.

And I've thought through to tomorrow which is also today. The telephone rings and you say to me Hello Buckling this is Christopher; or Daddy it's Allegra; or Mr. Fuller this is the Telephone Company Business Office; and I say you are inaccurate. Because I knew you were going to call and furthermore I recognize that it is God who is "speaking."

And you say aren't you being fantastic? And knowing you I say no.

All organized religions of the past were inherently developed as beliefs and credits in "second hand" information.

Therefore it will be an entirely new era when man finds himself confronted with direct experience with an obviously a priori intellectually anticipatory competence that has interordered all that he is discovering.

[No More Secondhand God]



Operating Manual for Spaceship Earth
Buckminster Fuller
1969; 143 pp.

\$4.25 postpaid from Southern Illinois University Press
600 West Grand
Carbondale, Illinois 62903
or
WHOLE EARTH CATALOG

To comprehend this total scheme we note that long ago a man went through the woods, as you may have done, and I certainly have, trying to find the shortest way through the woods in a given direction. He found trees fallen across his path. He climbed over those crisscrossed trees and suddenly found himself poised on a tree that was slowly teetering. It happened to be lying across another great tree, and the other end of the tree on which he found himself teetering lay under a third great fallen tree. As he teetered he saw the third big tree lifting. It seemed impossible to him. He went over and tried using his own muscles to lift that great tree. He couldn't budge it. Then he climbed back atop the first smaller tree, purposefully teetering it, and surely enough it again elevated the larger tree. I'm certain that the first man who found such a tree thought that it was a magic tree, and may have dragged it home and erected it as man's first totem. It was probably a long time before he learned that any stout tree would do, and thus extracted the concept of the generalized principle of leverage out of all his earlier successive special-case experiences with such accidental discoveries.

To begin our position-fixing aboard our Spaceship Earth we must first acknowledge that the abundance of immediately consumable, obviously desirable or utterly essential resources have been sufficient until now to allow us to carry on despite our ignorance. Being eventually exhaustible and spoilable, they have been adequate only up to this critical moment. This cushion-for-error of humanity's survival and growth up to now was apparently provided just as a bird inside of the egg is provided with liquid nutriment to develop it to a certain point. But then by design the nutriment is exhausted at just the time when the chick is large enough to be able to locomote on its own legs. And so as the chick pecks at the shell seeking more nutriment it inadvertently breaks open the shell. Stepping forth from its initial sanctuary, the young bird must now forage on its own legs and wings to discover the next phase of its regenerative sustenance.

A new, physically uncomprised, metaphysical initiative of unbiased integrity could unify the world. It could and probably will be provided by the utterly impersonal problem solutions of the computers.

Heisenberg's principle of 'indeterminism' which recognized the experimental discovery that the act of measuring always alters that which was being measured turns experience into a continuous and never-repeatable evolutionary scenario.

The gold supply is so negligible as to make it pure voodoo to attempt to valve the world's economic evolution traffic through the gold-sized needle's 'eye.'

Brain deals exclusively with the physical, and mind exclusively with the metaphysical. Wealth is the progressive mastery of matter by mind....

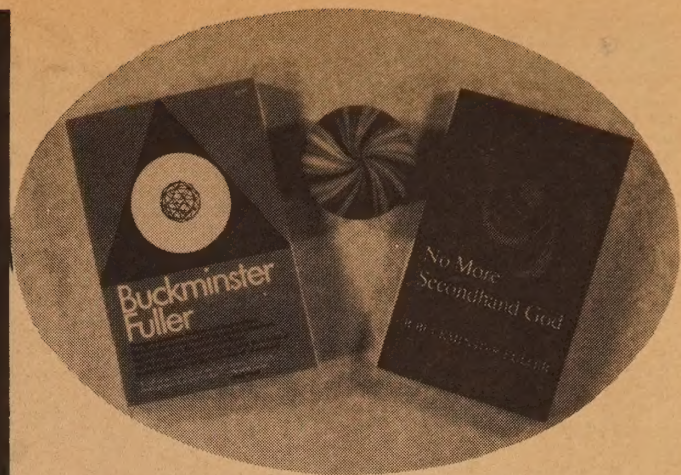
Possession is becoming progressively burdensome and wasteful and therefore obsolete.

You and I are inherently different and complementary. Together we average as zero—that is, as eternity.

● [Operating Manual for Spaceship Earth]

Common to all such "human" mechanisms—and without which they are imbecile contraptions—is their guidance by a phantom captain.

This phantom captain has neither weight nor sensorial tangibility, as has often been scientifically proven by careful weighing operations at the moment of abandonment of the ship by the phantom captain, i.e., at the instant of "death." He may be likened to the variant of polarity dominance in our bipolar electric world which, when balanced and unit, vanishes as abstract unity I or O. With the phantom captain's departure, the mechanism becomes inoperative and very quickly disintegrates into basic chemical elements. continued



Ideas and Integrities

Buckminster Fuller
1963; 318 pp

\$1.95 postpaid

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The Macmillan Company
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Riverside, N. J. 08075

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No More Secondhand God

Buckminster Fuller
1963; 163 pp.

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Standing by the lake on a jump-or-think basis, the very first spontaneous question coming to mind was, "If you put aside everything you've ever been asked to believe and have recourse only to your own experiences do you have any conviction arising from those experiences which either discards or must assume an a priori greater intellect than the intellect of man?" The answer was swift and positive. Experience had clearly demonstrated an a priori anticipatory and only intellectually apprehendable orderliness of interactive principles operating in the universe into which we are born. These principles are discovered but are never invented by man. I said to myself, "I have faith in the integrity of the anticipatory intellectual wisdom which we may call 'God.'" My next question was, "Do I know best or does God know best whether I may be of any value to the integrity of universe?" The answer was, "You don't know and no man knows, but the faith you have just established out of experience imposes recognition of the a priori wisdom of the fact of your being." Apparently addressing myself, I said, "You do not have the right to eliminate yourself, you do not belong to you. You belong to the universe. The significance of you will forever remain obscure to you, but you may as sume that you are fulfilling your significance if you apply yourself to converting all your experience to highest advantage of others. You and all men are here for the sake of other men."

[Ideas and Integrities]

I define 'synergy' as follows: Synergy is the unique behavior of whole systems, unpredicted by behavior fo their respective sub-systems' events.

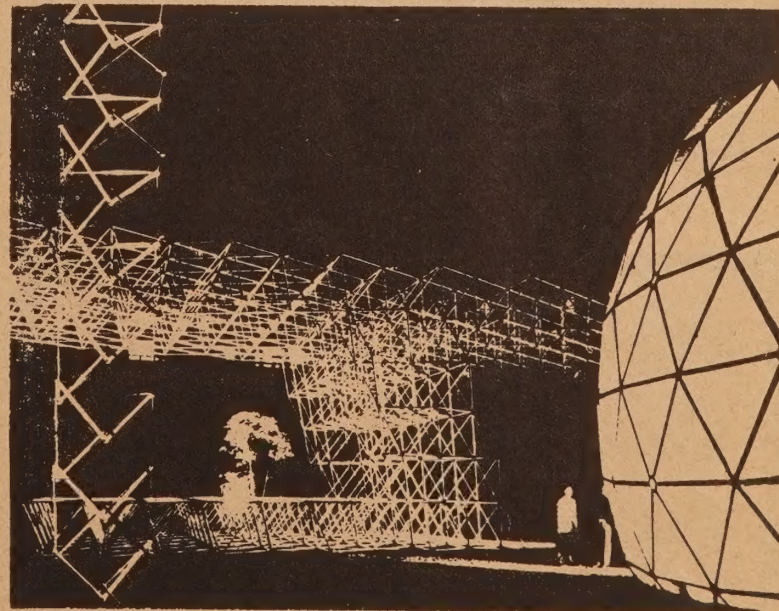
[Ideas and Integrities]

selfishness (self-preoccupation pursued until self loses its way and self-generates fear and spontaneous random surging, i.e. panic, the plural of which is mob outburst in unpremeditated wave synchronization of the individually random components)

[No More Secondhand God]

Thinking is a putting-aside, rather than a putting-in discipline, e.g., putting aside the tall grasses in order to isolate the trail into informative viewability. Thinking is FM—frequency modulation—for it results in tuning-out of irrelevancies as a result of definitive resolution of the exclusively tuned-in or accepted feed-back messages' pattern differentiability.

["Omnidirectional Halo" No More Secondhand God]



This captain has not only an infinite self-identity characteristic but, also, an infinite understanding. He has furthermore, infinite sympathy with all captains of mechanisms similar to his.

An illuminating rationalization indicated that captains—being phantom, abstract, infinite, and bound to other captains by a bond of understanding as proven by their recognition of eachother's signals and the meaning thereof by reference to a common direction (toward "perfect")—are not only all related, but are one and the same captain. Mathematically, since characteristics of unity exist, they cannot be non-identical. [Nine Chains to the Moon]

To start off with it is demonstrated in the array of events which we have touched on that we don't have to "earn a living" anymore. The "living" has all been earned for us forever. Industrialization's wealth is cumulative in contradistinction to the inherently terminal, discontinuous, temporary wealth of the craft eras of civilization such as the Bronze Age or Stone Age. If we only understood how that cumulative industrial wealth has come about, we could stop playing obsolete games, but that is a task that cannot be accomplished by political and social reforms. Man is so deeply conditioned in his reflexes by his milleniums of slave functioning that he has too many inferiority complexes to yield to political reformation. The obsolete games will be abandoned only when realistic, happier and more interesting games come along to displace the obsolete games.

[WSDS Document 3]

Tension and Compression are complementary functions of structure. Therefore as functions they only co-exist. When pulling a tensional rope its girth contracts in compression. When we load a column in compression its girth tends to expand in tension. When we investigate tension and compression, we find that compression members, as you all know as architects, have very limited lengths in relation to their cross sections. They get too long and too slender and will readily break. Tension members, when you pull them, tend to pull, approximately, (almost but never entirely), straight instead of trying to curve more and more as do too thin compressionally loaded columns. The contraction of the tension members in their girth, when tensionally loaded, brings its atoms closer together which makes it even stronger. There is no limit ratio of cross section to length in tensional members of structural systems. There is a fundamental limit ratio in compression. Therefore when nature has very large tasks to do, such as cohering the solar system or the universe she arranges her structural systems both in the microcosm and macrocosm in the following manner. Nature has compression operating in little remotely positioned islands, as high energy concentrations, such as the earth and other planets, in the macrocosm; or as islanded electrons, or protons or other atomic nuclear components in the microcosm while cohering the whole universal system, both macro and micro, of mutually remote, compressional, and oft non-simultaneous, islands by comprehensive tension; — compression islands in a non-simultaneous universe of tension. The Universe is a tensegrity.

[WSDS Document 2]

I was born cross-eyed. Not until I was four years old was it discovered that this was caused by my being abnormally farsighted. My vision was thereafter fully corrected with lenses. Until four I could see only large patterns, houses, trees, outlines of people with blurred coloring. While I saw two dark areas on human faces, I did not see a human eye or a teardrop or a human hair until I was four. Despite my new ability to apprehend details, my childhood's spontaneous dependence only upon big pattern clues has persisted.

I am convinced that neither I nor any other human, past or present, was or is a genius. I am convinced that what I have every physically normal child also has at birth. We could, of course, hypothesize that all babies are born geniuses and get swiftly de-geniused. Unfavorable circumstances, shortsightedness, frayed nervous systems, and ignorantly articulated love and fear of elders tend to shut off many of the child's brain capability valves. I was lucky in avoiding too many disconnects.

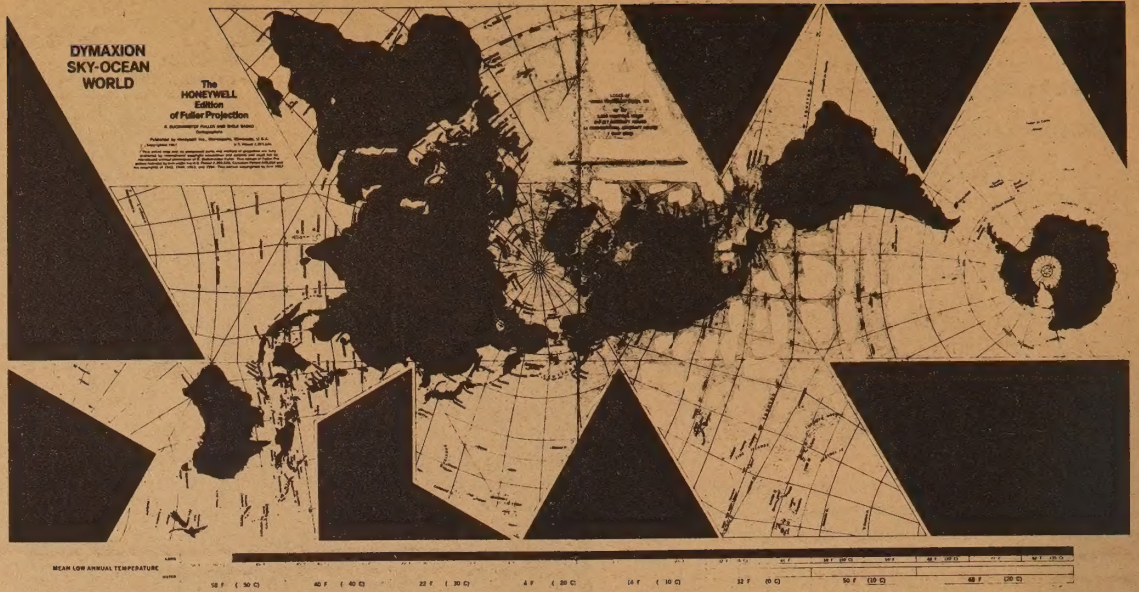
There is luck in everything. My luck is that I was born cross-eyed, was ejected so frequently from the establishment that I was finally forced either to perish or to employ some of those faculties with which we are all endowed—the use of which circumstances had previously so frustrated as to have to put them in the deep freezer, whence only hellishly hot situations could provide enough heat to melt them back into usability.

[WSDS Document 5]

In the 1920's with but little open country highway mileage in operation, automobile accidents were concentrated and frequently occurred within our urban and suburban presence. Witnessing a number of accidents, I observed that warning signs later grew up along the roads leading to danger points and that more traffic and motorcycle police were put on duty. The authorities tried to cure the malady by reforming the motorista. A relatively few special individual drivers with much experience, steady temperament, good coordination and natural tendency to anticipate and understand the psychology of others emerged as "good" and approximately accident-free drivers. Many others were accident prone.

In lieu of the after-the-fact curative reform, trending to highly specialized individual offender case histories, my philosophy urged the anticipatory avoidance of the accident potentials through invention of generalized highway dividers, grade separators, clover leafing and adequately banked curves and automatic traffic control stop-lighting systems. I saw no reason why the problem shouldn't be solved by preventative design rather than attempted reforms. My resolve: Reshape environment; don't try to reshape man,

[WSDS Document 1]



The Honeywell edition of Fuller's world map (more brightly colored than previous editions) is available for \$4.00 postpaid

from:
P.O. Box 909
Carbondale, Illinois 62901

'Still further—over the microphone STEPPED-UP electrically this music enters a super-or-sub-sensorial wave-length frequency that makes it broadcastable, apparently BACK INTO THE UNIVERSE AGAIN, the full LATENT broadcast of which men on ships at sea, an aviator in the air, or Julia Murphy in a city hovel, or the farmer's wife, can tune in upon, without any personal-equation dissonance by unwanting diverting human beings in their presence, and so hear the music of the universe that Bach heard years ago.

'Here is IMMORTALITY!'

'Darling,—that radiant flash of infinite understanding had flashed between Jonesie and the X-ian—'I can understand those houses all right.'

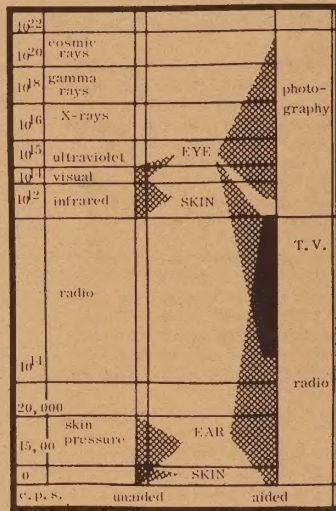
[Nine Chains to the Moon]

However, man unconcernedly sorting mail on an express train with unuttered faith that the engineer is competent, that the switchmen are not asleep, that the track walkers are doing their job, that the technologists who designed the train and the rails knew their stuff, that the thousands of others whom he may never know are collecting tariffs, paying for repairs, and so handling assets that he will be paid a week from today and again the week after that, and that all the time his family is safe and in well being without his personal protection constitutes a whole new era of evolution—the first really 'new' since the beginning of the spoken word. In fact, out of the understanding innate in the spoken word was Industrialization wrought after milleniums of seemingly whitherless spade work.

[The Unfinished Epic of Industrialization]

Nine Chains to the Moon
1938, '63; 375pp,
normally \$2.45 from
Southern Illinois University Press
or WHOLE EARTH CATALOG
is out of stock until September 1969.

The Unfinished Epic of Industrialization
Buckminster Fuller 1963; 227 pp
\$4.50 postpaid from
Small Publishers Company
276 Park Avenue South
New York, N. Y. 10010
or
WHOLE EARTH CATALOG



RELATIONSHIP OF MAN TO ELECTROMAGNETIC SPECTRUM

WSDS Document 1

According to Ed Rosenfeld, Fuller is giving a June-July study project on *The World Game at New York Studio School, 8 West 8th Street, New York City 10011.*

World society has throughout its millions of years on earth made its judgements upon visible, tangible, sensorially demonstrable criteria. We may safely say that the world is keeping its eye on the unimportant visible 1 percent of the historical transformation while missing the significance of the 99 percent of overall, unseen changes. Forms are inherently visible and forms no longer can "follow functions" because the significant functions are invisible.

WSDS Document 4

Concept Twelve — SELF DISCIPLINES

Working assumptions, cautions, encouragements, and restraints of intuitive formulations and spontaneous actions. My own rule: "Do not mind if I am not understood as long as I am not misunderstood."

Personal Self Disciplining. In 1927 I gave up forever the general economic dictum of society, i.e. that every individual who wants to survive must earn a living. I substituted, therefore, the finding made in concept one, i.e. the individual's antientropic responsibility in universe. I sought for the tasks that needed to be done that no one else was doing or attempting to do, which if done would physically and economically advantage society and eliminate pain.

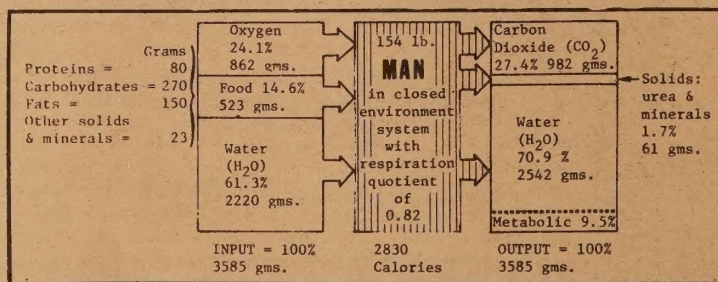
As a consequence, it was necessary for me to discipline my faculties to develop technical and scientific capability to invent the physical innovations and their service industry logistics.

My Recommendations for a Curriculum of Design Science:

1. Synergetics
2. General Systems Theory
3. Theory of Games (Von Neumann)
4. Chemistry and Physics
5. Topology, Projective Geometry
6. Cybernetics
7. Communications
8. Meteorology
9. Geology
10. Biology
11. Sciences of Energy
12. Political Geography
13. Ergonomics
14. Production Engineering

[WSDS Document 5]

HUMAN DAILY METABOLIC TURNOVER



Source: Apogee, Douglas Missile & Space Publication No. 4, 1961. p. 8.

The *World Design Science Decade* documents contain some that is in the other books and much that isn't. The 6 volume set costs \$10.50 postpaid to students (formal and informal); \$30.00 postpaid to others. This is a very good deal.

We find that original question asking is a consequence of inferences, whether in the computer or the human brain. We find then that original questions are second derivative events in the computer life.

[WSDS Document 2]

Order from:
World Resources Inventory Office
P.O. Box 909
Carbondale, Illinois 62901

The will of history reads "for everybody or for nobody," and since we balk at "for nobody" it has to be "for everybody". And that's the way it is going, lickety-split and the world around.

[WSDS Document 3]

WORLD DESIGN SCIENCE DECADE 1965-1975

Phase I (1963) Document 1
INVENTORY OF WORLD RESOURCES
HUMAN TRENDS AND NEEDS

World Resources Inventory
Southern Illinois University
Carbondale, Illinois, U.S.A.

WORLD DESIGN SCIENCE DECADE 1965-1975

Phase II (1964) Document 2
THE DESIGN INITIATIVE

World Resources Inventory
Southern Illinois University
Carbondale, Illinois, U.S.A.

WORLD DESIGN SCIENCE DECADE 1965-1975

Phase III (1965) Document 3
COMPREHENSIVE THINKING

World Resources Inventory
Southern Illinois University
Carbondale, Illinois, U.S.A.

WORLD DESIGN SCIENCE DECADE 1965-1975

Phase I (1963) Document 4
THE TEN YEAR PROGRAM

World Resources Inventory
Southern Illinois University
Carbondale, Illinois, U.S.A.

WORLD DESIGN SCIENCE DECADE 1965-1975

Phase II (1967) Document 5
COMPREHENSIVE DESIGN STRATEGY

World Resources Inventory
Southern Illinois University
Carbondale, Illinois, U.S.A.

WORLD DESIGN SCIENCE DECADE 1965-1975

Phase III (1967) Document 6
THE ECOLOGICAL CONTEXT:
ENERGY AND MATERIALS

World Resources Inventory
Southern Illinois University
Carbondale, Illinois, U.S.A.

The Population Bomb

There's a shit storm coming. Not a nice clean earthquake or satisfying revolution but pain in new dimensions: world pain, sub-continents that starve and sub-continents that eat unable to avoid each other. The consequences will dominate our lives. In the heart of the problem are the solutions, and the sooner we're clear about what's happening the sooner the solutions can work their way out. This book is the best first hard look that's around. The author is a well-regarded young population biologist and ecologist who freaked out of his lab and into the media with the bad news. Besides freaking well he reports well.

It is, of course, socially very acceptable to reduce the death rate. Billions of years of evolution have given us all a powerful will to live. Intervening in the birth rate goes against our evolutionary values. During all those centuries of our evolutionary past, the individuals who had the most children passed on their genetic endowment in greater quantities than those who reproduced less. Their genes dominate our heredity today.

The reproductive function of sex must be shown as just one of its functions, and one that must be carefully regulated in relation to the needs of the individual and society. Much emphasis must be placed on sex as an interpersonal relationship, as an important and extremely pleasurable aspect of being human, as mankind's major and most enduring recreation, as a fountainhead of his humor, as a phenomenon that affects every aspect of his being.

As White says, 'By destroying pagan animism, Christianity made it possible to exploit nature in a mood of indifference to the feelings of natural objects.' Christianity fostered the wide spread of basic ideas of 'progress' and of time as something linear, nonrepeating, and absolute, flowing from the future into the past.

The battle to feed all of humanity is over. In the 1970's the world will undergo famines—hundreds of millions of people are going to starve to death in spite of any crash programs embarked upon now. At this late date nothing can prevent a substantial increase in the world death rate, although many lives could be saved through dramatic programs to 'stretch' the carrying capacity of the earth by increasing food production. But these programs will only provide a stay of execution unless they are accompanied by determined and successful efforts at population control. Population control is the conscious regulation of the numbers of human beings to meet the needs, not just of individual families, but of society as a whole.

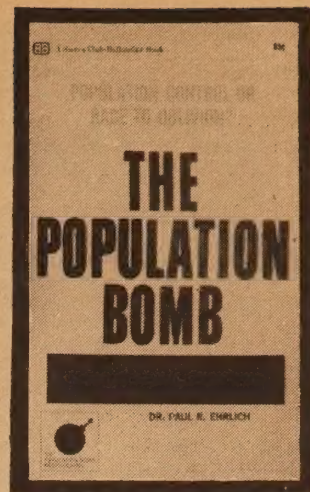
Nothing could be more misleading to our children than our present affluent society. They will inherit a totally different world, a world in which the standards, politics, and economics of the 1960's are dead. As the most powerful nation in the world today, and its largest consumer, the United States cannot stand isolated. We are today involved in the events leading to famine; tomorrow we may be destroyed by its consequences.

Remember also that in virtually all underdeveloped countries, people have gotten the word about the better life it is possible to have. They have seen colored pictures in magazines of the miracles of Western technology. They have seen automobiles and airplanes. They have seen American and European movies. Many have seen refrigerators, tractors, and even TV sets. Almost all have heard transistor radios. They know that a better life is possible. They have what we like to call 'rising expectations.' If twice as many people are to be happy, the miracle of doubling what they now have will not be enough. It will only maintain today's standard of living. There will have to be a tripling or better. Needless to say, they are not going to be happy.

A ship has hit the rocks and is sinking. The passengers scream for help. Some jump overboard and are devoured by the circling sharks. A group of distinguished scientists is on board. One of their number suggests that they can help man the pumps. 'Oh, no!' shout the others. 'That might hurt the captain's feelings. Besides, pumping is not our business. It's outside our field of competence.' You can guess what they do. They appoint a committee to study the problem, with subcommittees on marine engineering and navigation. They announce to the passengers that in two or three years the committee will produce a wonderful report which will be acceptable to the passengers, the captain, and the steamship line. Not so passive are the politicians. Some jump up to say that the passengers don't understand the political realities of the situation. Other more progressive politicians grab thimbles and start bailing, stopping every few seconds to accept praise for their valiant efforts.

I predict that the rate of soil deterioration will accelerate as the food crisis intensifies. Ecology will be ignored more and more as things get tough. It is safe to assume that our use of synthetic pesticides, already massive, will increase.

Careless overuse of DDT has promoted to 'pest' category many species of mites, little insectlike relatives of spiders. The insects which ate the mites were killed by the DDT, and the mites were resistant to DDT. There you have it—instant pests, and more profits for the agricultural chemical industry in fighting these Frankensteins of their own creation. What's more, some of the more potent miticides the chemists have developed with which to do battle seem to be powerful carcinogens—cancer-producing substances.



The Population Bomb

Dr. Paul R. Erlich
1968; 223 pp.

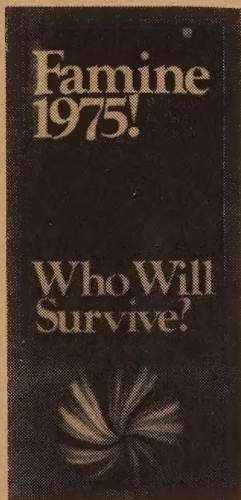
\$0.95 postpaid



from
Ballantine Books, Inc.
c/o Simon & Schuster, Inc.
630 Fifth Avenue
New York, N. Y. 10020
or
WHOLE EARTH CATALOG

Famine 1975!

Population Bomb has the world ecologist's viewpoint. Famine 1975! is the international-aid viewpoint, by brothers who've been there.



Famine 1975!

William & Paul Paddock
1967; 276 pp.

\$2.35 postpaid

from
Little, Brown & Company, Inc.
200 West Street
Waltham, Mass. 02154
or
WHOLE EARTH CATALOG

The old idea that industry could create the mess and then the taxpayers must clean it up has to go. The garbage produced by an industry is the responsibility of that industry.

Today, nearly half of the people in the undeveloped world are under the age of fifteen years.

More than any other single factor, the opportunity to have an abortion performed under safe and easily available conditions and, above all, legally, is the cause of Japan's success in population control. Such a method is completely taboo in much of the hungry world.

Haiti	Can't-be-saved
Egypt	Can't-be-saved
The Gambia	Walking Wounded
Tunisia	Should Receive Food
Libya	Walking Wounded
India	Can't-be-saved
Pakistan	Should Receive Food

Today twelve thousand people died of hunger in the world. Tomorrow another twelve thousand will die.

Los Angeles, for instance, has had stringent smog control laws for about 20 years. Breathed any of their air lately?

As Webb said, the frontier was, in essence, 'a vast body of wealth without proprietors.' Europeans moved rapidly to exploit the spatial, mineral, and other material wealth of the New World. They created an unprecedented economic boom that lasted some 400 years. The boom is clearly over, however, at least as far as land is concerned. The man/land ratio went beyond 27 people per square mile again before 1930. Since all of the material things on which the boom depended also come ultimately from the land, the entire boom is also clearly limited. Of course, how to end that boom gracefully, without the most fantastic 'bust' of all time, is what this book is all about.

The Times Atlas of the World



Times Atlas of the World

Comprehensive 1 Vol. Edition
1968; 568 pp.

\$57.50 postpaid

from
Houghton Mifflin Company
Wayside Road
Burlington, Mass. 01803
or
WHOLE EARTH CATALOG

'A world remade must be a world remapped.' That intelligent dictum was issued at the end of World War I by Lord Northcliffe, then proprietor of The Times of London. He didn't wait for someone else to do the job; The Times Survey Atlas of the World, with cartography by John Bartholomew of Edinburgh, was issued in 1921, and was recognized immediately as one of the finest atlases ever printed. The tradition has been continued, and the latest Times Atlas—the Comprehensive Edition—is the best place for an English-reading person to find where in the world something is located. The book also has a unique ability to convey the feel of the world. It measures 18" x 12 1/2" x 2", weighs 11 pounds, and contains 568 pages, of which 240 are double-page maps of superb accuracy and beauty. The index-gazetteer includes more than 200,000 entries, incomparably more than any other atlas of the world, and the entries are keyed not only by individual map coordinates, but by latitude and longitude as well (a feature offered by no other atlas). Despite the huge number of place names the maps are extraordinarily legible, and they are mercifully free of the pink-purple-yellow political emphasis offered by lesser cartographers. Some of the place names may look strange to American readers, because the atlas follows the rules of the Permanent Committee of Geographical Names. This supra-political body sensibly believes that places should be called what their occupants call them. In cases where the generic name is unfamiliar, the traditional anglicized name is also given, in parentheses.

The Comprehensive Edition of The Times Atlas of the World is published in the United States by Houghton Mifflin Company, Boston, Massachusetts. It is dedicated, by gracious permission, to Her Majesty Queen Elizabeth II, and bound in appropriately regal bright red linen, gold-stamped. It costs \$45, and it will make anything else on your coffee table seem puny, as the whole world should.

[Suggested and reviewed by
Dr. Morton Grosser.]



Distribution and Density of Population.

Birth and death rates.

Population, Evolution, and Birth Control

Once you've woken up to the population squeeze and the blindness of most of your fellow men, it's worth looking around. Garret Hardin has assembled a strong selection of eyes to look around with. Here are the ingredients for understanding. Now, how do we get the mule's attention?

The closed earth of the future requires economic principles which are somewhat different from those of the open earth of the past. For the sake of picturesqueness, I am tempted to call the open economy the 'cowboy economy,' the cowboy being symbolic of the illimitable plains and also associated with reckless, exploitative, romantic, and violent behavior, which is characteristic of open societies. The closed economy of the future might similarly be called the 'spaceman' economy, in which, therefore, man must find his place in a cyclical ecological system which is capable of continuous reproduction of material form even though it cannot escape having inputs of energy.

Kenneth E. Boulding

If the food supply is falling short, or a new disease threatens us, inventions to relieve it must be made before famine and pestilence have done their work. Now, we are far nearer to famine and pestilence than we like to think. Let there be an interruption of the water supply of New York for six hours, and it will show in the death rate. Let the usual trains bringing supplies into the city be interrupted for forty-eight hours, and some people will die of hunger. Every engineer who has to deal with the administration of the public facilities of a great city has been struck with terror at the risks which people are willing to undergo and must undergo every day, and at the complacent ignorance of these risks on the part of his charges....

Norbert Wiener

Man's Domain

Man's Domain

General Drafting Co. 1968; 75 pp.

\$2.75 postpaid

from McGraw-Hill Book Co. Princeton Road Hightstown, N. J. 08520

Manchester Road Manchester, Mo. 63062

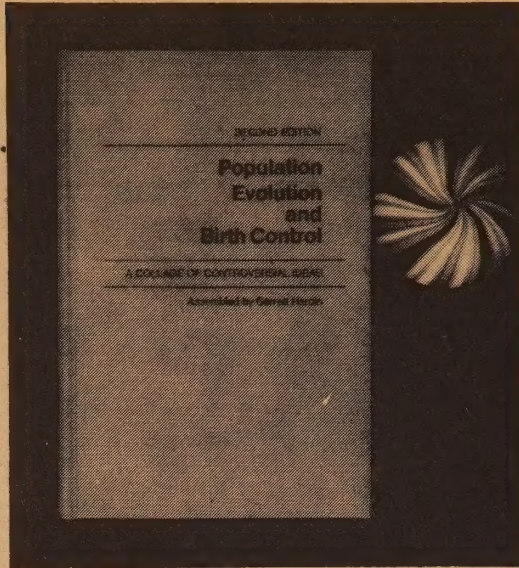
8171 Redwood Highway Novato, CA 94947

or WHOLE EARTH CATALOG

I scarcely believe it. An inexpensive, paperback, lightweight but complete World Atlas that skips all the political planetary persiflage and goes straight to the guts: climate, minerals, agriculture, population, languages, land forms, ocean forms—all the remorseless factors that have been invisible to most of humanity until recently. Nice work, McGraw-Hill, you whipped Rand-McNally and Hammond at their own game. Now how about a globe that does the same thing? (Like it's physical geography with the inside light off, dynamic geography—climate, transportation, population—when you turn the light on.) [Hm, I see they do have a Globographic System—consisting of sets of transparencies for overhead projection onto a 36-inch inflatable outline globe.] We're going to press, too late to check.]

The rest of the night I lay there sleepless, trapped between the quavering human cry in the night and the cold fact that forced me to know I could not save him or the thousands of others whose cries I could not hear. The next morning they came and told us that the beggar was dead.

Gerald Winfield



Population, Evolution, and Birth Control

Garrett Hardin, ed. 1964, 69; 386 pp.

\$2.95 postpaid

from W. H. Freeman & Co. 660 Market St. San Francisco, CA 94104 or WHOLE EARTH CATALOG

We must once again declare that the direct interruption of the generative process already begun, and, above all, directly willed and procured abortion, even if for therapeutic reasons, are to be absolutely excluded as licit means of regulating birth.

Equally to be excluded, as the teaching authority of the Church has frequently declared, is direct sterilization, whether perpetual or temporary, whether of the man or of the woman. Similarly excluded is every action which, either in anticipation of the conjugal act or in its accomplishment, or in the development of its natural consequences, proposes, whether as an end or as a means, to render procreation impossible.

Pope Paul VI

And God blessed them, and God said unto them, Be fruitful, and multiply, and replenish the earth, and subdue it: and have dominion over the fish of the sea, and over the fowl of the air, and over every living thing that moveth upon the earth.

5. Abortion is the most widely used single method of birth control in the world today.

6. A properly performed abortion is much less dangerous than a normal childbirth. The most recent experience indicates that surgical abortion ('D and C'—dilation and curettage), as carried out legally in eastern Europe, is only one-eighth as dangerous as a normal childbirth in the United States (with complicated childbirths the contrast is even greater). A vacuum method of early abortion, first developed in Russia and now being used in England and America, will undoubtedly prove even safer.

7. Abortion does not produce sterility. An incompetently performed one can, of course.

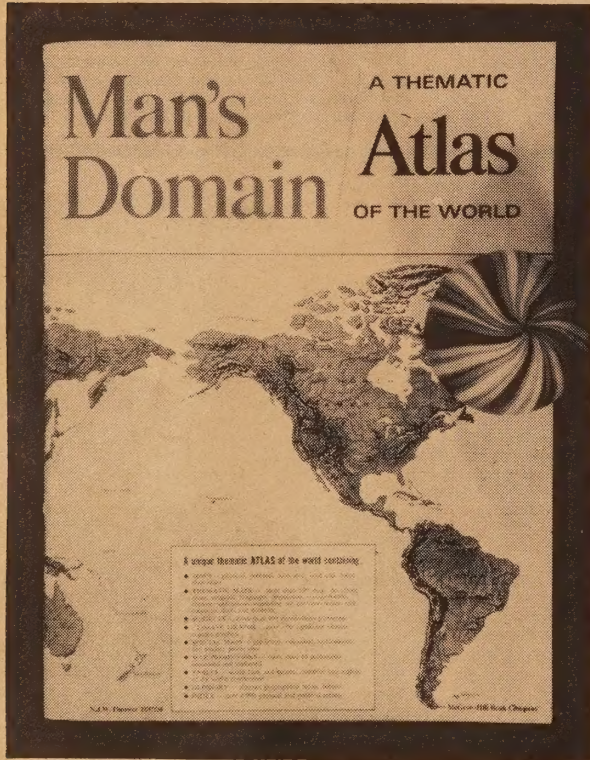
8. Abortion, when legal, need not be expensive. In Roumania, it costs less than \$2.00. We should not expect such a bargain in the United States, but \$25.00 would perhaps be a reasonable fee by American standards. The essential thing is to perform the abortion early (before the 12th week). If it is performed early there is no need for a hospital; a clinic or a doctor's office will do. (You can't get in and out of an American hospital for less than two hundred dollars.)

Garrett Hardin

Chapter III

Sturmius held, that the examination of the eye was a cure for atheism.

William Paley



Cosmic View

"The Universe in 40 Jumps" is the subtitle of the book. It delivers.

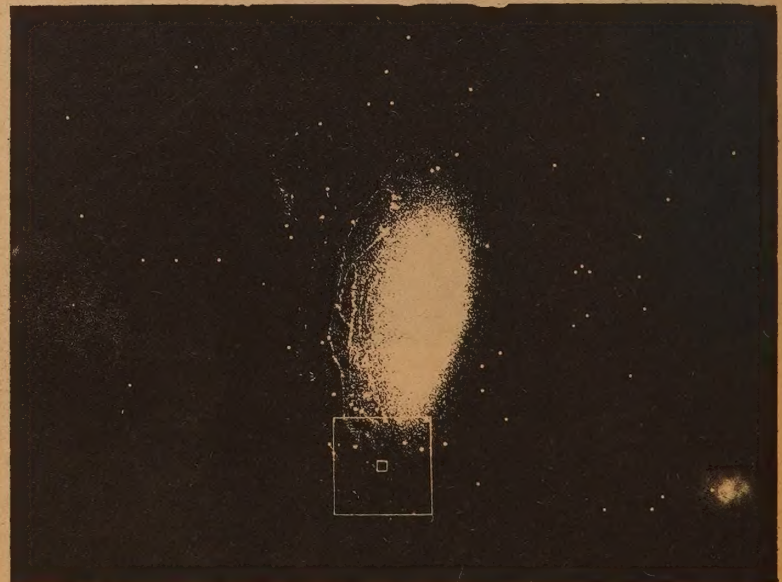
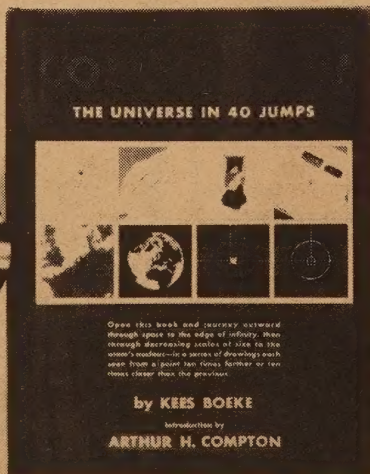
The man who conceived and rendered it, a Dutch schoolmaster named Kees Boeke, gave years of work to perfecting the information in his pictures. The result is one of the simplest, most thorough, inescapable mind blows ever printed. Your mind and you advance in and out through the universe, changing scale by a factor of ten. It very quickly becomes hard to breath, and you realize how magnitude-bound we've been.

Cosmic View Kees Boeke 1957; 48 pp.

\$4.50 postpaid

from: The John Day Company 62 West 45th Street New York, N.Y. or WHOLE EARTH CATALOG

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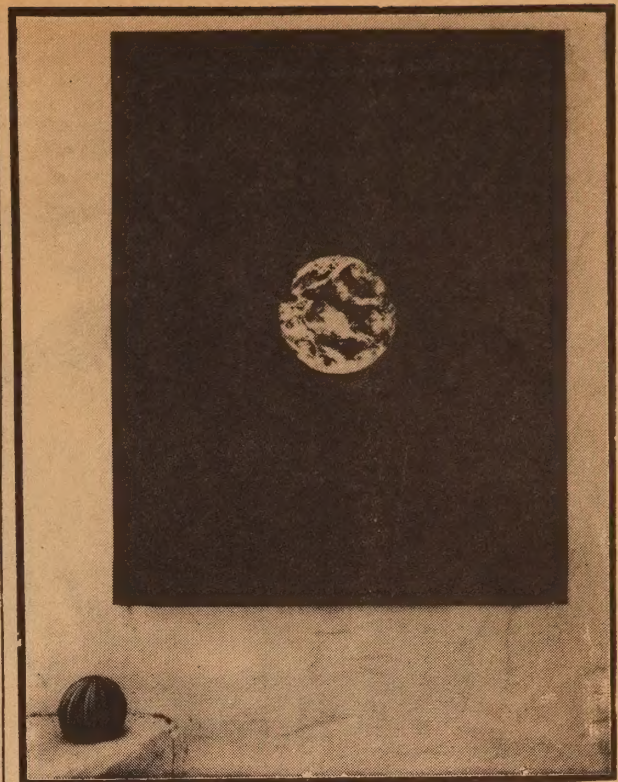




Apollo 8

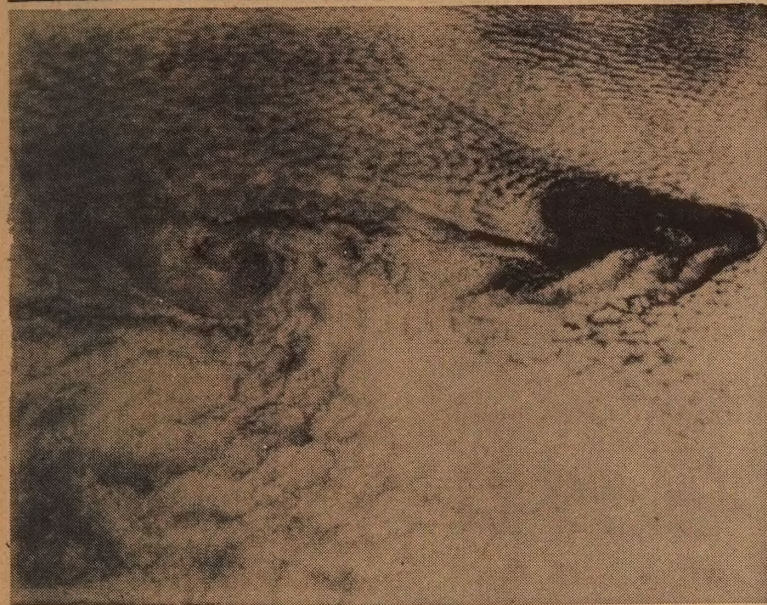
One of the best films we've ever seen is available on loan free from NASA. It's called 'Debrief: Apollo 8', it's 28 minutes long, 16mm, color, sound. (But skip the sound—pedestrian and obvious; instead put something rich on the record player—Steve Miller's *Children of The Future* makes exquisite synch with 'Debrief: Apollo 8'.) The film is well shot and superbly edited. In it are transcendent sequences of weightlessness, remote blue Earth, Nevada Moon travelling by. The splashdown on dawn Pacific is mythic.

Inquire at nearest NASA offices, or write
 Les Gaver
 Chief, Audio Visual Branch
 Public Information Division
 Office of Public Affairs
 National Aeronautics and Space Administration
 Washington, D. C. 20546



Full Earth

Mandala Earth, the high noon color image shot from a synchronous satellite over South America in November 1967, is available as a poster from *WHOLE EARTH CATALOG* for \$2 postpaid. It's the same as the cover of the Fall '68 *CATALOG*, only 22" x 27". An order for five or more gets 50% discount.



Earth Photographs

NASA SP. 129 is a hell of a book. Two hundred forty-three full page color photographs of our planet from the Gemini flights of 1965. If it were a Sierra Club book, and it could be, it would cost \$25. It costs \$7.

There are numerous discoveries in the book. One is that this beautiful place is scarcely inhabited and scarcely inhabitable.



A second photograph of California's Imperial Valley giving a clear view of the Salton Sea. No agreement exists concerning the cause of the gyre seen in the center of the sea.

9-63-45748



Earth Photographs from Gemini III, IV, and V.

spread from Earth Photographs

NASA
 1967; 266 pp.

\$7.00 postpaid

Exploring Space With a Camera

NASA SP-168 (1968 O-292-583)
 1968, 214 pp.

\$4.25 postpaid

both from

U.S. Govt. Printing Office Bookstore
 710 North Capitol Street
 Washington, D. C. 20402

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 Federal Office Building
 219 S. Dearborn St.
 Chicago, Illinois 60604

U.S. Govt. Printing Office Bookstore
 Rm 135 Federal Building
 601 East 12th St
 Kansas City, Missouri 64106

U.S. Govt. Printing Office Bookstore
 Federal Building
 450 Golden Gate Avenue
 Rm 1023 Box 36104
 San Francisco, California 94102

or *WHOLE EARTH CATALOG*

Exploring Space With a Camera

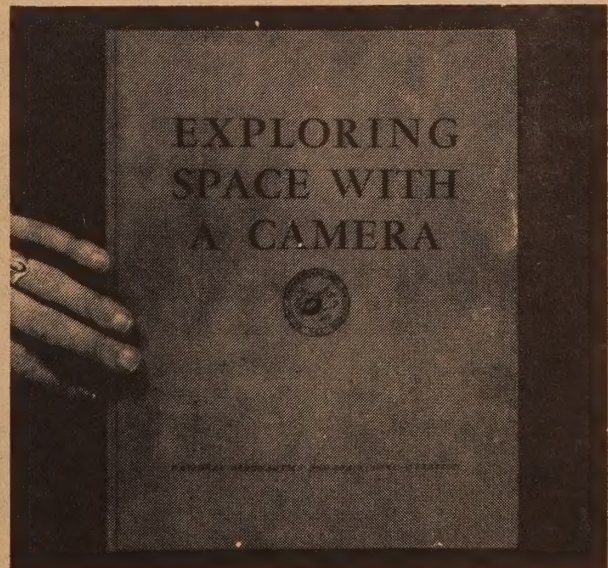
The Gemini photos book (above) is purer, but this new book of pictures from NASA really is better for understanding the whole systems of Earth, Earth-Moon, and Solar System. All of the outstanding photographs, color and black & white, up through Apollo 7 are here in one family album, with unusually complete information on what can be discovered in the images. It's NASA's bid for your interest in next steps in the real space odyssey. It's convincing.



A band of cirrus clouds crosses this picture of the Nile Valley and the Red Sea. "Such cloud bands," says KENNETH M. NAGLER, Chief, Space Operations Support Division, Environmental Science Services Administration, "normally occur on the equatorward side of the core of a strong westerly windflow known

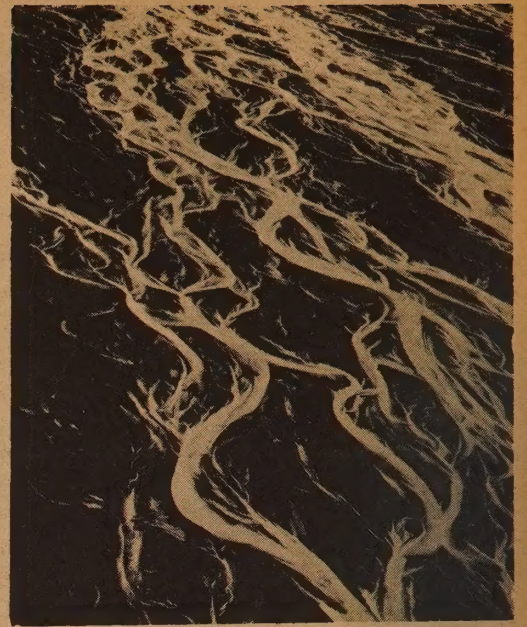
as the jetstream, in which winds of 100 knots to occasionally more than 200 knots are common. Often seen in less detail in weather-satellite views, these cirrus bands are particularly useful as indicators of the direction of the upper level wind. In the foreground small cumulus clouds are lined in rows."

GEMINI XII



The World From Above

Close-up glamor shots of the Earth. Mystery shots (What is that? What's our altitude above it, 10 feet or 10,000?) (Fold out captions tell all.) Good traffic flow pattern shots: surface anatomy of civilization. Not a bad compendium; it'll do until they reprint E.A. Gutkind's Our World From the Air.



The World From Above

Hanns Reich
1966; 88 pictures

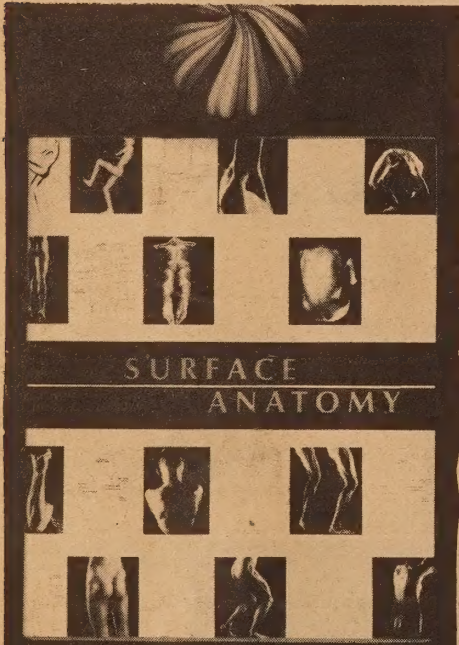
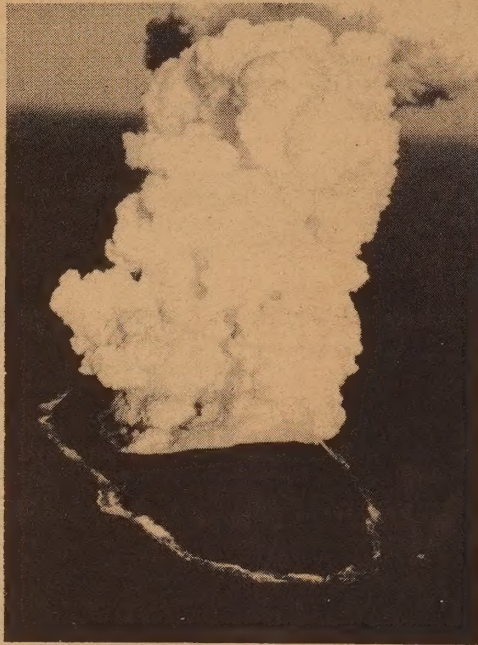
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from:
Hill and Wang, Inc.
141 Fifth Avenue
New York, N.Y. 10010
or
WHOLE EARTH CATALOG

Surface Anatomy

This book is included as a companion piece to the Earth picture books. The whole lovely system of the human creature, seen from without, surface by surface, is here. One of its main revelations is how cliché ridden our usual views of ourselves are — we are still not good with mirrors (satellites were up 10 years before we got a full view of the Earth). Posing friends and neighbors, with a simple light set-up and a 35mm camera, Joseph Royce has shot the most beautiful human album I know.

It also teaches anatomy.

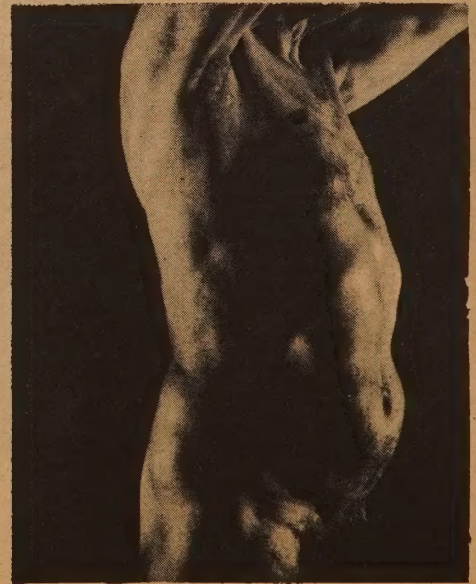
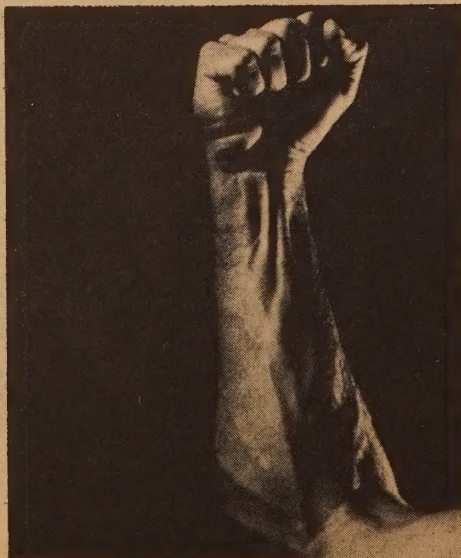
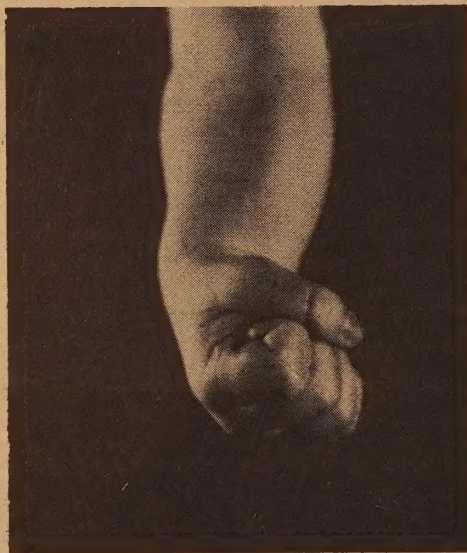


Surface Anatomy

Joseph Royce
1965; 124 photographs
and some diagrams

\$12.50 postpaid

from:
F.A. Davis Company
1914 Cherry Street
Philadelphia, Pa 19103
or
WHOLE EARTH CATALOG



Geology Illustrated

A artist of aerial photography, Shelton uses some 400 of his finest photos to illuminate a discussion of the whole-earth system. Not a traditional textbook, but a fascinating exploration of the problems posed by asking "How did that come about?" Worth buying for the photos and book design alone, but you'll probably find yourself becoming interested in geology regardless of your original intentions

[Reviewed by Larry McCombs]



As a means of communicating geological concepts, the pictures are fully as important as the words that accompany them. On most pages the photographs represent the facts, the words supply the interpretation. Many of the illustrations will, therefore, repay a little of the kind of attention that would be accorded the real feature in the field. In keeping with this, almost no identifying marks have been placed on the photographs and very few on the drawings. The text (which almost invariably concerns an illustration on the same or a facing page) serves as an expanded legend for the picture; if, while reading it, it is necessary to look more than once to identify some feature with certainty, this is no more than Nature asks of those who contemplate her unlabelled cliffs and hills.

Geology Illustrated

John S. Shelton
1966; 434 pp.

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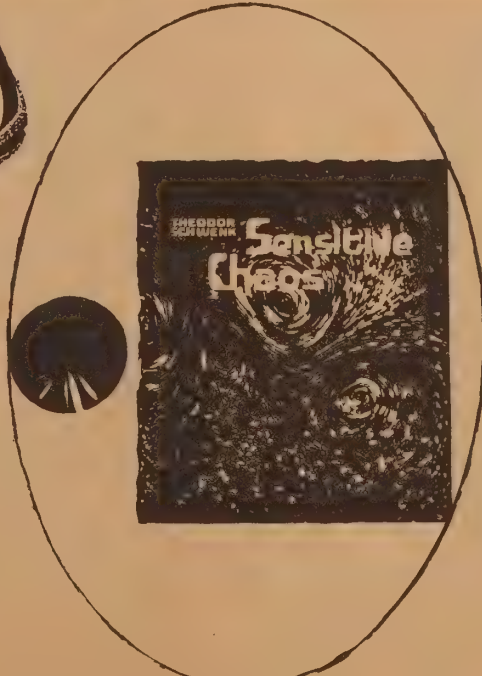
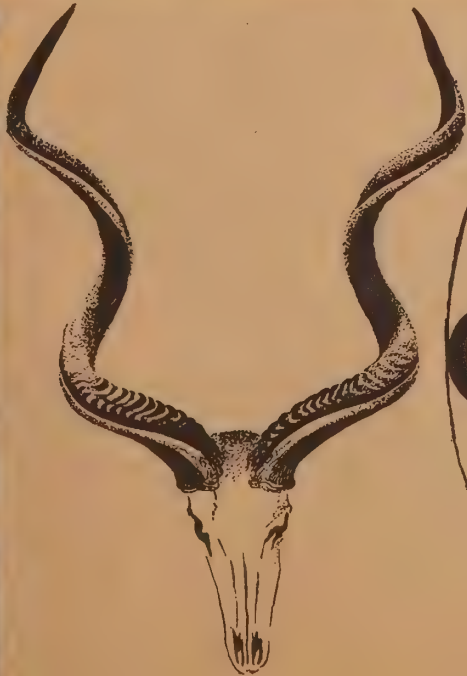
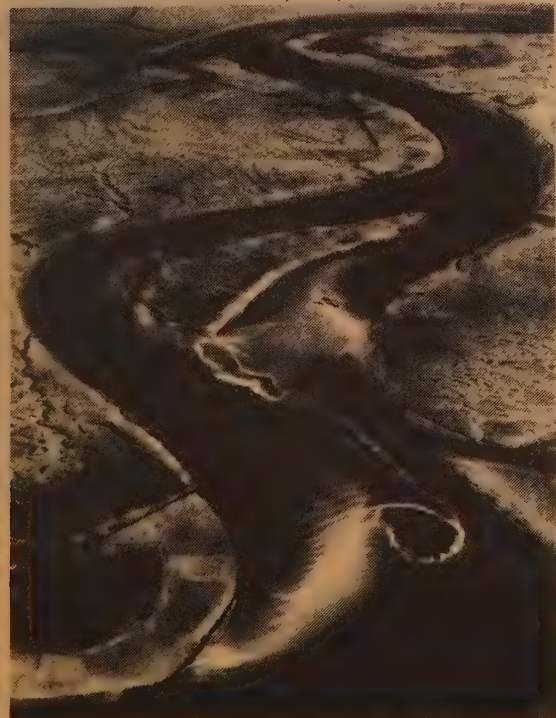
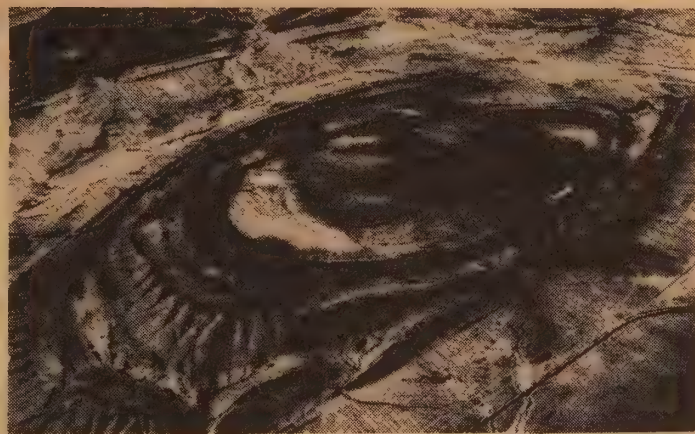
Sensitive Chaos

Schwenk directs an institute in the Black Forest devoted to the study of the movements of water and air.

Within the last few centuries, he says we have "lost touch with the spiritual nature of water." As a result, we have attempted to control the fluids in ways contrary to their nature, and the results are evident in the problems of pollution, damage to the ecosystem, and even drying up of natural water sources. Schwenk attempts to penetrate beyond the mere observable phenomena to an ability to "read" the true spiritual nature of flowing substances.

I found the book to be a peculiarly fascinating mixture of overgeneralization, simplification, undifferentiated fact and theory, and shrewd observation and insight. If you regard analogy as the weakest form of argument, this book is definitely not for you. On the other hand, Schwenk's juxtaposition of similar forms in different flowing media may spark some exciting bisociations, if you are open to them. The section of 88 pages of black and white photos at the back of the book could stand alone as a beautiful art collection.

[Suggested by Lama Foundation, reviewed by Larry McCombs]



Here too the form of the vortex seems to hover invisibly over the growth processes, even before the horns are actually there, for they proceed along this spiral path with mathematical exactitude in their annual growth. It is significant that the axes of the two spiralling horns meet either in the nose or the eyes or in their immediate vicinity, a fact which stresses the strong connection of the horns with sense perception and with the animal's sense of its surroundings. Furthermore, in structure, the horn, like the water vortex, is finely laminated, layer upon layer.

Sensitive Chaos

Theodor Schwenk
1965; 144 pp. 88 plates

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Human Use of the Earth

To get a handle on your future you've got to get outside yourself, because only from outside can you see your space-time environment whole. One way is to identify out into another culture, Indian or whatever (this is Jim Nixon's idea). Another way is to take Philip Wagner's trip into fascinated objectivity about Earthly doings. In this book he merges some of the best of geographical and anthropologic perspective into a detailed treatise on the Earth as tool, how it is used and how to understand it better to use it better.

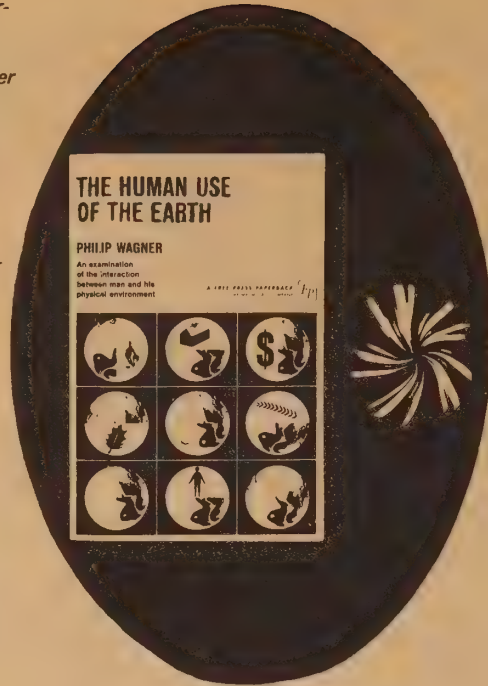
We have established Standard Orbit around a culturally active planet. Science Officer Wagner peers into the tricorder and intones:

The Human Use of the Earth

Philip Wagner
1960; 270 pp.

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Riverside, New Jersey 08075
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Manufacture adds vastly to the wealth upon which men can draw by making more things usable. It confers the status of resources upon things that are of no benefit to any other animal.

Those same features of the most complex human communities which indicate their ecological advantages also suggest an unusual degree of inherent ecological risk. Such communities are complex and delicately balanced, and depend utterly upon their artificiality. They and the individuals in them are threatened by the same biological penalties that attend any highly specialized system or species. Their very technical perfection may destroy them in time as other high specializations have destroyed many former species of animals and plants.

The individual organism must, on the one hand, be specialized enough in function to exploit some particular conditions in the habitat, so as to occupy a niche that no other organism can contest with it; and it must, on the other hand, possess enough versatility to adapt to any conditions of environment that may impinge upon its life activities. These two requirements may be thought of as polar extremes of a continuous scale, and every species may be placed somewhere along the scale between specialization and versatility. Some of the disadvantages of commitment to either specialization or versatility are overcome by aggregation of organisms into larger groups within the community.

Man lives as a member of natural communities. Being an animal, man is at least indirectly dependent upon plants for sustenance. He dwells in very intimate association with other animals and plants, and with other men, and is fully involved in the intricate complex of mutual relationships that runs through all of nature.

Symbiotic relations are those in which the life processes of one organism are in some essential way dependent upon other organisms. They may be either obligate relations, in which one individual cannot survive independently from other individuals, of the same or another kind; or facultative relations, in which an individual may, but need not, take advantage of the presence of some other organism to carry on its life processes. Using a broad conception of symbiosis, we shall speak of it as including 1) predation, in which an individual destroys members of its own or another species in seeking its own livelihood; 2) parasitism, in which an individual lives at the expense of other organisms without providing direct benefits to them; 3) mutualism, in which both individuals involved derive benefit from the relation; and 4) commensalism, in which two or more species or individuals of one species depend upon the same habitat conditions, which one or both may help to maintain.

The third and closest form of symbiosis among humans is full 'mutualism,' which we can equate with constitution of a single economy. There are three possible degrees of symbiosis among men: 1) those in which the mutual relationship which is the economy is much smaller in scope than the society (subsistence); 2) those in which there is a facultative mutual connection between the basic livelihood unit and the larger social group (peasant economies); and 3) those in which the limits of the economic unit and the social unit coincide, and the full obligate mutual relationship prevails throughout (commercial economy).

Eskimos keep their igloos hot. The microclimatology of buildings is a vast and little-known subject, but we may surmise that the interior climate of most kinds of buildings used by different human groups is about as follows: temperature mostly equal to or above prevailing outside temperature (except where thick walls are used, as in the Mediterranean area and Near East); humidity usually above the level of the open air; oxygen concentration considerably lower than outside, and carbon dioxide and other minor gases far more abundant; noxious odors very prevalent.

As we shall see, one of the strategies by which supplies of goods and services become available for actual use is the movement of the would-be consumers themselves to the sources of goods or services. There are even objects that act as containers of man himself, which move over land, across water or through the air, delivering the individual to the places at which he can obtain goods he desires, or where he will be served as he wishes.

Redistribution is a necessary condition and an essential feature of government, and governments always exercise a redistributive function. There is some similarity between the hostile economic intercourse discussed earlier and the redistributive relation, for both depend upon the employment or potential threat of force. The redistributive function specifically depends, however, upon a monopoly of force, and on an institutional relation established within a society. The regular and exclusive use of redistributive power by an agency organic to a given society is quite different from raids by enemies and the activity of criminals, and governments make every effort to suppress competition from this quarter. Authentic redistributive agencies often invoke as much violence, however, and show as little respect for individual 'rights' and interests, as do criminals and predatory raiders. Under both types of economy, goods and services are transferred not in return for goods and services of equal value—there may be no concept of equal value in these cases—but in accordance with the specific obligations of one person toward another, of an individual toward the redistributive state or collectivity, of the collectivity in turn toward individuals.

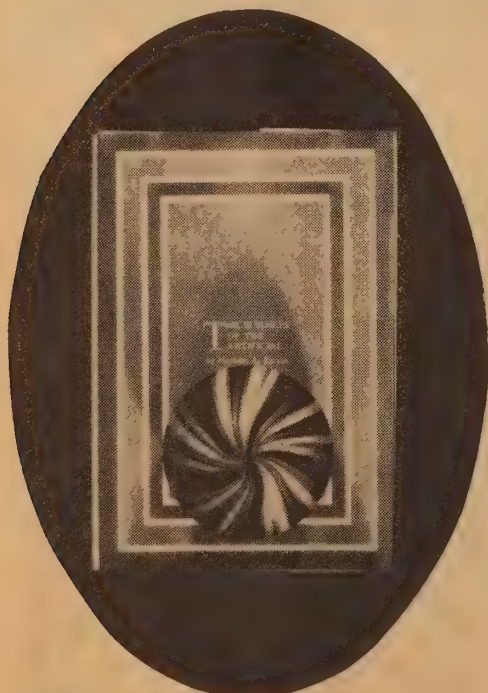
The modern inhabitant of a commercial country does not make his world; he buys it. The material circumstances of his life are not the outcome of his individual encounter with the natural order, but arise out of his relations with the social order.

Ecologically speaking, even very primitive man is an extremely far-ranging creature. Men have migrated far more widely than almost any other animals.

Man has been described as a 'tool-using animal,' but as is well known, many other higher mammals can employ natural objects spontaneously as tools. Tool making, however, is peculiar to man.

The Sciences of the Artificial

Simon says: we have generalized methods of obtaining elegant information from nature. We don't have generalized methods of making elegant things to add to nature; we lack a science of design. He's right and he doesn't waste much time being right, but proceeds to make useful suggestions—lots of them probably wrong and useful anyway. His notion of sub-system stability in evolution is beautiful.



The Artifact as 'Interface'

We can view the matter quite symmetrically. An artifact can be thought of as a meeting point—an 'interface' in today's terms—between an 'inner' environment, the substance and organization of the artifact itself, and an 'outer' environment, the surroundings in which it operates. If the inner environment is appropriate to the outer environment, or vice versa, the artifact will serve its intended purpose. Thus, if the clock is immune to buffeting, it will serve as a ship's chronometer. (And conversely, if it isn't, we may salvage it by mounting it on the mantel at home.)

A man, viewed as a behaving system, is quite simple. The apparent complexity of his behavior over time is largely a reflection of the complexity of the environment in which he finds himself.

I should like to point to evidence that there are only a few 'intrinsic' characteristics of the inner environment of thinking man that limit the adaptation of his thought to the shape of the problem environment. All else in his thinking and problem-solving behavior is artificial—is learned and is subject to improvement through the invention of improved designs.

From evidence obtained in other experiments, it has been estimated that only some seven items (or perhaps as few as two) can be held in the fast, short-term memory and that perhaps as many as five seconds are required to transfer an item from the short-term to the long-term store.

...all mathematical derivation can be viewed simply as change in representation, making evident what was previously true but obscure. This view can be extended to all of problem solving—solving a problem simply means representing it so as to make the solution transparent. If the problem solving could actually be organized in these terms, the issue of representation would indeed become central.

The Evolution of Complex Systems

Let me introduce the topic of evolution with a parable. There once were two watchmakers, named Hora and Tempus, who manufactured very fine watches. Both of them were highly regarded, and the phones in their workshops rang frequently—new customers were constantly calling them. However, Hora prospered, while Tempus became poorer and poorer and finally lost his shop. What was the reason?

The watches the men made consisted of about 1,000 parts each. Tempus had so constructed his that if he had one partly assembled and had to put it down—to answer the phone, say—it immediately fell to pieces and had to be reassembled from the elements. The better the customers liked his watches, the more they phoned him and the more difficult it became for him to find enough uninterrupted time to finish a watch.

The watches that Hora made were no less complex than those of Tempus. But he had designed them so that he could put together subassemblies of about ten elements each. Ten of these subassemblies, again, could be put together into a larger subassembly; and a system of ten of the latter subassemblies constituted the whole watch. Hence, when Hora had to put down a partly assembled watch in order to answer the phone, he lost only a small part of his work, and he assembled his watches in only a fraction of the man-hours it took Tempus.

The time required for the evolution of a complex form from simple elements depends critically on the numbers and distribution of potential intermediate stable forms.

A little reflection reveals that cues signaling progress play the same role in the problem-solving process that stable intermediate forms play in the biological evolutionary process. In fact, we can take over the watchmaker parable and apply it also to problem solving. In problem solving, a partial result that represents recognizable progress toward the goal plays the role of a stable subassembly.

If a complex structure is completely unredundant—if no aspect of its structure can be inferred from any other—then it is its own simplest description.

Most of the complex structures found in the world are enormously redundant, and we can use this redundancy to simplify their description. But to use it, to achieve the simplification, we must find the right representation.

The Sciences of the Artificial

Herbert Simon
1969; 123 pp.
from
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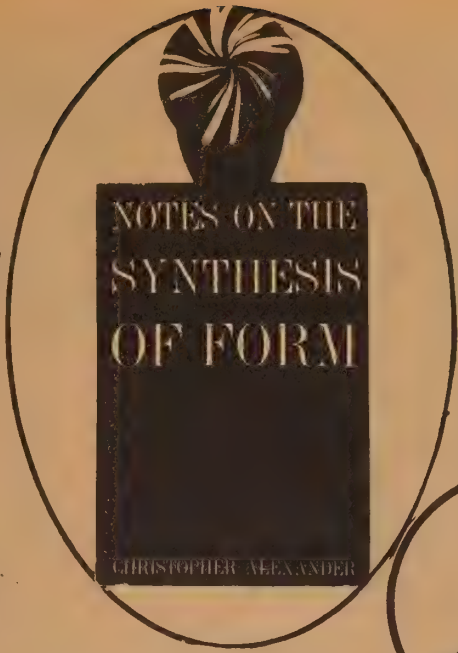
Synthesis of Form

Christopher Alexander is a design person that other design people refer to a lot. This book deals with the nature of current design problems that are expanding clear beyond any individual's ability to know and correlate all the factors. The methodology presented here is one of analysis of a problem for misfits and synthesis of form (via computer-translatable nets and hierarchies) for minimum misfits.

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But if we think of the requirements from a negative point of view, as potential misfits, there is a simple way of picking a finite set. This is because it is through misfit that the problem originally brings itself to our attention. We take just those relations between form and context which obtrude most strongly, which demand attention most clearly, which seem most likely to go wrong. We cannot do better than this. If there were some intrinsic way of reducing the list of requirements to a few, this would mean in essence that we were in possession of a field description of the context: if this were so, the problem of creating fit would become trivial, and no longer a problem of design. We cannot have a unitary or field description of a context and still have a design problem worth attention.



Notes on the Synthesis of Form

Christopher Alexander
1964; 216 pp.

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Indeed, not only is the man who lives in the form the one who made it, but there is a special closeness of contact between man and form which leads to constant rearrangement of unsatisfactory detail, constant improvement. The man, already responsible for the original shaping of the form, is also alive to its demands while he inhabits it. And anything which needs to be changed is changed at once.

A subsystem, roughly speaking, is one of the obvious components of the system, like the parts shown with a circle round them. If we try to adjust a set of variables which does not constitute a subsystem, the repercussions of the adjustment affect others outside the set, because the set is not sufficiently independent. The procedure of the unselfconscious system is so



organized that adjustment can take place in each one of these subsystems independently. This is the reason for its success.

In the selfconscious situation, on the other hand, the designer is faced with all the variables simultaneously

The greatest clue to the inner structure of any dynamic process lies in its reaction to change.

The Mousgoum cannot afford, as we do, to regard maintenance as a nuisance which is best forgotten until it is time to call the local plumber. It is in the same hands as the building operation itself, and its exigencies are as likely to shape the form as those of the initial construction.

The selfconscious individual's grasp of problems is constantly misled. His concepts and categories, besides being arbitrary and unsuitable, are self-perpetuating. Under the influence of concepts, he not only does things from a biased point of view, but sees them biasedly as well. The concepts control his perception of fit and misfit—until in the end he sees nothing but deviations from his conceptual dogmas, and loses not only the urge but even the mental opportunity to frame his problems more appropriately.

The solution of a design problem is really only another effort to find a unified description. The search for realization through constructive diagrams is an effort to understand the required form so fully that there is no longer a rift between its functional specification and the shape it takes.

Two misfits are seen to interact only because, in some sense at least, they deal with the same kind of physical consideration. It is such a physical center of implication, if I may call it that, which the designer finds it easy to grasp. Because it refers to a distinguishable physical property or entity, it can be expressed diagrammatically, and provides a possible non-verbal point of entry into the problem.

On Growth and Form

A paradigm classic. Everyone dealing with growth or form in any manner can use the book. We've seen worn copies on the shelves of artists, inventors, engineers, computer systems designers, biologists. Would one of you do a thorough review of D'Arcy Thompson's venerable book for the CATALOG?

When Plateau made the wire framework of a regular tetrahedron and dipped it in soap-solution, he obtained in an instant a beautifully symmetrical system of six films, meeting three by three in four edges and these four edges running from the corners of the figure to its centre of symmetry. Here they meet, two by two, at the Maraldi angle; and the films meet three by three, to form the re-entrant solid angle which we have called a 'Maraldi pyramid' in our account of the architecture of the honeycomb. The very same configuration is easily recognized in the minute siliceous skeleton of *Callimitra*. There are two discrepancies, neither of which need raise any difficulty. The figure is not rectilinear but a spherical tetrahedron, such as might be formed by the boundary edges of a tetrahedral cluster of four co-equal bubbles; and just as Plateau extended his experiment by blowing a small bubble in the centre of his tetrahedral system, so we have a central bubble also here.

This bubble may be of any size; but its situation (if it be present at all) is always the same, and its shape is always such as to give the Maraldi angles at its own four corners. The tension of its own walls, and those of the films by which it is supported or slung, all balance one another. Hence the bubble appears in plane projection as a curvilinear equilateral triangle; and we have only got to convert this plane diagram into the corresponding solid to obtain the spherical tetrahedron we have been seeking to explain (Fig. 63).

The geometry of the little inner tetrahedron is not less simple and elegant. Its six edges and four faces are all equal. The films attaching it to the outer skeleton are all planes. Its faces are spherical,



Fig. 63. Diagrammatic construction of *Callimitra*. (a) A bubble suspended within a tetrahedral cage; (b) another bubble within a skeleton of the former bubble.

and each has its centre in the opposite corner. The edges are circular arcs, with cosine $\frac{1}{3}$; each is in a plane perpendicular to the chord of the arc opposite, and each has its centre in the middle of that chord. Along each edge the two intersecting spheres meet each other at an angle of 120° .¹

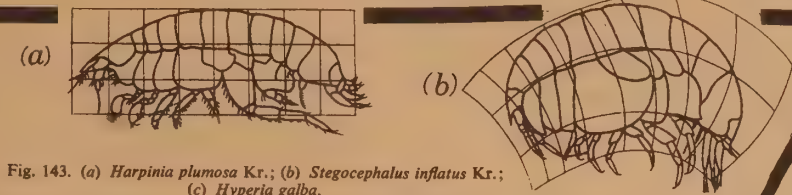


Fig. 143. (a) *Harpinia plumosa* Kr.; (b) *Stegocephalus inflatus* Kr.; (c) *Hyperia galba*.

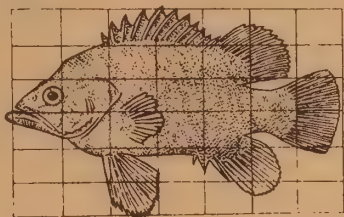


Fig. 150. *Polyprion*.

Fig. 151. *Pseudopriacanthus altus*.

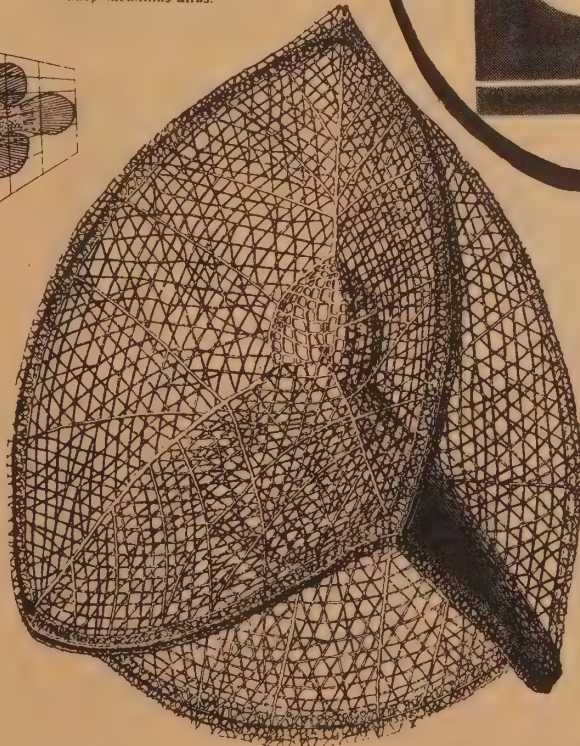
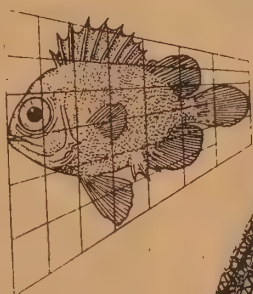


Fig. 62. A Nassellarian skeleton, *Callimitra agnesae* Hkl. (0.15 mm. diameter)

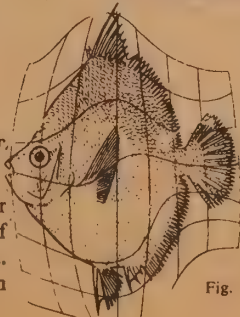


Fig. 153. *Antigonia capros*.

The engineer, who had been busy designing a new and powerful crane, saw in a moment that the arrangement of the bony trabeculae was nothing more nor less than a diagram of the lines of stress, or directions of tension and compression, in the loaded structure: in short, that Nature was strengthening the bone in precisely the manner and direction in which strength was required; and he is said to have cried out, 'That's my crane!'



On Growth and Form

D'Arcy Wentworth Thompson
Two volume edition
1917, 1952

\$27.50 postpaid (Currently out of print)

Abridged paper edition
1917, 1961; 346 pp.

\$2.75 postpaid

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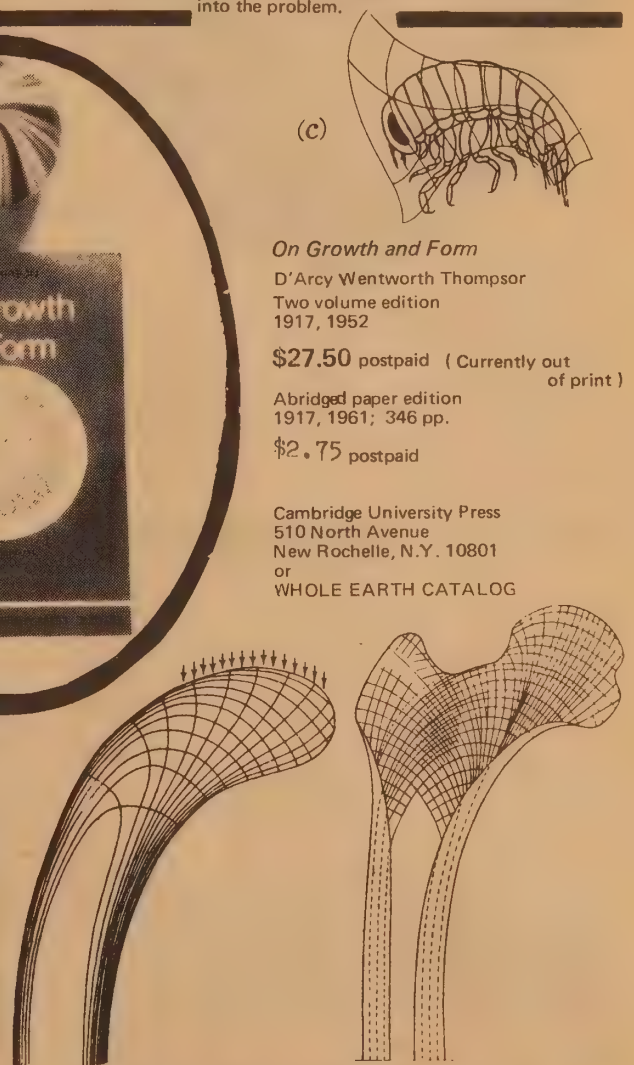


Fig. 101. Crane-head and femur. After Culmann and J. Wolff.

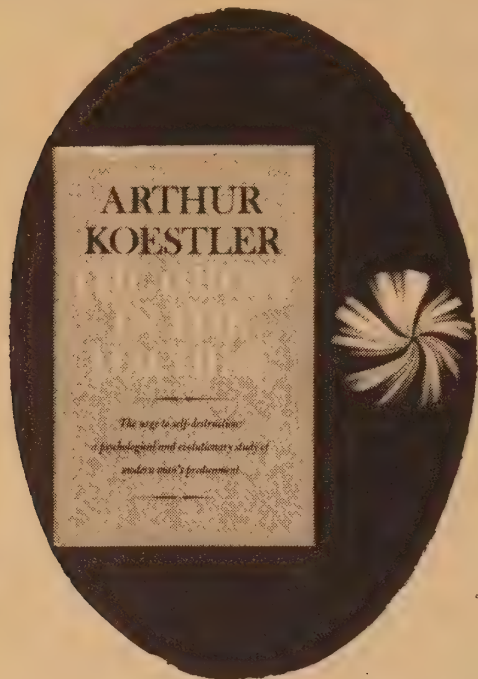


The Ghost in the Machine

Koestler's latest book seems to be sharing the fate of Norman O. Brown's *Love's Body*: the book after the big influential one (*Act of Creation, Life Against Death*) is considered too far out, fragmented, excessive... and sells half-heartedly.

Nevermind. Koestler here is doing useful dirty work: saving rat psychology, exploring broader implications of biological systems research, and foreseeing our imminent demise unless we organize our brain-use better. Which brings him to drugs. He proposes research to find a chemical which will voluntarily disengage old-brain from new-brain—the interior emotional kill-heavy unprogrammable stuff from exterior rational flexible stuff. Our paranoia is accidentally designed in, he suggests, and may be designed out.

Get to it, outlaws. No nation is going to support this research.



The Ghost in the Machine

Arthur Koestler
1967; 384 pp.

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The Year 2000



Is Herman Kahn the bad guy (as liberal opinion would have it) or a good guy (as in some informed opinion)? Kahn will hang you on that question and while you're hanging jam information and scalding notions into your ambivalence. He does this best with a live audience, but this book is a fine collection of the information he uses.

Here is most of the now-basic methodology of future study—multi-fold trends, surprise-free projections, scenarios, etc. And here are their results. It's the best future-book of the several that are out.

In my opinion, it is not particularly an accurate picture of the future but the most thorough picture we have of the present—the present statistics, present fantasies, present expectations that we're planning with. We are what we think our future is.

If computer capacities were to continue to increase by a factor of ten every two or three years until the end of the century (a factor between a hundred billion and ten quadrillion), then all current concepts about computer limitations will have to be reconsidered. Even if the trend continues for only the next decade or two, the improvements over current computers would be factors of thousands to millions. If we add the likely enormous improvements in input-output devices, programming and problem formulation, and better understanding of the basic phenomena being studied, manipulated, or simulated, these estimates of improvement may be wildly conservative. And even if the rate of change slows down by several factors, there would still be room in the next thirty-three years for an overall improvement of some five to ten orders of magnitude. Therefore, it is necessary to be skeptical of any sweeping but often meaningless or nonrigorous statements such as "a computer is limited by the designer—it cannot create anything he does not put in," or that "a computer cannot be truly creative or original." By the year 2000, computers are likely to match, simulate, or surpass some of man's most "human-like" intellectual abilities, including perhaps some of his aesthetic and creative capacities, in addition to having some new kinds of capabilities that human beings do not have. These computer capacities are not certain; however, it is an open question what inherent limitations computers have. If it turns out that they cannot duplicate or exceed certain characteristically human capabilities, that will be one of the most important discoveries of the twentieth century.

The Year 2000

Herman Kahn and Anthony J. Wiener
1967; 431 pp.

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ESCAPE FROM SPECIALIZATION

There is now strong evidence in favour of the theory, proposed by Garstang as far back as 1928, that the chordates—and thus, we, the vertebrates—are descended from the larval stage of some primitive echinoderm, perhaps rather like the sea-urchin or sea cucumber (echinoderm = "prickly-skinned"). Now an adult sea cucumber would not be a very inspiring ancestor—it is a sluggish creature which looks like an ill-stuffed sausage with leathery skin, lying on the sea bottom. But its free-floating larva is a much more promising proposition: unlike the adult sea cucumber, the larva has bilateral symmetry like a fish; it has a ciliary band—a forerunner of the nervous system—and some other sophisticated features not found in the adult animal. We must assume that the sedentary adult residing on the the sea bottom had to rely on mobile larvae to spread the species far and wide in the ocean, as plants scatter their seeds in the wind; that the larvae, which had to fend for themselves, exposed to much stronger selective pressures than the adults, gradually became more fish-like; and that eventually they became sexually mature while still in the free-swimming, larval state—thus giving rise to a new type of animal which never settled on the bottom at all, and altogether eliminated the senile, sedentary cucumber stage from its life history.

This speeding up of sexual maturation relative to the development of the rest of the body—or, to put it differently, the gradual retardation of bodily development beyond the age of sexual maturation—is a familiar evolutionary phenomenon, known as neoteny. Its result is that the animal begins to breed while still displaying larval or juvenile features; and it frequently happens that the fully adult stage is never reached—it is dropped off the life cycle.

This tendency towards a 'prolonged childhood', with the corresponding squeezing out of the final adult stages, amounts to a rejuvenation and de-specialization of the race—an escape from the cul-de-sac in the evolutionary maze. As J.Z. Young wrote, adopting Garstang's views: 'The problem which remains is in fact not "how have vertebrates been formed from sea squirts?", but "how have vertebrates eliminated the (adult) sea squirt stage from their life history? It is wholly reasonable to consider that this has been accomplished by pedomorphosis....'

Neoteny in itself is of course not enough to produce these evolutionary bursts of adaptive radiations. The 'rejuvenation' of the race merely provides the opportunity for evolutionary changes to operate on the early, malleable phases of ontogeny: hence pedomorphosis, 'the shaping of the young'. In contrast to it, gerontomorphosis (geras = old age) is the modification of fully adult structures which are highly specialized. This sounds like a rather technical distinction, but it is in fact of vital importance. Gerontomorphosis cannot lead to radical changes and new departures; it can only carry an already specialized evolutionary line one more step further in the same direction—as a rule into the dead end of the maze.

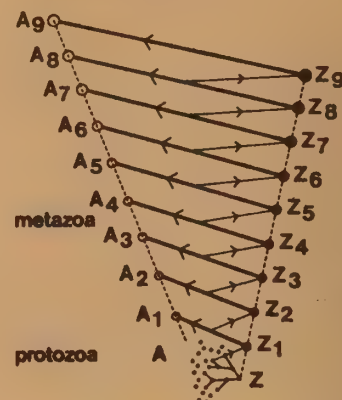
DRAW BACK TO LEAP

It seems that this retracing of steps to escape the dead ends of the maze was repeated at each decisive evolutionary turning point. I have mentioned the evolution of the vertebrates from a larval form of some primitive echinoderm. Insects have in all likelihood emerged from a millipede-like ancestor—not, however, from adult millipedes, whose structure is too specialized, but from its larval forms. The conquest of the dry land was initiated by amphibians whose ancestry goes back to the most primitive type of lung-breathing fish; whereas the apparently more successful later lines of highly specialized gill-breathing fishes all came to a dead end. The same story was repeated at the next major step, the reptiles, who derived from early, primitive amphibians—not from any of the later forms that we know.

And lastly, we come to the most striking case of pedomorphosis, the evolution of our own species. It is now generally recognized that the human adult resembles more the embryo of an ape rather than an adult ape.

Figure 10 is from Garstang's original paper, and is meant to represent the process of evolution by pedomorphosis. Z to Z9 is the progression of zygotes (fertilized eggs) along the evolutionary ladder; A to Ag represents the adult forms resulting from each zygote. Thus the black line from Z4 to A4, for instance, represents ontogeny, the transformation of egg into adult; the dotted line from A to Ag represents phylogeny—the evolution of higher forms. But note that the thin lines of evolutionary progress do not lead directly from, say, A4 to A5—that would be gerontomorphosis, the evolutionary transformation of an adult form. The line of progress branches off from the unfinished, embryonic stage of A4. This represents a kind of evolutionary retreat from the finished product, and a new departure towards the evolutionary novelty Z5—A5. A4 could be the adult sea cucumber; then the branching-off point on the line A4—Z4 would be its larva; or A8 could be the adult primate ancestor of man, and the branching-off point its embryo—which is so much more like the Ag—ourselves.

FIGURE 10



(after Garstang); see text

But Garstang's diagram could also represent a fundamental aspect of the evolution of ideas.

The revolutions in the history of science are successful escapes from blind alleys. The evolution of knowledge is continuous only during those periods of consolidation and elaboration which follow a major break-through. Sooner or later, however, consolidation leads to increasing rigidity, orthodoxy, and so into the dead end of overspecialization—to the koala bear. Eventually there is a crisis and a new 'break-through' out of the blind alley—followed by another period of consolidation, a new orthodoxy and so the cycle starts again.

But the theoretical structure which emerges from the break-through is not built on top of the previous edifice; it branches out from the point where progress has gone wrong. The great revolutionary turns in the evolution of ideas have a decidedly pedomorphic character. Each zygote in the diagram would represent a seminal idea, the seed out of which a new theory develops until it reaches its adult, fully matured stage. One might call this the ontogeny of a theory. The history of science is a series of such ontogenies. True novelties are not derived directly from a previous adult theory, but from a new seminal idea—not from the sedentary sea urchin but from its mobile larva. Only in the quiet periods of consolidation do we find gerontomorphosis—small improvements added to a fully grown, established theory.

At first sight the analogy may appear far-fetched; I shall try to show that it has a solid factual basis. Biological evolution is to a large extent a history of escapes from the blind alleys of overspecialization, the evolution of ideas a series of escapes from the bondage of mental habit; and the escape mechanism in both cases is based on the principle of undoing and re-doing, the draw-back-to-leap pattern.

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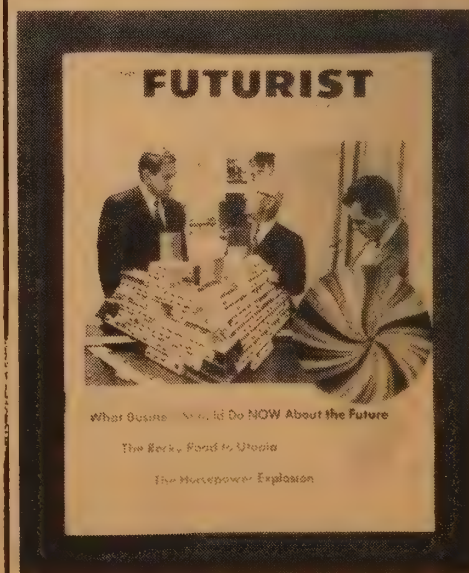
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TABLE IX

The Postindustrial (or Post-Mass Consumption) Society

1. Per capita income about fifty times the preindustrial
2. Most "economic" activities are tertiary and quaternary (service-oriented), rather than primary or secondary (production-oriented)
3. Business firms no longer the major source of innovation
4. There may be more "consentives" (vs. "marketives")
5. Effective floor on income and welfare
6. Efficiency no longer primary
7. Market plays diminished role compared to public sector and "social accounts"
8. Widespread "cybernation"
9. "Small world"
10. Typical "doubling time" between three and thirty years
11. Learning society
12. Rapid improvement in educational institutions and techniques
13. Erosion (in middle class) of work-oriented, achievement-oriented, advancement-oriented values
14. Erosion of "national interest" values
15. Sensate, secular, humanist, perhaps self-indulgent criteria become central



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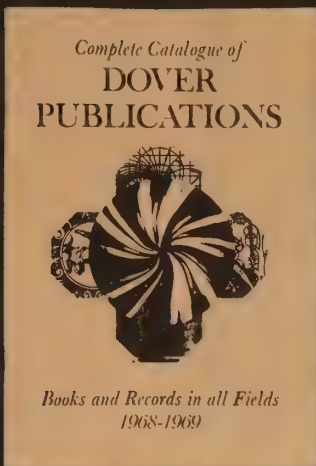
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The sphere is a conceptual representation of the biosphere of the earth, with all information arrayed in a highly random way. Self-reflexive consciousness occurs as a point on the sphere, the natural product of biological activity. The location of a point on the surface is immaterial of course. Information about the environment (contained at any single point) is nil, the only awareness being of the point's own existence. From this point, the information acquired by the self-reflexive system is gathered according to the principle of least work, i.e. the most accessible information is gathered first, and this process produces a circle of enlightenment rolling out from the point of self-reflexion. Now the information on the sphere is distributed more or less randomly; it is improbable that a great deal of information about a component of the ecosystem will be concentrated in one region; instead this information is spread about, more like chocolate in a marble cake than like raisins in raisin bread. The information about the environment which man extracts from the sphere is never complete (even information about the most minute phenomenon) unless all information has been extracted.

But as the circle of enlightenment becomes larger, its perimeter cannot enlarge without limit. Its extent cannot, of course, exceed that of the sphere's circumference, and when it reaches that limit it forms a Great Circle and enlightenment covers half the surface, and contains approximately half the information originally contained on the surface. With further enlightenment, the radius of the circle grows but its perimeter diminishes, an extraordinary phenomenon. The many specialties into which the perimeter was broken in order to grow so larger are no longer required, and begin to synthesize with one another at an increasing rate, until what is unknown implodes, the circle vanishes and the entire sphere has been explored. All specialties (which are particular world-views from different perspectives) merge into one. All individuals then see the world from the same perspective, that is, they see it comprehensively. No longer will one man's trivia be another man's data; there will be no disagreement over the importance of any bit of information. It does indeed seem to approximate a state of enlightenment.

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WHOLE EARTH CATALOG

The left-handed chank mentioned above is an example of a phenomenon for which there is no scientific explanation, the shell of a normally right-handed species building contrary to nature's established functions. These left-handed shells preserve to the minutest details everything necessary to the animal's well-being, and are in every way the exact mirror image of the normal shell. They are of great rarity and therefore very valuable. It may well be that the Hindu priest serving medicine in the holy shell (the left-handed chank, usually decorated with gold and precious stones) to an ailing member of his community has found the strength of belief that gives him the power to produce a miracle. Seeing the shell's perfection in spite of its contrary conception, he is reminded of all the other wonders of creation and its greatness, and this mystical encouragement tends to give success to his performance.



It is known, of course, that the emperor of Japan is the foremost shell collector of the land; this makes shell collecting not only fashionable but also stimulates people of all social levels to competition. We shall never forget visiting the house of a notable collector-scientist in Kyoto whose vast collection, it was whispered, was more complete than the emperor's. (Such statements, naturally, are never made aloud.) The dignity of his home, with its doors wide open to the gardens all around, seemed to make it literally a "museum without walls." We vividly recall the simple austerity of the setting as we knelt or sat on the matted floor around our wise and friendly host, a company of four brought together by a common interest. New and beautiful shells were brought in constantly by the master's disciples, disappearing swiftly after we had admired them to make place for still more beautiful shells. Certain rare shells were delicately lifted from their boxes by our host and placed on a low table before us. When this happened, the conversation of the Japanese ceased and everyone contemplated the piece with intense interest. The atmosphere, beginning in a relaxed mood, had now become ceremonial.

Three hours and thousands of shells later when we took our leave, we felt ourselves enriched and refreshed by an experience of mysterious spiritual strength. Still under the spell of the ritualistic contemplation of the shells, we groped awkwardly for words of thanks, the interpreter making no attempt to translate what we were trying to say. Apparently our host understood perfectly. His indulgent smile seemed to tell us, "Don't thank me, thank the shells." What he said in reality was, "You have not seen half my collection."

A Year From Monday

The question is: Is my thought changing? It is and it isn't. One evening after dinner I was telling friends that I was now concerned with improving the world. One of them said: I thought you always were. I then explained that I believe—and am acting upon—Marshall McLuhan's statement that we have through electronic technology produced an extension of our brains to the world formerly outside of us. To me that means that the disciplines, gradual and sudden (principally Oriental), formerly practiced by individuals to pacify their minds, bringing them into accord with ultimate reality, must now be practiced socially—that is, not just inside our heads, but outside of them, in the world, where our central nervous system now is. This has brought it about that the work and thought of Buckminster Fuller is of prime importance to me. He more than any other to my knowledge sees the world situation—all of it—clearly and has fully reasoned projects for turning our attention away from "killingry" toward "livingry."

Everything we come across is to the point. Living underground because there was no money. Arizona land and air permitted making mounds, covering them with cement, excavating to produce rooms, providing these with skylights. For anyone approaching, the community was invisible. Cacti, desert plants: the land seemed undisturbed. Quantity (abundance) changes what's vice, what's virtue. Selfishness is out; carelessness is in. (Waste's

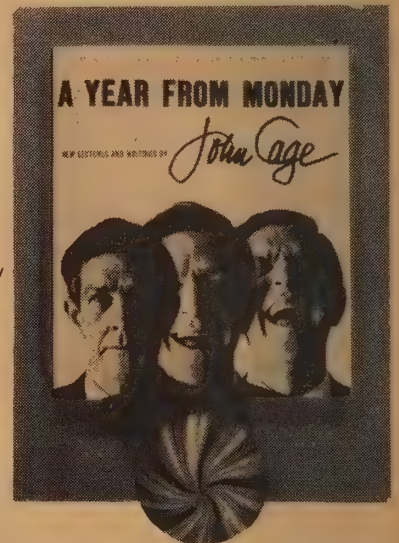
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John Cage
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to wait. XXXVI. Weather feels good. Isn't. More rain is needed. Water. He played two games, winning one, losing the other. He was continually himself, totally involved in each game, unmoved by the outcome of either. What's the nature of his teaching? For one thing: devotion (practice gives evidence of it). For another: not just playing half the game but playing all of it (having a view that includes that of the opponent). Suddenly a clam rose to



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No one develops his personality because someone told him it would be useful or advisable for him to do so. Nature has never yet allowed herself to be imposed upon by well-meaning advice. Only coercion working through casual connections moves nature, and human nature also. Nothing changes itself without need, and human personality least of all. It is immensely conservative, not to say inert. Only the sharpest need is able to rouse it. The development of personality obeys no wish, no command, and no insight, but only need; it wants the motivating coercion of inner or outer necessities. Any other development would be individualism. This is why the accusation of individualism is a cheap insult when it is raised against the natural development of personality.

The man who would learn the human mind will gain almost nothing from experimental psychology. Far better for him to put away his academic gown, to say good-bye to the study, and to wander with human heart through the world. There, in the horrors of the prison, the asylum, and the hospital, in the drinking-shops, brothels, and gambling halls, in the salons of the elegant, in the exchanges, socialist meetings, churches, religious revivals, and sectarian ecstasies, through love and hate, through the experience of passion in every form in his own body, he would reap richer store of knowledge than text-books a foot thick could give him. Then would he know to doctor the sick with real knowledge of the human soul.

A neurosis has really come to an end when it has overcome the wrongly oriented ego. The neurosis itself is not healed; it heals us. The man is ill, but the illness is an attempt of nature to heal him. We can therefore learn a great deal for the good of our health from the illness itself, and that which appears to the neurotic person as absolutely to be rejected is just the part which contains the true gold which we should otherwise never have found.

The secret of the earth is not a joke and not a paradox. We need only see how in America the skull- and hip-measurements of all European races become Indianized in the second generation. That is the secret of the American soil. And every soil has its secret, of which we carry an unconscious image in our souls: a relationship of spirit to body and of body to earth.

The greater the contrast, the greater is the potential. Great energy only comes from a correspondingly great tension between opposites.

The Human Use of Human Beings

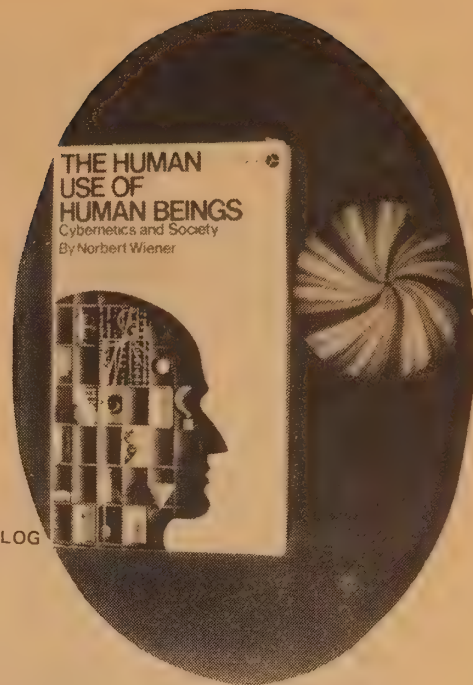
A proper sequel to his Cybernetics [see p. 62], this book is social, untechnical, ultimate in most of its considerations. Its domain is the whole earth of the mind.

Norbert Wiener is one of the founders of an n-dimensional inhabited world whose nature we've yet to learn.

The Human Use of Human Beings
Norbert Wiener
1950, 1954; 288pp.

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It is the thesis of this book that society can only be understood through a study of the messages and the communication facilities which belong to it; and that in the future development of these messages and communication facilities, messages between man and machine and between machine and machine, are destined to play an ever-increasing part.

Messages are themselves a form of pattern and organization. Indeed, it is possible to treat sets of messages as having an entropy like sets of states of the external world. Just as entropy is a measure of disorganization, the information carried by a set of messages is a measure of organization. In fact, it is possible to interpret the information carried by a message as essentially the negative of its entropy, and the negative logarithm of its probability. That is, the more probable the message, the less information it gives. Clichés, for example, are less illuminating than great poems.

I believe that Ashby's brilliant idea of the unpurposeful random mechanism which seeks for its own purpose through a process of learning is not only one of the great philosophical contributions of the present day, but will lead to highly useful technical developments in the task of automatization. Not only can we build purpose into machines, but in an overwhelming majority of cases a machine designed to avoid certain pitfalls of breakdown will look for purposes which it can fulfill!

We are not stuff that abides, but patterns that perpetuate themselves. A pattern is a message, and may be transmitted as a message.

It is the great public which is demanding the utmost of secrecy for modern science in all things which may touch its military uses. This demand for secrecy is scarcely more than the wish of a sick civilization not to learn the progress of its own disease.

It is illuminating to know that the sort of phenomenon which is recorded subjectively as emotion may not be merely a useless epiphenomenon of nervous action, but may control some essential stage in learning, and in other similar processes.

It is naturally a fundamental error to believe that if we see an anti-value in a value, or an untruth in a truth, the value or the truth is then invalid. They have only become relative. Everything human is relative, because everything depends upon an inner polarity, for everything is a phenomenon of energy. And energy itself necessarily depends on a previous polarity without which there can be no energy. There must always be high and low, hot and cold, etc., so that the process of adjustment which is energy, can occur. The tendency to deny all previous values in favour of their opposites is therefore just as exaggerated as the former one-sidedness. Where generally accepted and undoubted values are suddenly thrown away, there is a fatal loss. Whoever acts in this way ends by throwing himself overboard with the discarded values.

The gigantic catastrophes that threaten us are not elemental happenings of a physical or biological kind, but are psychic events. We are threatened in a fearful way by wars and revolutions that are nothing else than psychic epidemics. At any moment a few million people may be seized by a madness, and then we have another world war or devastating revolution. Instead of being exposed to wild beasts, tumbling rocks, and inundating waters, man is exposed today to the elemental forces of his own psyche. Psychic life is a world-power that exceeds by many times all the powers of the earth. The Enlightenment, which stripped nature and human institutions of gods, overlooked the one god of fear who dwells in the psyche. Fear of God is in place, if anywhere, before the domination power of psychic life.

No doubt it is a great nuisance that mankind is not uniform but compounded of individuals whose psychic structure spreads them over a span of at least ten thousand years. Hence there is absolutely no truth that does not spell salvation to one person and damnation to another. All universalisms get stuck in this terrible dilemma.

Tantra Art

Every phenomenal object is the concentration and reflection of a certain pattern.

There exists no form of concentration more absolute than the creation of images.

Yantra is an apparatus to connect one outside time and space in eternity.

In this way is a path toward truth and realization of the self.



For any one interested in Yantra, Mandalas, Archetypal art, 'Objective' art this book is invaluable. Incredible color and B&W reproductions of works not usually available or attainable. This book will become a standard dictionary for 'objective' language study. Recommend concurrent readings of Tucci's Theory & Practice of the Mandala, Tantra Art, as text, while poetic and interesting is not precise or specific enough for those desiring all de tales.

[Reviewed by Steve Durkee. Suggested by Ann Hogle.]

Tantra Art is said to be going out of print, though a few copies are still available from Shambala and WHOLE EARTH. However, Mookerjee is supposed to be coming out with a second volume this summer, also published by Ravi Kumar in Paris. We'll report on availability in the Supplement to the CATALOG.

Meanwhile, you can still get six of the best images (including above) from Tantra Art in poster form—\$2.50 postpaid each—from Shambala or WHOLE EARTH.

Tucci's Mandala book is not currently in print.

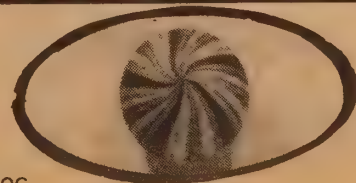
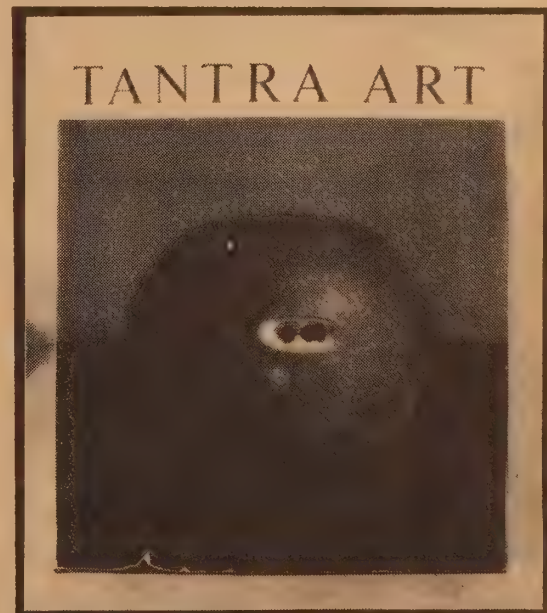
**“What is here, is elsewhere.
What is not here, is nowhere.”**

Vishvasara Tantra

Tantra Art
Ajit Mookerjee
1966; 100 pp.

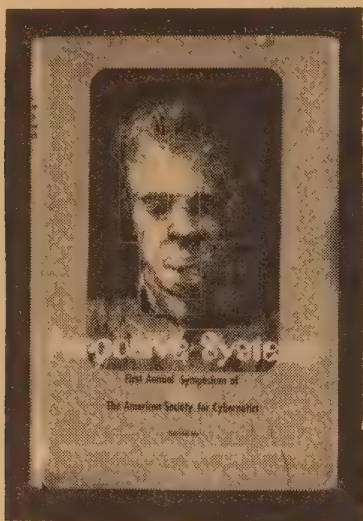
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Purposive Systems

You're a purposive system. So am I. We're very good at it, and not as good as we'd like to be. Humanity, as a whole, is lousy at it, and worried. This collection of recent cybernetic thoughts can cheer you up and give you better concepts to worry with.



Purposive Systems

Ed.: Heinz von Foerster, J. D. White, L. J. Peterson, J. K. Russell
1968; 179 pp.

\$10.00 postpaid

from
Spartan Books
432 Park Avenue South
New York, N. Y. 10016
or
WHOLE EARTH CATALOG

We have not yet built into our educational system any recognition of the points where precision is essential, and yet we are living in a society where one mistake can dislocate the lives of thousands of people, wreck distribution systems, and distort life-history data, and subsequent career lines.

I have always regarded a drop of water sliding down a slightly inclined plain as showing all the manifestations of purposeful behavior. It is going downhill because it 'wants to get somewhere' and it does so by an erratic and quite unpredictable path. Another, more obvious, example of purposeful behavior is that of a homing torpedo or missile or, also, for those of you who had the pleasure of seeing it, Shannan's demonstration at one of the early cybernetics conferences. He brought in a maze, a checkerboard of squares with wire walls and a true open thoroughway with a blind alley. His 'subject,' which he called a mouse, was propelled by motors in two coordinates. It ran into walls all along the way, but finally, after innumerable blunders, it reached the end. Shannan then put the mouse back at the starting point and, without an error, it went directly through the correct path to the end. This was purposeful behavior in the best sense; it was learning in the best sense; and the mechanism producing it was elegant and simple in the best sense. The machinery was simply set so that the direction in which the mouse left a given square for the last time was the one it 'remembered' and, since the only time it never came back was when it was on the right path, it was automatically programmed for completely 'purposeful' and correct behavior.

Man, of course, spends his life riding two rails—the rail of the desired, what he wants the future to be like for him, and the rail of the expected, what he thinks or fears it's going to be.

Two evaluations are necessary: one before and one after the innovation. The first is an evaluation of prospects. The second is an evaluation of results. The uncertainty inherent in technological innovation means there will usually be a difference between the two. To that extent, new technology will lead to value change.

There is no basic reason why one cannot design a control memory with a different technology, a technology which would allow the computer itself to alter the information stored in the control memory. Thus we would have a computer that could alter its own character as required. To my knowledge very little conceptual work has been done in thinking through the implications of this extremely powerful possibility. The possibilities are so staggering and deep. The poor harried souls responsible for trying to understand the classical computer as we now know it wish this idea would go away.

The act of choosing a representation for a problem involves the specification of a space where the search for solution can take place. Such a specification involves the choice of a language—and its use—for expressing problem conditions, properties of solutions, and knowledge of regularities in the search space.

If we detach the concern of survival from computers, as is generally the case, they can learn abilities more useful to man than the struggle for existence.

Exaggerated politeness is a powerful source of misunderstanding.

The great symbol of the eolithic impulse, submerged but not suppressed, is the junkman. Both he and his customers suffer from social disesteem because they do not bow to the dominant principle of design. The logic of the design principle eats farther into the organization of life when designers go from uniformity of materials to uniformity of parts and kits whose mass production eliminates all competing intermediate species. Thus, more and more it happens that a practical man, wanting to satisfy his individual and, by the new standard, eccentric wants, is forced to improvise with materials never intended for these purposes. In the interest of mass production, men's goals themselves are forced into restricted and stereotype patterns.

A friend of mine once gave what I regard as a nice shorthand formula. When in a dilemma, introduce novelty.

Regularity seeking activities that seem to be generally useful include the detection of symmetries, the identification of 'critical points' (key points through which the search must go to get a solution), and the recognition of redundant information in problem descriptions.

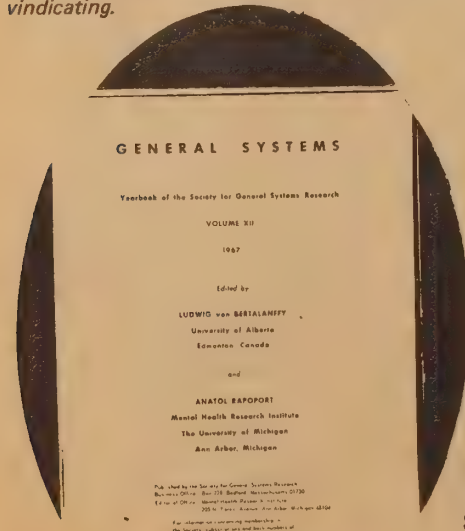
Aspects of Form

Formmmm mani padme form. It's a useful sect, and this is a well-used collection of insights by venerable initiates.

- HERBERT READ Preface
- LANCELOT LAW WHYTE Introduction / Chronological Survey on Form / Bibliography on Form
- S. P. F. HUMPHREYS-OWEN Physical Principles Underlying Inorganic Form
- C. C. L. GREGORY Shape and Distance Considered by an Astronomer
- C. H. WADDINGTON The Character of Biological Form
- F. G. GREGORY Form in Plants
- JOSEPH NEEDHAM Biochemical Aspects of Form and Growth
- ALBERT M. DALCQ Form and Modern Embryology
- HUGH B. COTT Animal Form in Relation to Appearance
- KONRAD Z. LORENZ The Role of Gestalt Perception in Animal and Human Behaviour
- W. GREY WALTER Activity Patterns in the Human Brain
- RUDOLPH ARNHEIM Gestalt Psychology and Artistic Form
- E. H. COMBRICH Meditations on a Hobby Horse, or The Roots of Artistic Form

General Systems Yearbook

Good thinking, rotten publishing. The usual graphic output in this yearbook is three pallid diagrams. And you know that the mothers who wrote the articles are forever whacking away at their blackboards, but because typewriters don't draw, all that vivid stuff gets left in the author's private experience. Man, there's something suspect about General Systems Theory if the practitioners are this far out of intelligent communication. Here's the contents of the current volume; do your own vindicating.



General Systems, Vol. 13

Ludwig von Bertalanffy, Anatol Rapoport,
Richard L. Meier, eds.
1968; 212 pp.

\$10.00 postpaid

from
Society for General Systems Research
Joseph Henry Building, Room 818
2100 Pennsylvania Avenue, N.W.
Washington, D. C. 20006

The appearance of symmetry is an invariable characteristic of growth whether it be of a living or non-living system;....

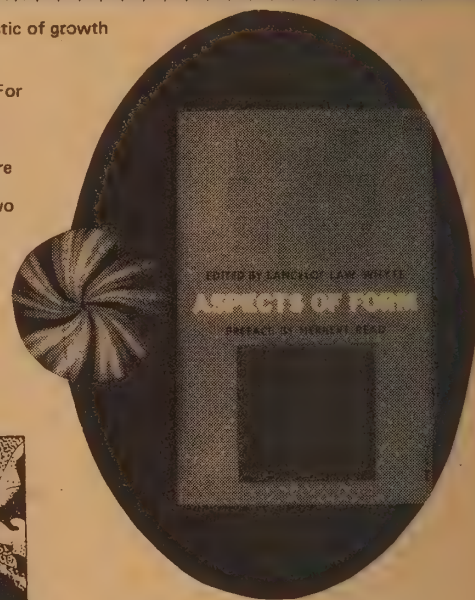
A man may learn by experience to associate two series of events between which any connection seemed at first wildly improbable. For such associations to be possible, provision must be made for every signal entering the nervous system to be relayed to every part, not merely to the specialised receiving zone. Thus from the knot of an event is generated a web of speculation; when two series of events are perceived together they form the warp and woof of a shimmering fabric into which is woven the pattern of the probability that the two events are significantly related.

An 'image' in this biological sense, then, is not an imitation of an object's external form but an imitation of certain privileged or relevant aspects. It is here that a wide field of investigation would seem to open.

We know that there are certain privileged motifs in our world to which we respond almost too easily. The human face may be outstanding among them. Whether by instinct or by very early training, we certainly are ever disposed to single out the expressive features of a face from the chaos of sensations that surrounds it and to respond to its slightest variations with fear or joy.



FIG. 2 Copperhead Snake—illustrating the effectiveness of disruptive contrast in relation to background configuration. (See page 126).



Aspects of Form

Lancelot Law Whyte, ed.
1951; 249 pp.

\$1.95 postpaid

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Indiana University Press
10th and Morton Streets
Bloomington, Ind. 47401
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An Approach to General Systems Theory
by George J. Klir

Concerning the Analysis of Initial Principles and Conceptions of Formal Logic
by G. P. Schedrovitsky

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Technosphere, Biosphere, and Sociosphere: An Approach to Their Systems and Optimization
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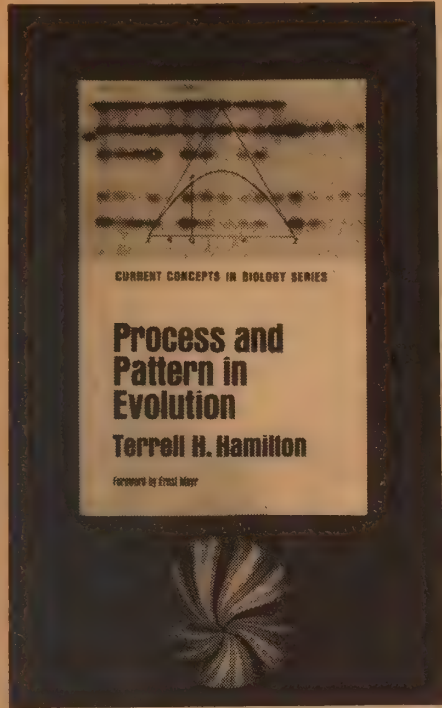
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Environment and Historical Paradox
by Philip C. Ritterbush

Aspects of the Future of Ecology
by Lawrence B. Slobodkin

Process and Pattern in Evolution

Since asserting that 'Evolution and cybernetics are going to come together; this is the edge of knowledge right now, and it's right at the heart of education, and the schools don't know it,' I've been looking for a book that would tidily summarize what is known about biological evolution. Here 'tis.



Process and Pattern in Evolution

Terrell H. Hamilton
1967; 118 pp.

\$1.95 postpaid

from
The Macmillan Co.
Front and Brown Streets
Riverside, N. J. 08075
or
WHOLE EARTH CATALOG

It is not the gene that is the unit of selection, but rather the whole individual. It is the 'goodness' of the whole organism that natural selection evaluates and either rewards or discriminates against.

The reproducing individual is the unit of selection, the gene or gene substitution is the unit or unit process of population adaptation, and the species is the unit of evolution.

- Individuals are not identical, but vary in their characteristics.
- Those variants that naturally fit their environments will be favored over those less fit. By inheritance those individuals better fit will pass their characteristics on to the next and future generations in greater numbers than those less fit.
- The following generations of individuals will exhibit, and continue to improve, the adaptations realized in gradual changes by their ancestors.

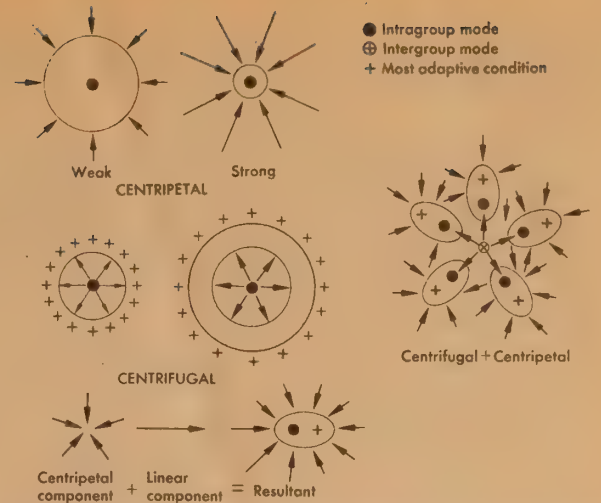


Figure 4-1. Direction of selection in relation to intensity, showing the theoretical possibilities of a centrifugal, centripetal, linear, or resultant selection. The shaded areas represent ranges of variations covered by the populations. [After G. G. Simpson, *The Major Features of Evolution*, New York: Columbia University Press, 1953.]

Ernst Mayr and others have reminded us that as a crude generalization it may be said that non-genetic variation adapts the individual, while genetic variation adapts the population.

Mutation is an incoherent if not random process which provides de novo changes in genes and chromosomes. Recombination, by far more frequent in occurrence, provides new individual variations within populations to a much greater degree than mutation. Indeed most of the individual genetic variations observed within populations are of a recombinational origin. But these are new variations limited to a range set by a preexisting genetic theme. New genetic themes arise only by mutation.

Man Adapting

René Dubos
1965; 527 pp.

\$2.95 postpaid

from
Yale University Press
149 York Street
New Haven, Conn. 06511

or
WHOLE EARTH CATALOG

Man Adapting

The focus of this book is the human individual, what he has to deal with in this life, and what means he has to do the dealing with. Dubos is a superdoctor, so you get a damned well-informed medical perspective on questions of environment, population, health, nutrition, adaptation, etc. that subverts many a popular opinion.

The concept of perfect and positive health is a utopian creation of the human mind. It cannot become reality because man will never be so perfectly adapted to his environment that his life will not involve struggles, failures, and sufferings. Nevertheless, the utopia of positive health constitutes a creative force because, like other ideals, it sets goals and helps medical science to chart its course toward them. The hope that disease can be completely eradicated becomes a dangerous mirage only when its unattainable character is forgotten. It can then be compared to a will-o'-the-wisp luring its followers into the swamps of unreality. In particular, it encourages the illusion that man can control his responses to stimuli and can make adjustments to new ways of life without having to pay for these adaptive changes. The less pleasant reality is that in an ever-changing world each period and each type of civilization will continue to have its burden of diseases created by the unavoidable failures of adaptation to the new environment.

The paradoxical truth is that the phenomenal increase in world population during the past 50 years has coincided with great epidemics, two world wars, several minor ones, and deep disruptions of social and economic life everywhere. Furthermore, as is well known, the most destitute and disease-ridden populations of the world are precisely the ones that are increasing the fastest.

As is well known, India is one of the countries where the overpopulation problem is most acute, and also where government agencies have been most active, imaginative, and bold in developing birth control. Yet several pages of the special issue devoted to 'The Wisdom of India' consist of endearing photographs illustrating the theme that children are the country's greatest wealth; their charm and the love bestowed on them constitute the most important source of happiness; their presence makes life bearable and enjoyable even in the most impoverished villages.

It is not for the sake of originality that I shall use here the word 'avalanche' instead of the more orthodox 'explosion' to refer to the present increase in the world population. My reason is that the word avalanche conveys more accurately the important truth that this increase is not a sudden event, as the word explosion would suggest, but rather corresponds to a continuous process that has to reach a certain momentum before it becomes dangerous. Public alarm is justifiable because the increase is now occurring simultaneously all over the world, and because its rate seems to be accelerating.

Lead poisoning is commonly found among children in the poorer and older areas of all American cities; it results from their ingestion of paint applied on the interior woodwork of houses and on furniture.

The truth is, that improvements in the general nutritional state began when prosperity and greater facilities for the transportation of food made it possible for many people to afford at least one square meal a day; likewise, the mortality of many infections began to recede in a dramatic fashion in Western Europe and North America long before the introduction of specific methods of therapy, indeed before the demonstration of the germ theory of disease.



The Phenomenon of Man



Reading *The Phenomenon of Man* is a bit unnerving: Teilhard de Chardin manages to say most of the things many of us are trying to say. He said them in 1938. Was no-one listening?

The Phenomenon of Man deals with evolution—the ascent to consciousness. The plan of the book is

Pre-life: Life: Thought—three events sketching in the past and determining for the future (survival) a single and continuing trajectory, the curve of the phenomenon of man.

His aim is to try to see (and to help us to see)

to try to develop a homogeneous and coherent perspective of our general extended experience of man. A whole which unfolds.

Teilhard de Chardin's vision and expression of that vision are beautiful—of man evolving a super-abundance of mind; in the noosphere where the All and the Person are one. The only way to put all this together without feeling bullshitted is to read *The Phenomenon of Man*.

Only one reality seems to survive and be capable of succeeding and spanning the infinitesimal and the immense: energy—that floating, universal entity from which all emerges and into which all falls back as into an ocean; energy, the new spirit, the new God.

hominisation...noogenesis...cosmogogenesis...when Teilhard de Chardin uses a simple word like homogeneous something magical happens to it.

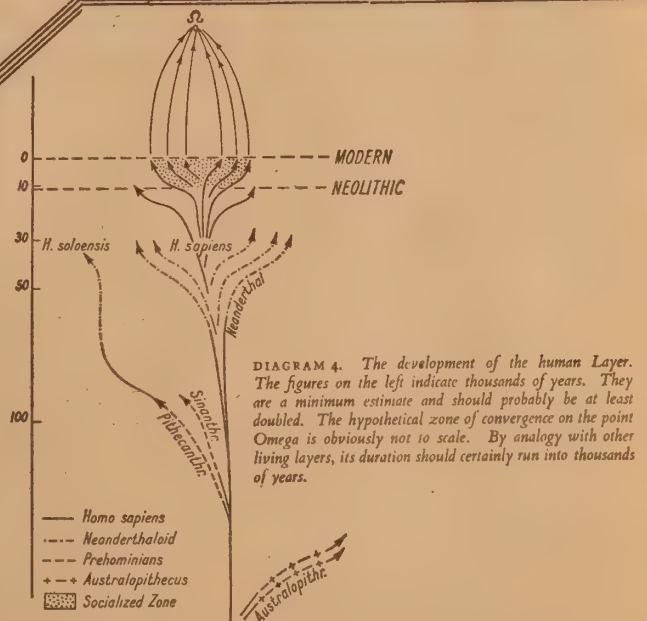


DIAGRAM 4. The development of the human Layer. The figures on the left indicate thousands of years. They are a minimum estimate and should probably be at least doubled. The hypothetical zone of convergence on the point Omega is obviously not to scale. By analogy with other living layers, its duration should certainly run into thousands of years.

The Omega point is where man is God and God is man, where all layers of the noosphere become involuted, fusing and consuming the All and the Person integrally in itself.

The mind is essentially the power of synthesis and organisation.

Underlying the beautiful presentation of man's ascent towards consciousness is a hard core of science:

Man, in nature, is a genuine fact, falling...within the scope of the requirements and methods of science.

[Reviewed by Dave Evans. Suggested by Julia Brand.]

The Phenomenon of Man

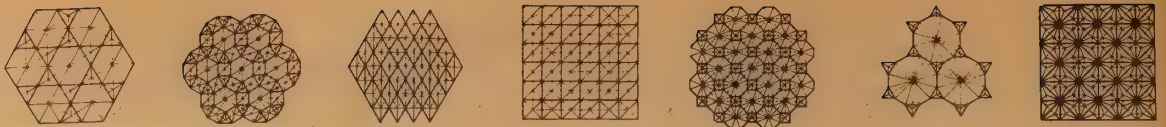
Teilhard de Chardin
1959; 320 pp.

\$1.95 postpaid

from
Harper & Row
49 East 33 Street
New York, N. Y. 10016
or
WHOLE EARTH CATALOG

Shelter and Land Use

Edited by Lloyd Kahn.



Space Grid Structures

A space grid is a means of spanning great distances with little weight, and few intermediate supports. Buckminster Fuller's Octettruss at the Museum of Modern Art in 1959 was 35' wide and spanned 60' one way, 40' another from one column of supports. It was fabricated of 2" pipe.

Space grids consist of two parallel planes, forming a floor and ceiling; 'web' members in between connect them in such a way that external loads are distributed in all directions.

This book is '...an exchange of information about what has been done recently in the development of flat space grid structures.' There are photos, drawings, models of structures and joints. The three sections of the book deal with flat double-layer space grid structures, stressed-skin space grids, and fine clear drawings of space grid geometries. Also an extensive bibliography. Very little text; it's not needed as the drawings and photos are excellent.



Space Grid Structures by John Borrego

Skeletal Frameworks and Stressed-Skin Systems

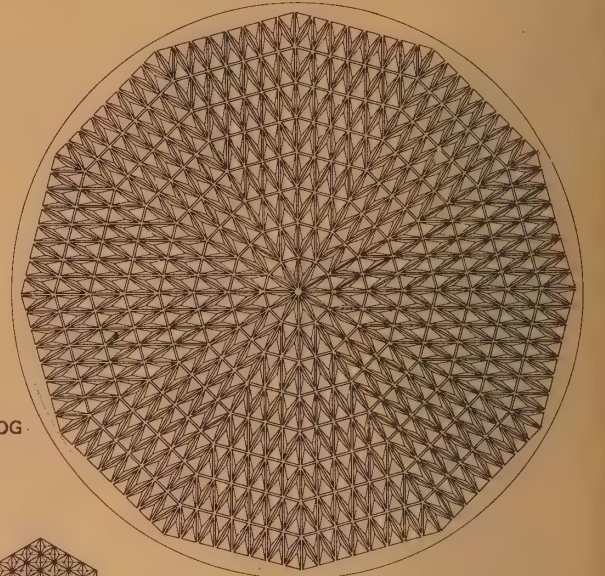
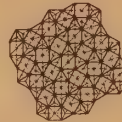
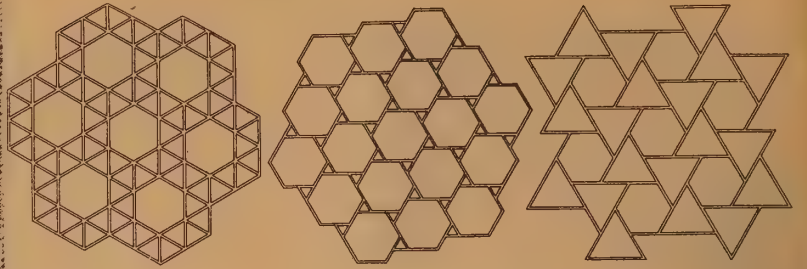


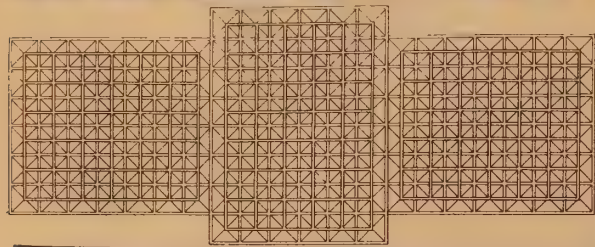
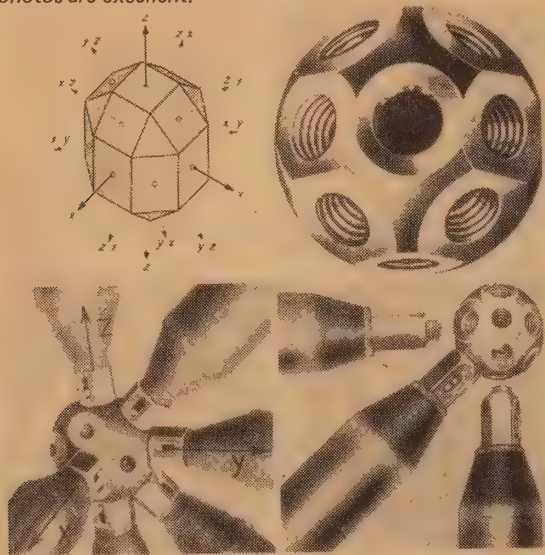
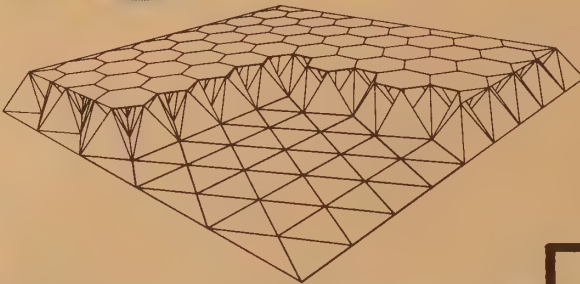
Plate 109 The selected cutting plan of the roof for the church at Dunstable, England, by Arthur F. F. and Partners. Structural design by Space Structures Research, Ltd., E. S. Makowski, structural consultant. The roof has 12 segments each made up of 84 elongated isosahedra. Details on Plate 110

Space Grid Structures

John Borrego
1968; 200 pp.

\$12.50 postpaid

from
The MIT Press
Cambridge, Mass. 02142
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WHOLE EARTH CATALOG



The Dymaxion World of Buckminster Fuller

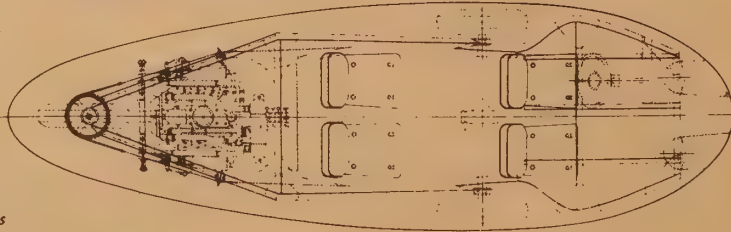
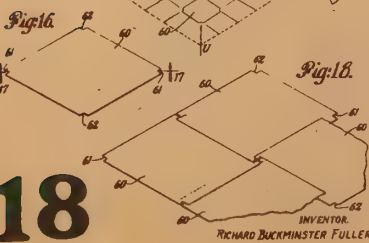
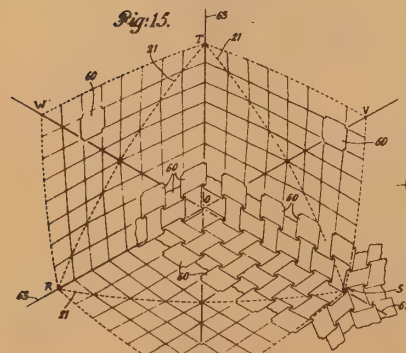
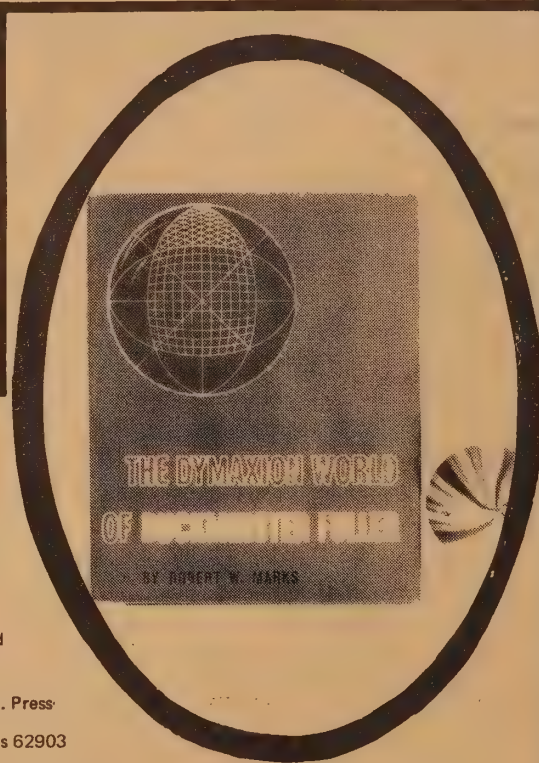
The most graphic of Fuller's books (it's about his work, by Robert Marks). Consequently it is the most directly useful if you are picking up on specific projects of his such as domes, geometry, cars, demographic maps and charts, etc.

The Dymaxion World of
Buckminster Fuller

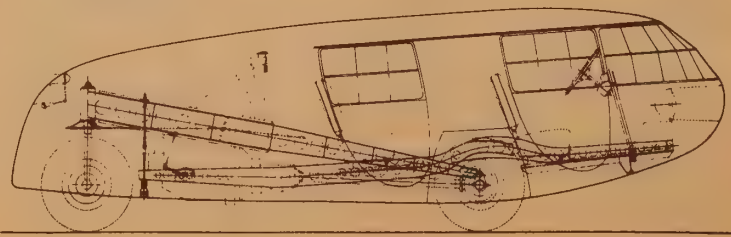
Robert W. Marks
1960; 232 pp.

\$12.50 postpaid

from
Southern Ill. Univ. Press
6000 West Grand
Carbondale, Illinois 62903
or
WHOLE EARTH CATALOG



Dymaxion car 1933

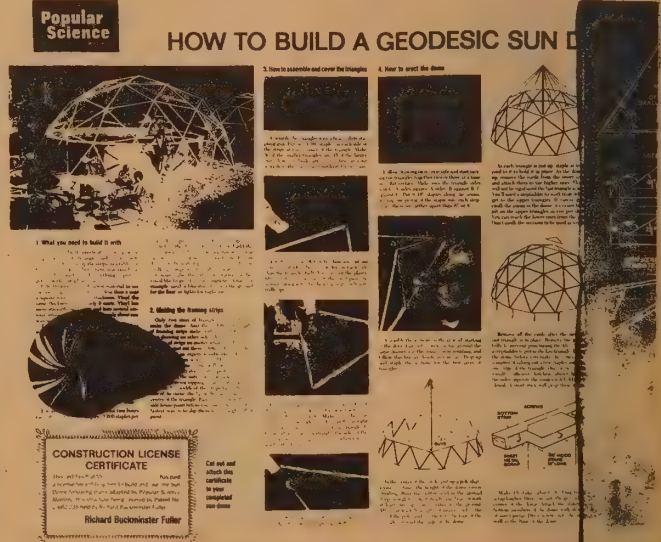


Fuller Sun Dome

The most readily available plans for a geodesic dome. The \$5 includes construction license. Designed for swimming pool covers, dome plans specify wood strips and cheap polyethylene skin. However you can modify to build domes of other materials, such as plywood, parachutes, or car tops. A simple system: two triangles make the dome; can be used up to about 35' diameter.

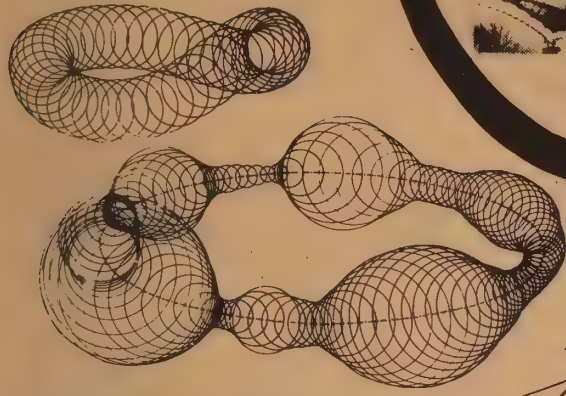
Geodesic Sun Dome
1966
\$5.00 postpaid
from
Sun Dome
Popular Science Monthly
355 Lexington Avenue
New York, N. Y. 10017

[Suggested by Ken Babbs.]

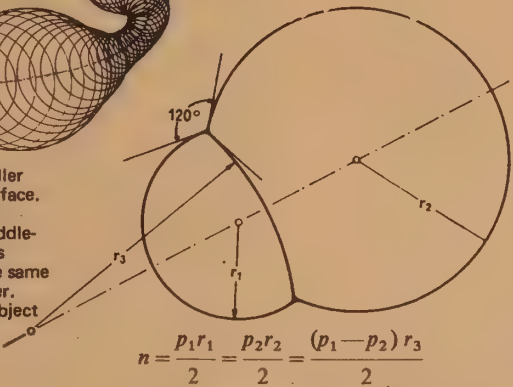
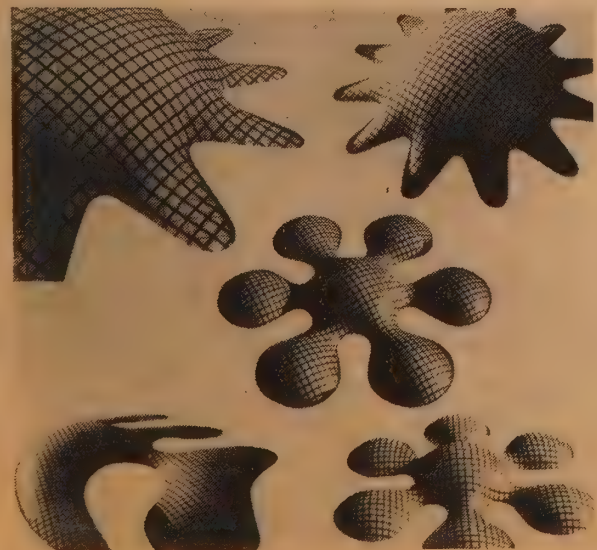
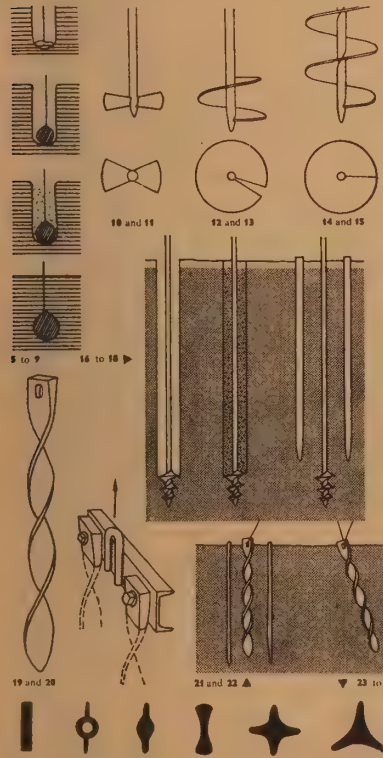


Tensile Structures, Volume One

The only pavillion of Expo 67 more beautiful than Fuller's U.S. Dome was the West German tent, designed by Frei Otto. He is currently the master of structures whose flexible skin is the prime structural element. Volume One of his 2-Volume work is devoted to Pneumatic Structures-air houses plus. Every designer we know who's seen this book has commenced to giggle and point, jump up and down, and launch into enthusiastic endorsement of Otto, design, being a designer, and look at this here. The book is comprehensive in its field, technically thorough, beautifully presented.



The saddle surface of the inside part has a smaller area than the outside, which is not a saddle surface. The torus differs from all other pneumatically tensed membranes by this characteristically saddle-shaped region. The circle on which the spheres forming the torus are strung need not be in the same plane, nor need the spheres have equal diameter. Here, too, unlimited variations are possible, subject to the general laws of formation, and to those particular to closed hoses.



If two soap bubbles of different diameters form a twin bubble (Fig. 10), the diaphragm is curved. If the membrane stresses are equal, the gas pressure p in the smaller bubble is higher than that in the larger bubble. The relationship between the radii r_1, r_2, r_3 , is given by:

Tensile Structures, Volume Two

Tensile structures is the complete story on tents and cable nets and like volume one the entire subject is covered in minute detail. The book is intended to show where the thinking and practice on the subject is at this time in history. There is an overview of the whole field, then specifics on cable, net and membrane structures. Each is thoroughly discussed and illustrated with photographs and drawings although graphics here are not as intriguing as in volume one. The last third of the book contains calculations on load-bearing abilities and design. For many readers this will be too technical to understand, much less use. But tensile structures are very exciting at this time, and the book is great for getting people started on experiments and construction. Canvas is a cheap building material. There's a lot to learn here. The forms are very organic, and coverage is complete.

[Reviewed by Jay Baldwin.]

Tensile Structures, Vol. Two
Cables, Nets and Membranes

Frei Otto
1969; 171 pp.

\$12.50 postpaid

Tensile Structures Volume One
Pneumatic Structures

Frei Otto
1967; 320 pp.
1660 illustrations

\$22.50 postpaid

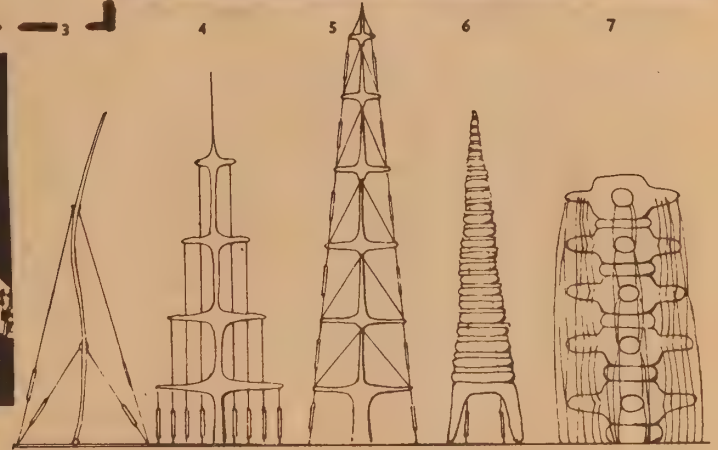
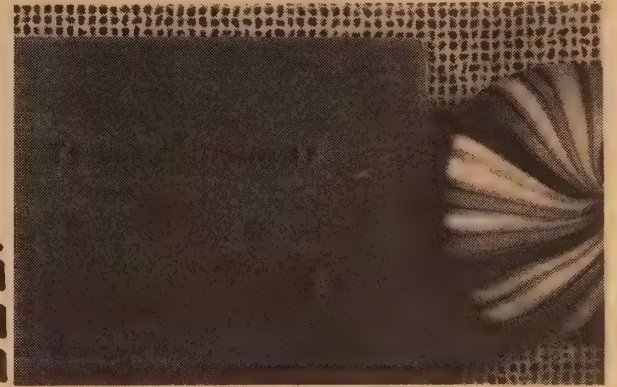
both from
The MIT Press
50 Ames Street
Cambridge, Mass. 02142
or
WHOLE EARTH CATALOG

Curved Membranes and Cable Nets Stretched between Cables



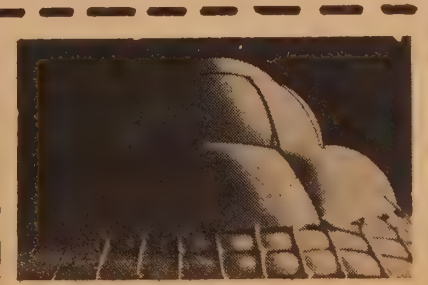
Experiments were undertaken in the years 1960-64, in which soap films were stretched in different frames and measured photographically in order to determine their shape.

A soap film can be stretched in any frame consisting of straight or curved components, provided that it forms a closed line. The film then forms a continuous surface, the frame being subjected to bending.



Guyed masts consist of one-dimensional central elements subjected to compression and surrounded on all sides by one- or two-dimensional tension-loaded elements. They thus form three-dimensional systems most suitable for mobile structures. Many contemporary designs of high cranes for wide reaches are variations of this basic system. An elastic central rod can be bent by varying the lengths of the guys (Fig. 3). For this, all cables must be adjusted simultaneously; this is done by synchronized hydraulic presses located at the anchoring point. A similar, but much more mobile system is shown in Fig. 4. A thin elastic central strut carries cantilevers connected to the ground by means of cables.

In living nature the spine of a vertebrate (Fig. 7) is a guyed mobile system, approximately as shown in Fig. 4. A multiple articulated, highly flexible central rod, capable of taking up large compressive forces, is surrounded by a tension-loaded system consisting of many members, which secures the central rod against buckling and bending, while ensuring its complete mobility.



Architecture Without Architects

A Short Introduction to Non-Pedigreed Architecture

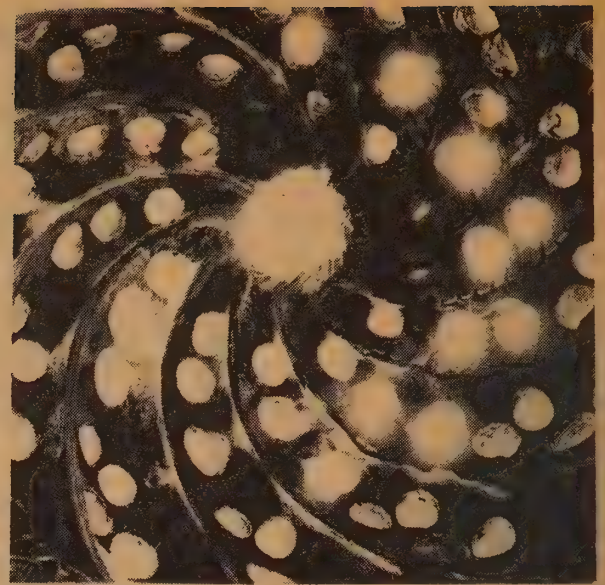
Trogdolyte caverns, 40 feet high treehouses, sculptured Iranian sail vaults; rare photos of man working in conjunction with nature. A book for architects and builders to meditate upon.

Architecture Without Architects

Bernard Rudofsky
1964; 160 pp.

\$3.95 postpaid

from
Doubleday & Company
Garden City, N.Y. 11531
or
WHOLE EARTH STORE



Cupola of a Turkish bathhouse—a whirlpool of bright stars, arrested, as it were, in its movement. The luminous disks embedded in the dome are thick, lenslike glass blocks. Iznic, Turkey. Othmanli period.

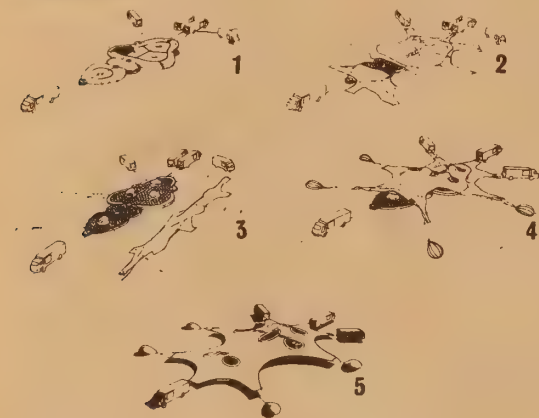


Many so-called primitive peoples deplore our habit of moving (with all our belongings) from one house, or apartment, to another. Moreover, the thought of having to live in rooms that have been inhabited by strangers seems to them as humiliating as buying second hand old clothes for one's wardrobe. When they move, they prefer to build new houses or to take their old ones along.

There is much to learn from architecture before it became an expert's art. The untutored builders in space and time—the protagonists of this show—demonstrate an admirable talent for fitting their buildings into the natural surroundings. Instead of trying to 'conquer' nature, as we do, they welcome the vagaries of climate and the challenge of topography.



Archigram



ERECTION SEQUENCE

1. Mark out ground, put out markers, fill ballast compartments with water, inflate pneumatic compartments, start compressed air circulation, put down floor covering.
2. Lay down and join up the three pieces of canvas, fix upper part of exhibition hall and information silo to canvas.
3. Unfurl prepared canvas, inflate vertical pneumatic volumes once attached to floor, locate axes using prepared ropes.
4. Locate anchorages temporarily according to axes. Canvas is now in final form, and is located bound to the vertical pneumatic volumes, and attached to the anchorages.
5. Completely inflate vertical volumes, inflate edges of roof-lights. Make final adjustments to anchorages and tension of canvas. Fix ropes binding canvas to pneumatic floor.
6. Locate and inflate windows of exhibition hall. Locate lower part of information silo and entrance cylinder. Zip up the structure to make it airtight. Distribute air-ducts and ventilation system.
7. Put final pressure on the structure.



Archigram is a free-form magazine published about twice a year by a group of architects, cyberneticians, audio-visual programmers, etc. from Britain and America. Because production is irregular, there is no subscription list; rather, a mailing list to which all new issues are sent with the understanding that you will remit by return.

[Suggested by ONYX]

Archigram 8

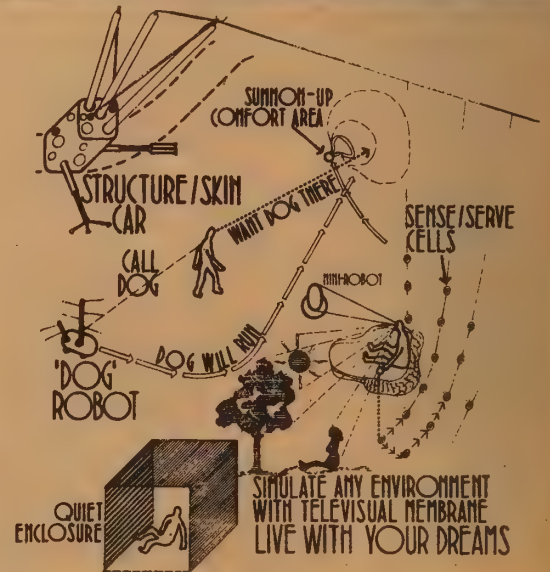
Editor: Peter Cook

\$1.00 postpaid

from (to get on mailing list)
Archigram Group
School of Architecture
U.C.L.A.
Los Angeles, CA 90024
or
59 Aberdare Gardens
London N.W.6, England

...the mouthpiece of a group of architects, designers, environmental researchers...(What's in a name...?), based in London and U.S. The first issue was produced in 1961 as a protest sheet. All issues have been manifestos.

...so we have no buildings here, the boundaries are down. There is a marvelous sense of relief and we are once more out on exploration. We hope to get other publications to add to the pack of cards.



ROLE AND IT ALL GETS CLEARER AS IT GETS NEARER THE MINDS WITHIN

© Peter Cook / April 1968

Architectural Design

This is the only architectural magazine we've seen that consistently carries substantial new information, as distinct from the stylistic eye-wash characteristic of most architecture journals.

Architectural Design

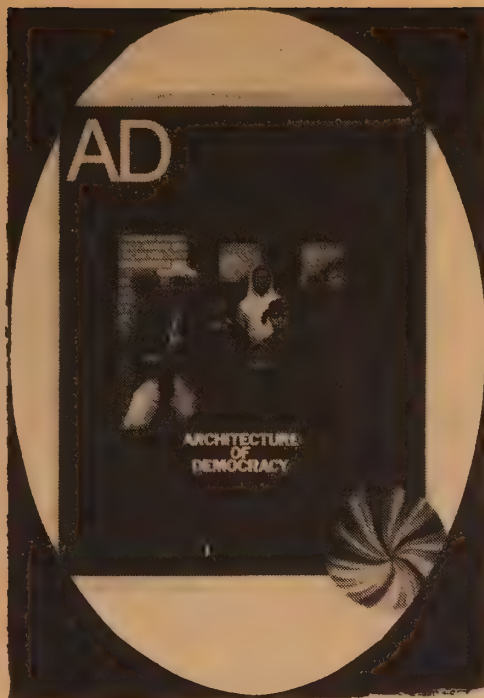
\$13.50 postpaid for one year (monthly)

from: Architectural Design 26 Bloomsbury Way London WC 1, England



Triggered by a lack of space, and wanting to do something, a group of architectural students at MIT last year spontaneously rebelled against the constraining environment of their drafting rooms. Scrounging materials, working clandestinely, they shifted block partitions and erected a series of mezzanines or platforms within their two-storey drafting rooms (centre). Three architecture students, Stern, Hanks and Owen, describe below the process as they saw it.

The design faculty, also cramped for space, solved their own problems more conventionally, through outside designers and contractors. This failed to generate a corresponding level of excitement, commitment or sense of achievement.



CULTURE? UGH!

THE IDEAL COMMODITY - THE ONE WHICH HELPS SELL ALL THE OTHERS! NO WONDER YOU WANT US ALL TO GO FOR IT!

Capsulized freak out
Metal to rubber of asphalt ribbons plugged into Vietnam and the price of aerosolled ketchup thru W.D.B.J. Star City via the chromium telescoping finger. 700 miles of the great highway turn on, 13 hours of keen-sell survival service and all the gear to keep the wheels flying, the gut full, and the mind blown on soul and acid, and tune-in, eat, and flash, rush, One South and zapp it forward, gas-up; and hum and sink into supa-fit vinyl pads and watch it all. All the cardboard cities and the X-ray of us all on the giant billboards. And buy me, lay me hot dog-burgers. Blink, zip me into bed and flash past a thousand Kleenex sleepieries and King-size pleas trying to break up the big high and consume hy-flyte, Pep-up, an alligator breakfast a nude-serviced eat.

Topic

To make each house so personal, individual and well-adapted to its inhabitants, that 100,000 houses will be as different from one another as 100,000 people are.

Author

Christopher Alexander, June 1967.

Pattern

IF: there is given any dwelling—apartment or house, irrespective of the number of inhabitants. (This pattern may also apply to certain other buildings like offices which require an individual and personal character.)

THEN: every wall, (both interior and exterior) is to be 3-5ft deep, and made of hand-carvable-space-frame. Floors are to be 2-3ft deep, and also made of hand-carvable-space-frame.

Definition:

Hand-carvable-space-frame is to be interpreted as follows. It is a rigid space frame, with an exterior vertical surface made of materials which are readily available on the retail market, and easily cut, modified, painted, nailed, glued, replaced by hand, using only tools available at any hardware store. Possible examples are wood, plywood, fibreglass, styrofoam, polystyrene. . . . The space frame is to be made highly redundant, so that large sections of it may be removed without weakening it. It is also made so that pieces or sections may be added to it in such a way that these sections become continuous with, and indistinguishable from, the original surface.

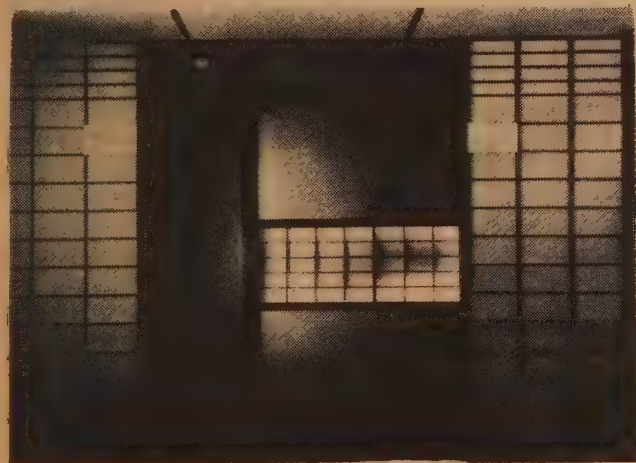
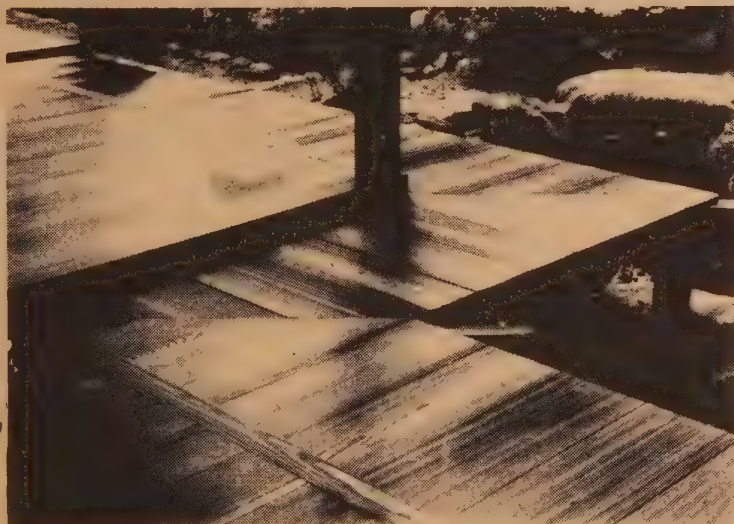
The Japanese House

Without getting all sentimental and exotic we're still going to agree that Japanese make better houses than anybody else (they also have the fastest growing economy in the world, but that's another story - or is it?). If you're going to build your own house and don't mind some inspiration on the subject, this book was laboriously made for you. It's a great big Christmas present of a book full of yummy photos and diagrams and details of technique, all of which seems right within reach: I-can-do-it. Nice cure for nothing-can-be-done-be-cause-it's-too-damned-big industrial blues.

[Suggested by Zen Mountain Center]

\$27.50 may choke you up, in which case get *Japanese Homes and Their Surroundings*, \$2.50 from Dover Publications—straight information on how to hand-make a lovable environment.

SECLUSION IN BUILDING is an essential instrument for establishing, or preserving, the freedom of man. For, only in solitude can man escape from the coercion to which he is subjected when among the masses.



Shoji paper is the "glass" of the Japanese house. Its qualities, however, are of a different nature, and, thus, also are its effects. The light, broken already by the broad overhang of the eaves, is diffused by the paper and creates a characteristic light condition comparable to twilight. This situation does not change basically even if the evening or winter sun hits the paper directly. No glare, no shadows; a general gloom creates a soft, emotional atmosphere. With artificial light in use, the shoji paper shows its reflective-diffusing ability, and at night with lights turned out, might even offer an interesting shadow play the moon has staged with the old weather-worn pine tree. As time passes, the paper darkens. Here and there, a torn piece is carefully cut out and replaced by new, lighter paper. The paper pattern becomes, though irregular, more interesting and lively. The paper ages, as does man.

The Japanese House - A Tradition for Contemporary Architecture

Heinrich Engel 1964; 495 pp.

\$27.50 postpaid

from: Charles E. Tuttle Co., Inc. Rutland, Vermont 05701 OR WHOLE EARTH CATALOG

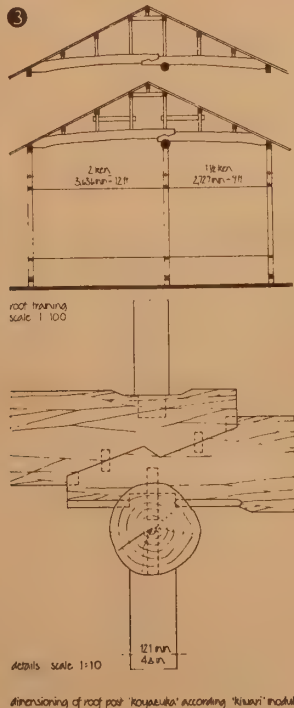


FIG. 167. — KITCHEN IN OLD FARMHOUSE AT KABUTOYAMA.

Japanese Homes and Their Surroundings

Edward S. Morse 1886, 1961; 372 pp.

\$2.70 postpaid

from: Dover Publications, Inc. 180 Varick St. New York, N. Y. 10014

\$2.50 postpaid

from: WHOLE EARTH CATALOG

The Owner-Built Home

Ken Kern makes a unique offer to anyone thinking about building his own home: for \$10 he furnishes a preliminary house design, as well as a copy of *The Owner-Built Home*, which is about the most useful book on building available.

For the design, send him a sketch of your building site, along with space requirements and personal likes and dislikes; or you may prefer to get the book first and read the first chapter on "Site and Climate" before sending in the information.

The book is sound advice on the best low-cost building techniques from around the world: Africa, India, Israel: countries that cannot afford U.S.-style waste. Much of it is not in print elsewhere.

A 1" concrete floor with loading stresses of 450 lbs per sq ft; houses built of earth, woven bamboo and bottles, as well as of conventional materials. How to hook up your plumbing in a simple central core.

Good dope on concrete-proportions, additives such as sawdust or emulsified asphalt for "comfort cushion" floor. Details on wood framing, how stud wall houses are overbuilt, the strength of threaded nails.

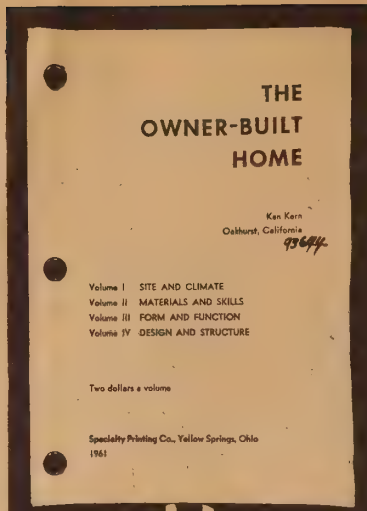
There is much good data on building with rock and earth; how to make a sliding form for rammed earth and a discussion of the strength of rammed earth and soil cement. Why don't you hear anything these days about earth wall buildings?

Inasmuch as there is nothing in bare earth to sell, no commercial group can be found to extol its merits.

Lots more, with a bibliography at the end of each chapter for further research. Kern is currently adding new sections to the book: homemade fireplaces, construction tools, and utilizing salvage materials.

He will soon publish a hardbound edition of this book, in conjunction with *The Owner-Built Homestead* (now appearing serially in *The Green Revolution* newspaper).

From the point of view of glare-control, the customary practice of placing the kitchen or bathroom window over the sink is ill-founded. The object requiring our attention should be the brightest thing in view. When something else is brighter, such as a glossy painted surface or a sink window, then a conscious effort is required to concentrate on the object requiring attention. Ability to see is thereby reduced, since our eyes will be adjusted to the brighter surface. A sink in a kitchen or bathroom should be placed so that the light from the window will come from the side or from the top, and not from the front.

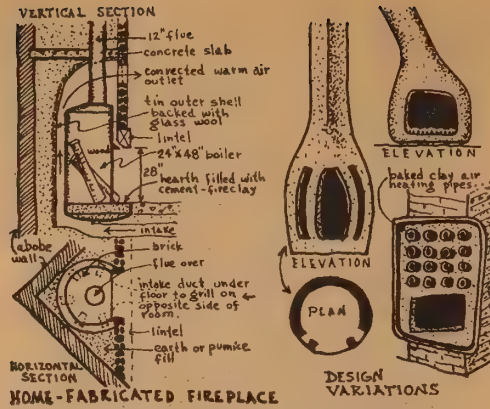


The Owner-Built Home and preliminary house design (send sketch, etc.)

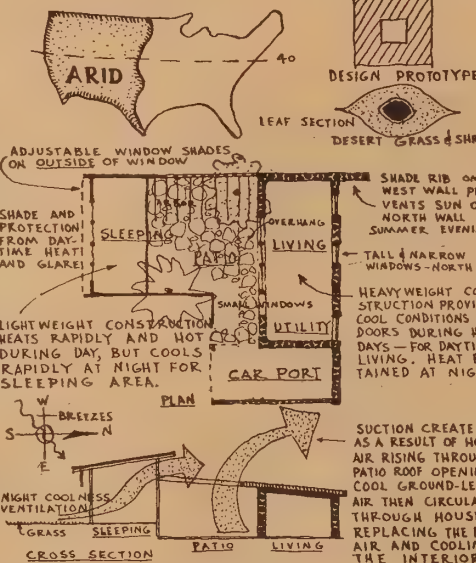
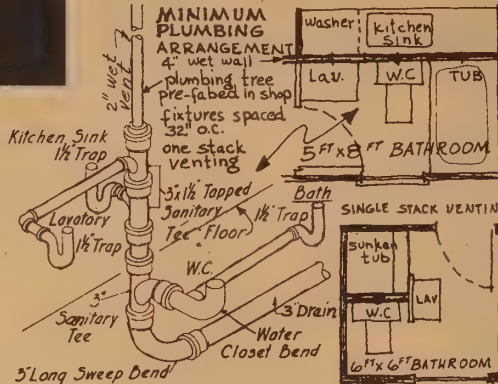
Ken Kern 1961; 300 pp.

\$10.00 postpaid

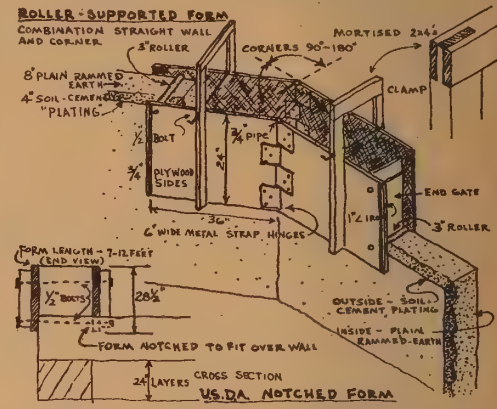
from Ken Kern Drafting Sierra Route Oakhurst, CA 93644



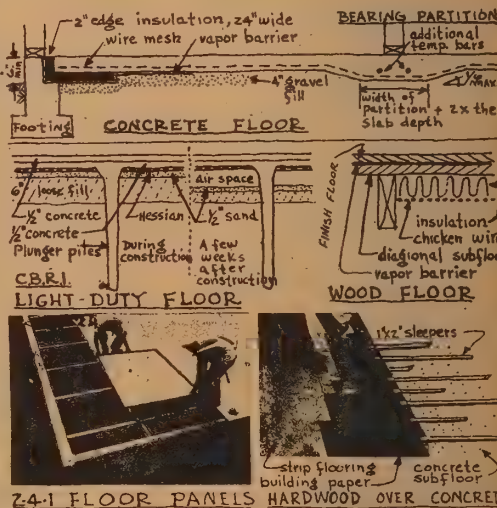
HOME-FABRICATED FIREPLACE
We come, thirdly, to the admixture of ventilating currents with combustion products. Count Rumford was the first to give extensive study to inside-fireplace proportions. His final rule-of-thumb is that the back of the fire-space should be equal to the depth of the recess. Deep fuel beds produce more smoke than the grate. Experience proves that the rate of smoke-emission increases proportionally with the depth of the firebox, especially in the early stages of firing.



Ideally, the best guarantee against capillarity is a continuous air space between floor and ground. A low cost floor of this nature was developed a few years ago by Dr. Billig of the Central Building Research Institute, India. Although described as a light duty floor, it was subjected to loading stresses up to 450 lbs. per square foot without showing any sign of distress. (Most building codes in America require a 30 to 50 lb. per square foot minimum, but in conservative residential occupancy the furniture loads seldom exceed 15 lbs. per square foot, uniformly distributed.) The CBRI floor consists of a one-inch thick lightly reinforced concrete slab, resting on plunger piles. To make a hole for a pile a crowbar is driven into the ground to a depth of three feet. The hole thus made is then filled with fine concrete. The piles are spaced on three foot centers. The slab consists of two layers of concrete, each 1/2-inch thick, spread over Hessian, a form of burlap. After a few weeks the loose earth filling settles and an air space is formed under the slab which finally rests on the concrete piles. An effective heat insulation results; the floor is cool in summer and warm in winter.



This book is being written in a rammed earth studio that I built four years ago. During the planning stages I made a study of numerous types of wall forms; then improvised on some of the more salient features. I ended up with a type of roller-supported plywood form that can be adjusted to fit any corner angle.



Your Engineered House

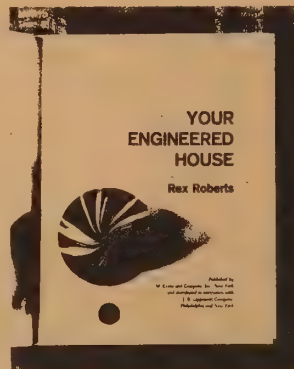
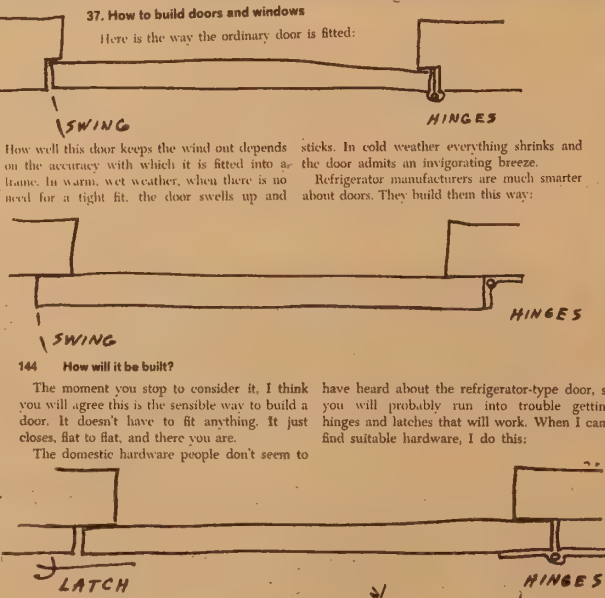
"To begin this book, and the day, what does it take to get the morning sun into the kitchen?"

A delight to read before designing or building your own home. General ideas on light, heat ventilation, house placement, acoustics, financing. Specific building tips on all aspects of building but mainly post and beam houses.

This is an easy way for a beginner to frame a house (as opposed to stud-wall construction), and it gets a roof over your head right away to keep the rain off while you finish the walls. Most of this information is seldom considered by architects, and is culled from the author's building experiences. You are encouraged and told how to pick up pencil and paper and design your own home-tailormade to your own specifications, aspirations, and finances, and, although not in great detail, how to build it yourself. A discussion and treatment of homes as human environments and a good place to start if you have no design or building experience.

[Suggested by Paul Wingate]

The difference in angle between winter sun and summer sun is a tool which remains unchanged, costs nothing, and can work enormously for your comfort. The amount of difference in angle depends on how far north or south of the equator you live, but for almost all of us there is a useful difference which can be put to work keeping us cool in summer and warm in winter. The angles sketched here are for an average location in a temperate zone—say, Pennsylvania.



Your Engineered House

Rex Roberts 1964; 237 pp.

\$7.50 postpaid

from J. B. Lippincott Company East Washington Square Philadelphia, Pa. 19105 or WHOLE EARTH CATALOG

Scenery is what you see from where you live. If your scenery is to cost you nothing, you will leave it where it is, and if that scenery already has character, you will make only minor modifications. You will move yourself around, move the house around, but you will not move the scenery around until you have lived with it for a while as it is.

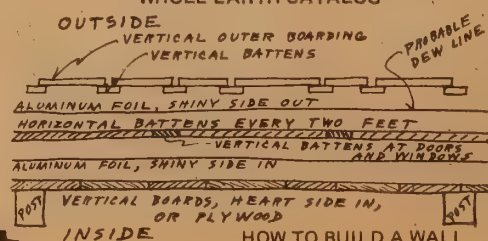
As a machine designer, I say that when we treat the window as a machine, asking it to perform multiple functions—admit light, admit air, or exclude it according to the weather, keep out bugs in summer, never mind the bugs in winter—and do all this at the twist of a crank without leaking or sticking—the window is bound to become expensive.

If we give the window one function and one only, to admit light, we can have all the windows we want at no extra charge. It is inexpensive to fix panes of glass permanently in place. Any smart carpenter can build a wall of glass about as quickly as he can build a wall of anything else.

As for the ventilator, it's a wooden door on the simplest of hinges, rigid, unbreakable, easy to weatherstrip, easy to screen. One frame does the whole job.

If we keep windows and ventilators separate, we wind up with more light, better ventilation, less trouble, less maintenance, and lower cost.

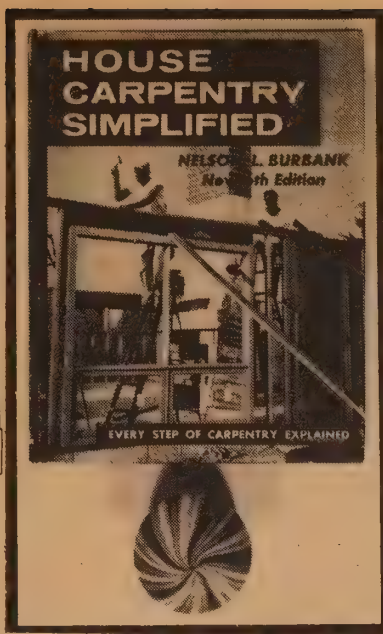
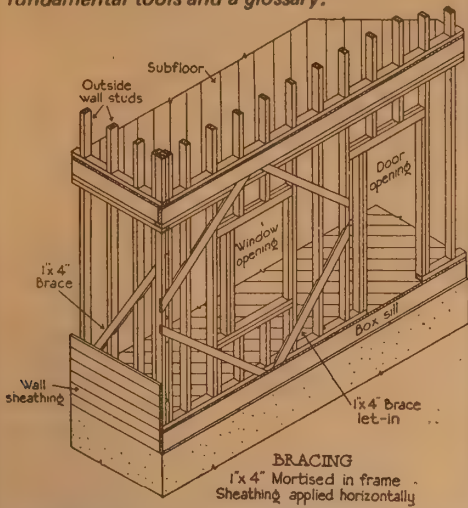
I am doing work with my hands, and am right-handed, I will prefer the major light source to be at my left and the minor source at my right. If I am left-handed, I will of course reverse the sources.



The habit of building a house in a certain way is not proof that the habit should be continued. Many of our present building methods are wrong, expensively wrong. I have tried to suggest building techniques which are inexpensively right.

House Carpentry Simplified

Clear how-to-do-it instructions on rectilinear house building. Reasonably current but not overly detailed, with a good section on fundamental tools and a glossary.

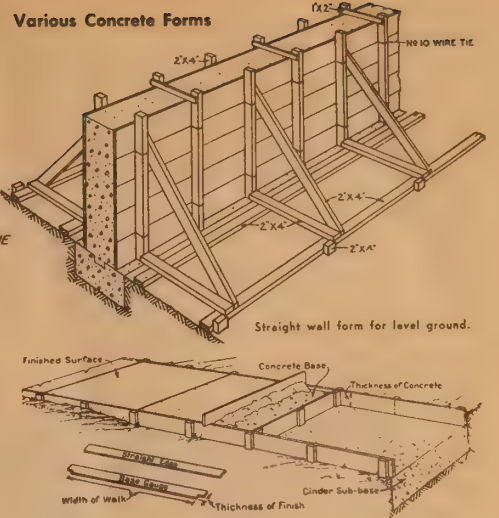
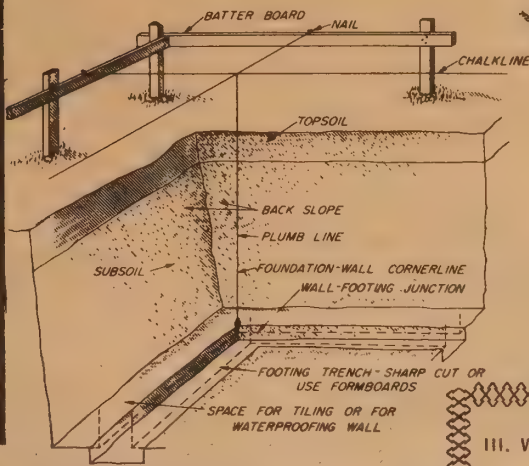


House Carpentry Simplified

Nelson L. Burbank
1958; 252 pp.

\$8.95 postpaid

from
Simmons-Boardman Books
30 Church Street
New York, N. Y. 10007
or
WHOLE EARTH CATALOG



Simplified Carpentry Estimating

When building, you'll do well to pre-calculate all materials and ask local lumber yards for competitive bids. This handbook, with short-cut tables, helps you quickly estimate all materials for conventional buildings: concrete, lumber, hardware, as well as labor hours.

Simplified Carpentry Estimating

J. Douglas Wilson and Clell M. Rogers
1962; 320 pp.

\$5.95 postpaid from

Simmons-Boardman Books
30 Church Street
New York, N. Y. 10007
or
WHOLE EARTH CATALOG

4. CEMENT CONTRACTORS' METHODS

A practical method used by cement contractors will give quite accurate results. This rule automatically allows for shrinkage.

Proceed as follows:

- Find cubic feet contents of footings, walls and piers.
- Divide the cubic footage by 15. Result equals tonnage of concrete aggregate (sand and rock combined). Material dealers will furnish concrete aggregate in several proportions, such as 50-50 or 40-60, etc.
- To find sacks of cement multiply tonnage of aggregate by a constant selected from table III.

TABLE III
AGGREGATE TABLE

Mix	Aggregate Mix	Constant
1-2-3	1-5	4
1-2-4	1-6	3 1/4
1-3-4	1-7	3
1-5-5	1-8	2 1/4



Plumbing and Wiring Books

Most plumbing and wiring books are either too old, or too detailed for use by a novice home builder. However, these two books by Popular Science will give you all you need to be your own plumber and electrician. The plumbing book also includes heating, air-conditioning, space heaters, and fireplaces-installation and repair. Home Electrician has installation of indoor and outdoor lighting, electric motors, and electrical repairs and testing.

Easy to understand while you have a tool in one hand.



How to Be Your Own Home Electrician

George Daniels
1967; 186 pp.

\$3.95 postpaid

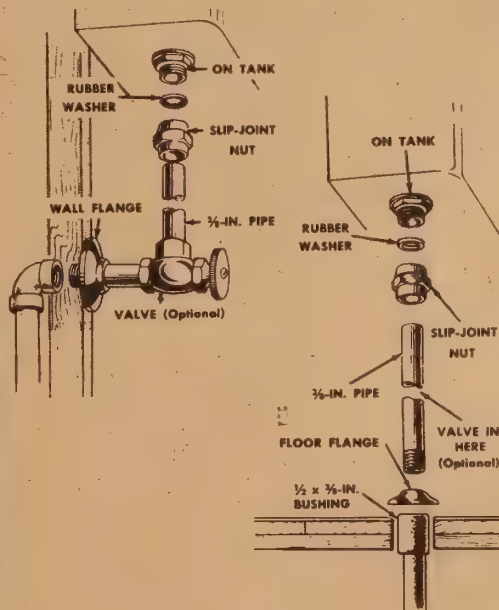
from
Harper & Row
49 East 33 Street
New York, N. Y. 10016
or
WHOLE EARTH CATALOG

Home Guide to Plumbing, Heating, Air Conditioning

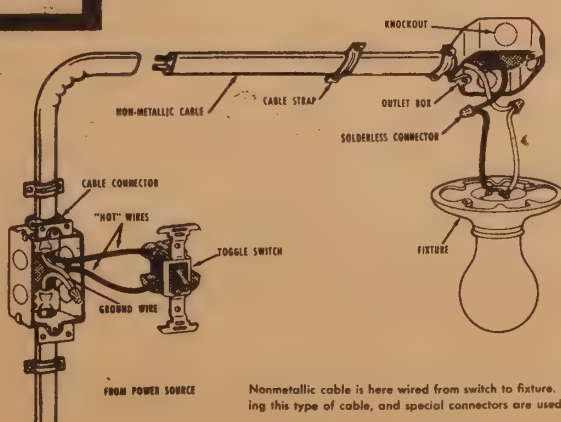
George Daniels
1965; 144 pp.

\$3.95 postpaid

from
Harper & Row
49 East 33 Street
New York, N. Y. 10016
or
WHOLE EARTH CATALOG



You'll hear scare stories about plastic pipe, fiber pipe, even concrete tile and ceramic tile. But they're in use from coast to coast, and doing nicely. If you're in doubt, contact the manufacturer directly. And keep in mind that our ancestors of only a generation or two ago didn't eat tomatoes because they considered them poisonous.



Nonmetallic cable is here wired from switch to fixture. Straps, not staples, are used in mounting this type of cable, and special connectors are used to attach cable to boxes.

III. WALL UNIT

The lumber in an ordinary framed wall will not vary a great deal for each 100 square feet of wall area, except as the stud sizes change, even though some walls have more openings than others and some openings are larger than others. Different wall heights require different constants.

Parts: Plates, studs, braces, firestops, backing, storm sheathing, topheaders.

Stud Size (16" o.c.)	2x4	2x4	2x6	2x6
Ceiling Height	8'	9'	8'	9'
Board Feet per Square Foot of Wall Area	1.25	1.32	1.87	2.00

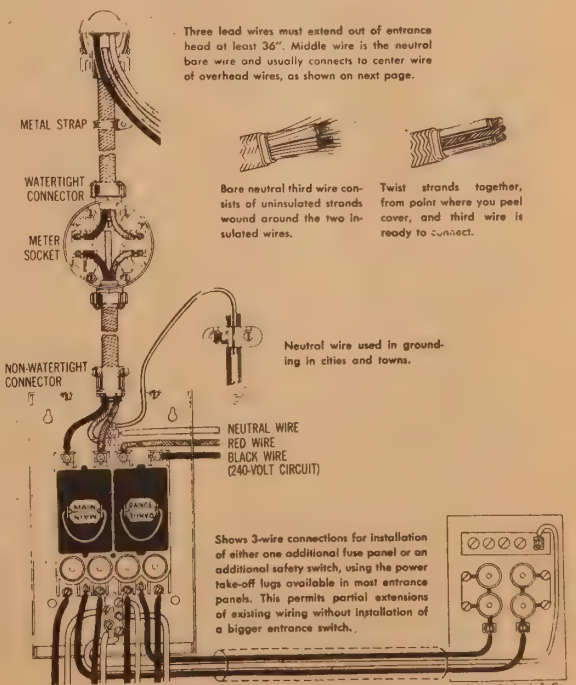
Variables: Storm sheathing and top headers.

There are two variables to be considered, namely diagonal or storm sheathing, as many buildings are not sheathed, and top headers which will vary in size and number.

Rule: Wall area X constant equals board feet of lumber; then add the variables.

The advantages of plastic pipe and its fittings are low cost, light weight, ease of assembly, and high resistance to corrosive elements that can damage metal pipe.

Although rigid plastic pipe is available for use with threaded fittings, the most popular connection system is the 'solvent welding' system. You simply coat the end of the pipe with a special plastic cement and push it into the fitting with a slight twisting motion to spread the cement. The solvent in the cement actually fuses the pipe and fitting together, hence the term 'solvent welding.' Be sure, however, that the type of cement you use is formulated specifically for the type of pipe. Common rigid plastic pipe lengths are 10' and 20'. You can cut it with a fine-toothed saw.



Three lead wires must extend out of entrance head at least 36". Middle wire is the neutral bare wire and usually connects to center wire of overhead wires, as shown on next page.

Bare neutral third wire consists of uninsulated strands wound around the two insulated wires. Twist strands together, from point where you peel cover, and third wire is ready to connect.

Neutral wire used in grounding in cities and towns.

Shows 3-wire connections for installation of either one additional fuse panel or an additional safety switch, using the power take-off lugs available in most entrance panels. This permits partial extensions of existing wiring without installation of a bigger entrance switch.

Sears, Roebuck & Co.

Audel Guides

We've seen no series of individual technique publications more complete than the Audel books published by Howard Sams and Company. However, we're not proficient enough in this area to critique particular manuals against others in their field. Suggestions and reviews invited.

This part of the **WHOLE EARTH CATALOG** should be one of the most thorough. How-to books are notoriously unreviewed.

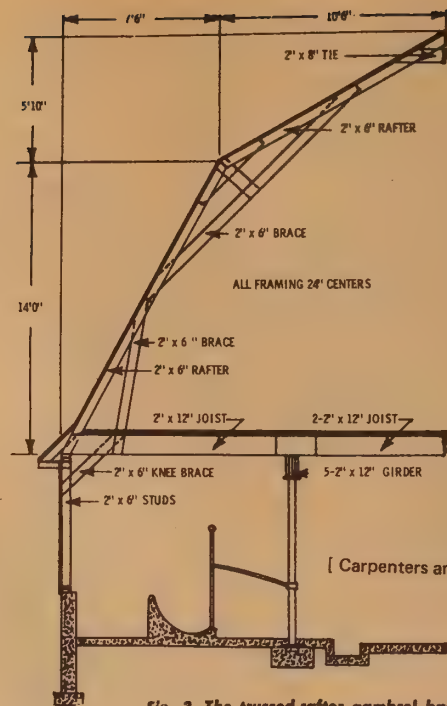
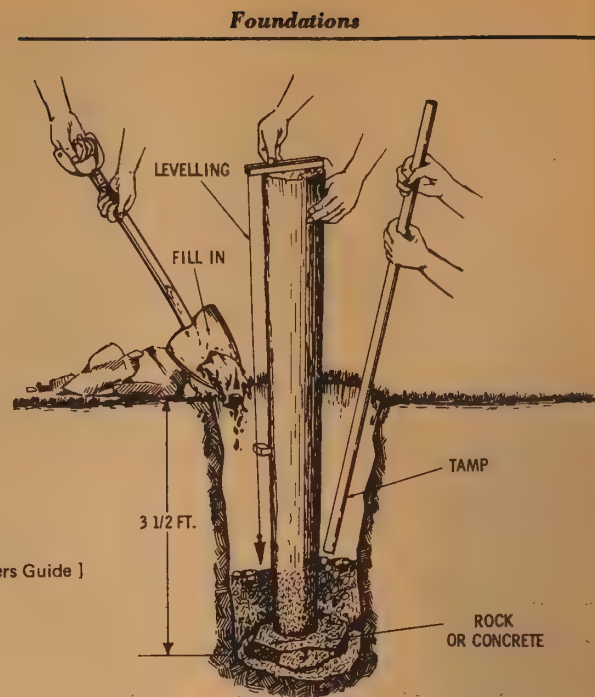


Fig. 3. The trussed-rafter gambrel barn roof.



1. A method of erecting a post. Note the large rock or concrete at bottom of the hole. The post is leveled from all angles with a alumb bob.

[Carpenters and Builders Guide]

from:

Theo. Audel & Company
4300 West 62nd Street
Indianapolis, Indiana 46206

All of the following prices are postpaid.

- Automobile Guide (AUD-1) \$6.95
- Home Appliance Service Guide (AUD-2) \$6.95
- Radiomans Guide (AUD-3A) \$5
- Television Service Manual (AUD-3B) \$5
- Handy Book of Practical Electricity (AUD-4) \$5.95
- Truck and Tractor Guide (AUD-5) \$5.95
- Plumbers & Steam Fitters Guides - 4 Vols. (AUD-6)
- Painting & Decorating Manual (AUD-7) \$4.95
- Carpenters and Builders Guides - 4 Vols. (AUD-8) set \$16.95
- Diesel Engine Manual (AUD-9) \$6
- Welders Guide (AUD-10) \$4.95
- Mathematics and Calculations for Mechanics (AUD-11) \$4.95
- Machinists Library (AUD-12) \$13.50 set
- Wiring Diagrams for Light and Power (AUD-13) \$4
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- Answers on Blueprint Reading (AUD-25) \$4.95
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- Sheet Metal Workers Handy Book (AUD-30) \$3.95
- Mechanical Drawing Guide (AUD-31) \$3
- Mechanical Drawing and Design (AUD-32) \$3.95
- Questions & Answers for Electricians Exams (AUD-34) \$3.50
- Electrical Power Calculations (AUD-35) \$3.95
- New Electric Science Dictionary (AUD-36) \$3.50

- Power Plant Engineers Guide (AUD-37) \$6.95
- Questions & Answers for Engineers & Firemans Exams (AUD-38) \$4
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- House Heating Guide (AUD-41) \$5.95
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- Programmed Basic Electricity Course (AUD-54) \$4
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- Home Modernizing & Repair Guide (AUD-56) \$2.95
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- Home Gas Heating and Appliance Manual (AUD-59) \$3.50
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- Practical Mathematics for Everyone - 2 Vols. (AUD-66) set \$8.95
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- Practical Guide to Tape Recorders (AUD-93) \$4.95
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- Practical Guide to Citizens Band Radio (AUD-95) \$4.95
- Practical Electronics Projects for the Beginner (AUD-96) \$4.95
- Practical Guide to Servicing Electric Organs (AUD-97) \$4.95
- Practical Guide to Building Maintenance (AUD-99) \$4.95
- Practical Guide to Fluid Power (AUD-100) \$6.95
- Practical Science Projects in Electricity/Electronics (AUD-102) \$4.95

Fastening Tools

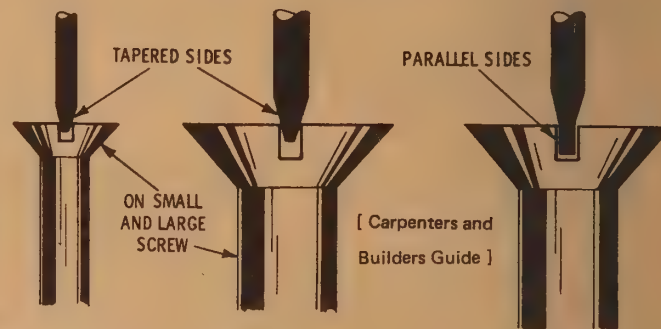


Fig. 7. The end of a screwdriver should be shaped so that its sides are parallel. A screwdriver whose end is tapered can be used, but considerable downward pressure must be exerted to prevent the screwdriver from rising out of the screw slot. With parallel sides, there is no tendency for the screwdriver to rise, no matter how much turning force is exerted.

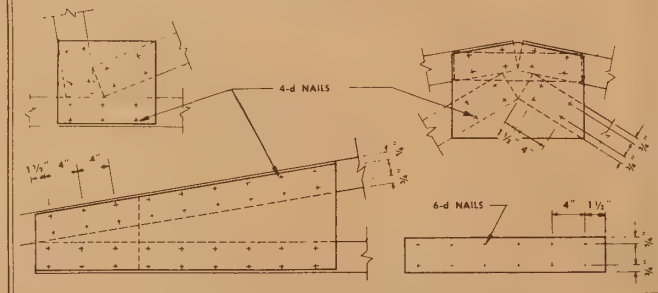
Glue-nailed Roof Trusses

A truss can be made of relatively small pieces of wood, is light, cheap and therefore a more economical means of spanning distances than a solid wooden beam. Complete clear plans of 14 different types of trusses are available, 50¢ each. Also, publications on various building techniques, and a set of circulars, 15¢ each, on subjects such as Selecting Lumber, Chimneys and Fireplaces, Plumbing, etc.

Brochure on publications from Small Homes Council-Building Research Council University of Illinois Urbana, Illinois

11 NAIL GUSSETS

Use 4-d nails for nailing gussets and 6-d nails for scabs and splice plates. Space nails 4 inches apart in two rows. Drive nails so heads are buried in the plywood.

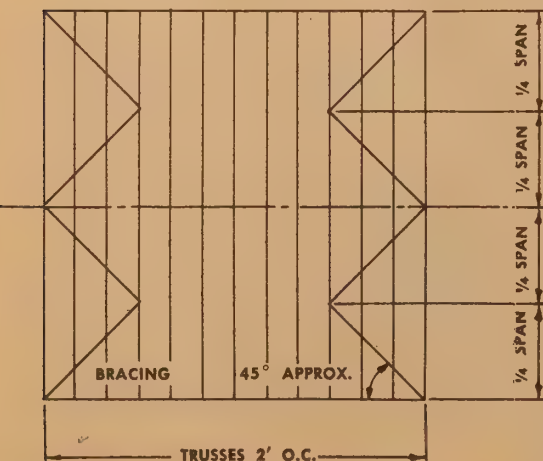
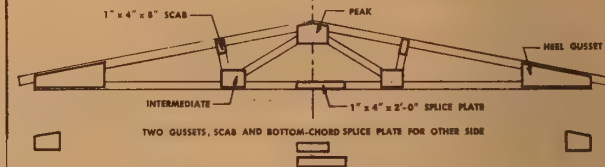


10 MARK FOR GLUING

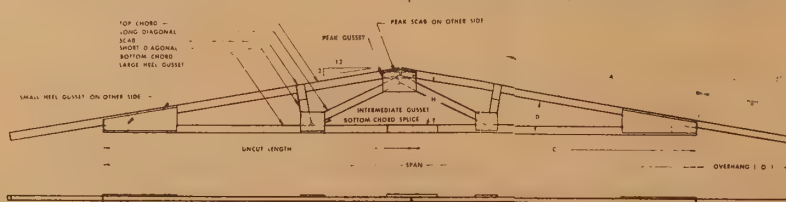
Place all the gussets on the truss as shown in the diagram. Mark around their outside edges, remove, and apply glue within the areas of the gussets. (See instruction sheet, "Nail-gluing of Roof Trusses and Frames.")

Nail gussets, the splice plate and scabs as shown in Figure 11. Remove truss from the jig. Turn the truss over. Glue and nail the 2 gussets, scab, and splice plate on the other side.

Stack the completed trusses. Let glue set 24 hours before handling trusses.



TO CONSTRUCT THIS 2/12 TRUSS



YOU WILL NEED THIS MATERIAL

- 1 TOP CHORD
- 1 BOTTOM CHORD
- 1 LONG DIAGONAL
- 1 SHORT DIAGONAL
- 2 LARGE HEEL GUSSETS
- 2 SMALL HEEL GUSSETS
- 7 INTERMEDIATE GUSSETS
- 1 PEAK GUSSET
- 2 SPLICE PLATES
- 2 SCABS
- ONE NAIL

3 CUT MEMBERS ACCORDING TO THIS SCHEDULE (Cut one pattern truss first.)

SPAN	CUTTING SCHEDULE															
	20'	21'	22'	23'	24'	25'	26'	27'	28'	29'	30'	31'	32'	33'	34'	35'
BOTTOM CHORDS	10'-8"	11'-0"	11'-4"	11'-8"	12'-0"	12'-4"	12'-8"	13'-0"	13'-4"	13'-8"	14'-0"	14'-4"	14'-8"	15'-0"	15'-4"	15'-8"
TOP CHORDS	Cut Top Chords Only if Less Overhang Than That Listed in Item "0" is Desired.															
SHORT DIAGONALS	18"															
LONG DIAGONAL	17"															
BOTTOM-CHORD SPLICE PLATES	18 1/2"															
HEELS	Use Material Left After Cutting Short Diagonals															
HEIGHT (Inside Dimension)	20 1/2"	21 1/2"	22 1/2"	23 1/2"	24 1/2"	25 1/2"	26 1/2"	27 1/2"	28 1/2"	29 1/2"	30 1/2"	31 1/2"	32 1/2"	33 1/2"	34 1/2"	35 1/2"
EXTENSION	4 1/2"	4 1/2"	4 1/2"	4 1/2"	4 1/2"	4 1/2"	4 1/2"	4 1/2"	4 1/2"	4 1/2"	4 1/2"	4 1/2"	4 1/2"	4 1/2"	4 1/2"	4 1/2"
OVERHANG	4 1/2"	4 1/2"	4 1/2"	4 1/2"	4 1/2"	4 1/2"	4 1/2"	4 1/2"	4 1/2"	4 1/2"	4 1/2"	4 1/2"	4 1/2"	4 1/2"	4 1/2"	4 1/2"
BIRMINGHAM "A"	7'-0"															

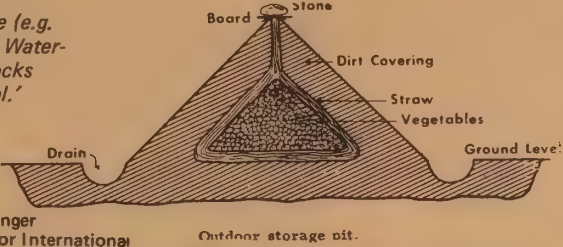
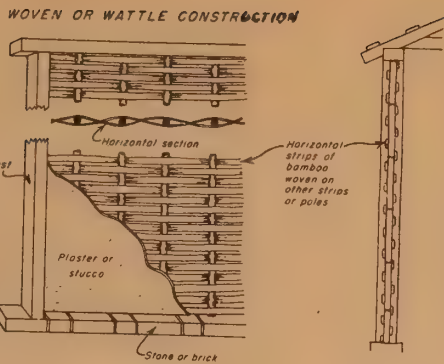
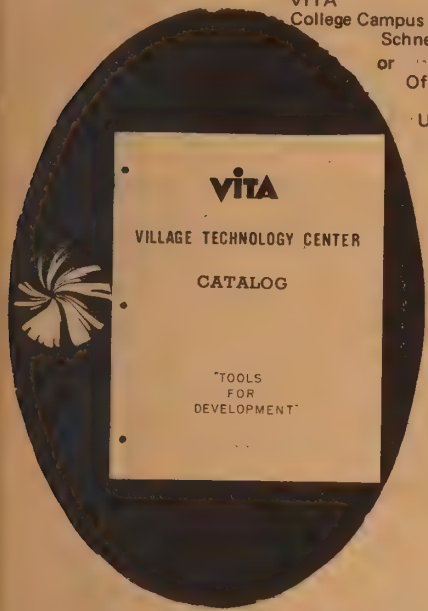
Village Technology

VITA (Volunteers for International Technical Assistance) is the only source of specific practical information on small-group technology that we've found. But what a source. They have prepared a two-volume "Village Technology Handbook" for overseas use by the U.S. Agency for International Development that is ideal for rural intentional communities. This handbook now is in revision; the new edition should be available as of August 1969—inquire for price.

Also VITA has a catalog of funky tools—Village Technology Center Catalog—available free. For the items listed they will supply plans for making the tools, or rent or sell the items—inquire for price.

VITA has a series of specific papers that cost very little (e.g. 30¢). Titles include "Low Cost Development of Small Water Power Sites," "How to Salt Fish," "Making Building Blocks with CINVA-Ram," "Solar Cooker Construction Manual."

VITA
College Campus
Schnectady N.Y.
12308
or
Office of War
on Hunger
U.S. Agency for International
Development
State Dept.
Washington, D.C.



Equipment for which suitable designs are being sought or developed for inclusion in future catalog supplements:

- | | |
|-----------------------------|-----------------------------------|
| 1 Animal harness | 28 Clothes wringer |
| 2 Tractors | 29 Chlorinator |
| 3 Moldboard plows | 30 Sterilizer |
| 4 Harrows | 31 Baby incubator |
| 5 Seed planters | 32 Baby scales |
| 6 Grain drills | 33 Automatic flush toilet |
| 7 Cultivators | 34 Solar food dryer |
| 8 Dusters | 35 Solar still |
| 9 Sprayers | 36 Soil mixer |
| 10 Threshing machines | 37 Sifting apparatus |
| 11 Winnowing machines | 38 Concrete mixer |
| 12 Seed cleaner | 39 Concrete block machine |
| 13 Rice huller and polisher | 40 Concrete block forms, wood |
| 14 Oil seed press | 41 Wheelbarrows |
| 15 Farm cart | 42 Flashlight projector |
| 16 Rice drying equipment | 43 Photo enlarger |
| 17 Incubators | 44 Bamboo science equipment |
| 18 Brooders | 45 Playground equipment |
| 19 Peanut sheller | 46 Arc welder |
| 20 Pumps | 47 Spot welder |
| 21 Deep well pump | 48 Blacksmith's forge |
| 22 Rotary centrifugal pump | 49 Sheet metal brake |
| 23 Diaphragm pump | 50 Sheet metal rolls |
| 24 Hydraulic ram | 51 Kiln |
| 25 Well drilling equipment | 52 Potter's wheel |
| 26 Well casing forms | 53 Bobbin winders |
| 27 Sawdust heating stove | 54 Spinning and weaving equipment |

SOLAR WATER HEATER

ABSTRACT

To provide hot water, primarily for washing clothes, in areas where fuel is scarce and sunshine is plentiful.

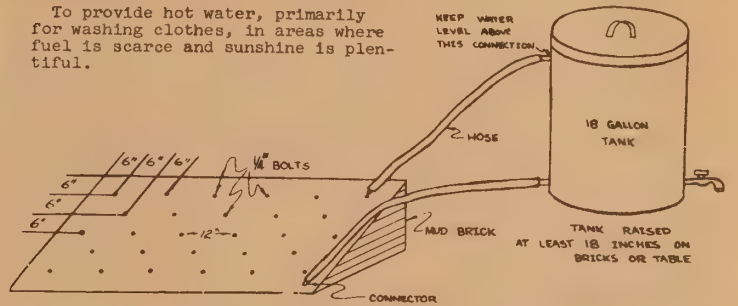
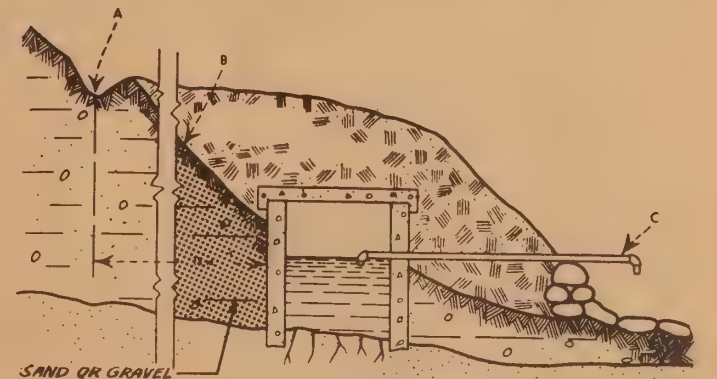


Fig. 33. PROPERLY PROTECTED SPRING (I)



- A Protective drainage ditch to keep drainage water a safe distance from spring
- B Original slope and ground line
- C Screened outlet pipe: can discharge freely or be piped to village or residence.

"BEEHIVE" BUILDING

Cat.No. M-103

The "BEEHIVE" BUILDING, so named because of its shape, is unusually well adapted for use as farm out-buildings (chicken houses, storage sheds and granaries). It is cheap to build because the walls are only 25 cm thick and come together to form the roof. Sun-dried bricks are suitable construction material in dry areas; stabilized earth or burned brick plus a covering of water-proof plaster must be used in areas with high rainfall.

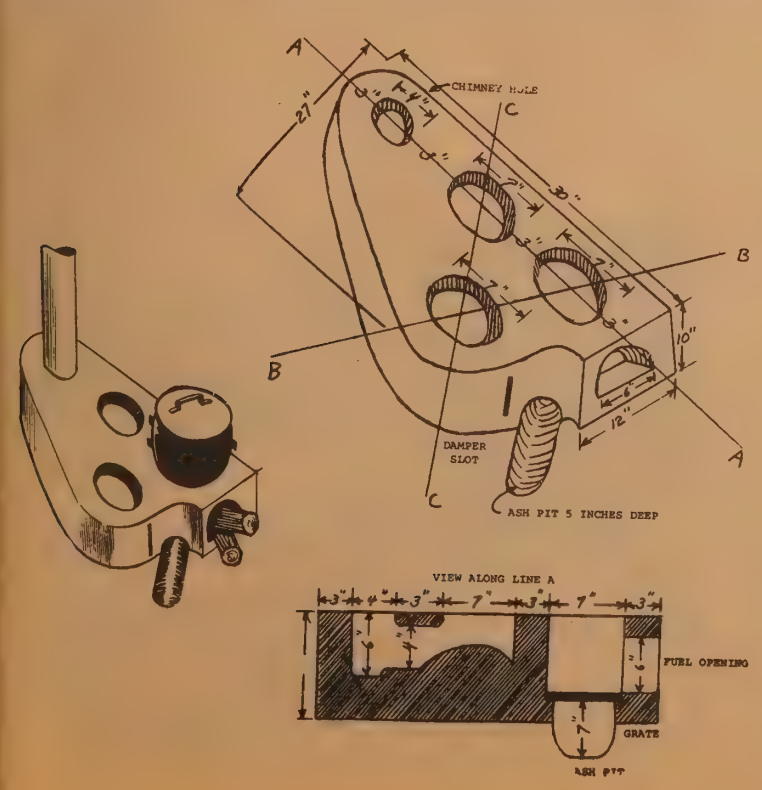
Building instructions only

CONSTRUCTION JIG for "BEEHIVE" BUILDING

Cat.No. M-103A

The construction of the "BEEHIVE" BUILDING is simple and can be done by unskilled people using the JIG shown. The JIG is designed to swing completely around while the free end serves as a guide pole. By laying the bricks against the end of the guide pole, the building is kept perfectly circular and the walls are brought in to form the "beehive" shape. Base and fitting only; poles must be provided locally.

Diameter: 3" - Length: 36" Wt. 30 lbs.



WOODMAKER'S CUTTING BENCH

Cat.No. M-114

This ingenious CUTTING BENCH has a vise at one end in which a block of wood could be held by pressing on a foot treadle—leaving both hands free to operate tools. It is a very useful device which has application in a number of situations. One of its earlier uses was for holding wooden shingles while tapering with a draw-knife.

Size: 20"x77"x42" Wt. 100 lbs.

EVAPORATIVE FOOD COOLER

Cat.No. M-83

In warm and dry climates, an EVAPORATIVE FOOD COOLER will extend the period for keeping food fresh and preserve leftovers. It also helps to keep crawling and flying insects away from food. The COOLER operates on the principle of evaporation of water from the heavy cloth cover which is kept wet at all times by absorbing water from the pan in which the cooler stands. It will not work in damp and humid areas.

Size: 17"x13"x57" Wt. 26 lbs.

VITA SOLAR COOKER

Cat.No. M-73

The VITA SOLAR COOKER is designed to be sturdy, relatively easy to make, easy to repair and low in cost. It uses the principle of the Fresnel reflector which concentrates light and heat. The COOKER—when used in areas having more than 2000 hours of sunshine per year—provides the heat equivalent to 500 watts (which will boil a quart of water in 12 to 15 minutes). Larger models of the COOKER can be provided.

Size: 52"x46"x50" Wt. 24 lbs.

Adobe Construction Methods

It's hard to track down instructions on building with adobe. But here's a \$.25 booklet, easy to read, which gives you basics on building with natural earth.

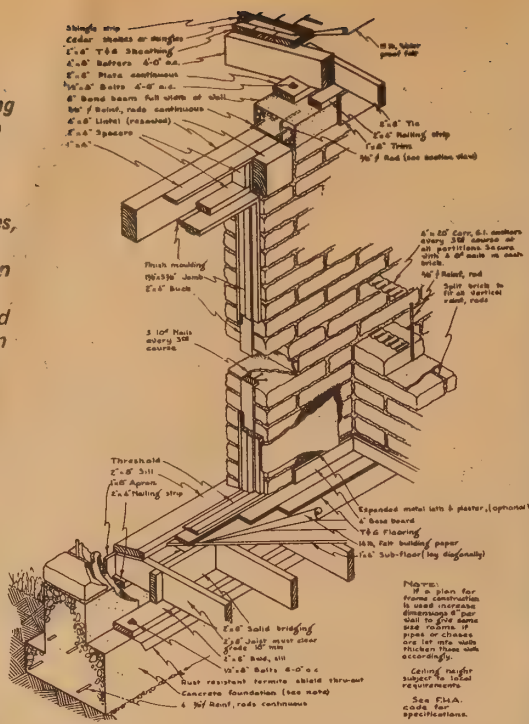
There are details on laying the bricks, fireplaces, and pictorial and cross section views of foundations, floors, and walls. Another section describes monolithic construction, where the entire mass of adobe is poured at one time, and there is a list of about 30 other publications on adobe.

Adobe Construction Methods

L. W. Neubaue
1964; 35 pp.

\$.25

from
Agricultural Publications
207 University Hall
University of California
Berkeley, Calif. 94720



PICTORIAL VIEW showing construction details, including wooden floor.

Oily, waterproofing agents, especially emulsified asphalt, are being widely and successfully used as stabilizers. A fractional volume of a water emulsion of asphalt, added to the earth-and-water mix, provides an internal waterproofing that permanently protects adobe bricks.

Making Bricks

Manual labor is, of course, the historical method of brick making... Make rectangular forms of wood or metal. Lay them on the ground, on a smooth area, and place mud in the forms by shovel or bucket. Spade the adobe carefully, and tamp it into all corners of the forms, to insure well-shaped bricks. Strike the top off level, then lift the forms, leaving the bricks in place... Not too wet, or the mud will run after you remove the forms, or may shrink and crack excessively upon drying. Cover bricks with paper to slow down the initial drying. After lifting the form, wash excess mud off its inner faces with water, and repeat the molding process. Allow the bricks to lie flat for one to three days, until they are sufficiently strong to hold their shapes when turned. At that time, set bricks on edge, so air may circulate freely on both sides. This will promote uniform drying and help prevent warping and cracking. After a few more days of drying in this position, stack the bricks in loose piles for a few weeks, to complete their drying and curing.

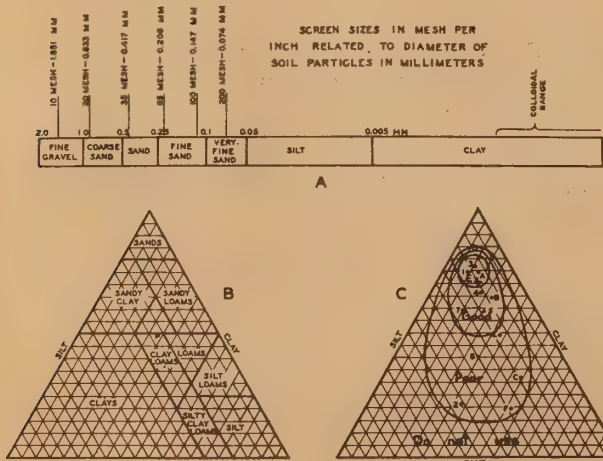
When you build with adobe, you get covered with it.

Structural Requirements

A high pressure machine such as the Cinva Ram (See WHOLE EARTH Supplement, March, 1969) can be used to produce bricks of greater strength.

In earthquake regions, hazard with all types of soil or masonry structure is rather serious.

Construct footings, piers, and foundations somewhat larger and stronger than usual, because they have to support walls heavier than usual.



A, Bar graph illustrating the soil texture classification as used by the USDA Bureau of Soils. B, Soil classes based on the relative amounts of clay, silt, and sand. C, Results of certain soil tests. The contours indicate suitability for earth construction. Note that the best mixes contain large percentages of sand.

Stabilization

You can often improve soils that are unsatisfactory for brick making by mixing them with other soils or materials.

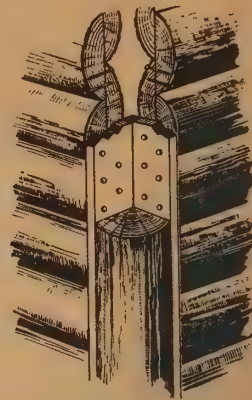
Course sand or even some types of gravel, may often be added to good advantage. Generally, clay in the soil adds strength, while sand and gravel aid in reducing shrinkage.

26

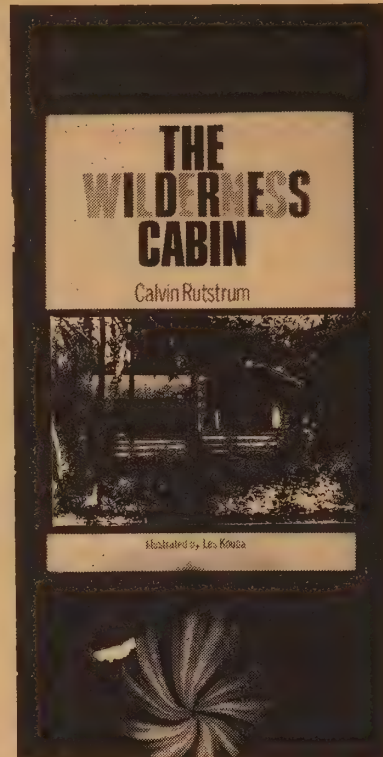
Portland cement increases the strength of soil, and makes it water resistant.

The Wilderness Cabin

Not many log cabins are still being built. For one thing, it uses a lot of wood. However, it's a way for a man to go into the woods and with very few tools, erect a shelter. Maybe you've got to clear trees for a building site, or thin out an overgrown forest, or there is no road to your land. If so, here are diagrammed instructions on selecting a site, use of tools, and building a log cabin. Details are not extensive, but common sense will fill the gaps.



The V-Plank Corner



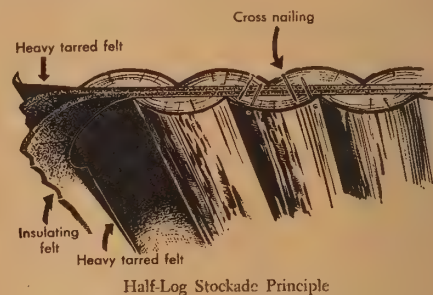
The Wilderness Cabin

Calvin Rutstrum
1961; 169 pp.

\$.95 postpaid

from
The Macmillan Company
Front and Brown Streets
Riverside, N. J. 08075
or
WHOLE EARTH CATALOG

Half-log construction, another aspect of the stockade type of cabin, has its most important feature in the overlap principle involved, producing a very tight wall. These are logs ripped down the center from end to end with a chain saw. As the illustration will show, the flat surface of each half-log covers the joint of two facing half-logs, thus tightly closing up the joint between them. In short, the outside half-logs are staggered with the inside half-logs.

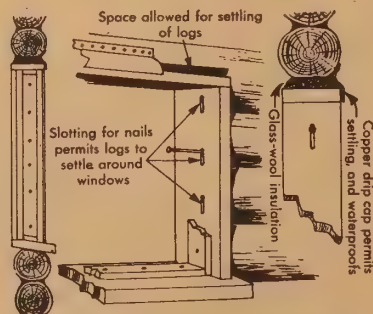


Half-Log Stockade Principle

The general appearance, both inside and outside, is that full, round logs, such as are seen in the regular stockade type of cabin, are being used. The big advantage, of course, is that insulation and waterproof paper, or roofing, can be applied between the two layers of half-logs.

Window and door frames should be installed in a manner regarded as 'floating.' That is, they must not be spiked to the logs in such fashion as to allow the logs, when drying out and shrinking, to settle their weight on the spikes.

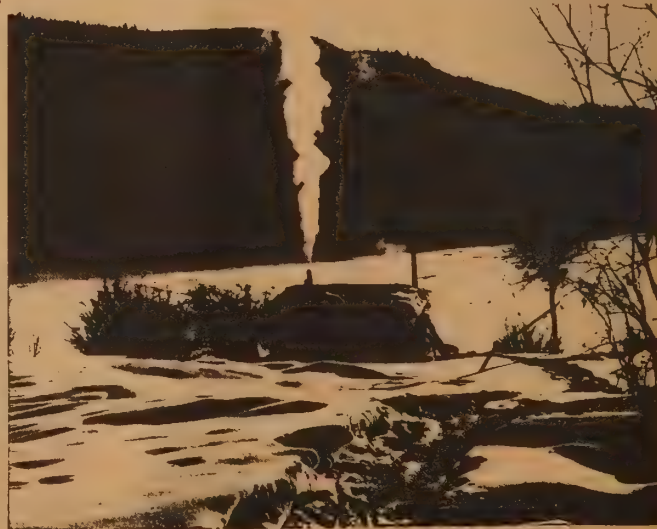
To accomplish this, I slot the door and window frames about 2 inches vertically at a position where every spike is driven through the door or window frames into the log ends. As the logs settle, the head end of the spike slides along these slots in the frames. As far as appearance is concerned there is no objection to this slotting because the door- and window-jamb strips cover these slotted areas. (See illustration.)



Method of Slotting and Spiking Window and Door Frames for Log Cabins

But an even better and more direct method than personal search is to go to the county seat in the county where you want to build. Ask the county auditor for a list of tax-delinquent properties, and the descriptions and plats of each location. During your first free weekend, examine the sites. If you find something you like, pay the back taxes.

When the original owner has failed to pay the taxes for a certain number of years—in many states the period is five years—and you pay the back taxes, you can get what is called a 'tax assignment' from the county. Your final ownership paper is about equivalent to a quit-claim deed. This is good enough while you personally own the site. Should you finally sell the property, it is best to have an attorney obtain a Torrens title for you, or procure a warranty deed through legal formality.



Cabin on the Yukon River at 50 Degrees Below Zero

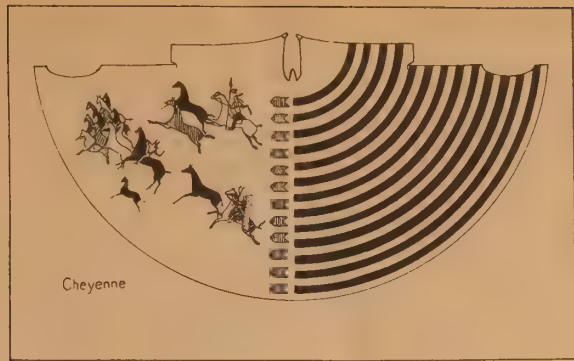
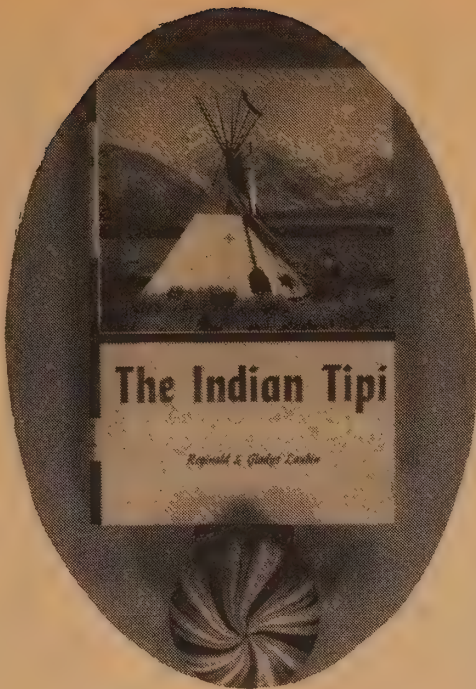
The Indian Tipi

Tipis are cheap and portable. To live in one involves intimate familiarity with fire, earth, sky, and roundness. The canvas is a shadow-play of branches by day, people by night. Depending on your body's attitude about weather, a tipi as dwelling is either a delight or a nuisance. Whichever, you can appreciate the elegant design of a tipi and the completeness of the culture that produced it.

The Laubin's book is the only one on tipis, but it is very good. All the information you need, technical or traditional, is here, and the Laubins are interesting people.

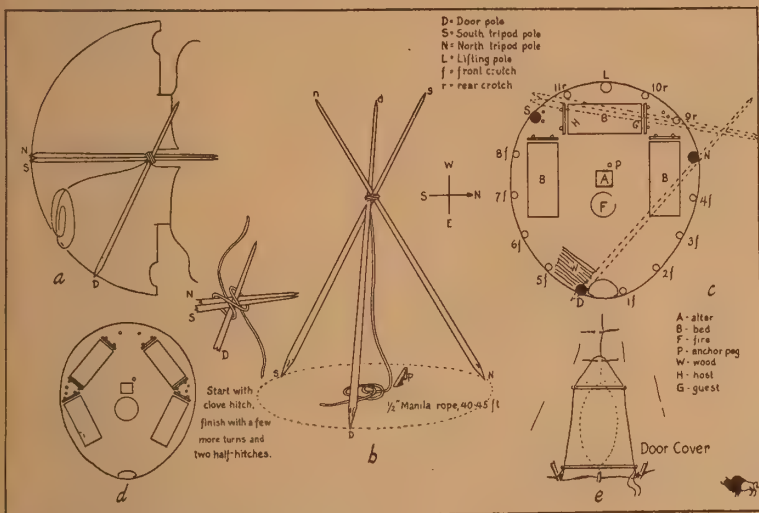
Later we discovered that the idea of a ventilating pipe underground to the fireplace is the very best way of insuring a clear lodge and the most heat.

It is a joy to be alive on days like this, and when we come back to the tipi, after a long ride or a hike in the mountains, the little fire is more cozy and cheerful than ever. The moon rides high in the late fall nights, and when it is full, shines right down through the smoke hole. Its pale white light on the tipi furnishings, added to the rosy glow of the dying fire, is beautiful beyond description.



Indians had definite rules of etiquette for life in the tipi. If the door was open, friends usually walked right in. If the door was closed, they called out or rattled the door covering and awaited an invitation to enter. A shy person might just cough to let those inside know he was waiting. If two sticks were crossed over the door, it meant that the owners either were away or desired no company. If they went away, they first closed the smoke flaps by lapping or crossing them over the smoke hole. The door cover was tied down securely and two sticks were crossed over it. The door was thus "locked," and as safe in Indian society as the most strongly bolted door would be in our civilization today.

The Indian way of attaching peg loops, as illustrated, is not only ingenious but easy and sturdy—far better than either sewn or stamped grommets. Insert a pebble about 3/4 of an inch in size on the under side of the cover about six inches above the edge, at a seam wherever possible, and around this pebble tie a piece of 3/16-inch cord. Double the cord, tie it in either a square knot or a clove hitch about the pebble, then join the free ends in a square knot. Marbles will do if you cannot find smooth round pebbles.



The Indian Tipi
Reginald and Gladys Laubin
1957; 208 pp.

\$4.95 postpaid

from:
University of Oklahoma Press
Sales Office
Faculty Exchange
Norman, Okla. 73069
OR
WHOLE EARTH CATALOG

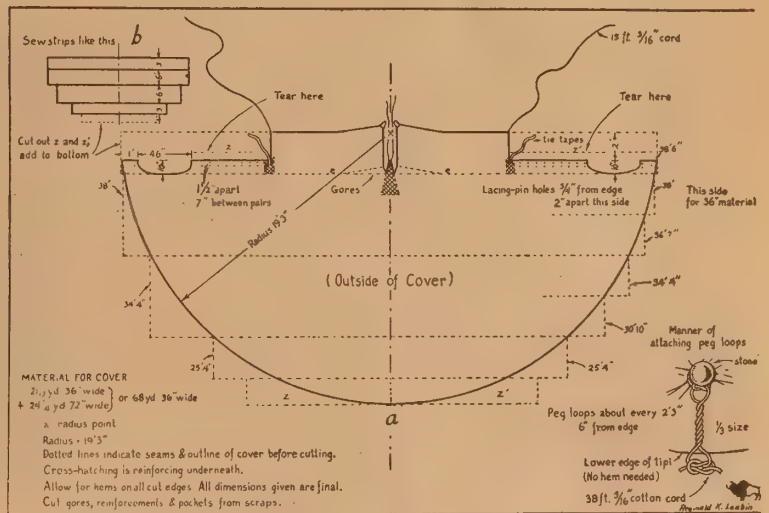


Fig. 3. Erecting the Sioux Tipi.

Fig. 1. Pattern for Sioux Tipi (18-foot).

Tipis

We have word about three sources in the U.S. of ready-made tipis, and so far Goodwin-Cole is still the best—best construction, lowest cost. They also have tipi liners, which you will need if weather is wet or cold.

For the following, shipping weights are undetermined. Inquire, or have the item sent shipping cost C.O.D.

	10 oz. white duck	10 oz. flame treated white duck
10' diameter	\$60	\$75
14' diameter	\$77.50	\$106.50
20' diameter	\$107.50	\$162

10-foot is suitable for nomadic couple; 14-foot for small family. 20-foot for extended family or occasions. Flame-treated is unpleasant; law requires it in some places. Tipis of green, blue, orange, red or yellow drill are available. Poles are available if you're that lazy.

from:
Goodwin-Cole Company
1315 Alhambra Blvd.
Sacramento, California 95816

OR
WHOLE EARTH CATALOG



Aladdin Kerosene Lamps

Coleman lamps are terrible — they hiss and clank and blind you, just like civilization.

Aladdin is the answer if you need good light and 117ac isn't around. It is bright, silent, and requires no pumping. (It does require some babying to keep the mantle from smoking up; it's like not burning toast.)

British made and efficiently designed, the lamps are available in this country from:

Aladdin Industries, Inc.
Kerosene Lamp Division
Nashville, Tennessee 37210

OR
WHOLE EARTH CATALOG

Some of the Aladdins are rather ornamental. The simplest designs are B-165 Font Lamp (aluminum) **\$15.97** shipping wt 2.5 lbs and B-223 Hanging Lamp **\$22.63** shipping wt 3.5 lbs shade extra: \$2.60



Man's Role in Changing the Face of the Earth

This book of almost 1200 pages is the result of a major conference held in 1955, sponsored by the Wenner Gren Foundation for Anthropological Research. More than 50 scholars submitted papers, covering almost every imaginable point of view related to man's capacity to transform his physical environment. Though first presented nearly 15 years ago, the facts and insights are richly rewarding today. In my opinion in fact, it is an unsurpassed achievement in assembling pertinent, insightful information of interest not only to serious students of the planet Earth, but to non-trained readers as well.

The three sections of the book are: I. "Retrospect", an historical background; II. "Process", methods and agencies involved in man's interactions with the land; and III. "Prospect", the effects and future implications of man's habitation of the Earth. Some typical subjects covered within these sections include: fire as the great force employed by man; origins and decline of woodlands; man and grass (sic); ecology of peasant life; harvests of the seas; ports channels and coastlines; and sewerage (don't belittle sewerage—society is structured around it).

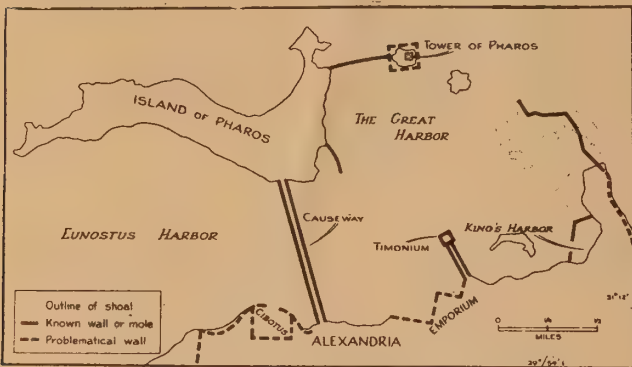


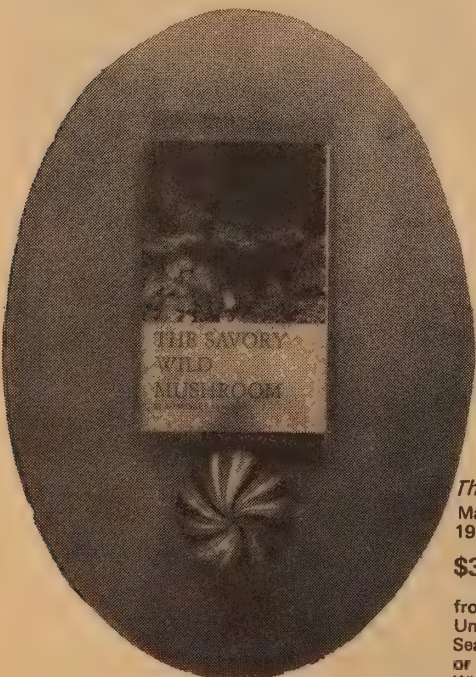
FIG. 106.—Harbor at Alexandria, Egypt, about the beginning of the Christian Era.

This book rewards a reader like me because of its minimum of moralizing and its abundant substance. Edgar Anderson, director of the Missouri Botanical Garden in St Louis and without whom such a book as this would be certainly incomplete, pointed out that the average thoughtful person has little inkling of how man has reclothed the world. Even professional biologists have been tardy in recognizing that a significant portion of the plants and animals surrounding us are of our own making. For example, neither Kentucky bluegrass nor Canada bluegrass is native to those places, but came from Europe. The corn belt is a very obviously man-dominated landscape, but the casual observer might never realize that even the grass covered and oak-dotted stretches of what looks like indigenous California vegetation came uninvited from the Old World along with the Spaniards.

[Reviewed by Richard Raymond]

Two Mushroom Books

Finding a strange, slimy, luminous colored growth on dark rotting wood is surprise and pleasure; to extend that experience into identifying it and possibly EATING it is even better. For the beginner one batch of mushrooms can occupy a whole day, from finding them, through waiting for a good spore deposit and making a decision, to cooking them. An efficient guidebook is essential to avoid frustrations.



The Savory Wild Mushroom
Margaret McKenny
1962; 133 pp.

\$3.95 postpaid

from:
University of Washington Press
Seattle, Washington 98105

OF
WHOLE EARTH CATALOG

On a tramp through the fields and forests, carry with you a small jar of butter, creamed with salt and pepper. On finding any edible mushroom (except morels or elfinsaddles), collect a few dry sticks and fire them. Split a green stick (alder or willow) at one end. Put the mushroom in the cleft, hold it over the fire until tender, season with the butter. Eat from the stick.

from "The Savory Wild Mushroom"

Generally speaking, the plants which follow man around the world might be said to do so, not because they relish what man has done to the environment, but because they can stand it and most other plants cannot.

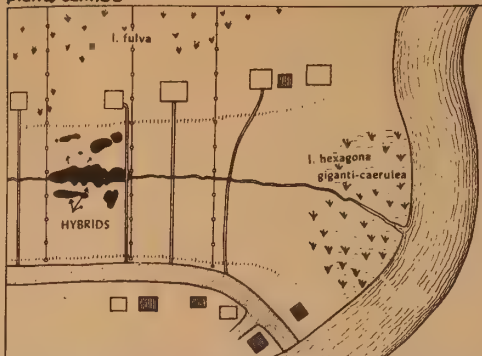
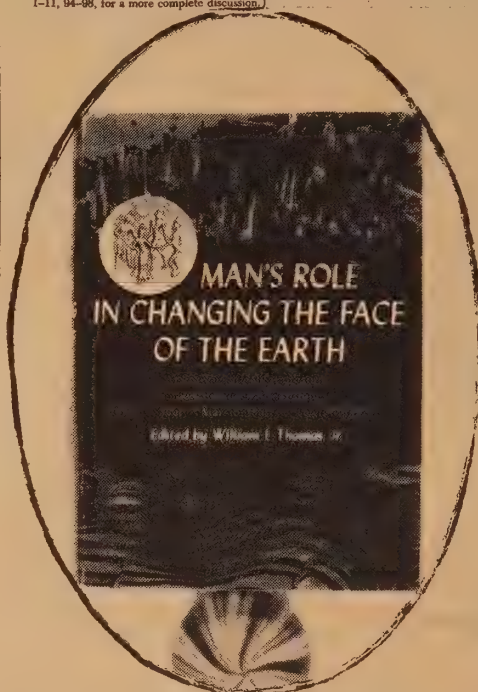


FIG. 163.—A demonstration of man's unconscious role in creating new plants. (From Riley, 1938.) At the far right one of the minor bayous of the lower Mississippi Delta. At right angles to it and running nearly across the figure is the abandoned channel of a former stream, now drained by a ditch. The natural levees of the stream are slightly higher than the surrounding country. Their sharp inner edges are indicated on the map by hachures. The road has been run along the lower levee, and houses have been built along the opposite one. The property lines (as in many old French settlements) produce a series of long narrow farms, which for our purposes serve as so many experimental plots. Each farm has its house on a low ridge with a long entrance drive connecting it across a swale to the public road on the opposite ridge. The farms (including a score of others which are out of sight to the left of the figure) were originally essentially similar. At the point where the ditch joins the bayou is a large population of *Iris hexagona gigantea-caerulea*. Behind the levee on which the houses were built, *I. fulva* grows on the lower ground as well as farther upstream along the ditch. The key fact to be noted is that the hybrids are on only one farm, that they are abundant there, and that they go up to the very borders of the property on either side. Nature is evidently capable of spawning such hybrids throughout this area, but not until one farmer unconsciously created the new and more or less open habitat in which they could survive did any appear in this part of the delta. (See Anderson, 1949, pp. 1-11, 94-98, for a more complete discussion.)



**Man's Role in Changing
the Face of the Earth**

William L. Thomas, ed.
1956; 1193 pp.

\$15.00 postpaid

from:
University of Chicago Press
11030 South Langley Ave.
Chicago, Illinois 60628

OR
WHOLE EARTH CATALOG

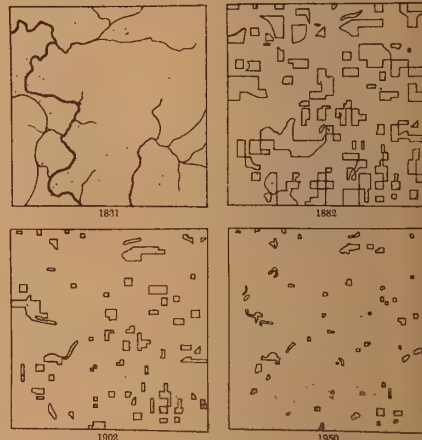
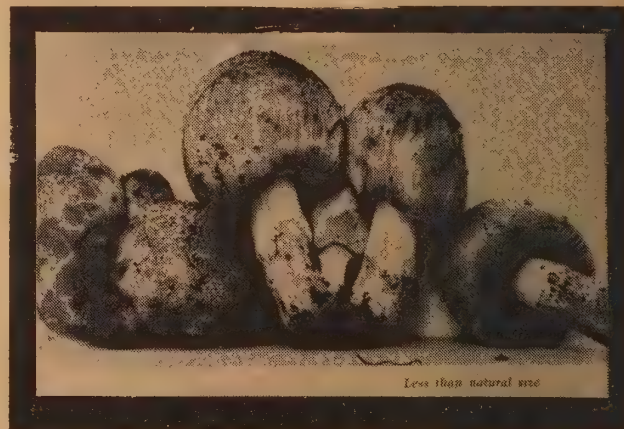


FIG. 147.—Changes in wooded area of Cadiz Township, Green County, Wisconsin (89°54' W., 43°30' N.), during the period of European settlement. The township is six miles on a side and is drained by the Pecatonica River. The shaded areas represent the land remaining in, or reverting to, forest to 1882, 1902, and 1950.



164. COPRINUS ATRAMENTARIUS (Inky Cap)

Edibility. Edible, but some people experience a peculiar type of intoxication from eating this species and afterward drinking an alcoholic beverage. I have now discovered three people in Michigan with this type of sensitivity.

from "The Mushroom Hunter's Field Guide"

KEYS TO FAMILIES

1. Gills turning black and "melting" at maturity *Coprinus*, in the family *Coprinaceae*
1. Gills not liquefying at maturity 2
2. Gills free from the stalk 3
2. Gills attached to the stalk 6
3. Spore deposit chocolate brown to blackish and mature gills the same color; ring present on stalk *The Agaricaceae*
3. Spore deposit and mature gills paler 4
4. Spore deposit pink to vinaceous or reddish; mature gills about the same color *The Volvariaceae (Pluteus magnus)*
4. Spore deposit white (greenish in one) 5
5. Volva present around base of stalk or remains of outer veil present on the cap *The Amanitaceae*
5. Volva absent; inner veil present; cap if scaly with the scales ingrown and usually of appressed hairs (fibrillose) *Chlorophyllum* and *Leucoagaricus*
6. Spore deposit white to pale lilac, yellow, or pinkish buff 7

from "The Mushroom Hunter's Field Guide"

Instant Weather Forecasting

Alan Watts (another one) uses 24 large color photographs of typical cloud patterns as a key for rapid short-term weather forecasting. He provides some theoretical background, and useful notes on extreme possibilities as well as likely happenings. This book would be particularly valuable to the amateur sailor. And, annotated with your own local observations, should be a useful framework for getting into the peculiarities of your own local weather.

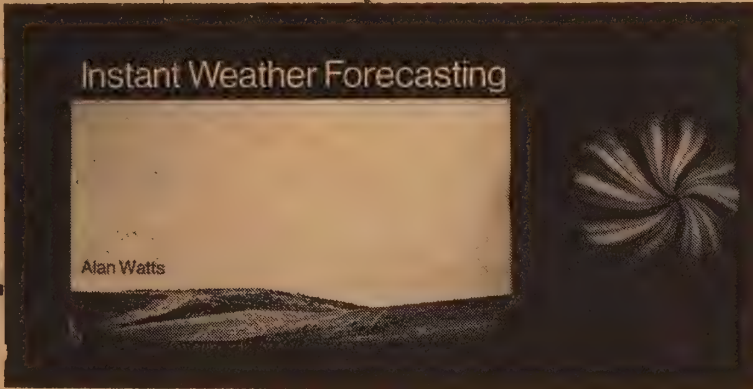
[Revised by Larry McCombs.]

Instant Weather Forecasting

Alan Watts
1968; 64 pp.

\$3.75 postpaid

from
Dodd, Mead & Company
79 Madison Ave.
New York, N. Y. 10016
or
WHOLE EARTH CATALOG



The Elements Rage

Every so often larger than normal pieces of cosmic energy lean on human affairs. The community dies, and is reborn, and ever after tells what the face of maelstrom looked like. Here are hair-raising photographs, intrepid accounts, hammerhead tragedies, and a seven-page scale of the energy gradient from a baseball homerun to the mass energy of the M31 galaxy. Classic.

[Suggested by Jordan Belson.]



The result of a lightning stroke. When Fred Berry of Suncook, New Hampshire, was struck, his shoes were blasted off, yet his only injuries were two badly cut feet.

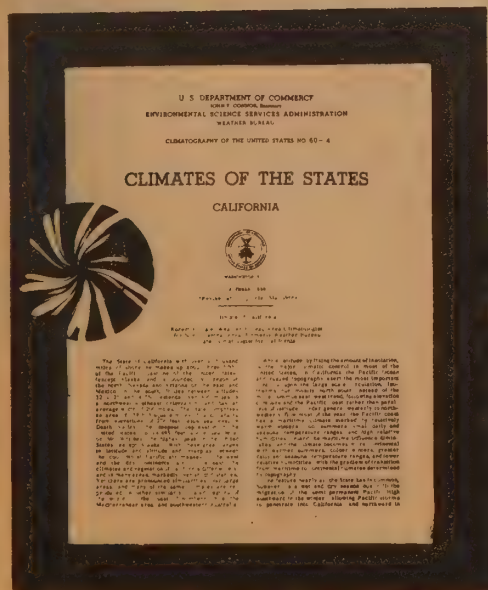
After each strike we moved in silence for a while, with only the tearing wind and slashing rain. Then the rocks would begin a shrill humming, each on a slightly different note. The humming grew louder and louder. You could feel a charge building up in your body. Our hair stood on end. The charge increased, and the humming swelled, until everything reached an unbearable climax. Then the lightning would strike again—with a crack like a gigantic rifle shot. The strike broke the tension. For a while we would grope forward in silence. Then the humming would begin again [quoted by Colin Fletcher.]



During a hurricane on Puerto Rico on September 13, 1928, a ten-foot pine board measuring three by one inches was shot through this Royal Palm tree.

Around us was an awesome display. Marge's eye was a clear space 40 miles in diameter surrounded by a coliseum of clouds whose walls on one side rose vertically and on the other were banked like galleries in a great opera house. The upper rim, about 35,000 ft. high, was rounded off smoothly against a background of blue sky. Below us was a floor of low clouds rising to a dome 8,000 ft. above sea level in the center. There were breaks in it which gave us glimpses of the surface of the ocean. In the vortex around the eye the sea was a scene of unimaginably violent, churning water.

Before Johnstown there were several small communities. The flood practically washed them out of existence, like a steamroller crushing toy villages. A stone viaduct was snapped in two as if made of dry clay, then ground to pieces. An iron bridge high in the valley was torn from its foundations by a blow from the edge of the flood. Dozens of locomotives and passenger carriages, hundreds of freight cars, and miles of track were swept forward as the monstrous river pounded down the valley. All these added immeasurably to the battering effect of the water.



Climates of the States

Specific climatological data on each state: rainfall, temperature, freeze occurrences, winds, etc.

\$.25 for each state.

from
U.S. Govt. Printing Office Bookstore
710 North Capital Street
Washington, D. C. 20402
U.S. Govt. Printing Office Bookstore
Rm 1463 14th floor
Federal Office Building
219 S. Dearborn St.
Chicago, Illinois 60604
U.S. Govt. Printing Office Bookstore
Rm 135 Federal Building
601 East 12th St
Kansas City, Missouri 64106
U.S. Govt. Printing Office Bookstore
Federal Building
450 Golden Gate Avenue
Rm 1023 Box 36104
San Francisco, California 94102



Sky associated with improvement

Major inference: The night will be clear and temperature will drop. The fractostratus clouds below the main cloudbase indicate that the air there is still wet from the rain falling out of the cold frontal clouds above. This wetness left on the ground in the evening and the fall of wind speed with the night may well produce mist and fog patches in areas sheltered from the wind. Frost can also occur in the winter half of the year.

Major clues:
(i) Good expanse of upper cloud on which the sun can project red rays
(ii) Immediate past history of cold front or occlusion (rain, showers, low cloud etc)
(iii) Obviously well broken skies behind the front
Explanation: The low sun of sunset (or sunrise) always projects red rays. These do not of themselves presage a fine night. The fine night follows because the sun can only illuminate the windward clouds if there is no cloud cover over the horizon (ie. to windward at sunset). The clouds in the foreground must be at medium and high levels. These conditions are fulfilled when a cold front has just passed and polar air is moving over the observer. It will then be a fine night.

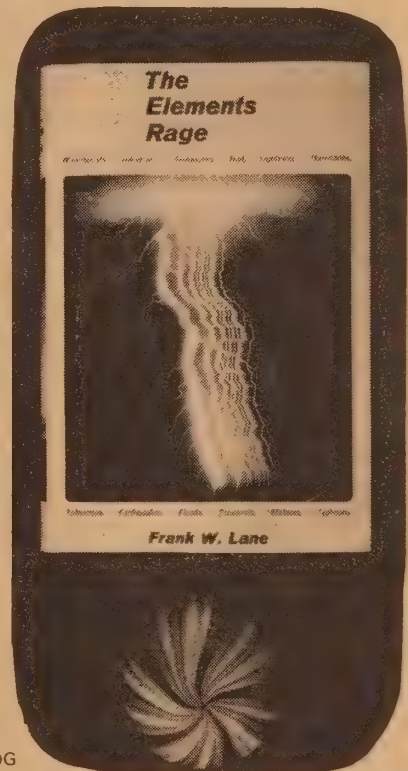
Reverse the situation and you have the dawn of a bad day. The sun is now to leeward and shining over a clear horizon onto the clouds of a warm front whose weather and wind has yet to come, and is that of which shepherds warn.

Element	Trend	Normal change is to	Normally over by	Risk of	Possibly
Wind	Decrease	W to NW Force 2-3 Calm in sheltered areas	Early hours of morning	Calm by dawn	Increasing again by dawn
Visibility	Decrease	Mist and fog in sheltered surrounding areas	Early hours of morning	Less than 50 yards in smoke	Clear all night if wind stays up
Precipitation	None, but perhaps ground frost	Hoar frost by dawn in winter half of year	Dawn	Air frost in winter and spring	None if wind stays up
Cloud	Decrease	Clear skies	Midnight	B/B low cloud when wind stays up and ground is left moist	Cloudy aloft by dawn if another front on the way
Temperature	Falling sharply	Cool but clear	Dawn	Very low in winter	Little change if wind stays up
Pressure	Rising	Steady rise	Sharp rise and signs of fall by dawn		Little change



The classic photograph of a tornado, taken near Jasper, Minnesota, on July 8, 1927. Lucille Handberg

A tornado, like thunder, is heard many miles away. As it approaches, there is a peculiar whistling sound that rapidly changes to an intense roar, reaching a deafening crescendo as it strikes. The screeching of the whirling winds is then so loud that the noises caused by the fall of wrecked buildings, the crashing of trees, and the destruction of other objects is seldom heard.

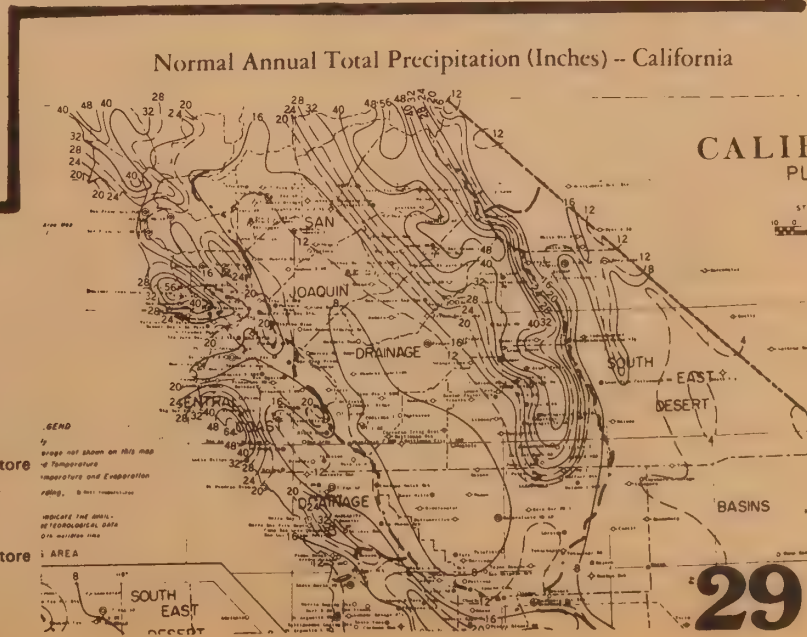


The Elements Rage

Frank W. Lane
1965; 346 pp.

\$7.50 postpaid

from
Chilton Books
401 Walnut Street
Philadelphia, Pa. 19106
or
WHOLE EARTH CATALOG



A monthly information exchange among gardeners who do not use artificial fertilizers or poisonous insecticides. Keeps you current on new techniques and discoveries.

The ads are valuable, telling you where to get seeds, farm machinery, etc.

I save tall fruit-juice cans for protecting transplants, and like them also for their electroculture value. Last year, after shading my broccoli and collards against transplanting shock, I left the cans between the rows in an experiment with electroculture. Soon the cans were hidden by lush growth, the plants reaching 3 feet or more.



I was ready to give up on growing corn any earlier. Then one day when I was trying to figure out what I should do with a stack of corrugated clear-plastic panels left by the former owner of our home, I got an idea. Why not bend the panels to make covers over the rows of my early corn? The plastic would make a sort of miniature greenhouse over the plants, keeping out cold air but letting sunlight flood in to warm the soil. Furthermore, the panels would keep out pesky crows, blackbirds and rabbits.

The idea worked like a charm.

Reports on new equipment:

When we called, the Gilson team was taking the wraps off a highly-experimental, pint-sized shredder. It has a very low center of gravity, is extremely mobile and light. Powered by a 3-h.p. engine, the Gilson composter features an idler clutch and an effective mixing and cutting chamber.

And editorials:

When you look at a plant growing in your garden, you do not see at once all the things which make it possible for that plant to thrive. But no living thing on this planet grows in isolation. Plants, animals, insects and people are all linked together in a web of life, with air, water, soil, minerals and other natural resources also playing vital parts. There is a cycle, a rhythm, to life.

One lesson that we are now learning is that the web of life is made of very fine strands. Upsetting the life patterns of only one type of plant or animal, even in a small way, can have an effect on many other living things.

Organic Gardening & Farming

\$5.85 for one year, monthly
\$0.60 per copy

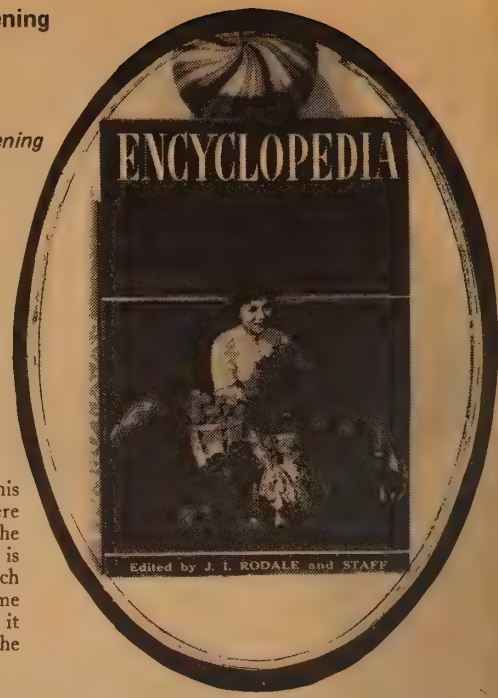
from
Rodale Books, Inc.
33 East Minor Street
Emmaus, PA 19049

The Encyclopedia of Organic Gardening

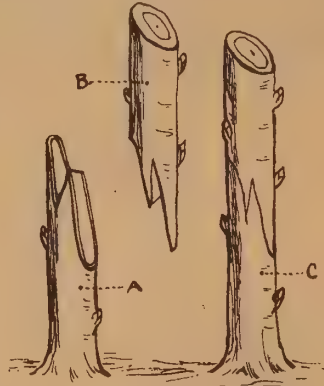
J.I. Rodale & staff
1968; 1145 pp.

\$10.19 postpaid

from
Rodale Books, Inc.
33 East Minor Street
Emmaus, PA 19049
or
WHOLE EARTH CATALOG



WHIP OR TONGUE GRAFT: This appears to be the best method where the stock and scion are close to the same thickness. When the stock that is to be grafted is greater than 3/4-inch in diameter, it is best to use some other form of grafting because it would be very difficult to make the proper cuts with the grafting tools.



A permanent reference book, compiled from years of magazine issues. How to plant, cultivate, fertilize and harvest. Thousands of subjects: composting, mulching, soil acidity, pruning, vegetables, fruit and nut trees, insect control, earthworms, etc.

I cross-reference anything useful in the magazine with the Encyclopedia, this keeps me up on latest information on the subject.

The Encyclopedia and 'How to Raise Fruits and Vegetables by the Organic Method' (below) are both indispensable: the former has many more subjects, the latter goes into greater detail.

[Suggested by Lama Foundation]

Organic Gardening

In the month that I have had my copy of "How to Grow Vegetables and Fruits by the Organic Method," I have browsed in it and referred to it for so many different reasons, out of so many different moods, that I can't decide if its resting place on the shelf is among my other "how-to" books or somewhere between the poetry and books on oriental religion.

But I shall worry about that problem when the time comes, if it does. Right now I'm digging into it so often and with such delight it doesn't need a place on a shelf. I keep it in handy reach on the dining room table.

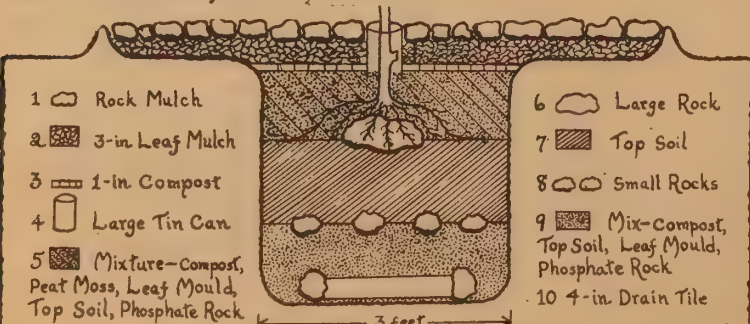
This book is the definitive manual on organic gardening. It is loaded with information, 550,000 words spread over 926 pages. It is wonderfully illustrated with pictures that are precise and useful, as well as pleasing to the eye. In a pleasant, relaxed prose style, the style of people who obviously have spent more time in the garden than in the library but who at the same time are so confident of what they're saying their words ring hard and true, the editors of this manual have gathered together every fact that one would need to know to become a successful organic gardener, almost anywhere in the United States.

Vitamin Losses

Vegetables to be cooked should be handled in the same manner as said vegetables. Gather immediately before using or else wash, dry and store in a cool place. If they are left at room temperature and in the light, much folic acid, vitamin B₂ and 50 per cent or more of the vitamin C in most fresh vegetables can be lost in a few hours.

Inoculate Garden Legumes

If you are planning to grow any beans, peas or peanuts in your garden this spring, why not take time out to inoculate the seed with nitrogen-gathering bacteria? It will certainly be worth your while.



Several "secrets" are involved in this diagram. In addition to digging an outside hole and using the large center stone, you also mulch with rocks and leaves and install adequate drainage.

This book has another quality one does not always find in gardening manuals: it is well organized. The first part is about the soil; the second part is about vegetables, the third part is about fruit, and the closing pages are devoted to nut culture and herbs.

In Section one, there are chapters on how to improve the soil; make compost; start plants from seed; watering and irrigation; when to harvest; fall and winter gardening; controlling insects; greenhouse gardening.

Section two looks closely at some 100 vegetables, giving a page to each vegetable, artichokes through zucchini, and what amounts to a brief essay that describes the history, vitamin content and how to raise each individual vegetable.

Another section does the same with some sixty varieties of North American fruit, from apples and apricots to watermelons and youngberries.

In addition, there are scores of charts and graphs that provide a complete planting guide for all the listed vegetables and fruits. Each geographical region of the United States and its peculiarities are accounted for. One table, for instance, is titled, "Planning Guide for a Family of Five in Washington." Categories of information for gardening in Washington include planting dates, growing period, length of the garden row, amount of seed, depth to plant, distance between rows, and distance between plants.

The entire book is that detailed on every subject it takes up.

A Tier-Shelf Bed for Mushrooms



How to Grow Vegetables and Fruits by the Organic Method

ed. J.I. Rodale and Staff

1961; 926 pp.

\$10.19 postpaid

from:
Rodale Books, Inc.
33 East Minor St
Emmaus, Penna

18049

or
WHOLE EARTH CATALOG

One need not, however, intend raising food for a family of five before this book can be useful to you, and a pleasure. I find it absolutely stimulating just as reading matter. It's pleasing in the way that thumbing through a catalog filled with delights you crave can be pleasing. Browsing in this book reminds one of fundamental things, of soil and water and air, and one's own involvement in the natural scheme of the world. The book is beautiful in the way that native crafts are beautiful: it's alive aesthetically at the same time that it's useful. That's more than one can say about most novels. I own very few books I'd rather have than this one. I recommend it to gardeners of all shapes and sizes, and to aware people in general who enjoy reading books whose themes, images and metaphors are drawn from the world of nature.

[Reviewed by Gurney Norman]

But we are more concerned here with the "meat-eaters"—birds which prefer to eat millions of insect life. A few birds prefer an all-insect diet. They include barn swallows, swifts, house wrens, grackles, flycatchers, brown creepers and some of the several species of warblers. Their bills are long and straight, or long and curved; or they may be short and whiskered; whippoorwills and the nighthawk family belong to this group.

Farmers of Forty Centuries

I have come more and more strongly to believe that the ultimate moral goal, even the moral necessity, of the American people must be to become the aborigines of the American land. An aborigine, my dictionary says, is 'an indigenous inhabitant ... as contrasted with an invading or colonizing people.' An indigenous people is one 'living naturally in a particular region or environment.' In general, aborigines are preservers of their land, whereas invaders or colonizers are the exploiters and destroyers of theirs. White Americans have for the most part remained the invaders and colonizers of the American continent; their relationship to the land has remained economic, exploitive, superficial, destructive. American history is to a fearful extent the history of a group of mercenary nomads, exhausting the land as they have moved over it.



Farmers of Forty Centuries

F. H. King
1811; 441 pp.

\$5.00 postpaid

from
Hillary House Publishers, Ltd.
303 Park Avenue South
New York, New York 10010
or
WHOLE EARTH CATALOG

A great mistake has been to assume that people could become American in any sense that would be meaningful and ennobling by means of the souped-up emotions of public patriotism, nationalism. The fact is that meaningful native Americanism would have to involve a complexly reverent and knowing and preserving attitude toward the land; it would manifest itself not only in public fervor but in private behavior; and it would be based on methods of land use. No matter how 'sophisticated' and urban our society becomes, our basic relation to the land will continue to be agricultural. And if we are ever to have a decent relation to our land, we will probably have to begin by converting from agricultural methods that are exploitive and wasteful to methods that are preserving. For this we will need more than the scientific expertise that we have relied on so far; we will need models.

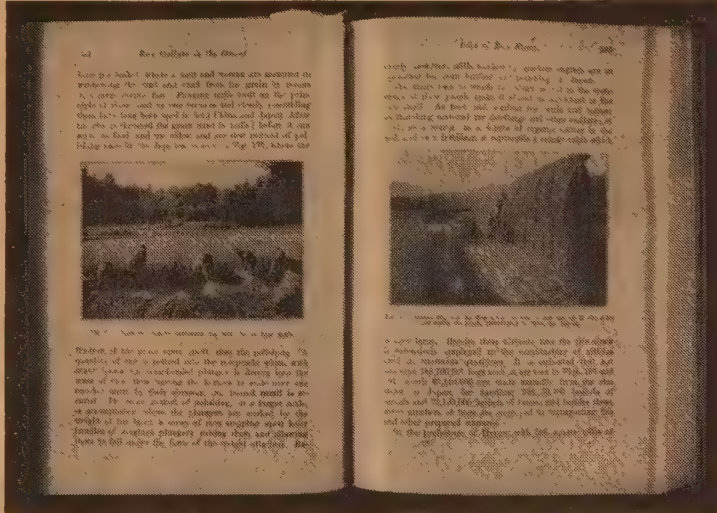


A great deal in the way of models and examples is to be learned from the American Indians, for their relation to this part of the earth seems to me to have been exemplary. Our assumption that we could learn to live here, ignoring their example, is a cultural disaster as well as an ecological one. But we have a great deal to learn from all truly indigenous peoples. The agricultural practices of primitives and peasants ought to be particularly instructive to us, for these people have farmed the land with a sense of profound unity with it; their ways, formed slowly over generations out of an intricate knowledge of the land and its needs, have tended to preserve it.



*One of the richest sources of information about peasant agriculture is a book called **Farmers of Forty Centuries** by an American professor of agriculture, F. H. King. In 1907 King traveled in Japan, Korea and China, looking closely at the local practices of agriculture and land management everywhere he went. He talked with experts and with peasants. He was full of interest in the knowledge and the life of farming. His book is loaded with details of the life of the people, observed sharply, and put down with delight and sympathy.*

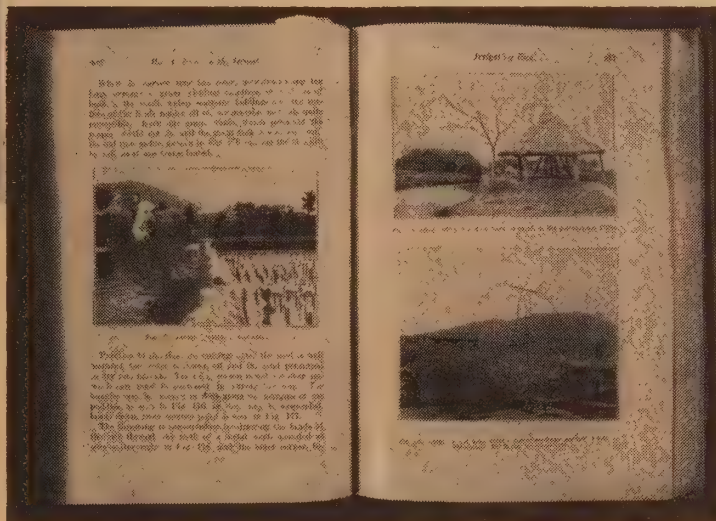
The question that King bore in mind throughout his travels was how these people had preserved their land, which after thousands of years of intensive use was as fertile as ever. The answer involved a complexity of methods and practices and traditions, but what it amounted to was that the taking of produce from the land was always balanced by a return of organic matter. The sewage of towns and cities, instead of being flushed out to pollute the waterways as with us, was brought back to the fields; the mud dredged from the canals was carried to the fields; no organic waste of any kind was ever thrown away, but always worked back into the soil.



King has a lot to say about the methods of composting, intertillage, crop rotation, irrigation, green manuring, and so on. He has a scientist's respect for statistics and he supplies plenty of them. But he also gives the sort of lively information that he could only have got by talking, by 'passing the time of day,' with the people he met in the fields. He writes of practices, tools, materials, dimensions. His book is the best sort of manual; it is one of the pioneer books on organic farming. And for the same reasons it is the best sort of travel book; he talks occasionally about how the plants are cared for around some temple or shrine, but for the most part avoids 'tourist attractions,' the life of the ordinary people, its sources and ways, was what fascinated him. There are more than two hundred photographs, not the work of a gifted photographer certainly, but informative and useful.

This is a book that can suggest things for you to do, if you have a piece of ground to do them on. Whether or not you have a piece of ground, it is a book that can change your mind.

[Suggested and reviewed by
Wendell Berry.]



Soil Test Kit

A soil test kit enables you to test your garden soil for acidity/alkalinity, nitrogen, phosphorus, and potash. A test will show what is present and what is lacking. There are test tubes, chemicals, and a color chart to gauge results. Be sure to ask for 'The Organic Supplement' prepared by Organic Gardening magazine in case "...you have decided to work with Nature's own methods of fertilization." Feed the soil, not the plant.

If the soil is too acid, it may be brought back to a favorable pH (acidity-alkalinity balance) by addition of ground limestone or dolomite.... Soils which are too alkaline can be corrected with organic matter, which produces natural acids directly as it decays.

Nitrogen is responsible for producing leaf growth and greener leavesOne of the easiest and most effective ways of adding nitrogen and building soil fertility is growing and turning under foliage crops such as clover, vetch, alfalfa, etc.

Phosphorous...is important for a strong root system, for brighter flowers and good growth....You can best add phosphorous to your soil with finely ground rock phosphate.

Potash, the third major nutrient carries carbohydrates through the plant, helps form strong stems, and fights disease. Major natural sources of potash are fly ash, wood ashes, granite dust, seaweed, etc.

How to Have a Green Thumb Without an Aching Back

A classic in organic gardening. Now in her 80's, Ruth Stout is still telling gardeners how to take it easy; mainly by using her home-devised mulching system, which is purported to eliminate composting, weeding, watering, tilling, digging, and worrying. Briefly, it amounts to covering ground around vegetables with about 8" of organic matter (such as hay), which keeps weeds down, moisture in, ground soft, and worms working.

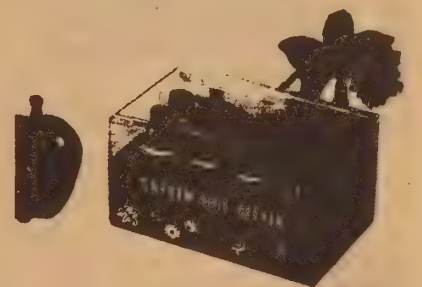
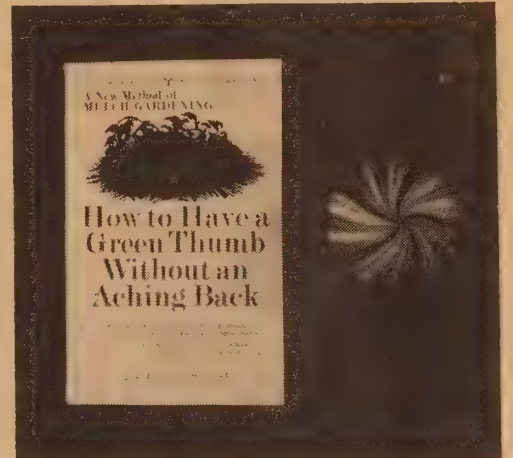
How to Have a Green Thumb Without an Aching Back

Ruth Stout
1955; 160 pp. (dk. green text)

\$1.45 postpaid

from
Cornerstone Library Publications
Simon & Schuster Inc.
630 Fifth Avenue
New York, New York
10020

or
WHOLE EARTH CATALOG



Popular Garden (Model H) \$8.95
Colorful, economical Kit for the small garden. Makes 50 individual tests for nitrogen, phosphorus, potash and acidity. Cased with attractive transparent plastic box. Helpful charts show needs of lawn grasses, 75 flowers, 50 vegetables.

Horticultural (Model B) \$20.95
An exact duplicate in small size of the \$39.95 DELUXE model. Full instructions and charts giving soil preference of 225 flowers, vegetables, etc. Sturdy steel case with carrying handle for on the spot tests. An excellent Kit for the more serious back yard gardener.



Sudbury Soil Test Kit

Send for descriptive literature, from
Sudbury Laboratory, Inc.
Sudbury, Mass. 01776

Kits: **\$5.95-39.95**

Seeds and Trees by Mail

Seeds are exquisitely designed instruction capsules for an orderly rearrangement of the elements. The gardener plays only a small role in the process — the seed tells the soil nutrients, air and water to organize into exactly what is described on the seed packet. Automation — and an example of what we've been given to work with on our planet. Write for brochures.

Vegetable and flower seeds. Organic fertilizers and insecticides. Tri-excel DS, a non-poisonous plant protectant for flowers, vegetables, berries, trees. It's made of ground-up flowers, resins, etc., and it works. The best all-around seed source.

from
Natural Development Co.
Bainbridge, PA 17502

Organic Seeds. "Untreated, natural, old-fashioned, unhybridized, uncrossed." Several gardeners report that these seeds have not germinated as well as hybrid types.

from
Vita Green Farms
P.O. Box 878
Vista, Calif. 92803



Not organic, but about the most complete vegetable and flower seed catalogue. Very fast and efficient service.

from
W. Atlee Burpee Co.
Riverside, Calif. 92502

Large complete catalogue, similar to Burpee.

from
Stokes Seeds, Inc.
Box 15, Ellicott St. Station
Buffalo, N.Y. 14205

Davis Headquarters Forest Nursery, Rt. 1, Box 1410, Davis, California 95616. The state of California's distribution center for trees for reforestation, erosion, windbreaks. A long form of course, but they mail pines, cypress, fir, redwoods, eucalyptus in quantities of 100-1,000 or more. One year old bare-root trees (4-10" height) are as little as \$10 per 500.

Dwarf, semi-dwarf and regular fruit trees by mail. This is a 3,000 acre nursery, over 150 years old.

from
Stark Brother's Nurseries & Orchards
Louisiana, MO.63353

Agricultural Publications

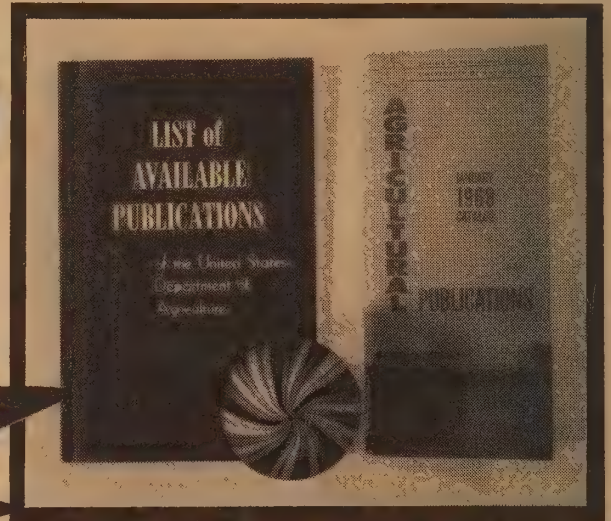
Free information on farming, livestock, forestry, soil science, etc. On general requests not more than one copy each of 10 publications is sent. Justification is required if you want more.

- Grass. (Yearbook.) \$2.00. *YB 1948
- Grass for conservation in the southern Great Plains. 1955. F 2093
- Grass makes its own food for growth, for forage, for good land use and for soil conservation. 1960. AB 223
- Loans for forestry purposes. 1964. PA 624
- Loans for water development and soil conservation. 1965. PA 554
- Loans to cooperatives serving rural families with low incomes. 1965. PA 662
- Loans to family farmers for recreation enterprises. 1963. PA 563
- Loans to rural groups. 1963. PA 560
- Growing pumpkins and squashes. 1963. F 2086
- Growing table beets. 1965. L 360
- Growing the Jerusalem artichoke. 1959. L 116
- Growing watercress. 1959. L 448
- Lettuce and its production. 1962. AH 221



List of Available Publications \$.40

from
U. S. Department of Agriculture
Washington, D. C. 02050



The University of California's Agricultural Experiment Station also has a batch of free pamphlets. You're entitled to 20 publications if a California resident, 10 if not.

Agricultural Publications FREE

from
Agricultural Publications
207 University Hall
University of California
Berkeley, Calif. 94720

Leaf. 116 Wild Rice
Instructions for growing wild rice for food or for the improvement of game reserves.

Leaf. 131 Water Management in Rice Production
Suggestions for better land preparation and irrigation practices for rice growers.

Leaf. 161 California Rice Varieties and Seed Selection
Describes the leading California rice varieties including experiments with long-grain varieties. For rice growers and members of the rice milling and marketing industry.

C 408 The Border Method of Irrigation
Gives directions for designing, constructing, and using irrigation systems employing border checks.

C 527 Handling Strawberries for Fresh Market
Discusses the things to do and the things to avoid to preserve quality in strawberries sold on the fresh market.

WALNUTS

Leaf. 137 Nutrition and Fertilization of Walnuts
Discusses soil nutrients needed by walnuts and how to correct excesses or deficiencies.

Natural Foods by Mail

Sources for foods that are not treated with DDT, fumigants, etc. Most of these outfits are family affairs, and dedicated to supplying customers with real foods, mostly by mail.

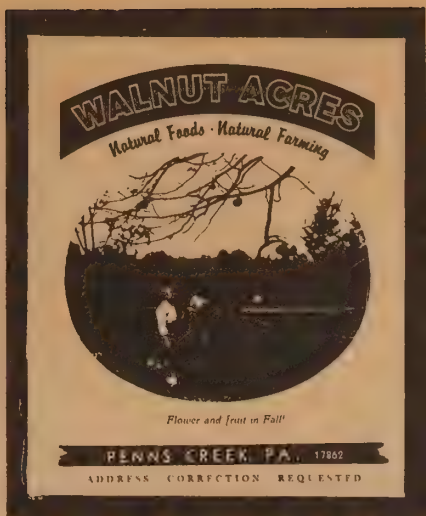
Walnut Acres

Best, most reputable source in U.S. Foods like you've never tasted: unrefined corn germ oil, 40 lb. tubs of peanut butter, wrinkled rye cereal. If you order with friends, bulk orders are economical.

Brochure from
Walnut Acres Mill & Store
Penns Creek, Penna. 17862

Flours

*BLENDED BREAD FLOUR	4.24	8.11	15.20
*BREAD FLOUR	4.41	8.47	15.86
*BREAD FLOUR, Unbleached			
White	4.89	9.28	18.41
CAROB FLOUR, Toasted	15.36	30.50	60.10
CAROB FLOUR, Raw	5.09	9.40	17.85
*CORN FLOUR, Yellow	5.09	9.40	17.85
*CORN MEAL, Yellow	4.41	8.47	15.86
CORNELL BREAD FLOUR	4.41	8.47	15.86
GLUTEN FLOUR	10.03	19.09	37.90
*GRAHAM FLOUR	4.05	7.81	14.53
*MUFFIN MEAL	4.05	7.81	14.53
*RYE FLOUR	3.87	7.45	13.86
*RYE MEAL	3.70	7.15	13.30
*SOYA CAROB FLOUR	10.30	19.09	37.90
*SOYBEAN FLOUR	6.33	11.85	23.17
*WHEAT FLOUR,			
Deaf Smith	5.12	9.75	18.52
*WHEAT FLOUR,			
Whole, all purpose	3.87	7.45	13.86
*WHEAT FLOUR, Unbleached			
white all purpose	4.41	8.47	15.86



Wheat

Deaf Smith County, Texas is a mineral-rich area that produces wheat with high amounts of protein—the best wheat available. 50 lbs: \$7.00 plus postage.

From
Vitamin Products Company
2401 South Atlantic Blvd.
City of Commerce, CA 90022
or
Lee Foundation
2023 W. Wisconsin Ave.
Milwaukee, Wisc. 53233

List of 325 Natural Food Sources

Organic Gardening Magazine has compiled a list of organic food suppliers throughout the U.S. Includes fresh and frozen vegetables, fruits, grains, etc. For 1969-70.

\$1.00 postpaid

from
Shopping Guide
Rodale Press
Emmaus, PA 18049

New Age Natural Foods

Headed by Fred Rohe, this is now San Francisco's largest natural food store. Their first mail order catalog is now available.

Catalog from
New Age Natural Foods
1326 Ninth Avenue
San Francisco, CA 94122

Jaffe Brothers

Oils, dried fruits, nuts, seeds, grains.

Brochure from
Jaffe Brothers
28560 Lilac Road
Valley Center, CA 92802

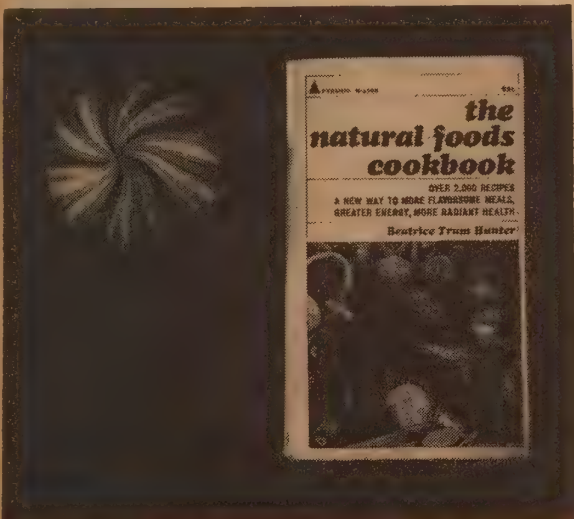
The Food Mill

Large stocks of bulk foods. Gallons of avocado honey, fresh peanut butter.

Leaflet from
The Food Mill
3033 MacArthur Blvd.
Oakland, CA

The Natural Foods Cookbook

Since one of the prime problems of the switch-over from supermarket foods to real foods is where to find them—this book begins appropriately with a check list of basic natural foods followed by a list of supply sources. From there on it's one fine and healthful recipe after another: basics (how to make yoghurt & cheeses, yeast, sprouts, whole grains) to Delights (herbed mushroom casserole, lemon-honey jelly with a few geranium leaves.) Concludes with a list of suppliers of appliances (grinding mills, vegetable steamers, yoghurt incubators).



The Natural Foods Cookbook

Beatrice Trum Hunter
1961; 368 pp.

\$0.95 postpaid

from
Pyramid Publications, Inc.
444 Madison Avenue
New York, N. Y. 10022
or
WHOLE EARTH CATALOG

Sour Dough Starter

1 cup rye flour ½ cake or ½ tbs. dried yeast, soaked in
½ cup lukewarm water ½ cup lukewarm water

Combine all ingredients. Cover. Without stirring, allow mixture to rise and fall. Keep at room temperature 2 or 3 days, until it attains desired sourness. Combine with bread dough. After dough has been mixed, reserve 1 cup as starter for next batch.

Baked Indian Pudding

1 quart milk ½ teaspoon ginger, ground
1/3 cup cornmeal ½ cup molasses
2 tablespoons soy flour 3 tablespoons nutritional yeast
1/3 cup sweet cider ½ cup dried fruit, chopped
½ teaspoon salt (optional)
½ teaspoon cinnamon, ground

Scald milk in top of double boiler over direct heat. Make paste of cornmeal and soy flour in cider. Blend with milk, cover and cook over hot water for 20 minutes. Add rest of ingredients. Remove from heat. Turn into oiled casserole. Bake at 325° F. for 2 hours or until set. Serve hot, topped with yoghurt. Serves 6.

New Macrobiotic Cookbook

A good place to start with Macrobiotics (the philosophy of eating as a means to vitality and rejuvenation).

This book is more recent, pleasantly readable, liberal and digestible than the writings of the system's founder-master Georges Ohsawa. However, once you read this, you may get into the others. Also a monthly publication.

In Japan it is known as yin and yang. Here, in America, it goes by the rather chemical terms of acidity and alkalinity. For instance, you eat something acid and have heartburn; common knowledge tells you to take something alkaline, Alka-Seltzer, perhaps. Acid foods are rich in potassium; alkaline, in sodium.

We can equate it thus:
Yin = Acidity = Potassium = Sugar = Fruits, etc.
Yang = Alkalinity = Sodium = Salt = Cereals, etc.

Yin expands: sugar is yin. Sugar, when placed on the tongue, tends to make it expand.

Yang contracts: salt is yang. Salt, when placed on the tongue, tends to make contract.

In food, the perfect balance of alkalinity and acidity is found in only one grain—brown rice. Experts such as Dr. Rene Dubos, the Nobel prizewinner, tell us that we can possibly live on this cereal alone. It contains a balance of 5 parts potassium (yin) to 1 part sodium (yang). Thus, in eating other foods, it seems that if we adhere to this ratio of 5 to 1, we are in good hands.

The 5-to-1 ratio may work for one person and not for another. A person who has much more potassium in his body surely needs more sodium; he would have to carefully introduce more sodium into his food, remembering, of course, that extreme action leads to extreme reaction.

Our cells, our body and mind keep changing all the time. Necessarily, our meals should follow this same law of change. What we are today we will not be tomorrow. Consequently, our meal of today should not be the same as the one of tomorrow. A very banal image of balance is the scale of justice. But there is another much more exciting image, that of the dynamic. We must modify our diet to fit with season and geography, time and place. Seasonal change is a drama in which we and our diet change also.

Apple Crunch

Peel and slice thin 10 apples. Place in a baking dish 2 inches deep. Pour on top ½ cup apple juice mixed with cinnamon. In a bowl mix together 1 cup whole wheat flour, 1 cup unbleached white flour, ½ teaspoon salt, ½ cup oil. Mix well and add 1/3 cup apple juice. Work all the ingredients together until the mixture is crumbly. Sprinkle over apples and let stand ½ hour. Bake in oven at 400° until apples are soft and juicy and top is beginning to brown.

Codfish a la Catalane (for 6 persons)

Fine in summer on the beach.

1 pound codfish filet
2 onions, large minced
5 garlic cloves
2 red peppers
2 leek tops
pinch thyme
pinch oregano
2 bay leaves
3 tablespoons oil
2 glasses dry white wine
sauce bechamel

Boil the cod in water for 10 minutes. Take it out and break up with a fork. Keep the water in which it was boiled. Sauté the onions with leek and garlic cloves in the oil. Brown the mixture in a saucepan and to it add peppers, 1 cup of the fish water, the spices and the wine. Simmer ½ hour. Pour half of this mixture into a baking dish. Place the fish in it and cover with the remaining mixture. Pour heavy sauce bechamel on the top and place dish in the broiler or in oven for 15 minutes. Serve hot with rice.



Zen Macrobiotic Cooking Book of Oriental and Traditional Recipes

Michael Abehsera
1968; 205 pp.

\$6.25 postpaid

from
The Order of The Universe Publications
Box 203, Prudential Center Station
Boston, Mass. 02199
or
WHOLE EARTH CATALOG

A few do's and don'ts

Learn above all to cook rice and to cook it well. One condition is to use a heavy cast-iron pot. Prior to cooking, wash the rice with cold water in a strainer. While cooking, never stir the rice, and keep it covered.

Sometimes when you cook rice, the bottom of the pot is slightly scorched. This part is yang. It is very rich in minerals and very good for yin people.

Avoid eating while you are cooking. Doing so may spoil your ability to create. An empty stomach is one of the secrets of any creative activity.

Don't throw away the green parts of vegetables such as carrots, radishes, etc. They may be used for soup.

Don't boil your vegetables. By sauteing rather than boiling them, you preserve valuable vitamins and minerals.

A nituke (vegetables sauteed) should be almost dry; otherwise it will be like soup.

Watch your intake of salt. Much salt brings about great thirst.

Avoid cooking your foods in aluminum utensils. Clay, glass and cast-iron pots are preferable. Clay especially heightens the taste. Stainless steel is also recommended.

Vegetables should not be peeled. A special brush (tawashi) is recommended for washing them. Rinse them under running water.

Being a stranger to Macrobiotic cooking, you will prepare foods that are not so delicious, at first. Never mind. Under these circumstances you will eat less—a vacation for your tired stomach and intestines. My congratulations! —Georges Ohsawa.

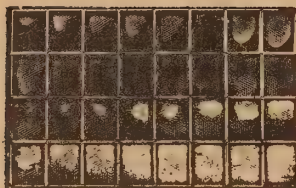
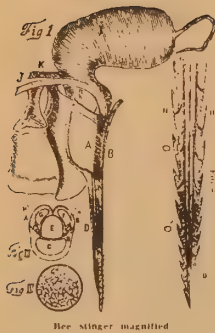
ABC and XYZ of Bee Culture

The first edition of this authoritative book was written in 1877 by Mr. A.J. Root. The current edition, the 33rd, is edited by Mr. E.R. Root, with the help of H.H. Root and J.A. Root. You get the picture.

We've been told by several people that bee-keeping is one of the easiest ways to make extra money with little effort and a certain amount of down-home adventure. If you are what you eat, food from flowers is hard to beat.

From whatever standpoint—commercial, nostalgic, or amateur scientific—this is a fascinating and useful book. The Roots also have a catalog of bee supplies, a beginner's book (*Starting Right With Bees*), and a magazine (*Gleanings in Bee Culture*—monthly, \$3.00 per year.

[Suggested by Tassajara Zen Center]



MARKETING HONEY.—The bee-keeper with four or five colonies of bees will have no difficulty in selling honey to his neighbors. It soon becomes known that he has a few hives of bees and the people in the vicinity, feeling that they can buy "real honey," will go to the neighbor and pay good prices furnishing their own utensils. If the honey is of first quality there is no trouble about selling the entire crop from the doorway.

ABC and XYZ of Bee Culture

A.J. Root, etc.
1877...1966; 712 pp

\$5.50 postpaid

or
WHOLE EARTH CATALOG

Starting Right With Bees

100 pp.

\$1.00 postpaid

or
WHOLE EARTH CATALOG

Catalog Free

from:
The A.J. Root Company
Medina, Ohio 44256

In cool weather, so far as conditions will permit the time selected for handling the bees should be between 10 o'clock in the morning and 3 in the afternoon. In warm weather the operator should never stand in front of the entrance—always to one side. First, a little smoke should be blown in the entrance. The cover should be lifted gently and more smoke blown between the cover and the hive before the hive is opened. More par-

Corona Hand Mill

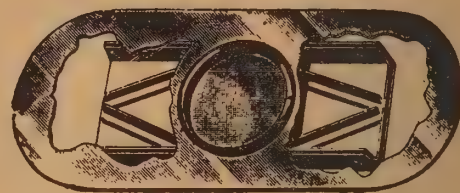
From all we can gather, this is the best of the hand mills for grains, etc. So far the only mail order source we know of is us. If someone else you know carries it, speak up, especially if they have a better price.



Corona Hand Mill

\$14.00 postpaid (\$12.50 in the store)

from
WHOLE EARTH CATALOG
558 Santa Cruz Ave.
Menlo Park, Ca. 94025



Porter bee escape. The two V-shaped prongs are made of thin strips of brass and are so sensitive that they spread easily to let the bees through at the apex. After the bees pass the springs, the points fly back to position, shutting off a return. If the prongs are bent or damaged they should be reset to 1/16-1/8-inch apart.

The Herbalist

Maidenhairs & mandrakes, booklimes & brambles—whatever grows will do SOMETHING for you.

Of all the herb books, this 50 year-old classic is the most complete, though cross-references are sometimes difficult. Botanical Materia Medica & recipes, plant vitamins & minerals, teas, spices & flavorings; natural insecticides & germicides, dentifrices & cosmetics; botanicals for detergents, smoke flavorings; aromatics; excellent section on natural dyes; many illustrations in color.

[Suggested and reviewed by Sarah Kahn]

BOTANICALS USED AS DETERGENTS

BOUNCING BET: Fresh herb is stirred in warm soft water, until it forms a lather. Used to wash fine silks and woolsens. Cleanses and imparts a beautiful lustre to materials. A common wayside weed.

LIGNUM VITAE: Fresh leaves used as soap in the West Indies.

PAPAYA: Fresh leaves used in Africa and the West Indies.

SOAP BARK: Contains more lather-forming qualities than any other plant known.

SOAP BULB or CHLOROGALUM: Fresh bulbous roots are mashed and stirred in soft water, to form a lather. Used for washing fine silks, delicate fabrics and hair. Contains neither alkali or oil. A soap made of this bulb was widely advertised as a remedy for numerous minor skin conditions. Plant found on hill slopes of California.

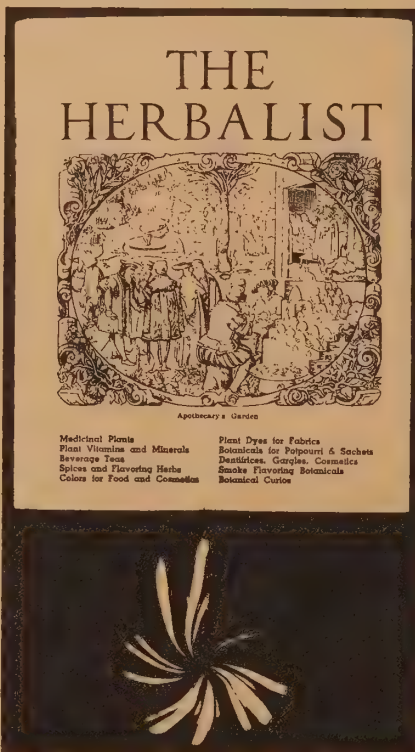
YUCCA BACCATA or GLAUCA: Chopped roots are tied up in a bag, then placed in warm soft water and stirred to a lather. Used for shampooing hair, and to wash woolsens and cotton fabrics. Said to leave a fine sheen on hair and wool. Yucca plants are common in the southwest, New Mexico, Arizona, etc.

The Herbalist

Joseph E. Meyer
1918; 304 pp.

\$4.50 postpaid

from
Sterling Publishing Co., Inc.
419 Park Ave. So.
New York, N. Y. 10016
or
WHOLE EARTH CATALOG



Medicinal Plants
Plant Vitamins and Minerals
Beverage Teas
Spices and Flavoring Herbs
Colors for Food and Cosmetics

Plant Dyes for Fabrics
Botanicals for Potpourri & Sachets
Essentials, Gargles, Cosmetics
Smoke Flavoring Botanicals
Botanical Cures

OLD RECIPE FOR MAKING PERFUMED SMOKE

Take Balm of Peru 1/2 ounce; 7 or 8 drops of Oil of Cinnamon; Oil of Cloves, 5 drops; Oil of Nutmegs, of Thyme, of Lavender, of Fennel, of Aniseed (all drawn by distillation) of each a like quantity, or more or less as you like the odor, and would have it strongest; incorporate with these half a dram of Ambergrease; make all these into a paste, which keep in a box. When you have filled your pipe with tobacco, put upon it about the bigness of a pin's head of this composition. It will make the smoke most pleasantly odoriferous, both to the takers and to those that come into the room, and one's breath will be sweet all day after.

Editors note: This recipe may best be used as an incense, rather than a pipe tobacco.

"The women in Pennsylvania, and other parts of North America, in dyeing worsted a fine lasting orange colour, which does not fade in the sun, use urine* instead of alum in dyeing, and boil the dye—Sassafras root—in a brass boiler, because in an iron vessel it does not yield so fine a colour."—Encyclopaedia of Arts and Sciences, 1743.

* Urine was used by the American Indians to set colors, and was also much used in the Orient, for the same purpose.

Heliotrope Sachet

1 pound Damask Rose petals; 1/2 pound Tonka beans; 2 oz. Vanilla pods; 2 pounds Orris root; 1/2 oz. Heliotrope Oil.

SAGE TEA: A heartening brew, if not made too strong. Sweeten with maple syrup, brown sugar, or honey. This tea is sometimes flavored with a squeeze of orange, lemon, or a dash of rum, pinch of mace, or cinnamon. In parts of Europe, Sage tea is mixed with equal parts of Melissa. In early Dutch trading days, the Chinese preferred Sage tea to their own native tea, and gave traders twice the quantity of their choicest tea in exchange.

Wild Foods

Euell Gibbons once was challenged to gather a lunch of wild foods from Central Park, N.Y.C. After a few hours of foraging, a trip to the challenger's apartment, some washing and preparation, Gibbons served up a large delicious lunch that all the neighbors came to sample.

Gibbons has been gathering wild foods for years and has written three books: Stalking the Wild Asparagus (foods from land); Stalking the Blue-Eyed Scallop (sea-foods) and Stalking the Healthful Herbs.

Nutritious wild edibles are all around us and Gibbons tells us what they look like, where to hunt, and gourmet recipes for preparation. Wild rice, cattails, fairy spuds, watercress, groundnuts. Scallops, seaweeds, clams, kelp soup. Comfrey, horehound, wild ginseng.

Mustard greens, to be at their best, must be gathered early, during the first warm weather of spring. If you are in doubt about the recognition of wild mustard, I'm sure any farmer will be glad to point it out to you, and he will be pleased if you gather your supply from his fields.

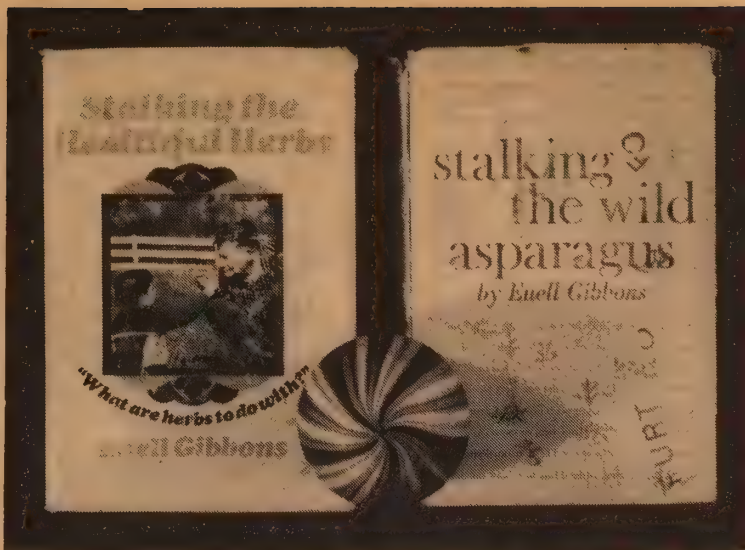
When picked at the right time and properly prepared, mustard greens have just the right combination of bitterness and pungency to make a tasty boiled green. You will need quite a lot, as they tend to shrink while boiling. Don't try to short-cook mustard greens as you do spinach. They should be boiled about 30 minutes, then seasoned with butter or bacon drippings and served with vinegar or pepper sauce.



WILD MUSTARD

The edible leaves, or Mustard Greens, are the lower leaves which are somewhat lyre-shaped, four to six inches long, on slender stems, with large terminal lobes and several small lateral lobes along the stem, all finely toothed around the edges. The leaves that appear on the flower stalk, after it starts developing, are smaller, almost stemless and very bitter. The flower stalk quite early forms flat-topped clusters of buds, the whole cluster looking like little heads of broccoli. As the stalk shoots up, it leaves individual buds scattered thickly along its length, and these soon open to become bright yellow flowers about three-eighths of an inch across. The flower stalk may reach a height of one or two feet. As in all the Mustard Family, the flowers have four petals and six stamens, which are in two sets, four long and two short.

A little fancier dish is made by chopping the cooked mustard greens and seasoning with crumbled crisp bacon, finely chopped onions and a topping of thin slices of hard-boiled egg. This can be served hot or cold with French dressing or plain cider vinegar.



Stalking the Healthful Herbs

Euell Gibbons
1966; 303 pp.
\$7.50 postpaid

Uncooked Rose Petal Jam is astonishingly easy to make. I would like to think that it was sheer genius that caused me to get all the proportions right in my first attempt to make this fragrant ambrosia, but I know it was just blind luck. Gather freshly opened roses before the sun has distilled away too much of their ethereal flavor and fragrance. Wild roses are best, but any fragrant rose, provided it has not been sprayed with poisonous insecticides, will do. The deep-red roses give the color that I like best, but by using a different color for each batch you can soon make your jam cupboard resemble a well-planned rose garden.

The white base of the rose petal contains a bitter substance, and should be clipped away. This is not nearly the tedious job that it sounds. Grasp as many petals as you can hold between your finger and thumb, pull them from the rose and snip the white bases from all of them at once with a pair of shears. Prepare 1 cup of petals and put them into a blender with ¼ cup of water and the juice of 1 lemon. Blend until smooth, then gradually add 2½ cups sugar with the blender still running, and let it run until you are sure all the sugar has dissolved. Stir 1 package powdered pectin (Sure-Jell) into ¼ cup water, bring to a boil and boil hard for 1 minute, stirring constantly. Pour the pectin into the rose-sugar mixture and run the blender on slow until you are sure the pectin has been thoroughly incorporated with the other ingredients. Pour immediately into small sterilized jars with screw caps that will seal them hermetically. Baby-food jars are ideal. I was amazed to find that fifteen minutes after I had gathered the roses, I was pouring the jam into the jars, and I hadn't hurried at all.

Allow the jars to stand at room temperature for a about 6 hours, and the jam will be nicely jelled. It will keep for a month in the refrigerator, but if you want some for next winter, store it in the freezer. Then when the wind is howling about the eaves, and the sleet is pelting against the storm windows, you can bring a bright June day right into your kitchen by opening a jar of this rosy jam.

Stalking the Wild Asparagus

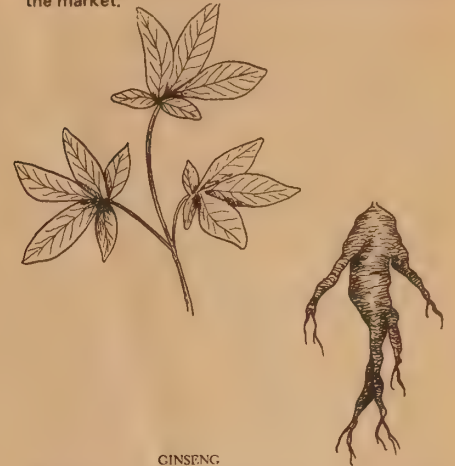
Euell Gibbons
1962; 303 pp.
\$7.95 postpaid

Stalking the Blue-Eyed Scallop

Euell Gibbons
1964; 303 pp.
\$7.95 postpaid

all from
David McKay Co., Inc. 750
750 Third Avenue
New York, N. Y. 10017
or
WHOLE EARTH CATALOG

Schinseng, in Chinese, means man-form, or man-shape, for the small root of ginseng often divides at the bottom into two leg-shaped forks, and sometimes has arm-like side roots higher up, resembling a tiny man in some grotesque posture. Some scholars ascribe the value placed on this root to the old doctrine of signatures, conjecturing that ancient medicine men interpreted its man-shape to mean that it would be a good medicine for man to take. This may have been true in the dim, primitive past, but the modern, educated Chinese of Formosa, Macao, Hong Kong, or Singapore still value the root as highly as did their honorable ancestors, and will pay a higher price for it than for any other drug on the market.



GINSENG

What is so wonderful about ginseng that the Chinese will pay these princely prices for it? Frankly, I don't know. Our own doctors admit that it is a fair stomachic and bitter tonic, and that it acts as a very mild heart and respiration stimulant, but it has long been discarded by most Western pharmacopoeias as worthless. Among the Chinese it is given to the sick to make them well and to the well to keep them from getting sick. It is believed to be a powerful aphrodisiac, especially efficacious in restoring vim, vigor, and the vitality of manhood to old and impotent men. But even more important, the regular use of ginseng is believed to greatly prolong life, and in Chinese families, where the old are honored simply because they are old, it is worthwhile trying to prolong existence into extreme old age. These reputed powers would easily explain why the root is so highly valued, if they could be proved to exist, but Western scientists maintain that all these Chinese uses of ginseng are utterly without any scientific justification. I wonder...?

For the number of different kinds of food it produces there is no plant, wild or domesticated, which tops the common Cattail. In May and June the green bloom spikes make a superior cooked vegetable. Immediately following this comes the bright yellow pollen, fine as sifted flour, which is produced in great abundance. This makes an unusual and nourishing ingredient for some flavorful and beautifully colored pancakes and muffins. From fall until spring a fine, nutritious white flour can be prepared from the central core of the rootstocks for use as breadstuff or as a food starch. On the leading ends of these rootstocks are found the dormant sprouts which will be next year's cattails. These can be eaten either as a salad or as a cooked vegetable. At the junction of these sprouts and the rootstock there is an enlarged starchy core the size of a finger joint. These can be roasted, boiled or cooked with meat. In the spring, the young shoots can be yanked from the ground and peeled, leaving a tender white part from six to twelve inches long which can be eaten raw or cooked.



CATTAIL

The National Fisherman

A monthly newspaper from Maine on fishing, boat building, sailing, ocean pollution and sea news in general. They are largely responsible for the current wave of interest in ferro cement, as they were first to give widespread U.S. publicity to the low-cost technique. Lately, each issue has had something new on f.c.

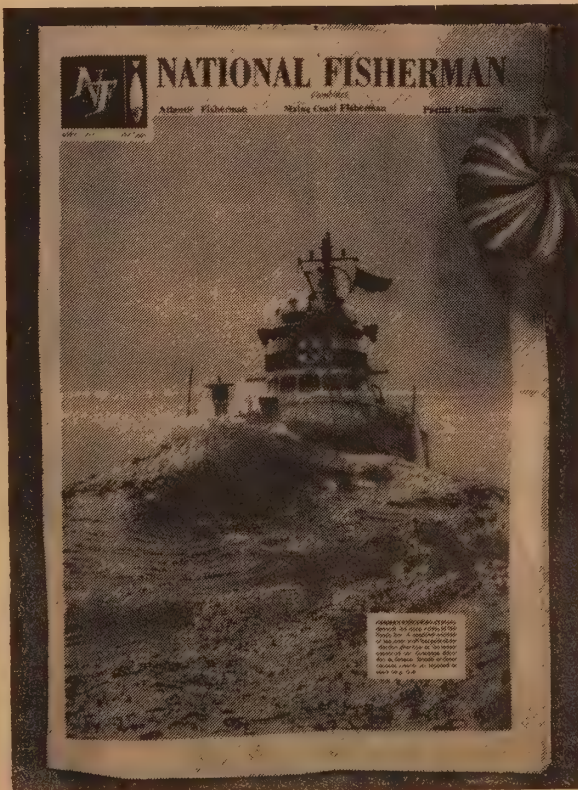
The National Fisherman

\$4.00 for one year

from
22 Main Street
Camden, Maine 04843

He relates that in the late 1950s a patented process for making pontoons as developed using cement and a lightweight aggregate. They looked good for a time, but after a little began to sink.

As he explains: "The culprit was found to be a species of rock oyster (*Pholadidea penita*). Its habitat is listed as ranging from the Bering Sea to the Gulf of California. It bores a hole in a rock and lives in that hole; and it seems to just love to bore into concrete. Various existing concrete structures are reported as being 'heavily infested' in California. The creature is not large, and usually bores only a couple of inches deep, so large concrete structures are not seriously affected. Old concrete ships being from 8" to a foot thick are not penetrated. Ferro-cement boats however, and thin-walled pontoons are a different story."



IN THIS ISSUE

This Issue Contains 76 Pages In Three Sections.

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Chemical Pollution Of The Sea May Be Serious	4-A
The Danger Of Oil Is In The Clean-Up	5-A
Ferro-Cement Given Fine Treatment In Detailed Book	8-A
Superegency For The Oceans	17-A
Russian Crew Lost As Ship Slices Trawler	26-A
Useful Tips Head Off Skiff-Building Problems	4-B
Research Early In Century Built Ferro-Cement Foundation	8-B
Fish Expo Grows As An International Attraction	12-B
'Guided Missile' Aids Trawlers	14-B
Pair Trawling For Herring Really Pays Off	16-B
The Giant Twins	2-C
Atlantic Coast	
400-Trap Limit Gets Airing At Augusta Hearing	10-A
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Fish Dealers And Apartments Are Incompatible In Boston	13-A
Coast Guard Loses Ground To Northeasters	19-A
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Potomac Kills Schooner And Two Crewmen	22-A
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Southern Coast	
La. Shrimpers Worried By Oil Spill	5-A
Shuckers For Florida Calico Beds	1-B
Texas Builder's 200th Boat Is Shrimper For Japan	6-B
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Fast Pile Driver Also Drills In Bottom	15-B
Miss. Oystermen Can't Dredge Offshore Reefs	4-C
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65' Fiberglass Tour Boat Built By Special Method	10-B
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Soviet Hake Fleet Keeps Up Pressure	1-C

[Suggested by Paul Wingate]

EAST BOOTHBAY, ME. — Solimar, a ketch-rigged craft believed to be the world's largest molded fiberglass sailing yacht, underwent sea trials recently.

This 40-ton, 58' yacht has been building at Hodgdon Brothers since late in 1967. cost of the new fiberglass yacht is based at \$139,000. From that point, costs range upward to a possible \$175,000, depending upon the variations and fittings chosen by the buyer. No report was given on the price paid by Coale but shipyard employees estimated it was over \$150,000.

SEVERAL TYPES

The new yacht is one of several types scheduled for production in mid-coastal Maine. Yachts from the same mold as Solimar are identified as the Boothbay Challenger. The Challenger will be made either with a centerboard or with a keel.

Electricity From the Wind

This is the only commercially available wind electric generator we know of. Sounds and looks good. Has anyone used one?

\$365.00 F.O.B. Sioux City, Iowa

from
Dyna Technology, Inc.
P.O. Box 3263
Sioux City, Iowa

LARGE, STURDY GENERATOR

Wincharger's big 7½" diameter generators for the 12 Volt models are far larger and sturdier than the ordinary heavy duty generator.



INSULATED INSTRUMENT PANEL

Completely wired. Connections-marked for easy installation. Reverse current device. Ammeter shows amount of charge/discharge. Voltage regulator not available.

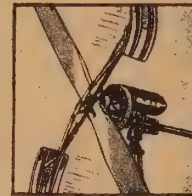


PATENTED AIR-BRAKE GOVERNOR

Operates by centrifugal force. When wind velocity exceeds 23 miles per hour, governor flaps automatically open and spread wind away from propeller (See illustration). Governor also acts as a fly wheel to maintain even propeller speed and eliminate vibration in gusty wind.



"Normal"



"Governing"

Tower can be mounted on pitched roof, on a mounted platform, or on any flat surface of any height.

Starts Charging in 7 Mile Breeze

All-around performance that can't be equalled in the 12-volt lighting field. Starts charging in a 7-mile breeze; with an output of 15 amperes in a wind velocity of 23 miles per hour. Has double the watt-hour output of ordinary radio chargers. Permits the use of a heavier electrical load over a longer period of time.

SPECIFICATIONS

Tower	10 Feet High
Propeller Type	2 Blade
Size	6 Feet
Material	Wood
Gear Ratio	Direct
Generator	7½" Diameter 4 Pole

Capacity (Watts)	200
Approximate Maximum Amps.	14
Approximate Maximum Volts	15
Generator Speed Range (RPM)*	270/900
Governor Type	22" Air-Brake

Average Usable KWH per month	
10 MPH Average	20
12 MPH Average	26
14 MPH Average	30

Size Battery Recommended	230 A.H.
(Battery not included)	
No. Battery Cells	6
Volts per Cell	2.5
(When fully charged**)	

Coot

A rough little 12 hp all-terrain vehicle that goes up steep banks, over rocks, through brush, mud, snow, swims across lakes, cuts grass, pulls trailers and apparently outperforms jeeps where the going is tough.

Best features are that it's mechanically simple, and will pull more weight and climb better than a jeep. When out in the brush and not near repair shops, simple owner maintenance is a fine feature.

Dennis McCosker of Canyon, California had one of the first Coots, and told us:

I've had jeeps and a weasel (½-track) and they didn't compare to this. It goes through and over just about anything. Mud snow rocks. If you get to a dangerous spot, can walk alongside it, operating by hand throttle so you don't worry about it turning over with you in it.

No radiator to poke holes through. Latest Coots have ironed out bugs of earlier models, and dealers will stand behind any malfunctions. No fuel pumps to mess with. A five-year old can pull the emergency brake.

It's a simple vehicle. I use it on a cattle ranch, load it with hay or fenceposts and go anywhere.

I went hunting in Carmel Valley and we drove straight up the side of a mountain in rain, through the brush.

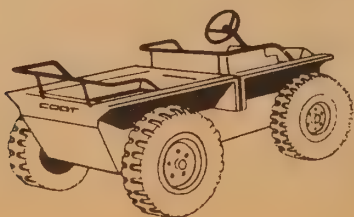
Bob Grey of Lafayette Motors, Lafayette, California says that one driver went four miles out into the ocean in a Coot (although he doesn't recommend this) and that he once pulled several 4-wheel-drive vehicles out of the snow with his Coot.

[Suggested by John O. Stevens]

Coot

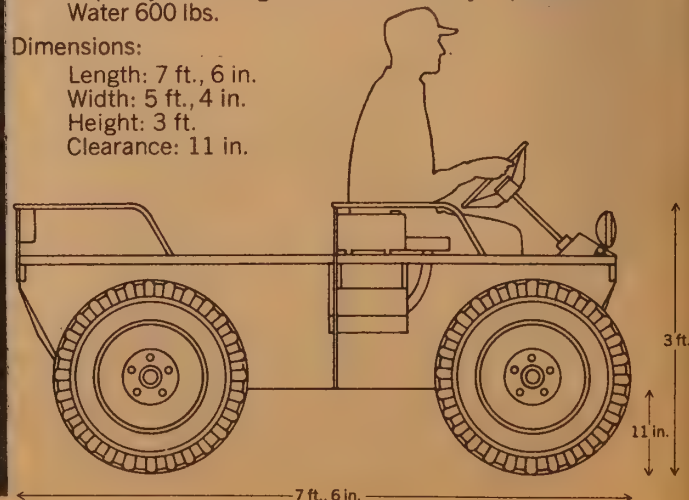
\$1695.00

Information on closest dealer from
Coot, Inc.
Suite 291
Ferry Bldg.
San Francisco, CA



Specifications:

- Drive: 4-wheel drive, positive traction.
- Suspension: Articulated bodies. Unobstructed undercarriage.
- Body: All steel.
- Frame: Laminated steel.
- Seats: Platform type. Heavy vinyl-covered, high density, foam filled.
- Tires: 885-15. Heavy duty nylon, non-directional tread.
- Tire Pressure: Standard—front 14 lbs., rear 8 lbs. Soft ground—front 8 lbs., rear 4 lbs.
- Ground Pressure: Less than 4 lbs. per square inch.
- Engine: Tecumseh air-cooled 4 cycle 27.66 C.I.D.
- Performance: Maximum land speed 20 mph. Maximum water speed 6 mph. Maximum gradeability 75%.
- Capacity: Engine oil 1.5 qts. Gasoline 1.5 gal. (3 gal. with optional tank). Torque transmitter 1 qt. each. Transmission 1 qt.
- Fuel: Regular gasoline.
- Torque Converter: Automatic variable speed.
- Transmission: 2 speeds forward, neutral, reverse, with P.T.O. shaft.
- Gear Ratio: 18 to 1 to 164 to 1.
- Brakes: Lever-actuated disc.
- Electrical System: 12 volt. 32 Amp battery. 10 Amp alternator. Solid state ignition system, Gear drive starter, Marine gauges and switches. Heavy duty wiring.
- Load Capacity: Land (light intermittent duty) 1,000 lbs. Water 600 lbs.
- Dimensions:
Length: 7 ft., 6 in.
Width: 5 ft., 4 in.
Height: 3 ft.
Clearance: 11 in.

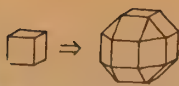


Dome Cookbook

A new art form is evolving in the southwest desert. Multi-colored cartop domes, put together with whatever's lying around. Free heat from the sun. Behind much of the innovating stands Steve Baer, a young inventor who generates enough energy to get others moving too.

This tabloid contains the crystallographic theory and junkyard practice behind Baer's domes: from how to distort a polyhedron without affecting connector angles to how to chop the top out of a car without losing your foot. From all we can determine, Baer's theory is unique in architecture. So is his practice; instead of dying of dissertation dry rot, his notions stand around in the world bugging the citizens.

The Dome Cookbook now in its second printing, is published by Lama Foundation, an experimental community in New Mexico.



this is a cube and an exploded cube. You can see that rectangles appear over the edges and triangles over the corners.



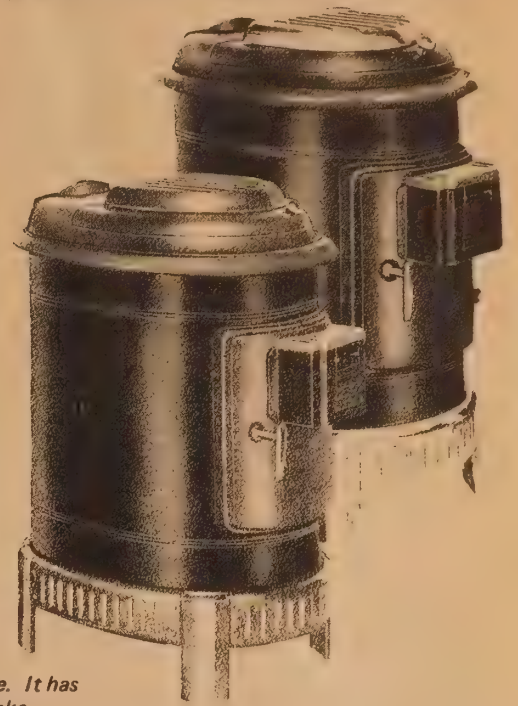
Here is an exploded cube inside a large cube showing that exploding a small figure or cutting away the edges and corners of a large figure can produce the same thing.

Dome Cookbook
Steve Baer
1968; 40 pp.

\$1.00 postpaid

P.O. Box 422
Corrales
New Mexico
87048

or WHOLE EARTH CATALOG



Ashley Thermostatic Wood Burning Circulator

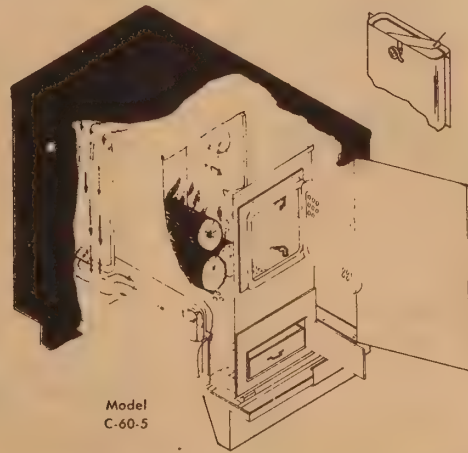
This is a unique wood burning stove. It has a thermostat which controls air intake, thereby burns much less wood than an ordinary stove. Will go up to 12 hours without refueling. In cold climates people build just one fire a season, adding wood 2-3 times a day. It takes any type wood, up to two feet long.

\$80-100 plus shipping for different sizes of the 'economy line.'

One kept us warm when we lived in a chicken coop with cold concrete floors and now an Ashley is the only heat we have in a 900 sq. ft. house with high ceilings.

The firebox is airtight and there is a lever on the air intake you can set for the desired temperature. A temperature-sensitive device (bi-metal helix coil) then automatically regulates air flow to keep heat at the setting you've chosen.

from
Ashley Automatic Heater Co.
P.O. Box 730
Sheffield, Ala. 35660
or
Ashley Spark Distributors, Inc.
710 N.W. 14th Ave.
Portland, Ore. 97209
or
WHOLE EARTH CATALOG



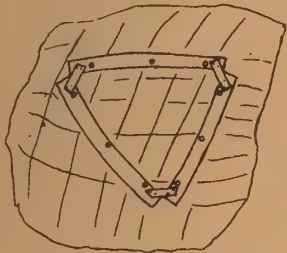
Firebox and ash doors are airtight. The only air admitted to primary combustion area of firebox enters at top (2) of down-draft stack, is preheated as it is drawn down stack, then is distributed evenly through air intake manifold (3) to bottom of firebox along its entire length, assuring even, more complete combustion, and eliminating hot spots (which also assures longer life of all firebox components). Thermostatic control (1) consists of damper (A) in top of down-draft stack activated by a bi-metal helix coil (B) which is temperature sensitive, opening and closing damper just enough to admit precisely the amount of combustion air necessary to maintain the level of comfort you have selected.

Please note that the Ashley introduces combustion air at FRONT of firebox (not at one end) so flow to flue is ACROSS the fire - not across one end or corner of it, as in other heaters. This promotes even, efficient burning along entire length of firebox.

fused cluster of exploded rhombic dodecahedra. The zones have been stretched different lengths and the entire cluster is cut by the plane of the floor. These are zones.

a rhombic dodecahedron and an exploded rhombic dodecahedron. In this case it has been exploded just as far as the edge lengths of the diamonds.

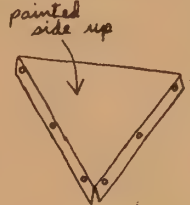
in this picture all the zones are the same length and they are also equal to the explosion $a=b=c=d=e$



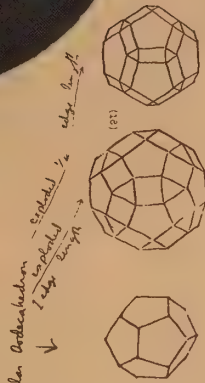
flexible plywood pattern on car top



panel cut and drilled



panel cut, drilled and broken



a model with the framing ring outlined

When you are putting up a dome panel by panel you often have to use poles to support the wobbly sides as they close in toward the center. When we were putting up the second to last panel in the shop dome we had three poles in strategic spots to hold the wobbly overhanging panels from collapsing. The poles were nailed at the top so they wouldn't fall away if during a moment's strain the load were lifted up and off of them. The panel was an 8' by 19' and extremely heavy. We put it up with an inadequate crew, two men and two women. We struggled for an entire afternoon the last few inches Albert Maher pushed from on top of a spool resting on top of the cab of his pickup which we had driven into the dome. It was touch and go, a clamp might slip, Albert might collapse, the poles might buckle. Each one of many failures seemed equally as probable as getting the monster joined to the neighboring panels. A huge shove, some quick work with the crow bar and clamps—Albert eased off and it still held, I took a few more turns on one clamp and added another one—it was a sure thing, we had it in place!

It felt as if the panel had been lifted into place by some incredible wave we had created that now washed back as we put down tools and Albert got down off the cab. But there was one last thing to check—the poles, were they dangerously bowed under this new load. The entire sensation in my head began for a moment to turn inside out when Holly yelled "look at them" but then I saw what it was—the dome was finding its shape, it had lifted all three heavy poles off the floor, they were hanging from where they had been toe nailed at their tops, swaying slowly. Three important pillars transformed in one moment into three dangling slow swinging pendulums.

Solar Stills

Horace McCracken makes solar stills that purify seawater, hard or brackish water using heat from the sun.

Price list (see chart)

from
Sunwater Co.
10404 San Diego Mission Road
San Diego, CA 92120

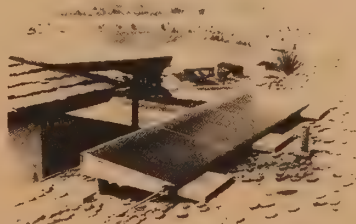
It consists of one or more shallow, insulated, glass-covered pans. A feed inlet admits water into one end of each pan, while an outlet tube at the other end maintains a shallow water level, and permits some overflow each night to flush out salts. Sunlight passes through the glass cover and warms the water in the pan. Vapor rises, condenses on the glass cover, and runs down into a collection trough.

PRICE LIST

Solar Stills

Model No.	1	3-1/2	5	7	10	15	20
Production Capacity in Gallons per Week	1	3-1/2	5	7	10	15	20
Outside dimensions: 5 1/2" high by 29" deep, by length:	15	32	46	62	84	118	168
Price, complete, ready to operate, FOB S.D.	\$11.50	\$27.50	\$37.50	\$47.50	\$60.00	\$80.00	\$115.00

Note: Quantities larger than 3 gallons per day may be obtained by connecting smaller units together in series or parallel. For installations of more than 10 gallons per day, kindly request quotation.



RESIDENTIAL TYPES
Bulletin 68-3

All standard and custom sizes are capable of being installed for manual feed or completely automatic feed, with product reservoir and kitchen tap. This is 2 gal./day.



COMMERCIAL TYPES
Bulletin 68-4

Many applications for motels; laboratories, research posts, etc. This 10 gal./day unit serves a restaurant in Mexico.

Foam Experiments

Plastic foams are entering the building industry. Shot from guns, poured into molds, or vacuum formed, foam is produced by mixing two liquids which expand to form the cellular structure.

Recent technological advances with urethane foams in application, fabrication, and product control have led to the current wave of experimentation. Designers such as Douglas Deeds and Felix Drury are working on structural applications of foam, hoping to achieve free-form buildings.

Equipment for spraying is expensive: a foam rig is \$1,500-7,000, and foam itself runs about 10¢ per board foot (1" x 12", one inch thick) if you're doing your own application, and buying bulk materials. Its biggest applications now are in roofing and as insulation.

This book describes a government sponsored project to determine the potential use of foam for housing in underdeveloped areas. It may well be that building codes, unions, lumber lobby interests, etc., will hold up foam development in the U.S., and that the real advances will be made in other countries. Details are given here on several years of testing various structural applications of polystyrene and polyurethane foams. There are pictures, construction details, drawings, graphs and charts on test results. Since this work was done several years ago, recent improvements in foams may have superseded some of the conclusions.

[Suggested by Ron Brooks & Ron Swenson]

Although techniques have played a major role in the research program, this report is intended to be primarily a discussion of ideas rather than techniques.

It is clearly to the interest of the plastic industry in the United States to enter the housing field on such a global scale. As the section on marketing aspects brings out, the industry is caught in a squeeze between steadily increasing surplus production capacities and a falling price curve for the basic chemicals. Housing looms as a most attractive mass market—chemicals would be bought by the ton, not just by the pound—but attempts to penetrate the housing field in the United States have been frustrated because of local building code restrictions and the opposition of established interests in the conventional way of building. In entering the housing field, the plastics producers will find better opportunities for success if initially they turn to the emerging countries where the building codes are less restrictive (if indeed any exist at all) and where there is consequently more freedom to develop a new kind of building industry.

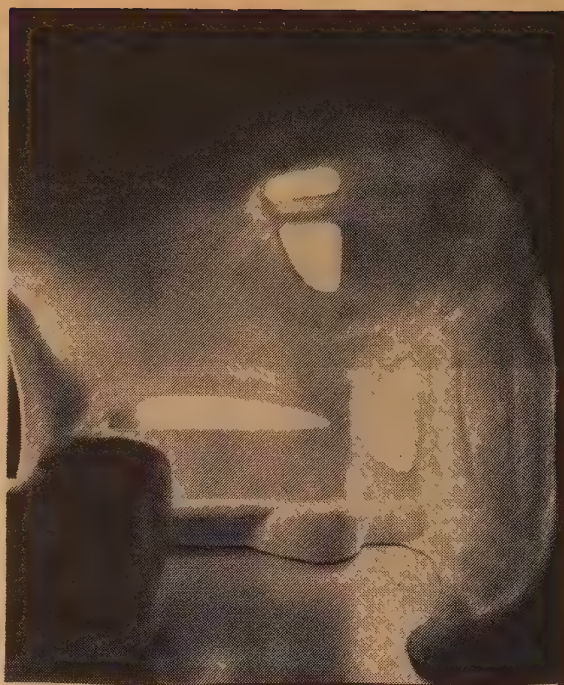
Foam inflation: a double walled bag, tailored in such a way that when foam components are placed in the bag they expand and inflate the structures. These bags can be made from polypropylene and milar films, tightly woven nylon fabrics, vinyl-impregnated fabrics...

All the shells were coated with liquid elastomer before being exposed to the weather. Two approaches were used. One was the use of the two-coat system, neoprene and Hypalon, and the other the use of two coats of Hypalon.

The shells were moved to the site by rolling each one like a giant wheel.

The shell was suspended and loaded with 20 lb sand bags to simulate uniform loading.

Petroleum is becoming increasingly the raw material for plastics intermediates.



Office room transformed into grotto by designer Douglas Deeds, San Diego. Deeds built foam up in layers, as coils of clay are used to form a pot.

Closed cell foam plastics offer excellent thermal insulation (with K-factors usually varying from 0.12 to 0.30) low water absorption and low moisture permeability.

Plastic materials, particularly the foam plastics, unquestionably have a high potential for housing use in the developing areas of the world.

Spray techniques have good possibilities for the construction of total structures using either air-inflated structures or lightweight armatures as form work; the present crude appearance of sprayed foam products can be overcome by mechanizing the spray gun or by using extremely skilled operators.

Vacuum forming: ABS foam, marketed by U.S. Rubber Co. under the name 'Expanded Royalite'...in sheet form is clamped in a stationary frame, heated, and then drawn into a female mold by vacuum....

The fewer the joints, the fewer are the problems the structure will have to face...lightness in structures can lead to some special problems of anchorage.

The cellular plastics admittedly have certain technical limitations. For instance, they have a low moduli of elasticity and high creep characteristics. These properties definitely restrict the way they can be formed or shaped, if they are to be used as independent structural materials.



Figure 8-13. WORKING OVER COIL TRUCK



Figure 8-14. GETTING OPENING IN POLYURETHANE SURFACE

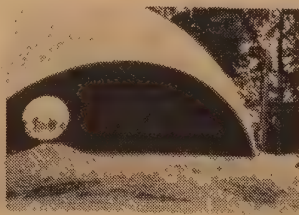
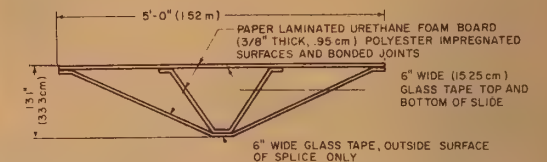
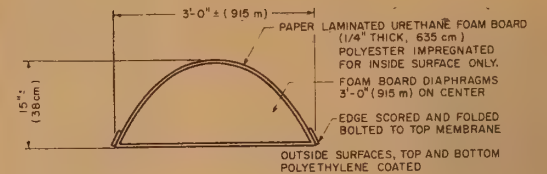
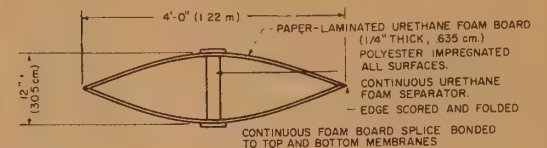


Figure 8-15. DONE WITH ONE EDGE SCORED

Figure F-2. INITIAL TEST STRUCTURES UTILIZING PAPER-LAMINATED POLYURETHANE FOAM BOARD

NOTE: PAPER-LAMINATED FOAM BOARD IS 2.5 LB/FT³ (40 kg/m³)
NOMINAL CORE DENSITY 69 LB KRAFT FIBER
LINER BOARD SKINS



Sunset Light-Curing Fiberglass Patches

A new product by 3-M: glass fiber cloth saturated with resin that hardens when exposed to sunlight, or ultraviolet. Use on wood, metal, glass, plastic. Flexible when applied, forms hard fiberglass surface when cured. Expensive, but useful for emergency repairs.

\$28.00 for kit with 12 4" x 4" pads and application squeegee.

Brochure with further information from:

3-M Company
New Business Ventures Division
3-M Center, Bldg. 219-1
St. Paul, Minn. 55101
Attn: J. J. Mueller

Foam Kit

A foam kit for experimentation is offered here, and instructions on how to make a mold and apply fiberglass. Used for filling voids in boat hulls, making surf riders, or other mold-shaped items.

The general steps required to make an item of this nature are as follows:
(a) Prepare a mold that is approximately the shape of the end product.
(b) Prepare enough foam mixture to fill the mold to the desired height. It is best to prepare 25% to 30% extra foam to cover foaming variations and to provide some extra material for removal to bring the item to its final shape and size.
(c) Pour the foam mixture in the mold.
(d) Remove the foam from the mold.
(e) Shape the foam. This material lends itself to easy freehand shaping.
(f) Apply fiber glass cloth using polyester resin.
(g) Apply finish coats of polyester resin. Color may be added if desired.
(h) Sand and finish final surface.

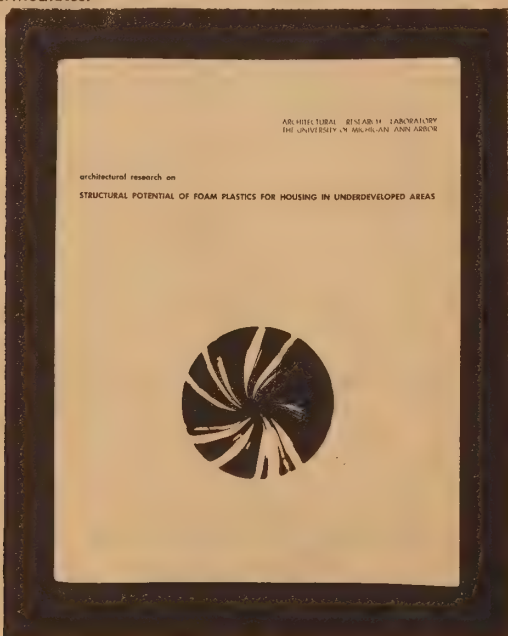
GENERAL

When ordering and working with materials advertised herein the following considerations should be kept in mind:

- (1) Polyurethane foam can be poured into any cavity, but too much can cause warping or breaking of the cavity walls if proper venting of excess material is not provided.
- (2) Polyurethane foam will adhere strongly to nearly any surface unless the surface is prepared for release.
- (3) Polyurethane foam adheres to itself. As a consequence it can be poured and cured in several increments if needed. This should be considered when filling voids of unknown size.
- (4) Large parts can be made using polyurethane foam but proper filling of the molds is difficult in home conditions.
- (5) It is recommended that small projects be planned first so the user can become familiar with the materials and their characteristics. Larger projects can be undertaken when confidence and skill have been built up.
- (6) The user is encouraged to plan each project carefully and order material as needed for that project.
- (7) When ordering polyurethane foam order enough material to include that lost by final shaping.
- (8) Some of the materials are considered hazardous. Be prepared to follow precautions. These precautions include restricting use to well ventilated areas, and avoiding exposure to skin and eyes.
- (9) Because of variations that we cannot control, no guarantees are made by C. Ross for the success of any project; however we will guarantee that the polyurethane foam ingredients supplied will make foam when properly prepared.
- (10) Never use polyester resin on styrofoam.
- (11) Instructions for use of materials are supplied with the order.
- (12) Both styrofoam and low density polyurethane foam require reinforcement through the application of fiber glass cloth if they are to be used where stresses will be applied.

\$5.00 for small kit—3½ lbs foam (1½ cu. ft. foam)
\$10.00 for large kit—8 lbs foam (4 cu. ft.)

Brochure with further information from
C. Ross
Box 133
Sugar Grove, VA 24375



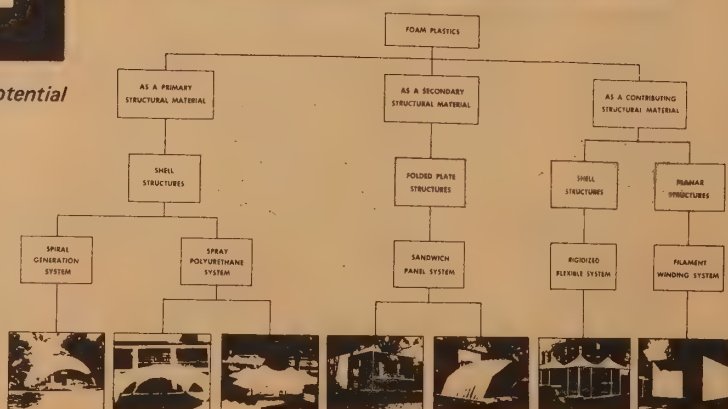
Architectural Research on Structural Potential of Foam Plastics for Housing in Underdeveloped Areas

Architectural Research Lab.

1966; 224 pp.

\$5.00 plus postage

from
Publication Distribution Service
University of Michigan
615 East University
Ann Arbor, Michigan 48106



Sundry Materials

A list I've gathered in the last 6 months in research on building other-than-rectilinear shapes.

FERRO CEMENT

Boats are being built on the West Coast of 3/4" thick ferro cement, often without forms. Pier Luigi Nervi has used the process extensively (for buildings) in Italy, and has encouraged fabricating boats by the same technique. It's cheap, strong, sounds relatively easy and some experiments will soon be taking place trying f.c. for domes and free-form buildings.

Good ferro cement information sources:

Special f.c. reprint \$1.00 from National Fisherman 22 Main Street Camden, Maine 04843

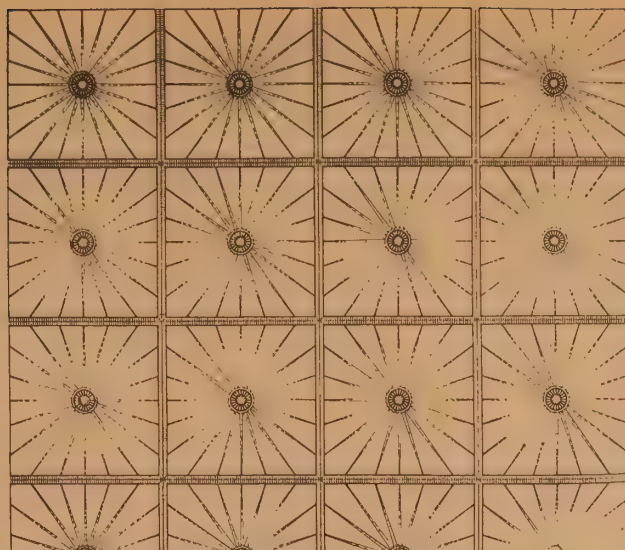
Concrete Boatbuilding, Its Technique & Its Nature Gainer W. Jackson, Jr. & W. Morley Sutherland 1969; 106 pp.

For information on how to obtain in U.S. write National Fisherman 22 Main Street Camden, Maine 04843

Ferro Cement Handbooks \$5-7

from Saga Technical Associates P.O. Box 733, Terminal Q Toronto, Ontario, Canada

Ferro Cement furniture September 1968 Popular Science



The bulk of the test data set forth below was extracted from a report prepared by Lloyd's Register of Shipping who have given classification 100 A.1. - their highest - to a vessel with a concrete (ferro-cement) hull, provided that in all respects, e.g. superstructure, engine installation, electricals, etc., the construction complies with their rules. (Lloyd's letter of confirmation--7/12/65.)

WINDBOATS LTD
Shipbuilders & Marine Engineers
WROTHAM, NORWICH, NORFOLK, NOR 03 Z

NOTES IN REGARD TO THE PHYSICAL PROPERTIES OF SEACRETE

PROPERTIES:-

(a) DENSITY
151 lbs/cubic foot. (Mahogany 36 lbs/cu. ft; reinforced plastic 100 lbs/cu. ft.)

(b) ULTIMATE STRESS, TENSILE
(1) Tensile bending stress on panels 48" x 12" x 7/8" loaded at centre point:

Stress to crack	1900 lbs. sq. in.
At yielding	3600 lbs. sq. in.
At ultimate	5340 lbs. sq. in.

(ii) Tensile stress:

Stress to crack	1300 lbs. sq. in.
Stress to break	1690 lbs. sq. in.

(c) ULTIMATE STRESS, COMPRESSION
Compression tests on sample cubes 6" x 6" x 6"

Falling load (tons)	Maturing time		
	7 days	14 days	28 days
Ultimate stress (lbs. sq. in.)	116	135.5	196.5
	7217.3	8742.2	12225

(d) YOUNG'S MODULUS

MEMBRANES

Mylar, clear and aluminized from Transparent Products Corp. P.O. Box 15924 Los Angeles, CA 90015 Attn: A. Robert Suba

Clear Vinyl About 6¢ sq. ft. from Wards Farm Catalog (Nearest Wards Branch.)

Coated fabrics (ripstop nylon, vinyl coated fiberglass, silicone rubber coated dacron, etc.)

Brochure 'Coated Fabrics for Industry' from 3M Company Film & Allied Products Division 1601 South Shamrock Ave. Monrovia, CA 91016

Brochure 'Dial-A-Spec Coated Fabrics' from Flexifirm Products 2300 North Chico Avenue El Monte, CA 91733

Parachutes: 24 ft. diameter canopies, white and in good condition. \$22.50 plus postage and tax from Security Parachute Co. P.O. Box 3096 San Leandro, CA 94578

Coated Nylon Fabrics

Brochures 'Protective Cover Fabrics' and 'Engineered Fabrics for Industry' from West Point Pepperell Industrial Fabrics Division 111 West 40th Street New York, N. Y. 10018



HUBS

Commercially available hubs for wood-framed domes. About \$1 per strut (connector for one piece wood.)

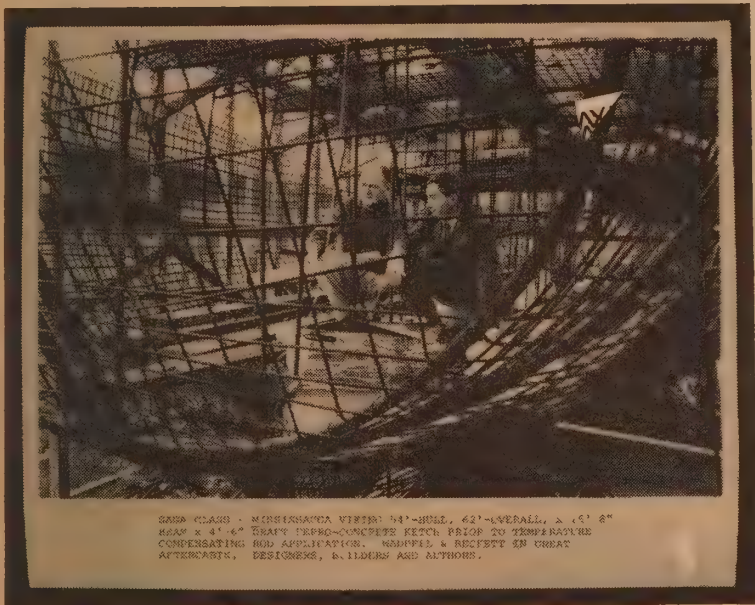
Brochure from Dyna-Strux 22226 North 23rd Ave. Phoenix, Arizona 85027

PLASTICS

Teflon, plexiglas, fiberglass, mylar, vinyl, foam guns, etc. A complete catalog of plastic materials and prices. from Plasticraft, Inc. 2800 North Speer Denver, Colo. 80211

Factory seconds of clear acrylic; complete line of plastics. Abe makes deals. from Abe Schuster Fiberglass 6211 Telegraph Avenue Oakland, CA 94609

Tedlar-coated Fiberglass Panels from Ornyte Fiberglass Panels 711 Olympic Blvd. Santa Monica, CA



TAPES FOR DOME SEAMS

Fab-Dek: 35 mil Hypalon impregnated with neoprene. 3" wide roll, 11¢ per lin. ft. Adhesive \$4.50 per gal. F.O.B. plant.

from Miracle Adhesive Corp. 27279 Industrial Blvd. Hayward, CA 94545 or 250 Pettit Avenue Bellmore, L. I., N. Y. 11710

Fiberglass tape with neoprene. 3" wide roll, 10¢ per lin. ft. includes adhesive. F.O.B. plant. from Dome Company P.O. Box 30 Hayward, CA 94543

Fiberglass tape with isophthalic resin.

Brochure from TAP 1710 E. 12th Street Oakland, CA 94606

Over 100 various pressure-sensitive tapes. Brochure 'Tapes for Industry' from 3M Company 320 Shaw Avenue South San Francisco, CA

FAB-DEK® is a 35 mil ONE SHEET ROOFING of HYPALON on an asbestos felt impregnated with Neoprene.

IT IS, WATERPROOF
FIRE RESISTANT
MILDEW RESISTANT
WEATHER RESISTANT

EASY TO APPLY
LIGHT IN WEIGHT
LABOR SAVING
QUICKLY INSTALLED
Guaranteed to Bridge Small Cracks

MIRACLE ADHESIVES CORP. Bellmore, N. Y.
HYPALON is a DU PONT copyright name.
KOLORPRENE is a MIRACLE copyright name.

FOAM

Free Brochure 'The Use of Rigid Urethane Foam as a Structural Insulant' from Mobay Chemical Co. Penn Lincoln Parkway West Pittsburgh, PA 15205 Attn: Mr. Byron E. Beard

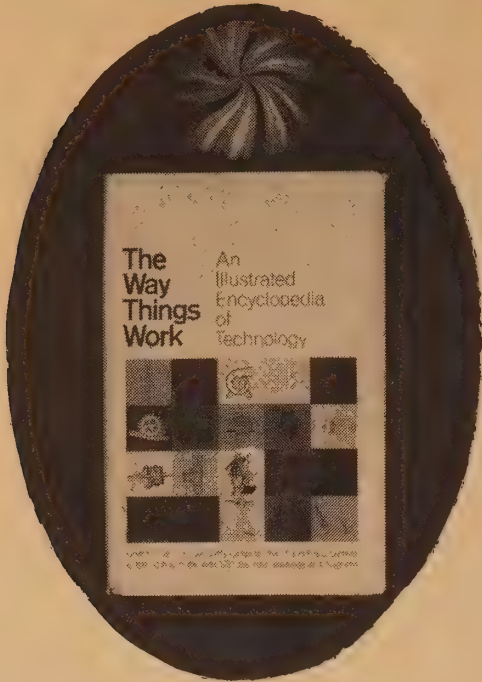
Foam guns from Sealzit Division/The Flintkote Co. P.O. Box 5347 Riverside, CA Attn: W. R. White

General foam info. from Yellow pages, your phonebook for local foam applicators.

LAMINITE CARDBOARD

Unbelievably tough, fire-retardant, and light. Samples from

Laminite Division Tri-Wall Containers, Inc. One Dupont Street Plainview, N. Y. 11803

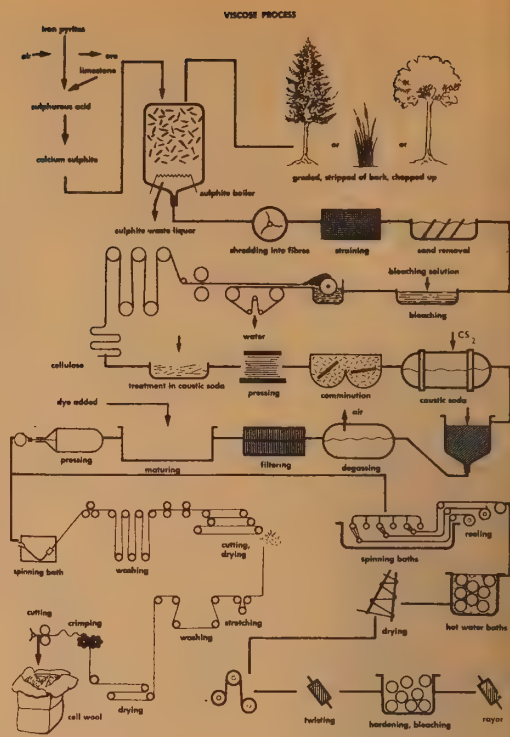
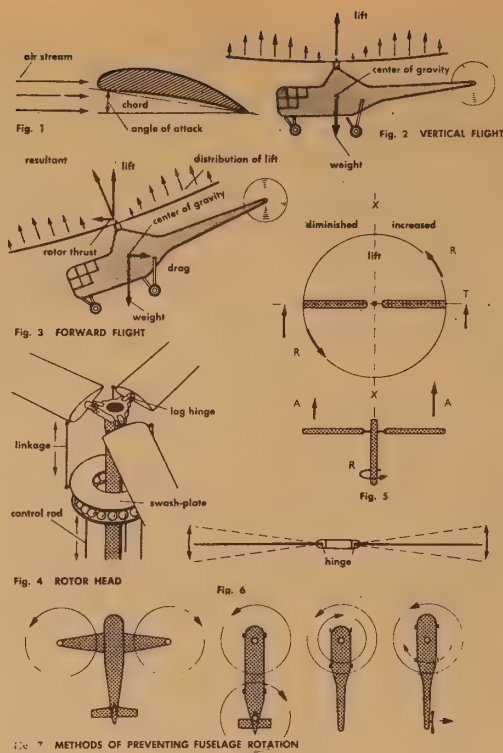


The Way Things Work

The Way Things Work
1967; 590 pp.
\$8.95 postpaid

from:
Simon & Schuster
630 Fifth Avenue
New York, N.Y. 10020
or
WHOLE EARTH CATALOG

Best book for the bathroom we've seen. Nibble your way to knowledge of technology. Each two pages of the book is a bunch of text and a bunch of diagrams on all the big and little gadgets and processes you can think of, ball-point pens to data-processing. If you develop time travel, it might be interesting to take this book back to the sixteenth century and leave it under some European's pillow. (Now think about contact with alien civilizations.)



Introduction to Engineering Design

Out of a whole section of books on design in the Engineering Library at Stanford, this book looked far the best. Recently Steve Baer (dome and solar designer) came across it on our editing tables, sat down and paged, then got up and hurriedly wrote a letter to a friend about the book and its author. I asked Steve to pick out some useful quotes and pictures and he wouldn't. "Look anywhere you open it," he advised, then ordered a copy.

Contents of the book include: *The Engineering Problem Situation, Design Project Organization, Information and the Need Analysis, Identification of the Problems, Information Sources, Synthesis of Alternatives, Estimation and Order-of-Magnitude Analysis, Engineering and Money, Preliminary Design, Engineering Problem Modeling, The Iconic Model, Conceptual Representation, Expansion of the Criterion Function, Checking in Engineering Design, Optimization, etc.*



Fig. 7.4 Possible water channel sections.
Water supply project for mountain cabin.

WATER SUPPLY FOR MOUNTAIN CAMP

For another simple example, let us estimate how we would bring water from a running stream into a tank (let's say a 50-gallon gravity tank) to supply water for a vacation cabin in the woods. A natural supply point is 100 ft away upstream, guaranteeing among other things a clean, continuous water supply. Our problem is transport. Shall we use pipe, an open rock-lined channel in the ground, or a wooden flume or trough? See Figure 7.4.

As we think about this, we discard the open channel in the ground as too easily contaminated. The pipe could be laid on the ground; and the wood flumes could be suspended from tree trunks and possibly covered as shown by the dashed "board" in the illustration. Thus, we have two reasonable ways of doing this job; the questions now concern cost and convenience.

Next we check the sizes needed. If we wanted the 50-gal tank filled in 15 min, we would need a flow of about 4 gal/min. This is a stream of water about as big as a person's finger when the water is flowing two feet per second, as shown by the equation in the footnote† deriving the cross-sectional area, A, of the stream.

This area would require a pipe one inch in diameter. If we were using the wood "vee" channels, we would need two boards each about three inches wide to avoid splashing over, or one-half board-foot per running foot of channel (per foot of channel length). (A board-foot is one square foot of wood, one inch or less thick.)

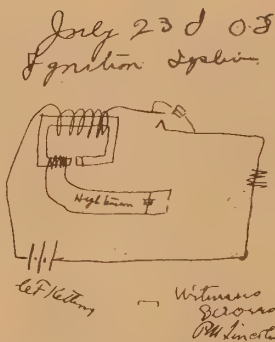


Fig. 6.2 A sketch that changed automobile ignition. (Courtesy General Motors Corp.)

Now we need to arrive at costs. The most convenient reference is a broad-coverage catalog (such as that of Sears, Roebuck), in which wood, metal, and other supplies can be found listed at retail prices. Of course, one can also phone the retail plumbing or lumber suppliers. In any case, we find

Wood: 15¢-20¢ / board-foot in the sizes we need
1 in. iron pipe: 30¢ / ft
3/4 in. copper pipe: 58¢ / ft (One size smaller than iron pipe for the same flow rate.)

Assuming one-half board-foot for each running foot of wood channel, the comparisons are

Wood: 10¢ / running foot, materials only
Iron: 30¢ / running foot, materials only
Copper: 60¢ / running foot, materials only

Since we would do the work ourselves, the cost of labor is disregarded, and it seems that wood should be our choice. On one final check though, we ask whether these are all the choices. Someone suggests plastic pipe, so we look that up: It is corrosion-resistant, flexible, easily connected, sanitary; it has a smooth interior; it could be in one piece and simply laid on the ground. It seems to be a natural choice. The price of 3/4-in. diameter plastic pipe is 10¢ / ft; 1-in. diameter is 16¢ / ft. Considering the labor needed with wood or iron pipe, or the cost of copper tubing, and the plastic's sanitary advantages, the plastic pipe (high-density polyethylene) is certainly the preferred choice.

Thus our final estimate is the use of this plastic tubing, probably 3/4-in. diameter at 10¢ / ft.

$$\dagger A = Q/V \quad (\text{area} = \text{flow}/\text{velocity})$$

where

$$Q = 4 \text{ gal/min} = 1000 \text{ cu in./min} \quad (1 \text{ gal} = 231 \text{ cu in.})$$

$$V = 2 \text{ ft/sec} = 24 \text{ in.}/(1/60 \text{ min}) = 1500 \text{ in./min}$$

$$A = \frac{1000 \text{ cu in./min}}{1500 \text{ in./min}} = 2/3 \text{ sq. in.}$$

Introduction to Engineering Design

Thomas T. Woodson
1966; 434 pp.

\$9.95 postpaid

from:
McGraw-Hill Book Company
Princeton Road
Hightstown, N.J. 08520
Manchester Road
Manchester, Missouri 63062
8171 Redwood Highway
Novato, Calif. 94947
or
WHOLE EARTH CATALOG

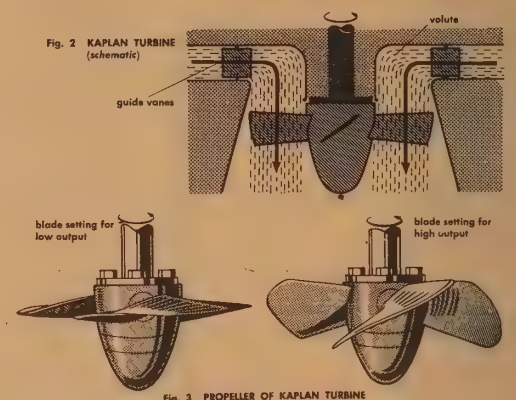
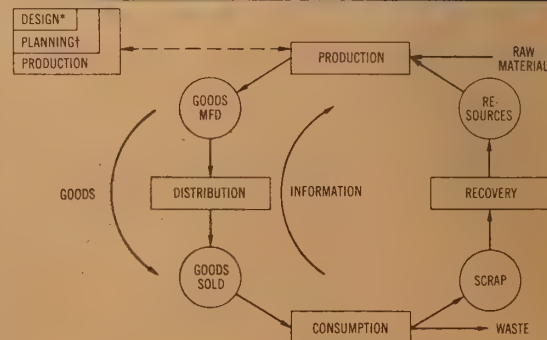


Fig. 3 PROPELLER OF KAPLAN TURBINE



*DESIGN is a part of PLANNING
†PLANNING is a part of PRODUCTION

Fig. 3.7 The production-consumption cycle, showing the place of engineering design.

Direct Use of the Sun's Energy

The best book on Solar Energy that I know of. Any curious and intelligent person can learn a great deal about our planet and ourselves by reading this book about ways of using sunlight. There are many numbers in the book but the math never goes beyond 8th grade arithmetic. The book is clear and simple whether talking about heating water—

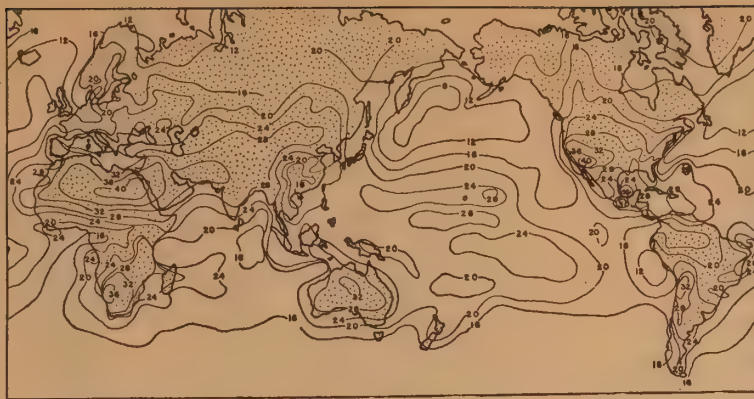
For general domestic use of hot water for bathing and washing dishes a temperature of 135°F (57°C) is considered adequate and 20 gal per person per day is a reasonable consumption. In many sunny climates these requirements can be met with an insulated storage tank and solar radiation absorber which has an area of 0.75 ft² gal⁻¹ of hot water. A family of four would need a tank of 80 gal and a solar absorber of 60 ft².

or photo chemical reactions —

The photo dissociation of iodine (I₂) molecules into atoms absorbs most of the visible light of the sun with a considerable amount of energy, but the iodine atoms recombine so fast that the energy cannot be retained. It is immediately evolved as heat during the exposure to light.

I read the book on a Greyhound bus in Texas two years ago and it has changed my life and my way of thinking.

[Reviewed by Steve Baer]

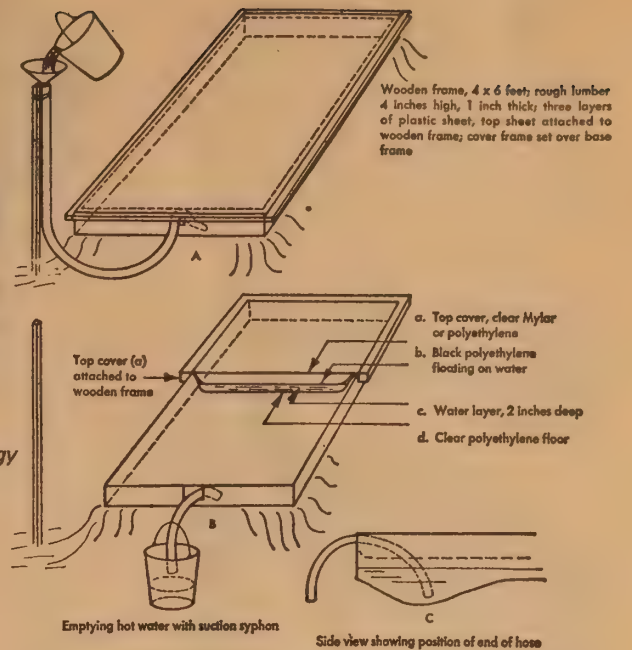


11. World wide distribution of solar energy in hundreds of hours per year. [Adapted with permission from Solar Energy, cover, 1, no. 1 (1957).]

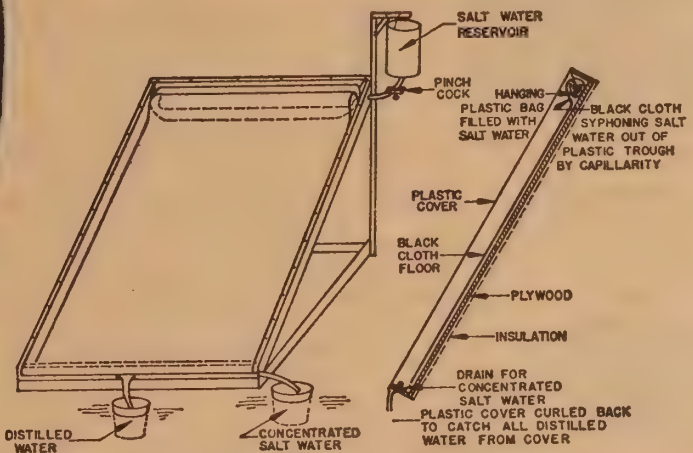
Direct Use of the Sun's Energy
Farrington Daniels
1964; 374 pp.

\$2.45 postpaid

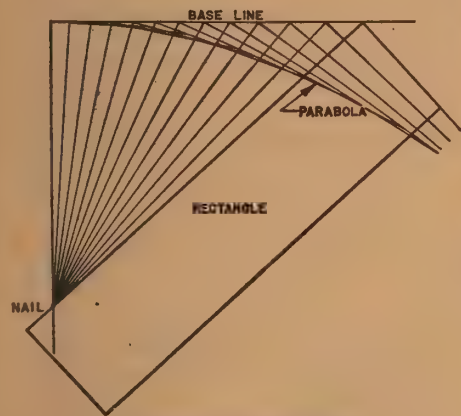
from:
Yale University Press
149 York Street
New Haven, Conn. 06511
or
WHOLE EARTH CATALOG



29. Inexpensive solar water heater. A. Filling with cold water. B. Emptying hot water with suction siphon. C. Side view, showing position of end of hose.



32. Tilted plastic still of simple construction.



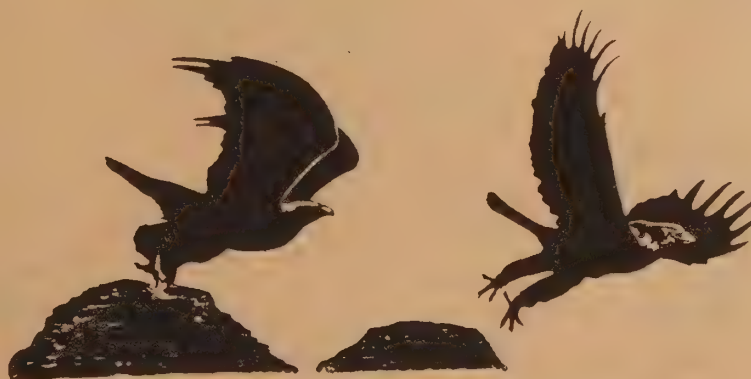
18. Method for drawing a parabola.

Structure, Form and Movement

The usual procedure is that R&D comes up with a new process, it's implemented for several years, and then some biologist says Hey did you know porpoises did that? (or snakes did that, or bees or elm seeds). And everybody says My, my, ain't Nature smart.

Herr Hertel and colleagues is trying to reverse the order, learn from nature first, save time and stay humble. (This approach now has a name, "bionics"; a book by that title that's around is terrible.)

This book may be too expensive for its direct usefulness, but it thoroughly displays the approach that research may take to bugs, birds, fish, etc. for yield in navigation, flight, streamlining, etc.



Golden eagle. Leaping off. Legs flexed at left, extended at right

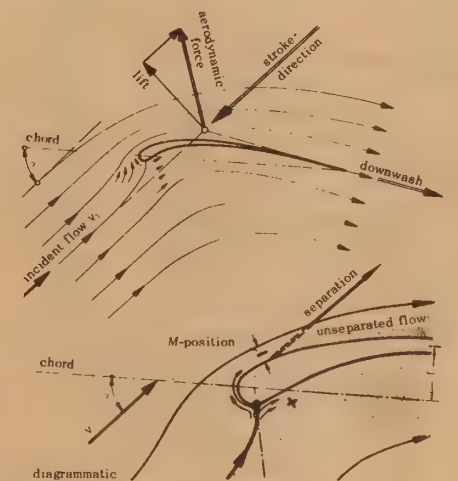


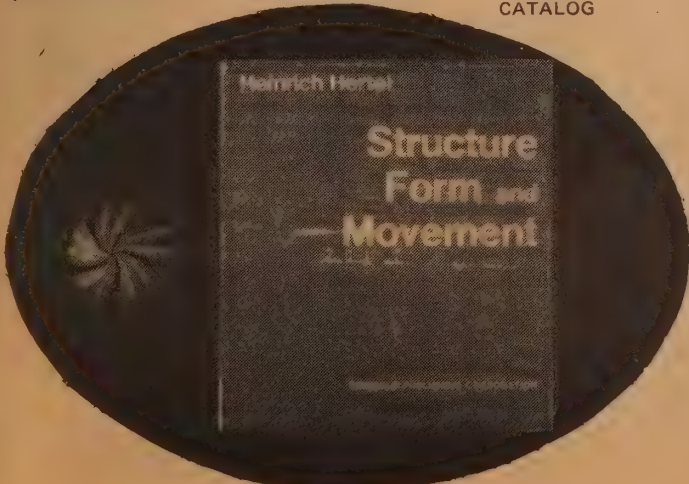
Fig. 52 Beginning of take-off = wing stroke forward and down Incident flow - downwash - forces. Below: stagnation point; flow around the leading edge.

Structure, Form and Movement

Heinrich Hertel from:
1963, 1966; 251 pp. Van Nostrand Reinhold Company
450 West 33rd Street
New York, N.Y. 10001

\$18.50 postpaid

or WHOLE EARTH CATALOG



The hand remiges of birds are masterfully perfected to obviate flutter:

- The hollow cross section of the supporting frame consisting of the feather quill is continuous over the entire length and approximates a cylinder, which resists torsion well. This cross section also improves resistance to bending.
- The ultralight construction of the vanes ensures minimum moment of mass about the quill axis.
- Variations in aerodynamic forces during oscillation affect 25% of the profile depth. Consequently, the form of the remiges, with narrower anterior vane sections and broader posterior vane sections, is appropriate for aeroelastic reasons. In the primary feather shown in figure 65, the resultant of aerodynamic forces lies behind the shaft.
- With this aerodynamically desirable arrangement it is impossible to locate the resultants of mass distribution ahead of the torsion axis.
- The arrangement of the three axes (in order from front to back: torsion axis, centroidal axis, aerodynamic axis) is thoroughly favorable for achieving a high critical velocity.
- Considerable damping of the oscillation system is provided by the foam filling (support of the coverts).

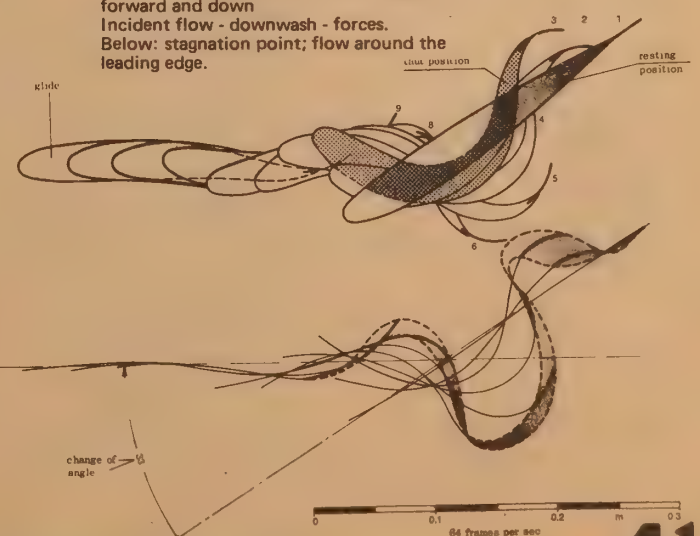
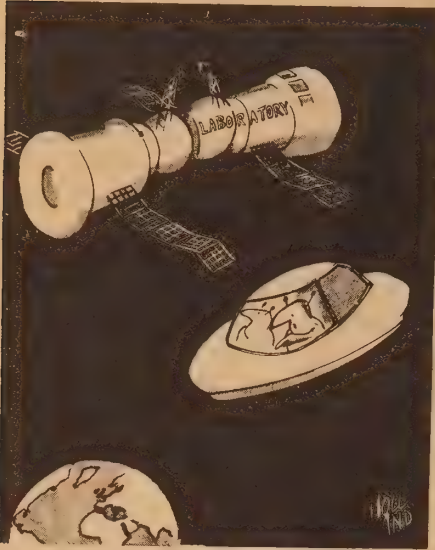


Fig. 204 Starting thrust-lunging of trout (*Salmo gairdneri*) Top: progress of movement according to motion picture record. Bottom: fin stroke.

New Scientist

New Scientist is the best evidence we've seen that there are new scientists in the world, young, politically aware, irreverent, active. Every week here's yet another blue New Scientist (if you get behind reading, it's hopeless), full of actual news, critique, and gossip of the research world. The magazine is British, so you get perspective on U.S. accomplishments (flattery nonetheless), and report of worldwide activities unreported in most American journals. The Ariadne column is a gem.

[Suggested by Steve Baer]



"And that, I suppose, is one of their experiments"



A crystal clear memory for many things

Holography is bringing about a rapid and spectacular revolution in applied optics. Three researchers at Bell Telephone Laboratories have now demonstrated that they can store up to 1000 holograms simultaneously in the small crystal of lithium niobate illustrated here. Their new optical memory has much greater efficiency than a conventional holographic plate, as well as much greater storage capacity.

ANOTHER HAZARD OF SMOKING

One in five of unsuccessful pregnancies in women who smoke regularly might have been successful if the mother did not smoke

Much depends on whether dormice have nightmares. ☹



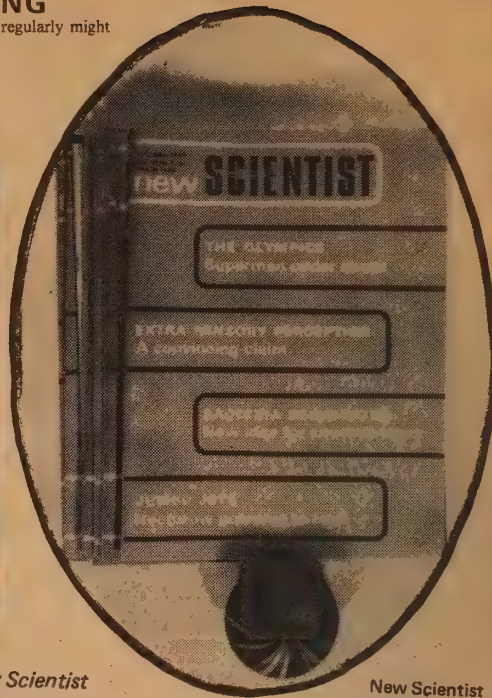
At last—a pulsar that flashes

All the way with DNA

New Scientist

\$16.00 for one year (weekly)

New Scientist
128 Long Avenue
London WC2, England



A protein from way-back-when

A new structural determination of a protein—which has turned out to be one of the most primitive ever examined—should help to chart the early course of evolution. It also supports a neat hypothesis to explain how living mechanisms have increased in complexity

Scientific American

Good old Scientific American.



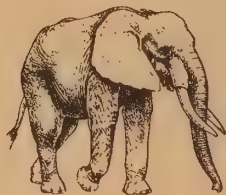
Scientific American
\$8.00 for one year (monthly)

More Brain, Better Brain?

Animals with more than the normal amount of brain tissue may learn more quickly than normal animals.



Murder at Thank God Bay



PROBOSCIDEA

Pollution by Fertilizer

Man's injection of excess nitrogen into the biosphere not only is seriously polluting rivers and lakes but also has greatly increased the frequency of a rare form of poisoning among both humans and domestic animals. Reporting at a symposium on pollution during the annual meeting of the American Association for the Advancement of Science, Barry Commoner of Washington University noted these results of the rise in nitrogen production in the U.S. during the past 25 years. Nitrogen from sewage, a reflection of the nation's population growth, has increased no more than 70 percent in that time, but the oxides of nitrogen produced by power plant fumes and automobile exhaust have increased by 300 percent and the use of nitrogen fertilizers by 1,400 percent. The last two processes add some 10 million tons of nitrogen compounds to the environment each year, more nitrogen than is cycled annually within the U.S. by all the processes of nature combined.

How to blow soap bubbles that last for months or even years

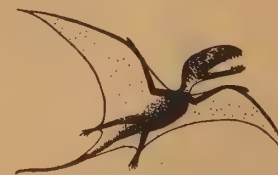
"One of the two solutions consists essentially of Kuehner's dibromostereate soap. The other one is a solution of polyvinyl alcohol, water and glycerin. Bromine is an extremely hazardous substance before it has reacted with the acid, and compounding these mixtures calls for controls that are not available in the home. For these reasons amateurs should not attempt to make double-bubble solution. It can be bought from the Techno Scientific Supply Company, Inc., P.O. Box 191, Baldwin, N.Y. 11510. The solution costs \$4 a pint, a quantity sufficient to blow thousands of bubbles.



DESMOSTYLIA (DESMOSTYLUS)

Tough Concrete

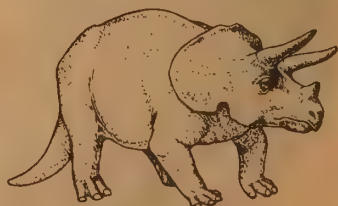
Treatment of concrete with a liquid monomer that is then polymerized and hardened by ionizing radiation produces a material that is far stronger and more durable than untreated concrete, according to a report by the U.S. Atomic Energy Commission and the Bureau of Reclamation of the U.S. Department of the Interior. The favored technique has been to soak ordinary hardened concrete in the monomer and then to expose the concrete for several hours to radiation consisting of gamma rays from cobalt 60. The most satisfactory monomer yet found is methyl methacrylate. The experimenters have also worked with other monomers, have achieved polymerization by a thermal-catalytic process rather than by radiation and are investigating the possibility of including the monomer in the original mix.



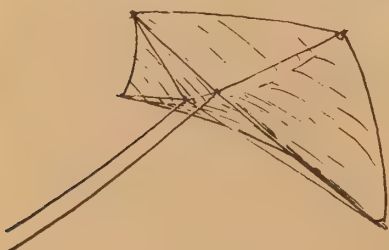
PTEROSAURIA (DIMORPHODON)



SAURISCHIA (BRACHIOSAURUS)



ORNITHISCHIA (TRICERATOPS)



**double-string
bridle for
maneuvering
Malay kite**



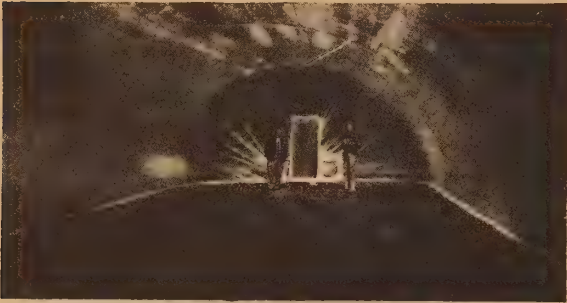
SIRENIA (MANATEE)



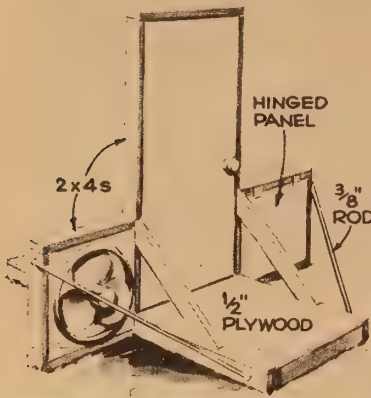
Popular Science

Of the three, *Popular Science*, *Popular Mechanics*, and *Mechanics Illustrated*, consistently the somewhat better is *Popular Science*. It's a good source for current applied science reporting and basement technology. Most of the tool sources we list advertise in the magazine.

[Suggested by J. Baldwin.]



Spacious interior of house made from 40-by-100-foot polyethylene sheet has floor bigger than a tennis court. It's held up by fan beside door at rear.



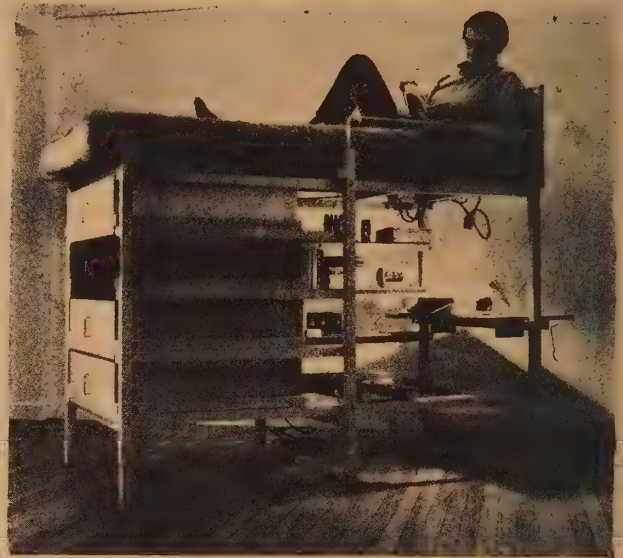
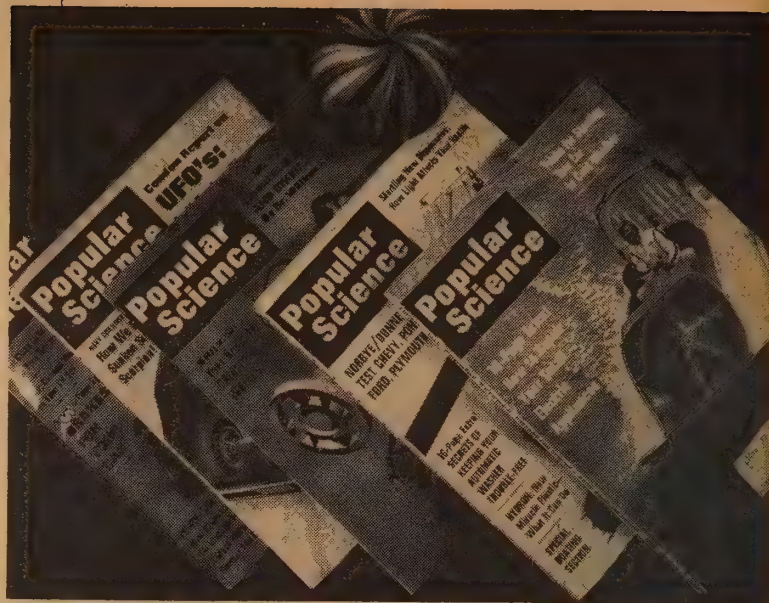
Almost any fan will inflate the building. A 15- or 18-inch exhaust fan is ideal. No air lock is necessary for a structure of this size. The door may even be left open without the plastic collapsing. When the door is closed, the hinged panel beside it serves as a crude pressure valve, keeping a constant pressure on the skin. Depending on the size of the fan, the vent should stay open six to eight inches.

A single sheet of polyethylene film can be fashioned, in one afternoon, into a giant enclosure that makes all this possible. This plastic "roof" is supported only by air from a household exhaust fan. Sound expensive? It's actually the cheapest and simplest shelter you can erect. The one illustrated gives you a floor space of 27 by 85 feet—the maximum you can get from a 40-by-100-foot sheet. There's no footing to dig—the edges are merely taped to sausage-like sandbags. The only construction involved is framing up the fan and entrance door, as shown below. The total cost? Under \$60. For covering smaller areas, figure less than three cents a square foot.

Polyethylene film lasts about a year when exposed to the only thing that weakens it—sunlight's ultraviolet rays. But that's a year of constant exposure, and the film's low cost makes it painless to replace. I used the four-mil thickness; six- or even eight-mil will bear up better if you plan to take the structure down several times. Most lumberyards handle the film in 40-foot widths, or can order it for you. The two-inch-wide tape is stocked by many hardware stores.

Popular Science
\$5.00/yr. (monthly)

from
Popular Science
Subscription Department
Boulder, Colo. 80302



Newest Living Structure is first issue has designed specifically for the young. A small house within a room, it includes drawer storage and a full-length bed (demonstrated at left and above by the designer), plus a private study with seat, table, and bookshelves.

Popular Mechanics Projects

On the other hand, *Popular Mechanics* offers a list of reprints of innumerable home projects, priced 15¢ to a dollar per project

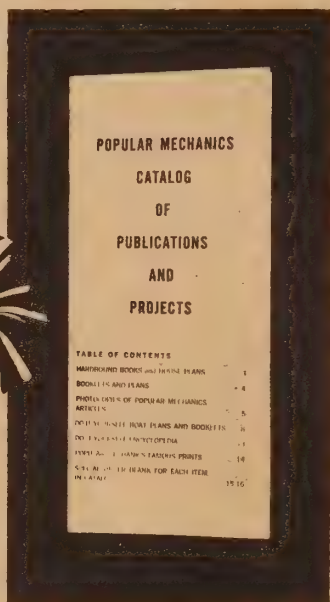
[Suggested by Mu.]

Popular Mechanics Catalog of Publications and Projects

free

from
Popular Mechanics
Service Bureau, Dept. RF
575 Lexington Avenue
New York, N. Y. 10022

- X12 Alternator, getting to know it 3/63-174, \$1.05
- X14 Amplifier for your po ket 10/66-198, 45¢
- X15 Amplifier, guitar 11/57-160, 75¢
- X16 Antenna boosts FM reception 11/63-189, 15¢
- X17 Antenna, UHF yagi 6/59-144, 45¢
- X18 Antiques, turning reproductions into 7/66-116, 75¢
- X19 Aqua-sled 7/66-138, 30¢
- X20 Arbor press for small shop 7/53-189, 45¢
- X21 Arbors & trellises 4/51-188, 60¢
- X22 Arc welder 9&10/48-205,213, \$1.35



- X23 Arc welder, auto powered 2/57-241, 60¢
- X25 Arc welding gun 3/64-171, 45¢
- X27 Attic dormers 10/63-164, 75¢
- X28 Attic, reinsulate 8/58-154, 30¢
- X29 Attic, remodeling 10/50-196, 75¢
- X30 Attic studio bedroom 4/65-146, 30¢
- X31 Attic vents 5/58-181, 15¢
- X32 Auger bits 2/67-188, 15¢
- X34 Ballistic chronograph 10/64-190, 30¢
- X35 Bandsaw blades 2/65-188, 15¢
- X36 Bandsaw, 4 wheel 12/48-225, 60¢
- X37 Bandsaw, 2 speed 12/50&1/51-204,215, \$1.05
- X38 Banjo, make your own 3/62-159, 75¢
- X39 Bar, cocktail 9/66-138, 75¢
- X40 Bar, rolling patio 7/64-139, 15¢
- X41 Barbecue from a barrel 6/65-142, 30¢
- X42 Barbecue pit, gas fired 8/65-145, 15¢
- X43 Barometer, how to read 3/65-152, 15¢
- X45 Basement glamour 1/53-165, \$2.00
- X46 Basement water proofing 6/60-170, \$1.05
- X47 Basement, what to do about wet 10/64-154, 75¢
- X48 Basement wiring 10/60-208, 90¢
- X80 Rowboat 11 1/2 ft. 2/49-202, 60¢
- X81 Scoot-about ski boat 7/62-146, 75¢
- X82 Trimarin sailboat 20 ft. 7/51-174, \$1.20
- X83 Duckboat 8 ft. 9/47-178, 75¢
- X84 Bicycle boat 4/57-174, 45¢
- X85 Airboat 5/55-190, 75¢
- X86 Boat trailer 6/52-194, 30¢
- X87 Bobsled 12/60-155, 30¢

BOOKCASES

- X88 Brick 10/58-185, 15¢
- X90 Shelves that grow 3/65-154, 30¢
- X91 Stack or pack 9/64-158, 30¢
- X92 In a wall 9/64-144, 30¢
- X93 Book rebinding 2/65-156, \$1.20
- X94 Boomerang 4/64-156, 60¢
- X96 Bottle flower vases 7/58-141, 15¢
- X98 Bottles, projects from bleach 8/63-146, 30¢
- X99 Bottle, submarine in a 1/67-158, 90¢
- X101 Bows & crossbows 8/51-165, 45¢
- X102 Boxes for indoor garden 12/57-182, 60¢
- X103 Boxes for plants 12/57-182, 75¢
- X104 Brakes, give them a break 7&8/65-156,154, \$1.35
- X106 Breakfast nook 9/54-165, \$1.05
- X107 Brick, 8 types of mortar joints 7/58-176, 45¢
- X108 Bridge for garden 4/61-159, 15¢
- X109 Buffer 7/60-172, 45¢
- X110 Building basics 9/63-148, 90¢
- X111 Built-ins for home 4/56-187, 90¢
- X112 Built-in theater wall 10/66-164, \$1.05
- X113 Built-outs, framing basics 9/64-124, 75¢
- X115 Bunk bed with storage drawer 8/45-114, 60¢
- X116 Bunks, room dividing 11/64-148, 75¢
- X117 Bunks, triple deck 8/66-122, 30¢

ROOF

- X539 How to apply asphalt shingles 9&10/50-212,217, \$1.35
- X540 Leaks, what to do about 5/56-181, 60¢
- X541 Open it to daylight 10/58-169, 45¢
- X542 Roll on a new one 9/61-208, 30¢
- X543 Rope ladder 6/62-153, 45¢
- X544 Rope lore 6/64-132, 90¢
- X545 Router guide 2/62-200, 45¢
- X546 Router plan 9/55-205, 30¢
- X547 Rubber stamp 12/62-158, 45¢
- X548 Rust, stopping it in home 8&10/55-186,218, \$1.20
- X549 Saber saw from sewing machine 1/62-192, 30¢
- X550 Saber saw speedy cuts 9/60-150, 60¢
- X551 Saber saws (2) 7/64-167, 75¢
- X552 Sail, how to mend 7/49-186, 60¢
- X553 Sand casting at home 7/63-166, \$1.05
- X554 Sandblaster 10/63-191, \$1.05
- X555 Sander, double duty 5/45-123, 45¢
- X556 Sander, tips on using 7/57-158, 30¢
- X584 Sauna bath 12/64-124, \$1.05
- X585 Saw circular, lifting & arbor 11&12/47-218,217, \$1.00
- X586 Sawhorses and scaffolds 2/52-211, 80¢
- X587 Scooter, fat-tire for sportsmen 4/63-151, 75¢

Clearinghouse

Its full name is "Clearinghouse for Federal Scientific and Technical Information," it's managed by the U.S. Department of Commerce, and it's quite a service. All current unclassified R&D (research and development) done for or by the Government is available through Clearinghouse; this amounts to 30,000 new documents each year. Specific accesses are: U.S. Government Research and Development Reports (December 1,000 new documents twice a month), \$22/year; Fast Announcement Service, for as many as 57 subject areas, delivered constantly, \$5/year; and Technical Translations, twice a month, \$12/year. These are indexes. Once you find what you want you order a paper copy (hard copy) for around \$3 or micro-film (microfiche) for around \$.65. The following examples of listings are from the Fast Announcement Service.

[Suggested by Jon Dieges]

Write for free information and order forms to:
U.S. Department of Commerce
Clearinghouse for Federal Scientific & Technical Information
Springfield, Va. 22151

AD-675 974 -- INSTRUMENTATION FOR ANIMAL TRACKING AND DATA ACQUISITION, W. H. Starks and N. S. Ostroff, American Electronic Labs., Inc., Colmar, Pa., for the Navy, June 68, 79p. . . . Describes instrumentation devices and concepts including a portable radio telemetry system consisting of a base station receiver, directional antenna, digital data display, bird and aquatic animal beacons, and telemetry devices with data sensors.

ORDER: PB-180 051 -- TRITON CITY - A PROTOTYPE FLOATING COMMUNITY, Triton Foundation, Inc., Cambridge, Mass., for the Dept. of Housing and Urban Development, Nov. 68, 131p.

AD-683 047 -- WHAT IS MEMORY THAT IT MAY HAVE HINDSIGHT AND FORESIGHT AS WELL, H. Von Foerster, Univ. of Illinois, Urbana, for the Air Force, Jan. 69, 61p. . . . Discusses the phenomenon of physiological memory from the viewpoint that memory is embedded into the totality of cognitive processes and considered as a computational operation rather than a storage and retrieval problem.

AD-681 752 -- A FIFTEEN-YEAR FORECAST OF INFORMATION-PROCESSING TECHNOLOGY, G. B. Bernstein, Naval Supply Systems Command, Washington, D. C., Jan. 69, 157p. . . . Uses SEER (System for Event Evaluation and Review), a technique that incorporates the consensus of participant experts, to produce a technological forecast of what is expected to occur in the information-processing industry.

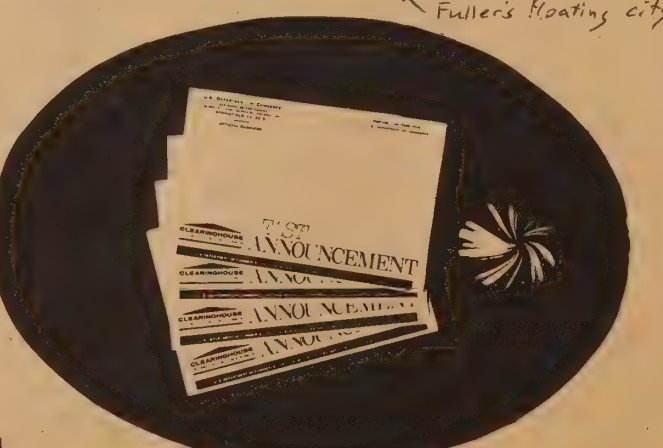
PB-180 665 -- THE INFLUENCE OF DESIGN ON EXPOSED WOOD IN BUILDINGS OF THE PUGET SOUND AREA, E. W. Schein, USDA, Pacific Northwest Forest and Range Experiment Station, Portland, Ore., Sept. 68, 50p. . . . Identifies the best existing design solutions to exposure hazards.

AD-680 168 -- SPIRAL GENERATION OF BUILDING SHELLS FOR MILITARY CONSTRUCTION, A. N. Collishaw and R. D. Graham, Dept. of the Army, Ohio River Division Labs., Corps of Engineers, Cincinnati, Ohio, Nov. 68, 30p. . . . Discusses immediate and potential applications of the spiral generation construction process to military construction. Included are permanent, semi-permanent, and temporary construction.

PB-182 401 -- BUILDING CLIMATOLOGY, PART IV: NOISE, National Swedish Institute for Building Research, Stockholm, 1968, 86p. . . . Annotated bibliography of literature dealing with the following aspects of noise: (1) subjective reactions to sound, noise, and vibration, (2) objective methods of registering sound and noise, (3) noise situations, (4) fighting noise (technical and legal steps to improve noise climate) and sound insulation, (5) acoustic planning, and (6) theory of sound propagation.

MLM-1397 -- QUICK-CURING FOAM SYSTEMS, L. W. Hartzel et al., Monsanto Research Corp., Mound Lab., Miamisburg, Ohio, for AEC, July 65, 76p. . . . Evaluates materials for reactivity over the temperature range -60 to 80°C, foaming ability, and solvent resistance of the end product. Effect of aging on viscosity, refractive index, heat of reaction, and foaming ability are determined for the various formulations.

AD-677 187 -- PSYCHOMOTOR EFFECTS OF LOW DOSES OF ACETAZOLAMIDE TO AID ACCOMODATION OF MEN TO ALTITUDE, B. O. Hartman and P. P. Crump, USAF School of Aerospace Medicine, Brooks AFB, Tex., July 68, 20p.



Joseph Needham is a renowned biologist who travelled into unexplored regions of Chinese technological history and became a yet more renowned historian and interpreter of what is for most of us the back of the planet. His series is awesome in size and depth; he's done the mining, but you've got to refine the ore to suit your own purposes. One purpose I know was Vic Lovell's, who found in Vol. I a rich lode of information on Taoism and how its influence helped the Chinese discover and utilize some technology long before the West and also overlook or never utilize other stuff that the West seized on. Another purpose might be taking some of the mechanical inventions of old China—from man-kites to water-wheels—and applying them to the hand technology of intentional communities. There's no source like the source in these matters.

Of the following, only Vol. IV, Part 2 is available at present from the WHOLE EARTH CATALOG. All quotes and illustrations are from that book.

Science and Civilization in China

- Joseph Needham
- Vol. I Introductory Orientations, 1954: \$15.00
- Vol. II History of Scientific Thought: \$17.50
- Vol. III Mathematics and Science of the Heavens and the Earth, 1959: \$30.00
- Vol. IV Pt. 1 Physics, 1962: \$16.50
Pt. 2 Mechanical Engineering, 1965: \$35.00

from Cambridge University Press, 510 North Avenue, New Rochelle, N.Y. 10801 or WHOLE EARTH CATALOG

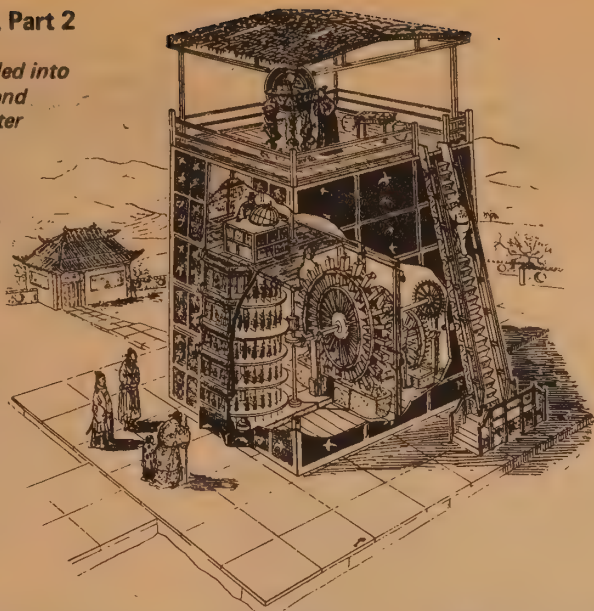
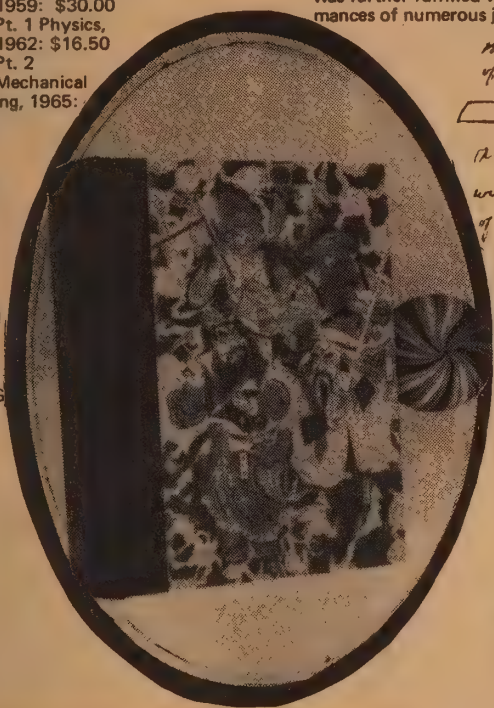
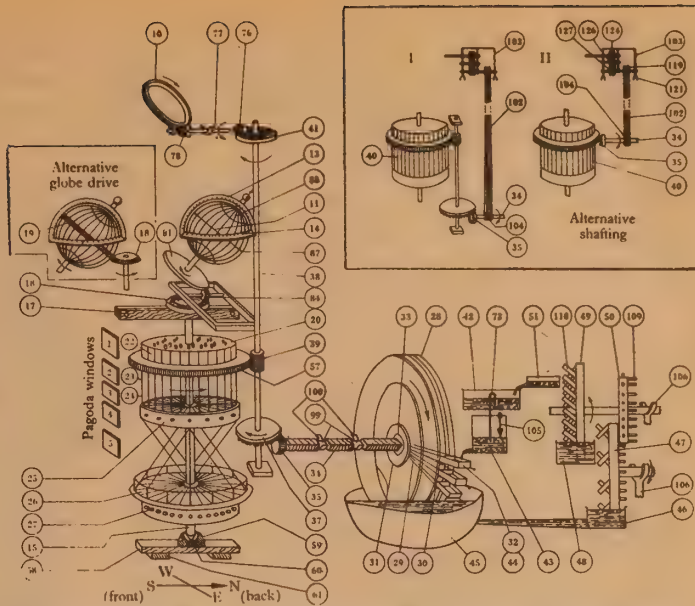


Fig. 650. Pictorial reconstruction of the astronomical clock-tower built by Su Sung and his collaborators at Khaifeng in Honan, then the capital of the empire, in +1090. The clockwork, driven by a water-wheel, and fully enclosed within the tower, rotated an observational armillary sphere on the top platform and a celestial globe in the upper storey. Its time-announcing function was further fulfilled visually and audibly by the performances of numerous jacks mounted on the eight super-

imposed wheels of a time-keeping shaft and appearing at windows in the pagoda-like structure at the front of the tower. Within the building, some 40 ft. high, the driving wheel was provided with a special form or of escapement, and the water was pumped back into the tanks periodically by manual means. The time annunciator must have included conversion gearing, since it gave 'unequal' as well as equal time signals, and the sphere probably also had this (see p. 456).



Su Sung's treatise on the clock, the *Hsin I Hsiang Fa Yao*, constitutes a classic of horological engineering. Orig. drawing by John Christiansen. The staircase was actually inside the tower, as in the model of Wang Chen-To (7). The historical significance of the mechanical rotation of an astronomical instrument (a clock-drive) has already been discussed in Vol. 3, pp.359ff.; cf. also p.492 below.

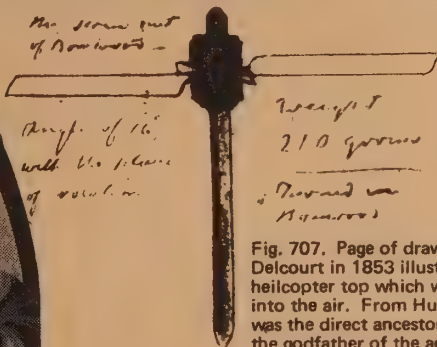


Fig. 707. Page of drawings sent by Cayley to Dupuis-Delcourt in 1853 illustrating an improved Chinese helicopter top which would mount more than 90 ft. into the air. From Hubbard & Ledebor (1). This was the direct ancestor of the helicopter rotor and the godfather of the aeroplane propeller

Allusion has already been made to the 'south-pointing carriage' (chih nan chhe) in Sect. 26i on magnetism, since it was long confused, both by Chinese and Westerners, with the magnetic compass. We know now, however, that it had nothing to do with magnetism, but was a two-wheeled cart with a train of gears so arranged as to keep a figure pointing due south, no matter what excursions the horse-drawn vehicle made from this direction.

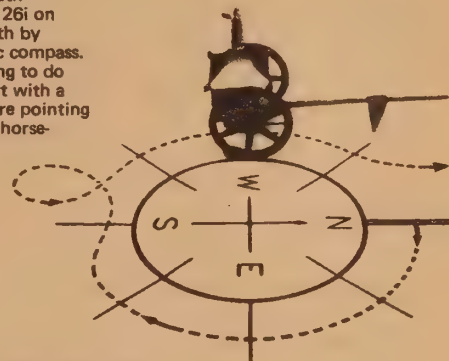
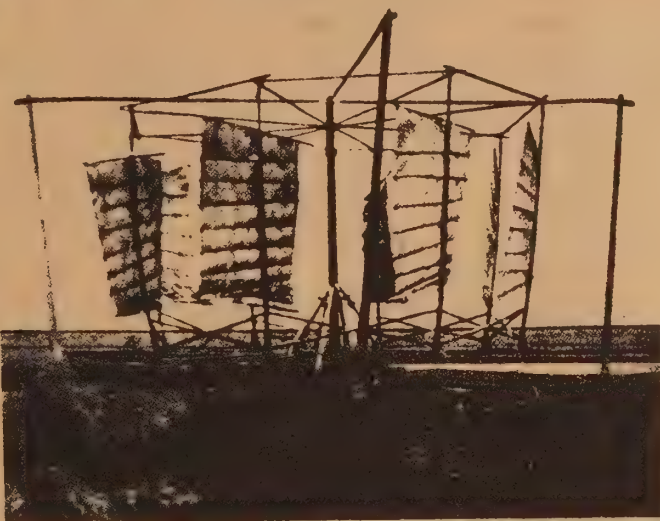
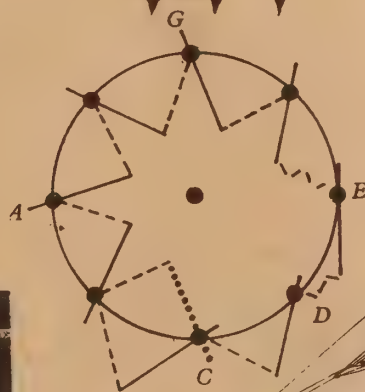


Fig. 519. Diagram of a sailing wheelbarrow from van Braam Houkgeest (+1797), showing the batten sail and multiple sheets so characteristic of Chinese nautical practice. (cf. Sect. 29g below).

Fig. 689. Typical Chinese horizontal windmill working a square-pallet chain-pump in the salters at Taku, Hopei (king, 3). The fore-and-aft mat-and-batten type sails luff at a certain point in the cycle and oppose no resistance as they come back into the eye of the wind (see diagram on p. 559)



Wind direction



Mechanics

Mechanics goes on in all our physical tool functions anyway. The advantage of understanding mechanics is the conceptual handle and mathematical fluidity it gives you is working changes. Den Hartog's book in unusually clear and thorough in presenting the basics.

[Suggested by Steve Baer.]

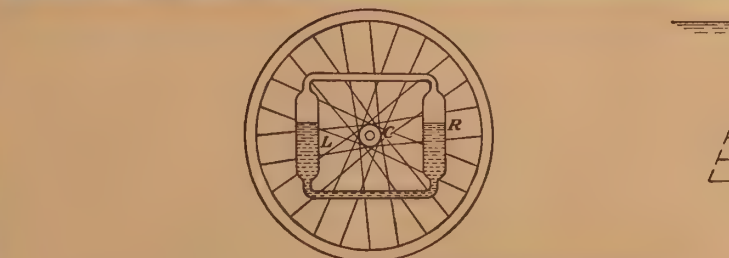


Fig. 298. A bicycle wheel with communicating vessels partly filled with a liquid tends to be unstable, like a ship with shifting cargo. It is a model of the "mercury ballistic."

Mechanics

J. P. Den Hartog
1948; 462 pp.
\$2.25 postpaid

from WHOLE EARTH CATALOG

\$2.45 postpaid

from Dover Publications, Inc.
180 Varick Street
New York, N. Y. 10014

Friction is of far greater importance in statics than is often realized. Without it no ladder could stand against a wall, a two-legged animal could hardly remain upright, and a large number of structures would become unstable. Most simple one- or two-family houses are set loosely on their foundations and depend on their weight and friction to stay there. Without friction, such houses would be blown away by the slightest breeze. Worse than that, without friction, all houses, animals, and men who were not standing on solid rock, but on sand, clay, or dirt, would sink down in it until Archimedes' law restored equilibrium through buoyancy.

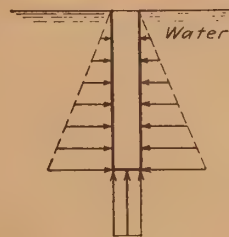


Fig. 54. Pressure distribution in still water under the influence of gravity.

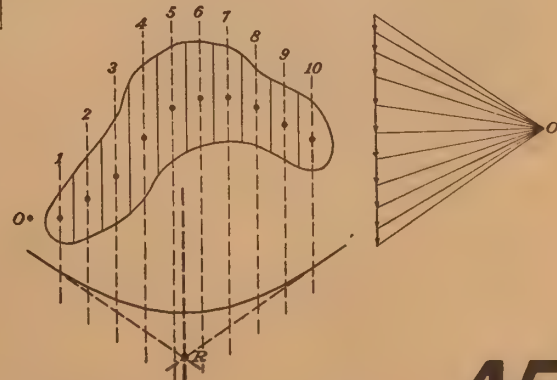
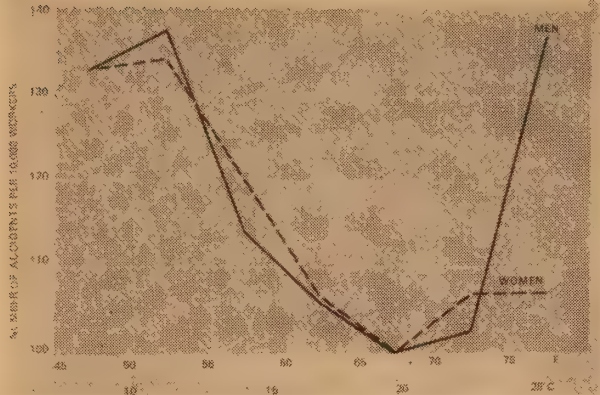


Fig. 82. The funicular diagram construction as a means for finding the center of gravity.

The Biology of Work

Here is an introduction to ergonomics: the study of man in relation to his work. Dave Guard reviewed the book by selecting the following charts and passages:

A noisy environment by itself can reduce performance in many tasks, but if a sleepless subject is tested with a background of noise his performance improves. The two stresses seem to counteract each other. Physical exercise also reduces the effect of lack of sleep, as does a drug such as benzedrine.



Accident frequency expressed as number of accidents per 10,000 workers rises steeply for both men and women as air temperature falls below 18°C (65°F). It also increases steeply in men when the temperature goes above 24°C (75°F). The rise for women is small but there were relatively few women workers exposed to these conditions.

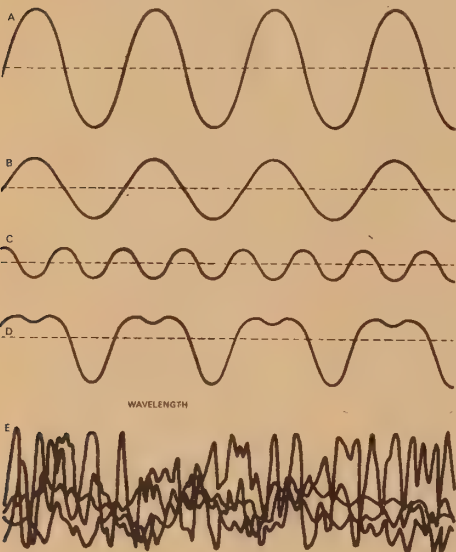
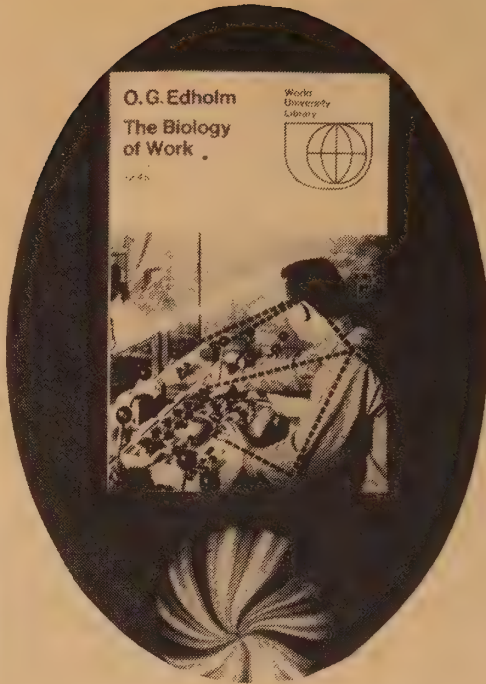


Figure 50 Sound pressure waves: A a single pure tone. B the same tone, but the amplitude is small so the sound will be less intense. C a simple harmonic of the same tone, one octave higher. D the same tone and its harmonic added. E noise: random and erratic pressure waves of varying intensity.



The Biology of Work

O.G. Edholm
1967; 256 pp.

\$2.45 postpaid

from
McGraw-Hill Book Co.
330 West 42 Street
New York, N. Y. 10036

from
McGraw-Hill Book Company
Princeton Road
Hightstown, N. J. 08520

Manchester Road
Manchester, Mo. 63062

8171 Redwood Highway
Novato, CA 94947

The strength of the muscles is recorded by means of a dial which measures the force exerted on the spring... The most remarkable finding is that the amount of training needed to produce an improvement is very small. One maximal contraction each day, maintained for less than a minute, is sufficient for the best rate of improvement. In other words, doing more than this amount of exercise does not result in a greater or more rapid increase in strength.

The power available for a man-powered aeroplane will depend on the skill with which the work from arms, legs and trunk can be absorbed. From the evidence presented here and from engineering considerations it appears that it is just possible to achieve manpowered flight, but success will depend on design.

The most satisfactory conditions are to have the area viewed, be it a book or a television screen, about three times brighter than the area just surrounding it, and this in turn should be about three times as bright as the rest of the room. The overall contrast should not exceed about ten to one.

So movement is essential, but nevertheless we move less frequently when the chair is comfortable. This is why chair seats designed to fit the shape of the buttocks and thighs are unsatisfactory; then tend to prevent movement.

The man with a recently acquired skill may be working as fast and as accurately as the experienced man in ordinary conditions but he has little reserve.

This resembles the general law concerning the performance of the central nervous system. Under the influence of anaesthetics, for example, the higher centres are affected first. These are the most recently acquired portions of the brain, and the older centres, in an evolutionary sense, are much more resistant. Recently acquired knowledge will be lost before older skills.

Because short-term memory deteriorates with age, it follows that training methods which depend on remembering verbal instructions are likely to be difficult for the older worker.

Figure 71 The force which can be exerted depends on the position of the body. In the upper part of the diagram, the subject is making a two-handed pull, in six different postures. These are arranged in the order of effectiveness: the weakest pull is exerted by the left hand figure in the top row (A), and the strongest in the squatting position shown at the right of the lower row (F). Pushing is shown in the lower diagram, again arranged in order of increasing (G-L) effectiveness.



Handbook of Chemistry and Physics

Among handbooks this one is unusually wealthy in basic information. Its 6-figure math tables are the standard (they're obtainable separately: \$6.50 from Chemical Rubber). Its chemistry and physics tables constitute a comprehensive inventory of invisible effects. It doesn't teach you how to use or even read the inventory, but if you know-how, here's the know-what tool chest.

[Suggested by L.Loyd Martin.]

WATER AGAINST AIR

Temperature °C	Surface tension dynes/cm.	Temperature °C	Surface tension dynes/cm.	Temperature °C	Surface tension dynes/cm.
-8	77.0	15	73.49	40	69.56
-5	76.4	18	73.05	50	67.91
0	75.6	20	72.75	60	66.18
5	74.9	25	71.97	70	64.4
10	74.22	30	71.18	80	62.6
				100	58.9

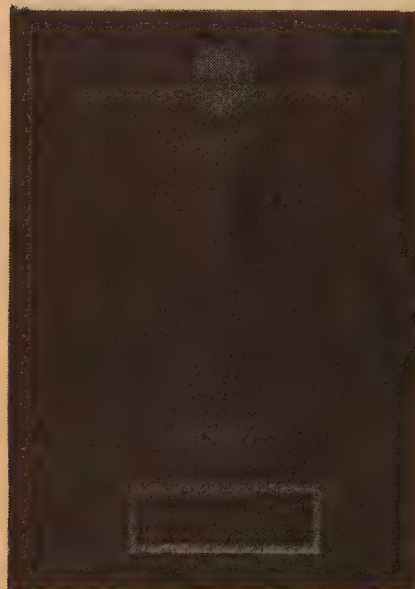
INTERFACIAL TENSION

Surface Tension at the Interface Between Two Liquids (Each liquid saturated with the other)

Liquids	Temperature °C	γ	Liquids	Temperature °C	γ
Benzene-Mercury...	20	357	Water-Heptylic acid	20	7.0
Ethyl ether-Mercury	20	379	Water-n-Hexane...	20	51.1
Water-Benzene...	20	35.00	Water-Mercury...	20	375
Water-Carbon tetrachloride	20	45.	Water-n-Octane...	20	50.8
Water-Ethyl ether...	20	10.7	Water-n-Octyl alcohol	20	8.8

PHYSICAL CONSTANTS OF ORGANIC COMPOUNDS (Continued)

No.	Name	Synonyms and Formula	Mol. wt.	Crystalline form, color and specific rotation	m.p. °C	b.p. °C	Density	n _D	Solubility					Ref.	
									w	al	et	ac	ba		other solvents
	Lupetidine	see Piperidine, dimethyl-													
165	Lupinase(1)	CaH ₂ NO	169.26	α _D ²⁰ -19	68.5-9.2	269-70 ^m							chl a	B211, 28	
166	-hydrochloride	CaH ₂ NO.HCl	205.74	pr (see al)	215-3										
167	-de-N-methyl-	CH ₂ NO	183.29	α _D ²⁰ -48 (w)		145-6 ^a									B211, 27
	Lupulin acid	see Hamulton													
168	Lupulone	β-Bitter acid, δ-Lupulinic acid, C ₂₈ H ₄₄ O ₆	414.57	pr (al)	92-4								peth a	hexane a	B77, 852
	Lutidine	see Karthopyll													
	Lutidine	see Pyridine, dimethyl-													
	Luxitol	see Arabinol													
169	Lycocentriol	C ₂₈ H ₄₄ O ₆	468.76	amor (al); +31.8 (111-14)											
170	Lycosarasinine	H ₂ C=C(CH ₂ CO ₂ H)NHC(CH ₂) ₂ CH ₂ NH ₂	227.23	α _D ²⁰ -48 (w)	227-8d										
171	Lycopene	Lycopin, Nrotycopen, C ₄₀ H ₆₄	534.85	pr or ad	173								et, chl, v	B38, 81	
172	Lycorine(1)	Amazylidine, Nareamine, C ₁₁ H ₁₇ NO	267.32	pr (al or Py)	280		sub						chl a	B217, 647	
173	Lycosanthin	C ₂₈ H ₄₄ O ₆	468.76	purple or red; 168 (al) (CS ₂), (no-peth)									CS ₂ a		
	Lysogamidine	see Ergline													
174	Lysarginic acid	C ₁₂ H ₂₁ N ₃ O ₅	308.32	l (w) α _D ²⁰ +40	238d								Py a		
	Lysidine	see 2-Methyl-2-imidazoline, 2-methyl-													
175	Lysine(1)	L-α-amino caproic acid, H ₂ N(CH ₂) ₄ CO ₂ H	146.16	nd (w or dl) α _D ²⁰ -3	224-5										B41, 857



Handbook of Chemistry and Physics

Robert C. Weast, ed.
1918....1968 (49th edition); 3604 pp.

\$22.50 postpaid

from
The Chemical Rubber Co.
18901 Cranwood Parkway
Cleveland, Ohio 44128

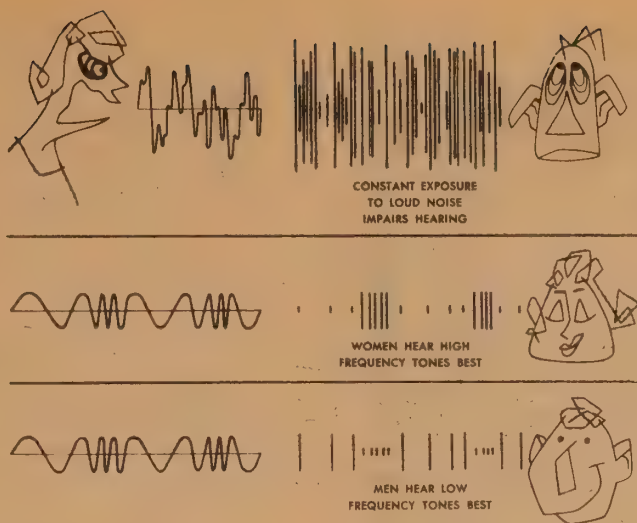
or
WHOLE EARTH CATALOG

46

Human Engineering Guide

Buy this book and keep it at hand at all times if you design or build anything that will be used by, for, or come in contact with people. Concise statement of ideas both through the informative writing and clear illustrations. The authors have followed their own guidelines and produced a device (this book) which will do well what it was designed to do, transfer a large amount of information between people. If you want information on human engineering, design of equipment and work space, vision, audition and body measurement, it's all in this book chapter by chapter. The above categories are a partial list of actual chapter headings. This book should be used by all design engineers, but it is not necessary to be a design engineer or even an engineer to use it. Really fundamental ideas clearly stated can be understood by anyone.

[Reviewed by F. LeBrun]



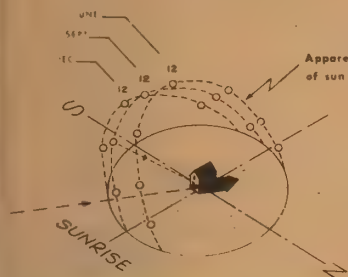
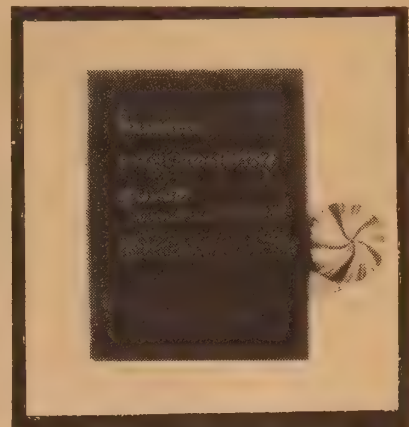
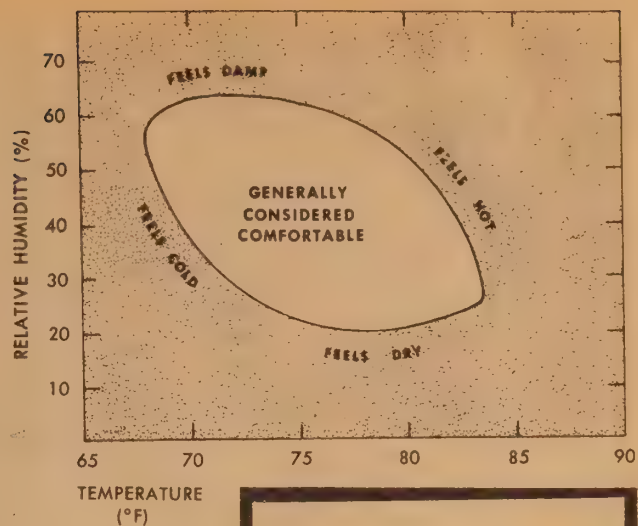
When a click in one ear leads that in the other by about 0.03 millisecond, the sound just begins to shift toward the first side; when there is a time difference of 0.65 millisecond or more, the sound appears completely localized on the side of first arrival, this localization remaining until the time difference becomes so great (3 milliseconds or more) that fusion is lost and the sound is heard separately in the two ears.

Where possible, work should be held by jigs or vises so that hands may be free to operate.

CONFIDENCE FACTOR

Since humans are used to evaluating things with "all their senses" from the time they are born, it is natural for them to expect this. Each of the sensory inputs, in fact, raises the level of confidence of the operator in what he is receiving — thus the converse of this, i.e., lack of certain inputs, tends to reduce the operator's confidence in the information he is receiving.

Hesitation — or the temporary and often minute cessation from motion — should be analyzed; its cause should be accounted for and, if possible, eliminated.

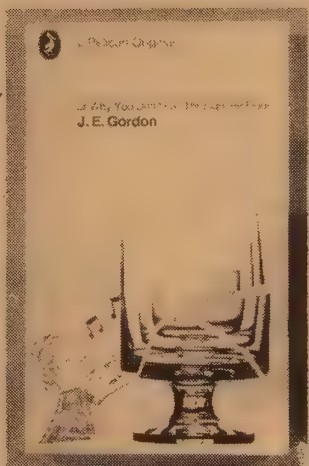


New Science of Strong Materials

Why does glass sometimes shatter and other times bend like a spring? A new field of science involves the study of materials as a whole, rather than in their special chemical, physical, and engineering aspects. Scientists have been investigating the atoms and molecules upon which the mechanical properties of materials depend, and this book is a clear explanation of some of the discoveries being made. Nothing beyond high school math, and a very palatable treatment of an exciting new science.

[Suggested by Steve Baer. Reviewed by Lloyd Kahn]

If easy, cheap production of sufficient accuracy can be achieved by small units then we may be able to reverse some of the centralizing trends of the Industrial Revolution and perhaps, in part, to set ourselves free from the worst tyrannies of mass production. There may then be more room for individualistic skills and for individual tastes — perhaps we shall all feel better for it. However there is very little research going on along these lines at present and I am afraid that the Satanic Mills have still quite a long future before them.



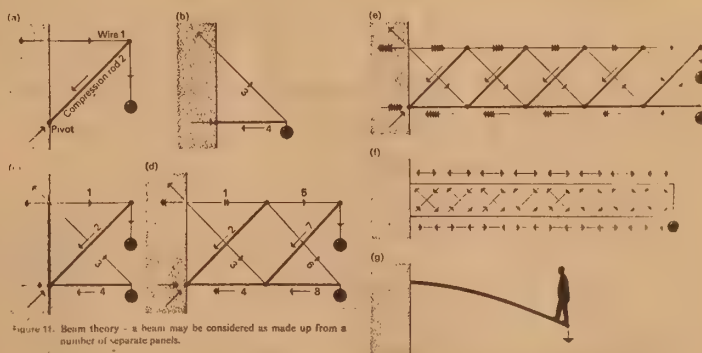
The worst sin in an engineering material is not lack of strength or lack of stiffness, desirable as these properties are, but lack of toughness, that is to say, lack of resistance to the propagation of cracks. One can allow for lack of strength or stiffness in design but it is much more difficult to allow for cracks which catch the engineer unawares and are dangerous.

New Science of Strong Materials

J.E. Gordon
1968; 269 pp

\$6.50
from
Walker & Co.
720 Fifth Ave.
New York, N.Y. 10019

The first thing we discovered was that we could get high strength from almost anything from Epsom salts to sapphire. Provided it was in the form of a thin whisker, it did not matter what the chemical nature of the stuff was or by what method the whiskers were grown. We must have worked on well over a hundred different substances and there was absolutely no doubt about it.



Human Engineering Guide for Equipment Designers

Wesley E. Woodson, Donald W. Conover
1954, 66; 473pp

\$10.00 postpaid

from
University of California Press
2223 Fulton St.
Berkeley, Ca. 94720
or
WHOLE EARTH CATALOG

Van Waters & Rogers

A few years back, when I needed to make a darkroom sink, Jerry Stoll told me about miraculous substance unaffected by wet, heat or chemicals that could be painted on plywood. So I got some clear Carboline paint at Van Waters & Rogers and it worked (still does): plain old plywood doesn't leak, crack, peel, or corrode. Now I'm thinking about a wood bath tub.

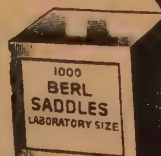
Van Waters & Rogers is a huge lab supply house. I don't know anything about them except they have a hard-bound catalog thick full of illegal-looking equipment. They have outlets all over the western U.S.

Van Waters & Rogers Catalog
1112 pp.

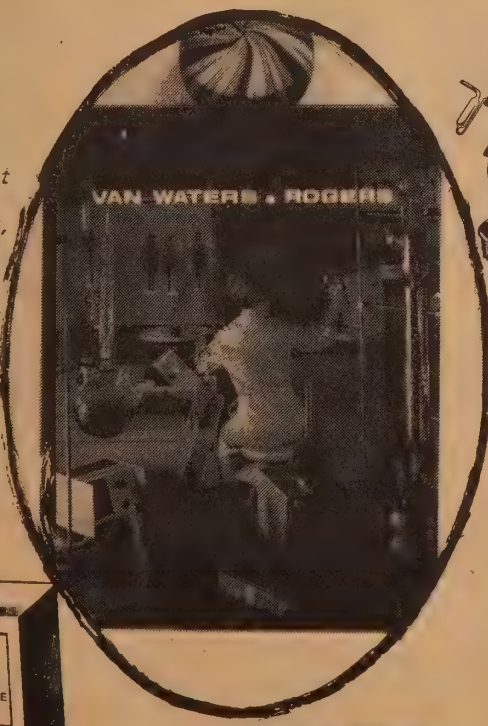


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San Francisco, California 94119



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PAINT, Corrosion-Resistant, Plastic, Self-Priming, Carboline, Series "K" — Provides excellent protection indoors and out against corrosive fumes, corrosive atmospheric conditions, occasional spillage of acids or alkalis. Particularly useful in the chemical, petroleum, laundry, food, beverage and similar industries. Long-lasting and economical. Simple to apply — requires no special surface preparation, and no primer, intermediate or seal coat. Stands up well under most acids and alkalis, oils, greases and alcohols. Excellent moisture resistance. Can be applied equally well to metal, concrete or wood. Brushes or sprays on.

52673-081	Black	Quart	2.45
52673-128	Clear	Quart	2.45
52673-161	Gray	Quart	2.85
52673-285	White	Quart	3.00
52674-084	Black	Gallon	6.70
52674-120	Clear	Gallon	6.70
52674-164	Gray	Gallon	8.00
52674-288	White	Gallon	8.45

THINNER — For use, only if necessary, in brush application, to make brushing easier. For use with Nos. 52673-081 — 52674-288. For spraying, one part of Carboline thinner to two parts of Carboline paint.

52675-043	Quart	1.65
52675-087	Gallon	4.35

CORROSION-RESISTANT LABORATORY PAINTS



52673-081 — 52675-087



Benzene

Woodcraft Supply

Some years ago, a large, dour Scot, Mr. Eaton by name, was trying to teach Boston schoolboys how to cut a clean mortise with machine-made carbon steel chisels. He couldn't, and being a Scot and stubborn, he began to import fine hand tools from across the water. He had to buy more than he needed, and he sold the surplus, reluctantly, from a dark cobwebbed shop on North Washington Street. To his surprise, he found that other craftsmen had also thrown shoddy tools through cellar windows in fits of frustration. North Washington Street has been torn up, and Mr. Eaton has passed on to the great workshop in the sky, but his company has become the Woodcraft Supply Corp., 313 Montvale Avenue, Woburn, Massachusetts 01801. It is a unique enterprise that operates contrary to the accepted principles of American business. As any hardware store owner will tell you, no one today will pay \$47.50 for a nickel-plated fitted wood case. You can buy one from Woodcraft - if you are willing to talk about it for an hour and enjoy a good cup of home-brewed tea. Have you ever had your forearm shaved as clean as a baby's with a 1-pound paring gouge? You're not likely to have the experience many other places. The same personal touch is apparent in everything handled by this unusual company. (They sell a German cabinet-maker's bench of polished red beech that is seven feet long, weighs 300 pounds, is fitted with two built-in vises, and would make most furniture companies blush with shame. \$235.) Woodcraft Supply publishes a large-format illustrated 30-page catalog full of tools that you will never see anywhere else. It costs 25 cents, and you will be a rare craftsman if you don't order something after one pass through it.

[Suggested and Reviewed by Dr. Morton Grosser]

Woodcraft Supply Catalog

\$0.25 postpaid

from
Woodcraft Supply Corporation
313 Montvale Avenue
Woburn, Mass. 01801



620 617 1/2 619 624 623 622

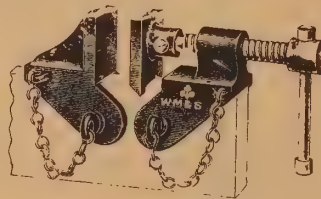
No. 600(6). Set of six knives as shown at the left. Length 5 to 6 1/4 inches. Mailing weight 1 pound. \$7.00

Individual knives as shown at the left. Order by stock number as indicated. Mailing weight 1/4 lb.

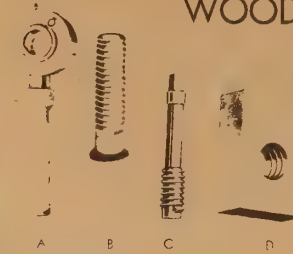
\$1.25

CLAMP HEADS

No. 4791. Clamp head. Fits on edge of any one-inch board to provide a clamp of any desired length. Mailing weight 3 pounds. \$3.25



WOOD THREADING KITS



No. X77. DeLuxe Threading Kit. Nothing has been spared to make it troubleproof. It consists of two pieces, a die that cuts male thread and a tap that cuts female thread.

The die is precision machined aluminum, this minimizes the danger of its being damaged if it is ever used with a misadjusted cutter. The adjustment of its cutting blade can be made merely by turning an exposed setscrew.

The tap is not cast, but is also precision machined.

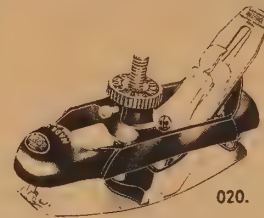
Merely order stock number X77 and specify which size.

Stock sizes	1/2"	5/8"	3/4"	7/8"	1"
Mailing weight	1 lb.	1 lb.	1 lb.	2 lb.	2 lb.
Price	\$20.75	\$21.50	\$22.00	\$24.00	\$26.90

Extra cutters are available for stock sizes \$1.50 each

In addition to the above stock sizes, we can also supply to orders those sized at the right, 2-3 months for delivery. These have longer and double handles as is needed for such large sizes.

Size 1 1/4 inches	Mailing weight 4 lbs.	\$36.50
Size 1 1/2 inches	Mailing weight 7 lbs.	63.00
Size 2 inches	Mailing weight 11 lbs.	120.00



No. 020. Adjustable Compass plane. Its flexible bed adjusts for work on either convex or concave surfaces.

Mailing weight 5 pounds. \$18.50

All of the above 9 planes are made in Sheffield England.

This is an aliphatic resin adhesive, widely used by industry. Liquid, ready-to-use. It offers the fast set and handling ease of white glues, and the tack-toughness-durability of hide glue. The joint will not creep in clamps or turn black when heated by sanding. Glue residue tools off easily. All sizes are in plastic containers as illustrated.



Stock No.	Mailing weight	Price
TB-P Pint	2 lbs.	\$2.45
TB-Q Quart	4 lbs.	3.50
TB-G Gallon	12 lbs.	6.00

4-gallon case shipped direct from the factory to you with express or truck charges to be paid upon delivery - \$5.00 per gallon.

SCULPTOR'S ADZ



No. 822.

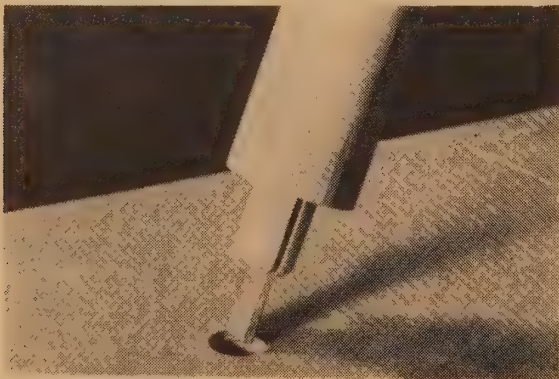
No. 822. Sculptor's Adz. Also useful for tree surgery and some operations of wood carving. Hand made in Italy of the same grade of German steel that is used to make straight razors. Length of handle 12 inches, head 6 1/4 inches. One end of head is a 1 1/2" chisel, the other end a 1 1/2" curved gouge. Mailing weight 2 lbs. \$10.00

How to Build Your Own Furniture

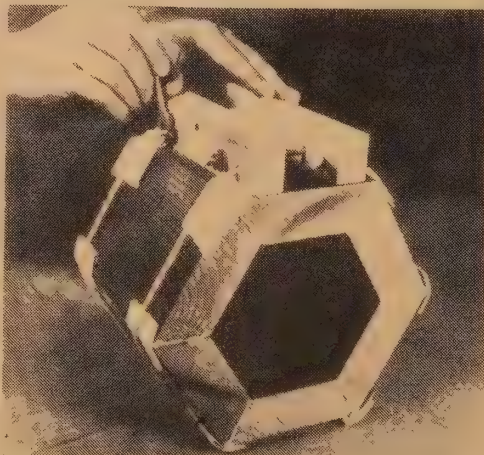
Unlike most books on do-it-yourself furniture, *How to Build Your Own Furniture* by R. J. DeCristoforo contains no plans on how to build your own furniture. What it does contain is information on what should go into the design of a given piece of furniture to make it function properly. If you have ever built a table that wobbled or a drawer that wouldn't open, you will appreciate this book.

The book gives a wealth of information and illustrations on techniques and methods of quality furniture craftsmanship. There are chapters on materials and general design and construction with separate chapters on each of the different categories of furniture (such as tables, chairs, desks, chests, etc.). The book is very concise and the instructions and illustrations are easily understandable. This is definitely a standard work for the designer-craftsman.

[Suggested and reviewed by Lloyd Martin.]

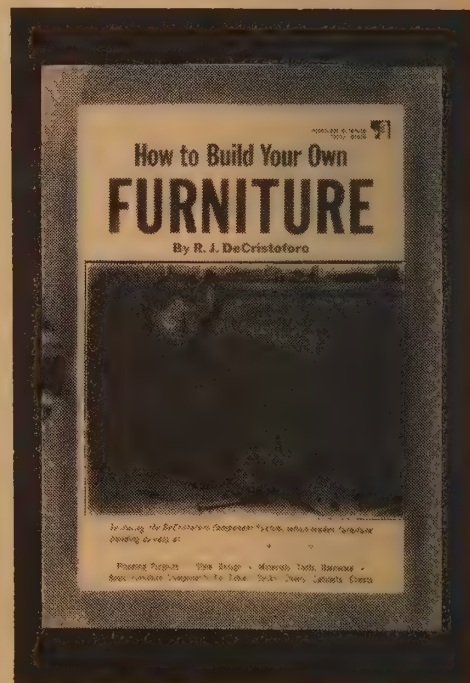
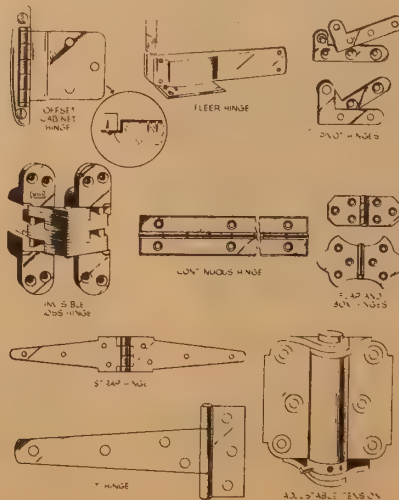


Tenon inserted in a slab can be considerably reinforced by a wedge in a slot cut in the tenon to spread the tenon tightly in the hole. Don't make the wedge too thick or you will have trouble getting tenon to "seat".



Improved setup for clamping irregular work. The "clamp" consists of two hardwood bars, two nuts and bolts and a couple of lengths of line.

Choose from a wide variety of hinges to suit a specific project...



How to Build Your Own Furniture

R. J. DeCristoforo
1965; 176 pp.

\$3.95 postpaid

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Harper & Row
49 East 33 Street
New York, N. Y. 10016
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WHOLE EARTH CATALOG

Thomas Register of American Manufacturers

Let it all hang out: 7 volumes, 10,000 pages, 50,000 product ads, 70,000 classifications. It's the great American industrial yellow pages—and like the yellow pages, an education. If the Sears Catalog will tell you where American consumption is at, TR tells you what's happening in production. And if you're trying to make the switch toward production, TR can help you find what you need.

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1	2	3	4	5	6	7
FEDERAL PACIFIC ELECTRIC Quality electrical control, distribution and power equipment	FREE FLEX Anti-friction Bearings Roller Clutches Machine Needles Precision Metal Parts Swaging Machines	IPC PACKAGING OIL SEALS PRECISION MELTING INTER-DIMENSIONAL MAGNETIC COOPERATION	RELMOUNT SPECIALTY BEARING & CO. INC. 2150 S. 10th Street Tulsa, Oklahoma 74106	KOPPERS CHECK KOPPERS FOR chemicals protective coatings roofing waterproofing treated wood laminated wood reinforced plastics sound control clean rooms piston rings couplings steel plants	ELCO	

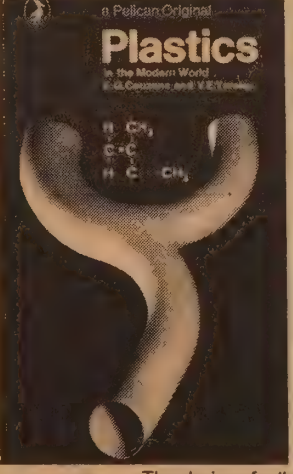
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	13—Who are the officials of the Erie Foundry Co.?
	14—What is the cable address of Acme Visible Facets, Inc.?
	15—What companies does Howmet Corp own or control?

Plastics

How does a person who becomes interested in plastics find out all there is to know about plastics? One solution may be to spend the rest of your life walking from plastic company to plastic company finding out what each are doing. This would be OK if you were looking for something to do for a long period of time. But if you are longing for a comprehensive review of the world of plastics and/or some good solid reference material on the subject, then I suggest the following three sources.

One is: *Plastics in the Modern World*. It is an interesting little Pelican Original pocket book by two Englishmen; E.G. Couzens and V.E. Yarsley. Part one contains: the Theory and Practice of Plastics which discusses the physical, chemical and behavioral aspects of plastics, while also explaining the manufacturing processes involved in plastics production. Part two of the book concerns itself with the domestic application of plastics and the utilization of plastics by industry.



Plastics in the Modern World
E.G. Couzens, V.E. Yarsley
1941, 56, 68; 386pp
\$1.65 postpaid

from
Pelican Books
7110 Ambassador Road
Baltimore, Md. 21207
or
WHOLE EARTH CATALOG

The Modern Plastics Encyclopedia comes with a subscription to *Modern Plastics* magazine, which is technically oriented and interestingly useful. The encyclopedia is by far the most comprehensive text available on the subject of plastics. It analyzes all available plastics, tells you what they can do and where you can get them. It describes the chemical structure of resins and moulding compounds, talks about what's going on in the field of foamed plastics, and describes machinery and methods that are used and available in making products with plastics. Both the magazine and the encyclopedia have free product literature cards at the back of each copy. These can bring you a wealth of detailed information if you desire to study a specific situation very precisely. You can also circle all the numbers on the card and receive a deluge of mail. So have some fun.

[Suggested and Reviewed by Michael Rosenthal]

FIBERGLASS made easy

Fiberglass molding has definitely been made easier because of the POLY GUN. With the Glas-Craft spray-up system, resin is pumped directly from the shipping container and automatically catalyzed at the gun head. This gun gives an excellent pattern and exceptional wet-out characteristics are achieved.

When the part is finished, the operator need only push a button to clean the gun. No other clean-up procedure is necessary. Because of these and many other fine features, the Glas-Craft spray-up system is the fastest selling system in the world today. Contact us directly or call your local Glas-Craft dealer for a demonstration.

the Poly Gun

3225 NORTH VERDUGO ROAD, GLENDALE, CALIFORNIA 91208, PHONE (213) 245-0201

Miscellaneous uses of urethane also are legion. It is now being used to construct lightweight radar antennas up to 60 ft. in diameter and having high resolution, ease of maintenance, and the advantage of being manufacturable on-site, in remote areas, with appropriate machinery. In more than 200 mines throughout the nation urethane is applied by the spray method to inhibit weathering of coal ribs, to improve ventilation by sealing off areas of gas seepage, for preventing the freezing of pipes during winter, for caulking shafts, for erecting fire seals, and for other uses.

The foam also is now an indispensable material for creating such diverse products as model terrains.

Modern Plastics

The choice of adhesive is determined by price, the nature of the substances to be joined, the strength of the bond required, and the appropriate gluing process. Thus phenol-formaldehyde and urea-formaldehyde glues are used chiefly for bonding wood, especially plywood; they may be either hot- or cold-setting according to the composition used, and P.F. resins give joints resistant to boiling water. The phenol glue gives the stronger joint, but leaves a dark glue line. The urea resins are cheap, colourless, easily handled, and extensively used in furniture, where moisture resistance is not important. They can also be applied in separate layers, that is with the resin on one surface and the hardener on the other, and where heating is required, radio-frequency heating of the 'glue line' can be employed. In general plastics glues have the advantage over screws and nails that they avoid local stresses and give joints of great strength.

A new method of packaging military equipment destined for areas without docking facilities has been developed. The part is placed in a sealed polyethylene bag then suspended in a carton, and the voids around it are foamed-in-place. Such a carton may be jettisoned overboard during an incoming tide, and will float ashore without damage to the contents, due to the foam's waterproof nature and its anti-shock protection.

Modern Plastics (Magazine & Encyclopedia)
\$10.00 yr. (monthly)

from
Modern Plastics
Fulfillment Manager
P.O. Box 430
Hightstown, N.J. 08520

Silvo Catalog

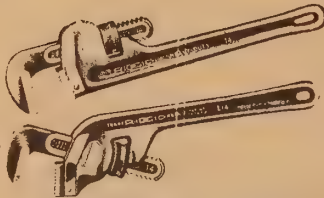
Tools tools tools tools tools. Brand names. No particular discrimination or evaluation. If you know what you want, it's probably here. Prices apparently good. Audel books, for example, cost 15% less than from the publisher or bookstores. Minimum order \$10.



Silvo Catalog
160 pp.

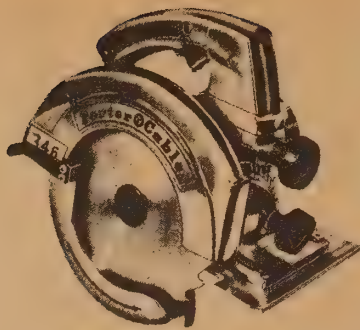
\$25

from:
Silvo Hardware Co.
c/o Mr. Collins,
Advertising
Department
107 Walnut Street
Philadelphia,
Pennsylvania
19106



Rigid Heavy-Duty Pipe Wrenches—World's most popular pipe wrench. Guaranteed housing—won't break or warp. Hardened steel jaws. Handy pipe scale. Comfort-grip 1-beam handle.

6-R4	1 lb.	6"	3/4"	Cap.	\$2.27
8-R4	1 lb.	8"	1"	Cap.	\$2.63
10-R4	2 lbs.	10"	1 1/2"	Cap.	\$3.45
12-R4	3 lbs.	12"	2"	Cap.	\$4.07
14-R4	4 lbs.	14"	2 1/2"	Cap.	\$4.64
18-R4	6 lbs.	18"	3"	Cap.	\$6.59
24-R4	10 lbs.	24"	4"	Cap.	\$10.40
36-R4	19 lbs.	36"	6"	Cap.	\$21.99
48-R4	35 lbs.	48"	8"	Cap.	\$33.17
60-R4	52 lbs.	60"	10"	Cap.	\$51.09



Portable Cable Heavy Duty Builder Saws—A builders' saw with the right combination of power and capacity for your particular cutting job! Each answers the present day demand for a modern low-cost builders' saw with the performance advantages needed for every type of cutting job whether hour-after-hour construction work or light trim work—All Ball Bearings on all saws.

Standard Equipment—Combination Saw Blade (3/8" diam. round hole for Models 315, 346 and 368; 3/4" diam. round hole for Model 592), Blade Wrench, Gear Lubricant, 3-Conductor Cord and Operating Manual.

346-R7 P—16 lbs.—10.5 amps—5800 RPM—6 3/4" blade—Cuts: 2 3/4" at 90° and 1 3/8" at 45°—Net weight 12 lbs.\$79.50



Genuine VISE-GRIP Product

Vise-Grip Welding Clamps—with easy release—made of fine alloy steel—Locks parts in perfect alignment. Leaves hands free for welding. The only welding clamp with the toggle action and positive lock. Special deep throated U-shaped jaws provide perfect visibility and working space for the welding operation. Easy release lever in handle.

9R-P3 P—2 lbs. 9" long—2 3/4" jaw width—adj. to 1 3/8"\$2.65



Estwing King Size Hammer—(Framing Hammer) with Straight Claw. Solid Steel with Nylon Grip. Comes 4 Sizes, or types—all have 22 oz. weight—with 16" handles or 14" handles—with scored face (SC-F) or smooth face (SM-F).

E3-22SM-E6 P—16" (SC-F) ..\$5.10
E3-22SM-E6 P—14" (SC-F) ..\$5.15
E3-22S-E6 P—16" (SM-F) ..\$4.69



Superlight All-Way Ladder—Magnesium—Use 3 ways—as a step ladder—as an extension ladder—or use as an adjustable ladder when working on steps or uneven surfaces. **Heavy Duty** for Industrial or home use—3 1/2" Step treads and Side Rails—6' ladder makes 10' extension ladder—7' makes 12'—8' makes 14'—9' makes 16'—and 10' makes 18' extension ladder—A super general purpose ladder for all around use.

SLAW-W12 BF—15 lbs. 6' \$29.40
SLAW-W12 BF—17 lbs. 7' \$33.60
SLAW-W12 BF—20 lbs. 8' \$39.20
SLAW-W12 BF—25 lbs. 10' \$49.00



Pipe Clamps—for Plastic Pipe and Hose—Worm Gear—All Stainless Steel.

2922S-G13	P—1/2" to 3/4"	..25
2924S-G13	P—3/4" to 1"	..27
2926S-G13	P—1" to 1 1/2"	..29
2927S-G13	P—1 1/2" to 2"	..30
2928S-G13	P—2" to 2 1/2"	..32



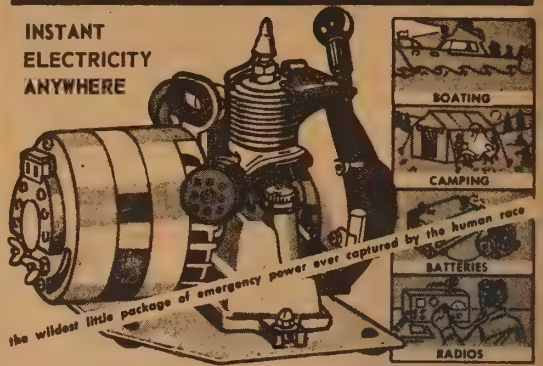
New Heavy Duty "Pop" Rivet Tool—For Industrial use—Sturdy, efficient Riveting Tool suitable for heavy duty riveting. Comes equipped with interchangeable nosepiece for larger diameter rivets.

T400-U2 P—2 lbs.\$11.98

12 lbs. of Gas **POWER** FITS IN ONE HAND
Motor Driven

"TINY TIGER" PORTABLE GAS ENGINE GENERATOR

INSTANT ELECTRICITY ANYWHERE



115 VOLTS AC AND 12 VOLTS DC POWER

Tiny Tiger Generator—Ohlsson and Rice, air cooled Engine, 85 H.P., 2 cycle recoil starter, 11 oz. fuel capacity, flywheel magneto system, use 14 oz. of gas per hour. **Techno Electric Generator**—Direct drive, automatic overload relief. Tiny Tiger has a 90 Day Mfg. Warranty. Tiny Tiger generators are shipped from factory at Toledo, Ohio, or Los Angeles, Calif. Size 10 1/2" long, 7 1/2" wide, 8 1/2" high. Net weight is 12 1/2 lbs. **TINY TIGER WILL: CHARGE YOUR 6 OR 12 VOLT BATTERY • LIGHT YOUR LIGHTS • COOK YOUR MEAL • AND EVEN PUMP YOUR BILGE!** (2 1/2 hours running time with 30 minutes cooling time). 350 Watts capacity. Turn him loose and he will light a 3 room house, operate a variety of power tools, play your radio, run lots of motors for lots of jobs (like pumps, fans and things). He may even save your life (by powering your ham radio).

65-1-T2 BF—16 lbs. Tiny Tiger\$83.95



Nicholas Carpenters Aprons—Split-leg in tough long wearing 6 and 21 oz. Army Duck—13 handy pockets and tool slots featuring 4 large nail pockets—Leather hammer loops and chisel slots—A ruggedly built leather split-leg, 2-bag apron. It gives finger tip control of a large assortment of tools and free leg action for climbing, kneeling, and bending. **Construction Features:** • 2 extra large inside and 2 large front pockets with snaps to close pockets not used. • All pockets are canvas bound for long wear. • Apron is double-stitched and reinforced with capped rivets.

C20-M4 P—2 lbs.\$5.65

Steel "Pop" Rivets—1/8" Dia. comes in 3 lengths: Short for materials to 1/8" thick—Medium for materials to 1/4" thick—long for materials to 1/2" thick. These Steel Pop rivets are cadmium plated—

Surplus Center Equipment Catalogs

Not only are these catalogs handy to the man who may need such parts, but they can also serve as idea-generators for solving certain mechanical problems—thumb through the pages. Some of the parts are better hunted locally where you can see, try, discuss with salesmen and haggle. Some are rare and good deals. Best suited to the mechanically hip, especially away from big city sources. All 'surplus' is risky stuff unless you're familiar with it.

[Reviewed by J. Baldwin.
Suggested by Lama Foundation.]

Catalogs from
P.O. Box 713
Lincoln, Nebraska 68501

COST GOV'T
OVER \$15.00

(ITEM #2209)

\$2.99

F.O.B. LINCOLN



(ITEM #2209) — Gov't. surplus flying suit rheostat that can be used as a control for surplus aircraft generators for welding or output control. Can also be used to regulate voltage on model trains, lights, generators, etc. Has "OFF" position and 2 female 25 amp., 125-volt receptacles. Rated 5.75-ohms, 100-watts. Size 7" x 5 1/4" x 1 3/4". Shipping weight 2 1/2 lbs.

3 Horsepower Battery Motor



COST GOV'T
OVER \$98.00

(ITEM #1000)

\$17.91

F.O.B. LINCOLN

(ITEM #1000) — New, government surplus. Powerful DC motor ideal for use to drive battery operated golf carts, scooters, trollingboats for fishermen, battery driven compressors, hydraulic pumps and uses in the field where AC current is not available.

This motor is rated 3 horsepower • 3800 r.p.m. • 24-volts DC. It will run very nicely on 12 or 18-volts DC at slightly reduced power, speed and current. Double fan cooled for continuous duty operation. Speed can be varied by varying the applied voltage. Rotation is clockwise but can be reversed with slight modification in connections (Instruction sheet shows you how).

SPECIFICATIONS

- Operates on 12 to 24-VDC
- 3800 RPM • 24-VDC
- Continuous duty rated
- Full load 115-amps.
- Idling current 10-amps.
- Speed can be varied
- Ball bearing equipped
- Rotation CW facing shaft
- Double fan cooled
- Shaft diameter 2 1/2"
- Size 12" x 6 1/2" x 6 1/2"
- Shipping weight 30 lbs.

DAVID WHITE Hand Sighting Level

ACCURATE READINGS UP TO 100 YARDS

(ITEM #807)

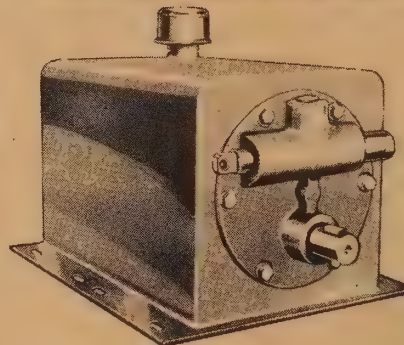
\$2.75

F.O.B. LINCOLN



(ITEM #807) — Rugged, low-priced hand level has black, impact resistant phenolic body, steel crosshair, glass front element optic, unbreakable mirror, sensitive spirit level, slotted eyepiece, integral sunshade over front lens. All parts permanently fitted. Nothing to get out of adjustment. Length 4-5/8". Shipping weight 8 oz.

Hydraulic Power And Control System For Single Or Double Acting Cylinders



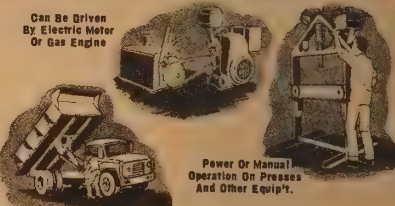
(ITEM #989-A)
For Single Acting Cylinders

\$59.90

Be Sure To Specify Which Model You Desire On Your Order

(ITEM #989-B)
For Double Acting Cylinders

\$62.90

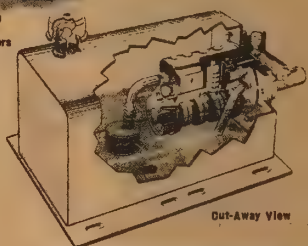


Can Be Driven By Electric Motor Or Gas Engine

Power Or Manual Operation On Presses And Other Equip't.

Can Be PTO Driven On Trucks, Tractors

3-Way Model (Illustrated) (ITEM #989-A)



Out-Away View

SPECIFICATIONS:
3-WAY AND 4-WAY HYDRAULIC POWER AND CONTROL SYSTEMS

- Positive displacement pump
- Heavy duty needle bearings on both ends of shaft
- Working pressure 3000 p.s.i.
- Recommended speed 1200 r.p.m. Maximum r.p.m. 1500
- 5.2 g.p.m. @ 1200 r.p.m.
- Can be driven either direction
- Built-in relief valve (3000 p.s.i.)
- Reservoir capacity 15-quarts
- Shaft diameter 1", with keyway
- Ports 3/8" N.P.T.
- 3-way model for single acting cylinders (ITEM #989-A)
- 4-way model for double acting cylinders (ITEM #989-B)
- Overall size 18 1/2" x 10" x 8 1/2"
- Shipping weight 50 lbs.

Some Uses For "ORBIT" Hydraulic Motors



Whittling & Woodcarving

This book was originally published in 1936, but something about it suggests a product of the 19th century. It might bear—unashamedly—the antiquated subtitle, *A Compendium*. It is basically a book of instructions and illustrations (464 of them) about wood carving. Unlike most of the books on carving, it doesn't discriminate between fine arts and folk craft. If you follow Tangerman's instructions you can make anything from a willow whistle to a Renaissance balustrade. The first copy I came across was a tattered red hardbound, and when it disappeared from the elementary school library I felt a sense of personal loss. In 1962 Dover Publications reissued it in paperback for \$2.00, and if you carve (or would like to), it is a must for your library.

Tangerman begins with some inspiring examples: no less than Grinling Gibbons and Tilman Riemenschneider. He gives a brief introduction to woods, knives, and sharpening, and then begins at the bottom with rustic whittling. The mysteries of chains carved from a single block of wood and the ball-in-a-cage are clearly explained in text and drawings. In about 300 pages you are led through chip carving, low relief, high relief, and sculpture in the round, and presumably a lot of chips will have accumulated on the floor by the time you finish the book. At 5 1/2" x 8 1/2" it isn't exactly pocket sized, but it will fit in a handbag or a glove compartment with ease. The writing is enthusiastic; it can convince you that if you want to learn to carve, all you need is a sharp knife, a piece of wood, some band-aids, and *Whittling and Woodcarving*.

[Suggested and reviewed by Dr. Morton Grosser]



Whittling and Woodcarving

E. J. Tangerman
1962; 293 pp.

\$2.00 postpaid

from
Dover Publications, Inc.
180 Varick Street
New York, N. Y. 10014
or
WHOLE EARTH CATALOG



FIG. 230 - Tool shank and edge shapes identified

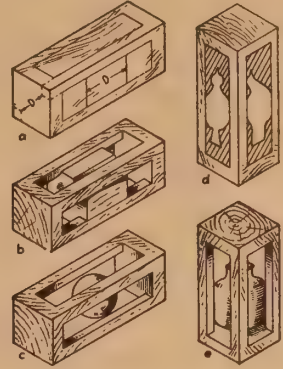
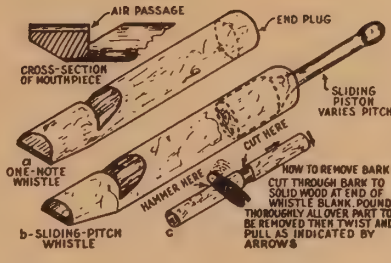


FIG. 93 - Three steps in making a ball-in-a-cage. a shows block with cage laid out on top and ball blank laid out on side, showing how to obtain blank length D from block end. Blank with waste end wood out at b, finished piece at c. At d is a bird-in-a-cage pattern (which shows shape of body for completed piece) and at e a jug-in-a-cage



Snap-on Tools

How much should you pay for a wrench? Snap-on Tools Corporation has built a huge business by betting that you are willing to pay more than twice as much as you would in your local hardware store. That's the approximate difference in price between Snap-on mechanics' tools and mass-distributed brands. You can gauge the success of their methods by walking into a racing pit or the service area of any premium auto repair shop. The contents of the tool chests are usually labelled 'SNAP-ON.'

What do you get for the extra money? The best steel, precision machining and heat treatment, superb finishing, and an unconditional guarantee. It is hard to explain the merit of fine tools to people content with dime-store quality, but a Snap-on tappet wrench will convince you that a tool can be a work of art.

Where can you buy them? Snap-on tools are sold from rolling salesrooms, and local representatives are listed in the telephone book. The truck will come to your house if you like, or you can arrange to meet the sales representative at a mutually convenient place. Assuming you can afford it, you can outfit a complete repair shop from a typical Snap-on truck. As a price reference, a Snap-on 3/8" square drive double hex socket set contains a ratchet handle, a speeder, a sliding T-bar, a nut spinner, three extension bars, a universal joint, and 11 double hex sockets, and costs \$45.62. A set of six ignition wrenches costs \$9.36. Not cheap, but you'll know why they're listed here as soon as you handle them. A free 150-page illustrated catalog is available from all Snap-on representatives.

[Suggested and reviewed by Dr. Morton Grosser.]

H. GERSTNER & SONS

INCORPORATED

MANUFACTURERS OF
**MECHANICS HIGH GRADE TOOL CASES
CHESTS AND CABINETS**

20 CINCINNATI STREET
DAYTON, OHIO 45407

High Grade Tool Chests

If you enjoy reading this catalog you are probably the kind of person that is seized by an irresistible urge to open all those beautifully fitted little drawers in antique cabinets. You can satisfy the urge in your own home thanks to H. Gerstner & Sons, Inc., 20 Cincinnati Street, Dayton, Ohio, 45407. They make superb wood cases that will hold small interesting things of almost any size and shape: machinist's chests, medical instrument cases, boxes for artists, photographers, dental hygienists, and so on, ad infinitum. The thing that sets Gerstner apart from their competitors is their concern with quality. You can buy a carpenter's box from them that will stand with perfect aplomb on your Chippendale end table. Their cases are made of polished quartersawed oak, American black walnut, or can be covered with black leather or vinyl. Prices range from \$27 to \$85, and one look will convince you that their products are a rare bargain in an injection-molded age. Their service is personal and quick; illustrated literature is available.

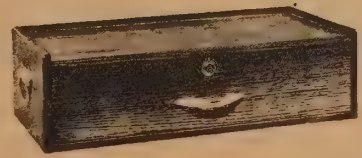
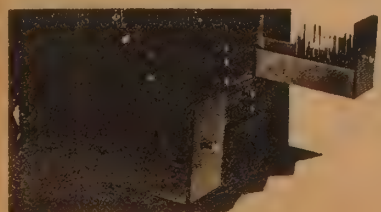


[Suggested and reviewed by Dr. Morton Grosser.]

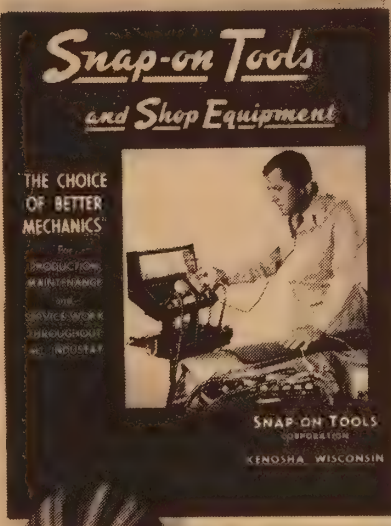
Literature from
H. Gerstner & Sons, Inc.
20 Cincinnati Street
Dayton, Ohio 45407

NEW! TWO VERTICAL DRAWERS...

...for handbook and drill block. Each drawer is about 25% larger than vertical drawers in other GERSTNER chests.



Used under a Gerstner Chest, this sturdy base with its 4" drawer will accommodate heavy tools too bulky for the chest above it. Each base has a lock, nickeled hardware and is available in any one of three finishes to match the chest.



Catalog from
Snap-on Tools Corp.
Kenosha, Wisc. 53140

MECHANICS BASIC SERVICE TOOLS
Snap-on 5088-GS-B SET

88 MOST NEEDED SERVICE TOOLS
This set is a well balanced selection of tools especially available for the man starting to build up his kit. It provides a basic set of Ferret 1/2" square drive and Master 1/2" square drive sockets, wrenches together with Boxsocket and Combination wrenches and the most essential hand tools; a set to which other units can be added as the need arises.

Stock No.	Description	See Page
219-FP	Ferret Wrench Set.....	37
325-M	Master Wrench Set.....	44
OEX-711	Combination Wrench Set.....	73
XS-607	Boxsocket Wrench Set.....	63
No. 47	7/16" Gripping Plier.....	81
No. 87	7/16" Diagonal Cutter.....	82
No. 96	7/16" Needle Nose Plier.....	83
BH-82	1 lb. Plastic Tip Hammer.....	84
BP-12	12 oz. Ball Peen Hammer.....	84
CS-1	Carbon Scraper.....	96
FB-301	Spark Plug Wire Gauge.....	58
FB-329	Feeler Gauge.....	58
HS-6	Ignition Point File.....	53
HS-8	Hack Saw Frame.....	59
PPC-4	Center Punch.....	74
PPC-104	1/2" Pin Punch.....	74
PPC-106	3/8" Drift Punch.....	74
PPC-110	1/2" Drift Punch.....	74
PPC-124	3/8" Starter Punch.....	74
PPC-206	1/2" Starter Punch.....	74
PPC-210	3/8" Starter Punch.....	74
PPC-816	1/2" Blade Chisel.....	74
PPC-824	3/8" Blade Chisel.....	74
SSD-2	2 1/2" Blade Screwdriver.....	76
SSD-4	6" Blade Screwdriver.....	76
SSD-8	8" Blade Screwdriver.....	76
SSDP-42	No. 2 Phillips Screwdriver.....	77
SSDP-84	No. 4 Phillips Screwdriver.....	77
SSD-146	Spark Test Screwdriver.....	78
S-570AD	Spark Plug Socket.....	94
KRA-21	Mechanikit.....	11

The KRA-21 Mechanikit shown here is described on page 11.

5088-GS-B Mechanics Basic Tool Set. Complete with KRA-21 Mechanikit.
5088-GS Set. Above Set tools only.

\$291

A GOOD STARTER SET FOR YOUNG MECHANICS

Brookstone Tools

If precision tools are what you need, this gentlemanly company will comply.

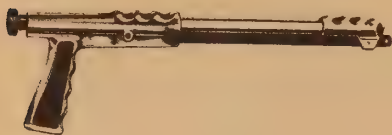
HACKSAW CUTS ANY DEPTH, STRAIGHT OR CURVED

Remarkable "endless" hacksaw cuts to any depth, even cuts curves, because no frame interferes with blade. All work is done forward of casing, by reciprocating blade. Does "impossible" jobs.

After drilling a hole, blade is easily inserted for sawing out parts of sheets, panels, flooring, etc., as in sketch. Blade breakage is reduced because blade is supported in front casing on 3 hardened steel bearing balls.

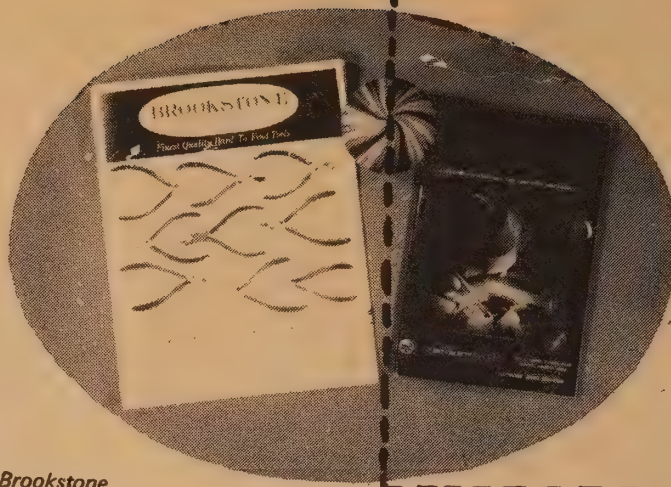
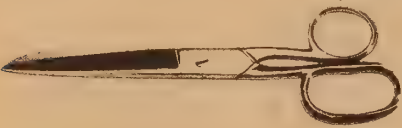
Enclosed spring returns blade automatically after each forward stroke.

Wall made. Polished chrome plated tube. Polished, nickel plated fittings. Enamelled casing and body. Uses standard 10" and 12" blades available everywhere. About 15" long. 67A-1293 Endless hacksaw \$7.95



D 8-1/2" shears. All-round shears for shop, office, shipping room, home. Heavily forged for toughest work. Won't bend, even using two hands. Stays sharp — the pair we first tested is still in daily use in our shipping room after a year, on tough paper and cartons, isn't dull yet! Extra-comfortable finger loops prevent fatigue. Precision-fitted to cut filmiest fabrics without raveling. A masterpiece of scissor making.

67A-1357 8-1/2" shears \$6.95
Six & up Each \$6.25



Brookstone Catalog
23 pp.

\$.25

from:
The Brookstone Company
27 River Road
Worthington, Mass. 01098

INTERNAL PIPE WRENCHES ARE TROUBLE SAVERS



FLEXIBLE FILES DO WHAT OTHERS CAN'T

These amazing files are flexible plastic strips impregnated with super-hard aluminum oxide abrasives. You can bend them almost double without breaking. You can snip them into special shapes. Now you can file and polish curved surfaces and otherwise inaccessible places.

They're waterproof, oilproof — for use wet or dry.

Excellent for shaping and fitting, and for fine finishing and polishing all metals (even hard steel) without scratching. Remove burrs, tool marks, corners. Touch up cutting tools. Smooth off sharp edges, even on hard glass and ceramics.

Electrically non-conductive — safe on live circuits. Unequaled for dressing and burnishing contacts, line starters, limit switches, commutators, relays.

Catalog Number	Width in.	Length in.	Thick. in.	Grit	Each
67A-1103	1/2	4-1/2	.040	80 (coarse)	20c
67A-1104	1/2	4-1/2	.040	120 (medium)	20c
67A-1105	1/2	4-1/2	.040	240 (ex-fine)	20c
67A-1106	1/2	4-1/2	.040	320 (polish)	20c
In lots of 10 dozen					\$2.15/doz.

Jensen Tools

Electrical Tools primarily. All prices postpaid.

Jensen Catalog
65 pp.

Free

from:
Jensen Tools and Alloys
3630 East Indian School Road
Phoenix, Arizona 85018

MODEL 355 MIDGETESTER

So very small (2-3/4 x 4-1/2 x 1") it easily slips into your shirt pocket. No wonder the 355 Midgetester is so popular with all who must make basic voltage and resistance measurements "in the field." Features self-shielding movement and 10,000 ohms per volt sensitivity on both AC and DC ranges. Measures 0-3, 0-12, 0-60, 0-300, and 0-1200 V AC or DC. Has four resistance ranges (R x 1, R x 10, R x 100, and R x 1K). Accuracy ±3% DC and ±5% DC. Furnished complete with test leads and manual. Case available. Note: The 355 is an optional component in the JTK-16 tool kit (P. 36).



50B417 TESTER \$50.00
50B425 CASE 5.50

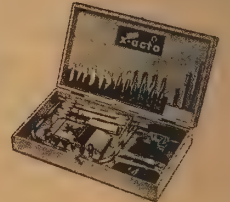
ELLIS "MAJOR" INSPECTION KIT



For close and accurate examination of equipment not normally accessible to the naked eye. The kit consists of a series of varying-length probes fitted with miniature electric lamps and lenses. By using these light probes and a combination of adjustable mirrors and magnifying fittings included in the kit, the most inaccessible spots may be viewed through very small apertures. Used for the inspection of waveguides (X, S, and Q bands), cavities, pumps, dies, valves, printed circuits, small motors, hydraulic systems, relays, switchboards, and electronic components (to name just a few). All parts interlocking and interchangeable. Included are the basic battery handle (complete with 2 "D" batteries), a 1.5" flexible probe, 5 rigid probes, 3 magnifying lenses, an adjustable mirror attachment with adapters, an acromatic magnifier, an illuminated magnifier, a mirror handle, 2 long-stem mirrors, 2 magnifying mirrors, an adjustable mirror with handle, and additional lenses and bulbs. All items are mounted in a handsome wooden case as shown above.

348672 \$155.00

\$18.50



COMPACT TOOL AND KNIFE CHEST #87

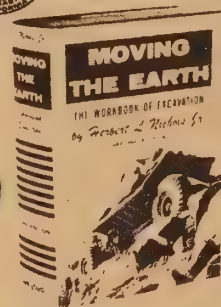
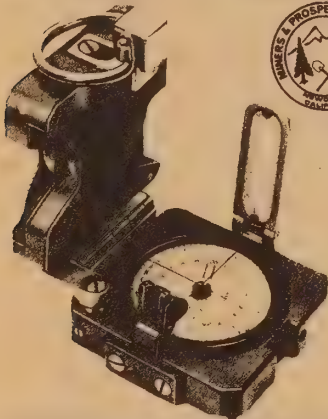
A smaller version of the #89 deluxe kit. Contains most of the tools needed for producing wooden mockups and models. This kit includes a light-duty knife, medium-duty knife, heavy-duty knife, complete assortment of knife blades, gouges, routers, punches, plus a planer, sander, saw, spokeshave, a balsa stripper, steel rule, pin vise, screwdriver, and assorted drill bits. Packed in a fitted wood chest.

CAT. NO. 87 NET EACH \$18.50

Miners Catalog

Mack Taylor, head of Exploration Laboratories, says this is the only Miners Catalog. We're glad it's a good one.

[Suggested by Mack Taylor]



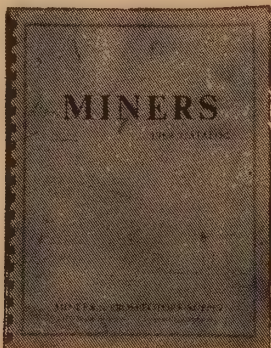
MOVING THE EARTH by Herbert L. Nichols, Jr. The most complete book on excavation practices, procedures and equipment ever written. This comprehensive book covers the entire field of excavation, was written primarily to fill the needs of those closest to the actual work: the estimator, the superintendent, the foreman and the operator, as well as the design engineer. An extremely practical book, divided into 21 chapters covering all types of above ground and below ground operations. 7 x 10, 1488 pages, 2700 illus, 1962, 2nd Ed. \$25.00

Complete Spanish Translation: 9x11, 1112 pages, 2700 illustrations, 1962. \$32.00

MODEL G1717 ENGINEERING COMPASS. Similar to Model G1719 Geological Compass except that it does not have pendulum clinometer, level bubble or extension rule. This is a fine instrument for most engineering measurements.

The compass and optical clinometer scales permit rapid reading of horizontal and vertical angles with a precision unusual in a hand-held compass. Weight with case 9 ozs. Complete..... \$72.50

ATLAS OF LANDFORMS by James L. Scovel et al. A terrain study atlas compiled essentially from the series of 100 topographic maps illustrating typical landforms published by U. S. Geological Survey. Text material, aerial photographs and diagrams. Effective guide to land form study. 14 1/2 x 12 1/2, 168 pp, 1965, Flexible binding. \$10.95



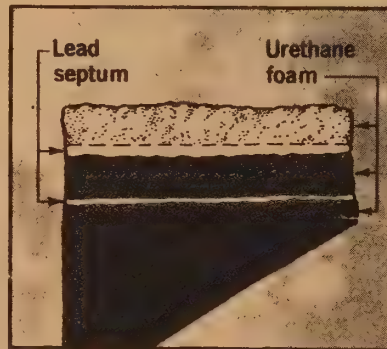
from:
Miners and Prospectors Supply
177 Main Street
Newcastle, California 95658

52

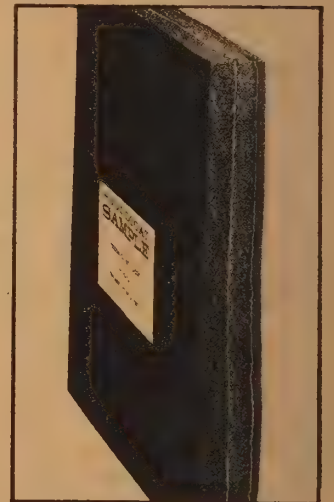
Miners Catalog Free
42 pp.

Soundcoat

If you long for a sensory deprivation tank to bathe your besieged nervous system, overwrought with trying to sort too little relevant signal from too much irrelevant signal (noise), then this here new stuff may be useful to you—if only to make your working environment more contemplatively still.



Sound-damping system offers a choice of a single- or multiple-septum sandwich.



Soundcoat brochure

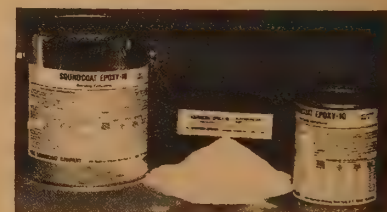
free

from
The Soundcoat Company, Inc.
515 Madison Avenue
New York, N. Y. 10022

Soundmat - LF 0.6 # Septum 1/2" thick: \$1.90/sq. ft. in sheets 2 ft. x 4 ft.

The heaviest and lightest materials have teamed up to shut out noise and let quiet be heard. The thin lead sheet sandwiched between two layers of polyurethane foam that does the job is the latest sound absorber and attenuator for machinery, power boats, and dental equipment.

Developed by Soundcoat Co., New York City, the laminated composite is attached to the inner wall of machinery enclosures. An adhesive with a rubber, asphalt, or epoxy base bonds the system to almost any wall surface.



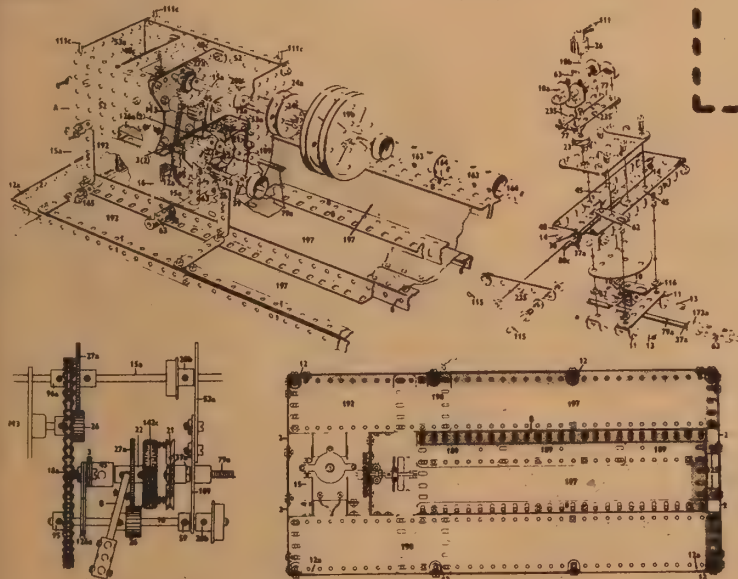
EPOXY-10 DAMPING COMPOUND. (Paste)

Meccano

Charles Babbage (1792-1871) was a British mathematician and a mechanical genius. His contemporaries thought he was crazy. He spent 37 years perfecting a mechanical calculating machine which was finally rejected by the government of England in 1842. After all, the idea was plainly ridiculous. By the 1930's it didn't seem so ridiculous anymore, and a group of British scientists decided to build a calculating engine which would automatically compute differential equations for shell trajectories. The machine required thousands of gears and shafts assembled in a complex metal frame; there was the usual shortage of time and money. The differential analyzer, forerunner of today's computers, was made possible by a construction toy called Meccano. Assembled from standard Meccano parts, the machine worked perfectly.



Meccano, originated by Frank Hornby, a Liverpool inventor, in 1901, was the prototype miniature metal construction system. American children are familiar with Erector, European kinder with Trix and Marklin, but they all spring from Hornby's original brainchild. Meccano is sold today from open stock, and in sets ranging in price from \$2.00 to \$160.00. There are hundreds of extra specialized parts available, and power units including two sizes of clockwork motors (these are genuine governor-controlled drives, not flimsy windups), four different electric motors operating on 4 1/2 volts D.C. to 240 volts A.C., and a reversing steam engine. Meccano gears are machined brass with setscrews; most other parts are stamped and plated steel. Auxiliary sets are available for making gear transmissions, mechanisms such as intermittent drives, and generators. Plans for many complex models are available from the factory, and there is a monthly Meccano Magazine with projects such as regulator clocks described in detail.



The point of all this is that if you want to breadboard an invention or a machine, Meccano is a tested, economical way to do it. Many laboratories in England carry stocks of Meccano parts to built test models with. Meccano is available in a few stores in the United States, but you are better off ordering it from major British toy suppliers such as Beatties of London, 15 Broadway, Southgate, London N. 14, or Hamley's, Lombard Road, Merton, London, S.W. 19. After more than half a century Meccano is still a viable mechanical system. It's also a pretty good toy.

[Suggested and reviewed by Dr. Morton Grosser.]

Model & Allied Publications

The British have good how-to books. MAP is a gathering of a passel of them.

[Suggested by Dr. Morton Grosser]

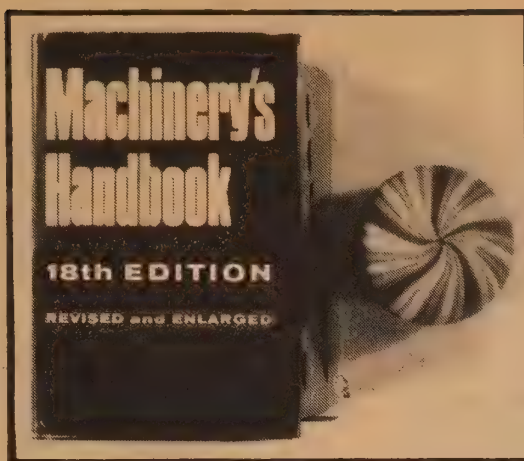
Catalog free

from Model & Allied Publications Ltd. 13/35 Bridge St. Hemel Hempstead, Herts ENGLAND

24 HOW TO WORK SHEET METAL

Metal working practice straight from the bench. Practical chapters embrace: Equipment; Metals used; Hollowing and Blocking; Planing; Edging and Seaming; Wiring Edge by Hand; Jannies and Wiring Machines; Beading and Swaging Machines, Conical Work; Pipes, Patterns and Joints; Planishing; Riveting; Brazing; Tank Construction. 7 1/2 x 4 1/2 in. 142 boxes. Drawn on two-colour card cover. 39 line drawings. (\$1.25) 6/-

Machinery's Handbook



Machinery's Handbook

1914...1969; 1192 pp.

\$16.00 postpaid

from Industrial Press, Inc. 200 Madison Avenue New York, N. Y. 10016 or WHOLE EARTH CATALOG

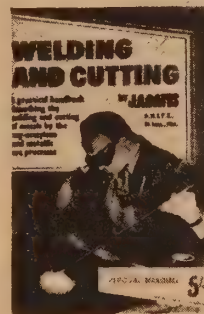
If you make things out of metal you need Machinery's Handbook. This thick, comprehensive guide to shop and engineering practice was originally designed to fit in the tall center drawer of a machinist's chest. Machinist's chests have stayed the same size, but the shaping of metal has become more and more complicated. Machinery's has coped with the squeeze heroically; the current (18th) edition contains 2293 pages printed on fine India paper, and it still fits the drawer. You can find in it things like tap drill sizes for S.A.E., metric, and Whitworth threads, what welding rod to use for which metal, and how much weight you can hang on a rope if it goes around a fat (or thin) barrel. You can also look up logarithms, area, volumes, and centers of gravity, and learn how to design helical gears, replace bearings, grind a lathe bit, and do many other useful and not-so-obvious things. The book is divided into thirteen main sections, indexed, thumb-indexed, and bound in tough, satisfyingly archaic industrial green with gold stamping.

[Suggested and reviewed by Dr. Morton Grosser.]

28 WELDING AND CUTTING

J. A. Ostas

A practical handbook describing the welding and cutting of metals by the oxy-acetylene and metallic arc processes. Chapters include: Prevention of Distortion; Gas Welding Equipment; Gas Welding techniques; Gas Welding Various Metals; Flame cutting methods; Types of Electric Arc Welding; Equipment for Metallic Arc Welding; Procedure and Techniques.

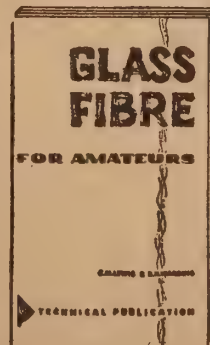


7 1/2 x 4 1/2 in. 93 pages. Two-colour drawn on card cover. 44 line drawings. (\$1.00) 5/-



35 GLASS FIBRE FOR AMATEURS

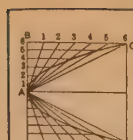
This is essentially a practical book for all who are interested in making things with reinforced glass plastics, or using this most versatile material for repair work, etc. It is the first work of its kind to cover materials, techniques and a vast range of applications in a single comprehensive volume - giving the reader literally all the information he will ever need for producing successful glass fibre mouldings of any shape, form or size. Seventeen chapters on materials, tools, resins, glass fibres, castings, design, male and female moulds projects, car bodies, marine domestic and modelling applications, trouble shooting. Nine appendices. Joint authors are well-known - Ron Waring is an authority on boats and their construction and Geoff Lewis is a working director of a leading glass, fibre firm.



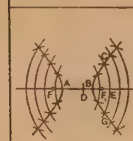
8 1/2 x 5 1/2 in. 172 pages. Printed litho with 120 illustrations and diagrams. Hardbound. Library edition. (\$2.00) 10/6

GEOMETRY

Geometrical Constructions



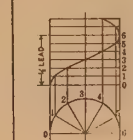
To construct a parabola: Divide line AB into a number of equal parts and divide BC into the same number of parts. From the division points on AB draw horizontal lines. From the division points on BC draw lines to point A. The points of intersection between lines drawn from points numbered alike are points on the parabola.



To construct a hyperbola: From focus F lay off a distance FD equal to the transverse axis, or the distance AB between the two branches of the curve. With F as a center and any distance FE greater than FB as a radius, describe a circular arc. Then with F1 as a center and DE as a radius, describe arcs intersecting at C and G the arc just described. C and G are points on the hyperbola. Any number of points can be found in a similar manner.



To construct an involute: Divide the circumference of the base circle ABC into a number of equal parts. Through the division points 1, 2, 3, etc., draw tangents to the circle and make the lengths D1, E2, F3, etc., of these tangents equal to the actual length of the arcs d1, A2, d2, 3, etc.



To construct a helix: Divide half the circumference of the cylinder on the surface of which the helix is to be described into a number of equal parts. Divide half the lead of the helix into the same number of equal parts. From the division points on the circle representing the cylinder draw vertical lines, and from the division points on the lead draw horizontal lines as shown. The intersections between lines numbered alike are points on the helix.

Table 8. American Standard non-Powder Steel Flanged Fittings

Nom. Pipe Size	Inside Diam. Flange	Flange Thickness	Flange Outside Diam.	Bolt Circle Diam.	No. of Bolts	Bolt Size	Dimensions to Contact Surface of Raised Face					
							AA	BB	CC	EE	FF	GG
1/2	1 1/8	3/16	4 1/2	3 1/4	4	7/16	4	5	2 1/2	6 1/4	2 1/4	4 1/4
3/4	1 3/8	3/16	5 1/4	4 1/4	4	7/16	4 1/2	5 1/2	2 1/2	6 3/4	2 1/4	4 1/4
1	1 7/8	3/16	6 1/4	5 1/4	4	7/16	5	6 1/4	2 1/2	7 1/4	2 1/4	4 1/4
1 1/2	2 1/4	3/16	7 1/4	6 1/4	4	7/16	6 1/4	7 1/4	2 1/2	8 1/4	2 1/4	4 1/4
2	3 1/8	3/16	8 1/4	7 1/4	4	7/16	7 1/4	8 1/4	2 1/2	9 1/4	2 1/4	4 1/4
2 1/2	3 7/8	3/16	9 1/4	8 1/4	4	7/16	8 1/4	9 1/4	2 1/2	10 1/4	2 1/4	4 1/4
3	4 3/8	3/16	10 1/4	9 1/4	4	7/16	9 1/4	10 1/4	2 1/2	11 1/4	2 1/4	4 1/4
3 1/2	4 7/8	3/16	11 1/4	10 1/4	4	7/16	10 1/4	11 1/4	2 1/2	12 1/4	2 1/4	4 1/4
4	5 3/8	3/16	12 1/4	11 1/4	4	7/16	11 1/4	12 1/4	2 1/2	13 1/4	2 1/4	4 1/4
4 1/2	5 7/8	3/16	13 1/4	12 1/4	4	7/16	12 1/4	13 1/4	2 1/2	14 1/4	2 1/4	4 1/4
5	6 3/8	3/16	14 1/4	13 1/4	4	7/16	13 1/4	14 1/4	2 1/2	15 1/4	2 1/4	4 1/4
5 1/2	6 7/8	3/16	15 1/4	14 1/4	4	7/16	14 1/4	15 1/4	2 1/2	16 1/4	2 1/4	4 1/4
6	7 3/8	3/16	16 1/4	15 1/4	4	7/16	15 1/4	16 1/4	2 1/2	17 1/4	2 1/4	4 1/4
6 1/2	7 7/8	3/16	17 1/4	16 1/4	4	7/16	16 1/4	17 1/4	2 1/2	18 1/4	2 1/4	4 1/4
7	8 3/8	3/16	18 1/4	17 1/4	4	7/16	17 1/4	18 1/4	2 1/2	19 1/4	2 1/4	4 1/4
7 1/2	8 7/8	3/16	19 1/4	18 1/4	4	7/16	18 1/4	19 1/4	2 1/2	20 1/4	2 1/4	4 1/4
8	9 3/8	3/16	20 1/4	19 1/4	4	7/16	19 1/4	20 1/4	2 1/2	21 1/4	2 1/4	4 1/4
8 1/2	9 7/8	3/16	21 1/4	20 1/4	4	7/16	20 1/4	21 1/4	2 1/2	22 1/4	2 1/4	4 1/4
9	10 3/8	3/16	22 1/4	21 1/4	4	7/16	21 1/4	22 1/4	2 1/2	23 1/4	2 1/4	4 1/4
9 1/2	10 7/8	3/16	23 1/4	22 1/4	4	7/16	22 1/4	23 1/4	2 1/2	24 1/4	2 1/4	4 1/4
10	11 3/8	3/16	24 1/4	23 1/4	4	7/16	23 1/4	24 1/4	2 1/2	25 1/4	2 1/4	4 1/4
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14 1/2	15 7/8	3/16	33 1/4	32 1/4	4	7/16	32 1/4	33 1/4	2 1/2	34 1/4	2 1/4	4 1/4
15	16 3/8	3/16	34 1/4	33 1/4	4	7/16	33 1/4	34 1/4	2 1/2	35 1/4	2 1/4	4 1/4
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32 1/2	33 7/8	3/16	69 1/4	68 1/4	4	7/16	68 1/4	69 1/4	2 1/2	70 1/4	2 1/4	

Allcraft Tool & Supply

Crafting requires tools specific to the material and the scale you're working with. This is the best supplier we've seen or heard of for craft tools.

[Suggested by ONYX.]

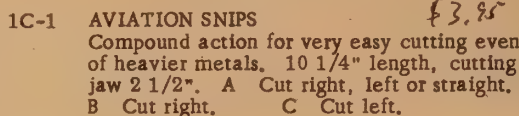
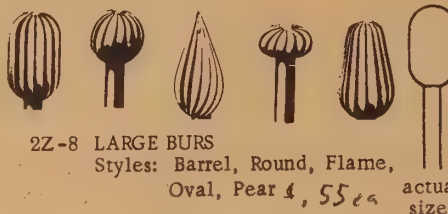
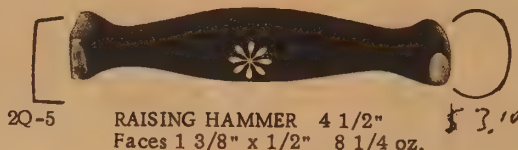
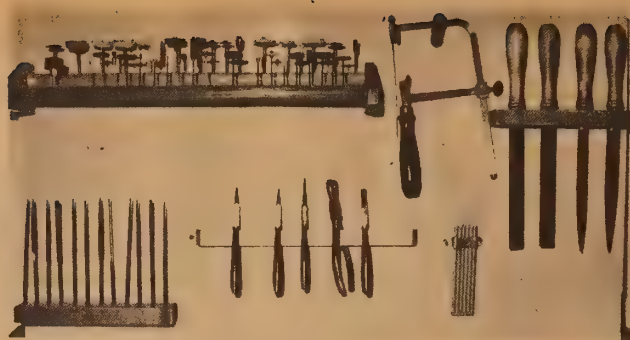


Allcraft Tool & Supply Catalog

\$1.00 (refundable with purchase)

from Allcraft Tool & Supply Company, Inc. 215 Park Avenue Hicksville, N. Y. 11801

- SHOP LAYOUTS & KITS.....
- SMALL HAND TOOLS.....
- CASTING.....
- SOLDERING EQUIPMENT.....
- POLISHING EQUIPMENT.....
- PLATING, ETCHING.....
- HAMMERS, STAKES, MANDRELS.....
- SHOP EQUIPMENT.....
- FLEXIBLE SHAFT SUPPLIES.....
- CHASING TOOLS.....
- ENGRAVING SUPPLIES.....
- FINDINGS.....
- ENAMELING SUPPLIES.....
- BOOKS.....
- CHEMICALS.....
- LAPIDARY EQUIPMENT.....



3M-5 COUNTER BALANCE SCALE This scale for weighing gold or silver needs no weights. Has fulcrum action for greater accuracy. Requires no adjusting, has no springs. All aluminum construction, Porcelain dial calibrated in pennyweights. Capacity 1 3/4 oz. Most handy for checking the weights of finished pieces, etc.

\$4.50 3M-5 Counter Balance Scale



Soldner Kick Wheel

Paul Soldner produces the best potter's kickwheel made at a very reasonable price. He also has a beautifully designed clay mixer (does 250 lbs.) for \$500.

[Suggested and reviewed by Jeff Schlanger.]



Soldner Kick Wheel

\$200 (unpainted), 195 lbs. shipping wt.

Soldner Mixer

\$500 (unpainted), 650 lbs. shipping wt.

from Soldner/Pottery & Pottery Equipment Box 917 Aspen, Colo. 81611



LARGE THROWING HEAD
14" aluminum alloy with concentric centering rings. The casting has been accurately turned on a machinist lathe. Shaft and mounting hole, 1" in diameter.

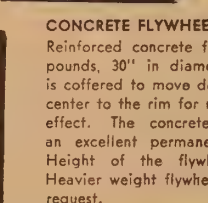
ADJUSTABLE SEAT
Both height and angle of the seat can be changed to accommodate individual preferences. 1" x 8" x 24" exterior plywood is both sturdy and comfortable.



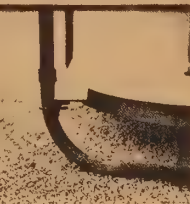
SELF ALIGNING BEARINGS
1" top and bottom ball bearings. Locking device adds structural support. Standard zero grease fittings are included for ease in occasional maintenance.



SAFETY FOOT RESTS
2" x 3" angle irons completely cover the top of the flywheel for safety and sure footing. An additional 2" guard protects the exposed back edge of the flywheel. Height of foot rests are adjustable.



DETACHABLE SPLASH PAN
15" aluminum alloy half pan has a snap on feature which permits its instant removal for cleaning or for attaching extra large plaster bats.



CONCRETE FLYWHEEL
Reinforced concrete flywheel of about 90 pounds, 30" in diameter. The underside is cuffed to move dead weight from the center to the rim for maximum centrifugal effect. The concrete "tooth" provides an excellent permanent kicking surface. Height of the flywheel is adjustable. Heavier weight flywheel is available upon request.

Buckskin

This is one of the best deals in the CATALOG. Buckskin in downtown San Francisco costs \$1.50 a square foot; Leather Tanning offers the same material for 90¢/sq.ft. postpaid anywhere in the U.S. The buckskin is chrome-tanned, which makes it more resistant to the effects of water than oil-tanned skin. The company also carries cowhide, elk skin, hair-on calf, etc. Orders for a dozen or more skins get 10¢/sq.ft. discount. Buckskins are generally 10-12 sq.ft. in size, calf skins smaller, elk skins larger. The shirt was made of two 12 sq.ft. buckskins.



Buckskin

Buckskin \$.90 /sq.ft. postpaid

from: Leather Tanning Company P.O. Box 2406a San Francisco, California 94124

Adhesive Products

Silicone molding rubber (cast anything!) at low prices & Monzini epoxy based casting compounds. 20th Century materials.

[Suggested and reviewed by Jeff Schlanger.]

Brochure & pricelist free

from Adhesive Products Corp. 1660 Boone Avenue Bronx, N. Y. 10460

1 1/2 Pt. Kit (1 1/2 lbs.) Consisting of 1 lb. ADRUB RTV and 1/2 lb. ADRUB RTV Rubber Hardener \$ 6.00



4530 MONZINI IRONZINI

54 5 gallons ----- \$.50 per pound
1 gallon ----- .60 per pound

MONZINI CASTING COMPOUNDS

MONZINI is a new media for sculptors. It represents ten years' intensive research to develop a material which would resist heat, cold, rain, snow and deterioration caused by the elements. MONZINI makes it possible to produce in a matter of minutes the beautiful textures for which nature requires centuries. It can be cast solid or hollow.

1. MONZINI is a liquid containing 100% solids and contains neither water nor highly flammable solvents. The liquid solidifies chemically.
2. To convert MONZINI from a liquid to a solid casting it is necessary to add only 1 or 2 parts of MONZINI Hardener to 100 parts of MONZINI Casting Compound. The Hardener is merely stirred in and the material poured into a mold to set. With MONZINI Kwikset only one per cent Hardener is used.
3. MONZINI will set in about 20 minutes at 75° F. and for several hours thereafter will continue to gain strength. If more casting time is required, half as much Hardener may be used, or twice as much Hardener where it is desired to have faster setting.
4. MONZINI Casting Compounds may be cast in KWIK-MOLD Latex rubber molds, plaster molds, ADRUB RTV rubber molds, metal molds or even molds made from MONZINI itself.
5. Where a large number of castings are required, MONZINI KWIKSTRIP Mold Release may be used. No mold release is necessary when using molds made of MOLDINO Rubber.
6. MONZINI may be cast in almost any thickness without fear of cracking or excessive shrinkage.
7. MONZINI KWIKSET is available in special formulations which will harden in 5 minutes.
8. DA MONZINI is used without mold for direct application on armatures.

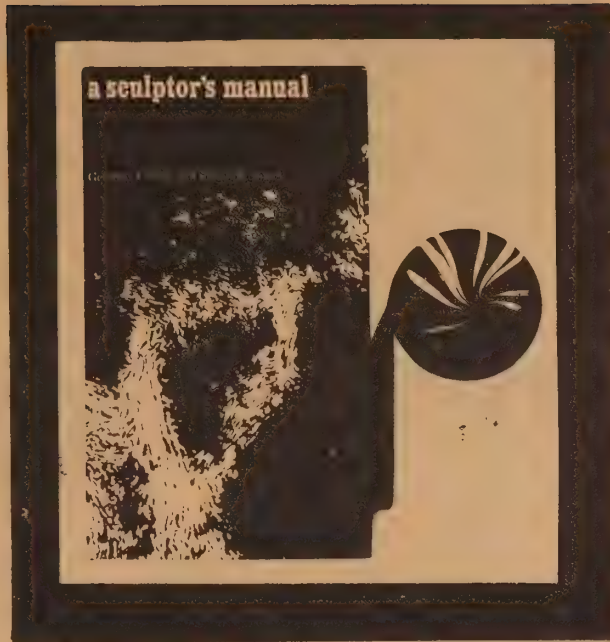
A Sculptor's Manual

This book is a well organized presentation of the basic processes behind sculpture. Detailed processes are made to seem simple, but not oversimplified; it remains obvious that a good deal of patience will be required to cast a bronze by the lost wax method. People who do not know what technique will suit them best and who want a solid footing from which to experiment, will find *A Sculptor's Manual* most useful. It encourages you to attempt the forms you have imagined, by showing you how.

The nine chapters cover plaster usage; foundry practice; flame and electric welding; plastics; cement; stone and wood; repetition casting; general construction; finishing; and surface coatings. Cross referencing, a glossary, and 27 diagrams make the book all the more usable. British sculptors will find a buyer's guide at the end of each chapter. Americans are referred to the yellow pages, Bernard Klein's "Guide to American Directories" and the "Thomas Register" (see p. 23 of the CATALOG) to find sources for materials.

At the back of the book is a section of 22 photos of finished sculpture, just enough to intrigue and egg you on without being pushy.

[Reviewed by Joe Bonner]



A Sculptor's Manual
Geoffrey Clarke & Stroud Cornock
1968; 158 pp.

\$8.50 postpaid

Van Nostrand Reinhold Co
Order Department
450 West 33rd St.
New York, N.Y. 10010

or
WHOLE EARTH CATALOG

The development of plastics has been continuing since the end of the last century and the term plastics now covers a complex of materials of which those dealt with here form a small and relatively simple part.

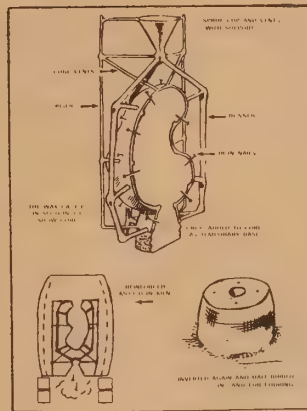
Firstly, there is the vast range of thermosetting plastics materials which are manufactured as liquids in two or three component parts. These are the polyesters and epoxy resins. They require reinforcement and are formed in a one-way process.

Secondly, there is an even larger range of thermoplastics, manufactured in powder or chip form and fabricated into very thin sheets which are subsequently laminated to provide whatever thicknesses may be required. They are structural materials—either flexible or rigid—and are formed under heat in a reversible process: raise a thermoplastic object carefully to the

temperature at which it was formed and it will revert through the sequence of forming operations back into a sheet.

Thermosets are built up with glass-fibre reinforcement over female mould surfaces and subsequently painted if required, though mass-pigmentation can be effected before lay-up.

Thermoplastics can be bent and formed when hot, either freely or by mechanical forming, e.g. they can be injected under pressure into moulds. These materials can be bonded with adhesives, welded together by high-frequency vibration, screwed over a frame or welded with hot gas and a filter rod. It is possible to vary the mass-pigmentation of various thermoplastics by laminating a screen-printed surface onto the rigid sheet.



Lost Wax process or cire perdue.

A lengthy and complex process. Join all wax runners, risers, etc., with a wax knuckle by modelling with a hot spatula. Reinforce grog with chicken wire. Before removal from kiln, reinforce surface with plaster and scrim. Keep sprue clear of sand, etc.

The process has changed little since the Greeks brought it to a pitch of achievement, and it is still so demanding that very few foundries exist. Their services are very costly. If you have a sculpture in clay, wax or plaster, and it is of a nature that demands faithful reproduction, there is no doubt that bronze—far denser than aluminium, cast by the Lost-Wax process—quite different from sand-casting—presents the only method of preserving the form and texture accurately.

This is an extremely complex and variable method, though large works can be cast more cheaply if it is followed up to the point at which the wax has been cored— or just to the production of the wax (without runners or core)—and the result is then given to a foundry for casting. If the foundryman produce a bad result, however—it will be your fault.

Does any reader know of a thorough book—up to date—on the techniques of working with plastics?

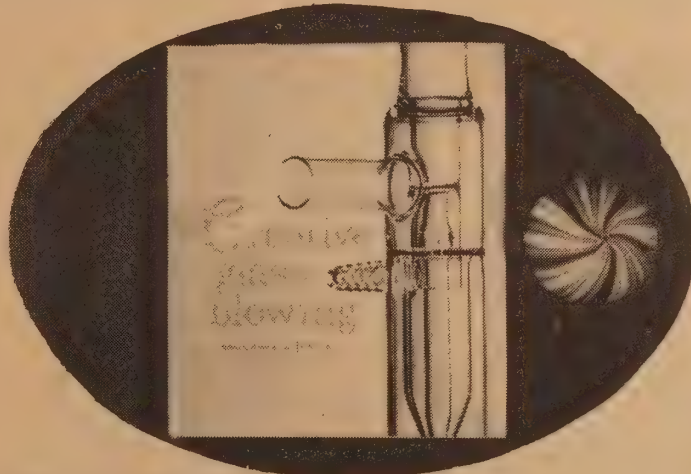
Creative Glass Blowing

This well-illustrated and carefully written book begins with the statement "Any one can learn to blow glass." To a large extent, the authors, one of whom is a professional glass blower, succeed in making that statement believable. However, the first 50 pages are concerned with the tools of the glass blower and I found myself wondering, "Yes, but can anyone learn to be a pipe-fitter, metal worker, carpenter, and electrician?" If you can do those things, there is little doubt that this book (and several hundred dollars worth of tools and related supplies) will enable you to blow glass—probably creatively.

Don't expect to take up glass blowing casually, with just this book, but if it is a hobby to which you can commit yourself seriously this book would be an excellent investment, for starters.

There is a page at the end that lists sources of tools and materials. Unfortunately, there are only a few suppliers mentioned, all of whom are in the East. Alas, we westerners need a special supplement, obviously.

[Reviewed by Richard Raymond]



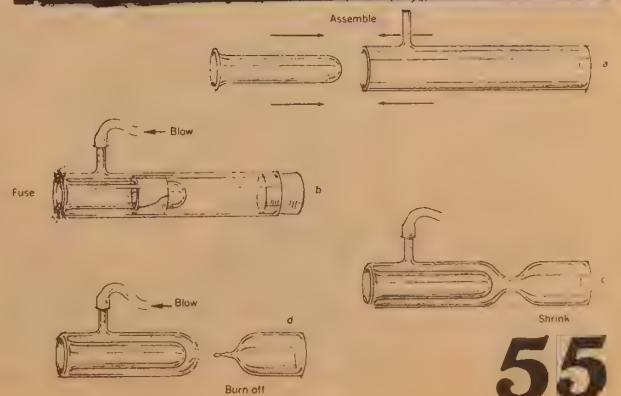
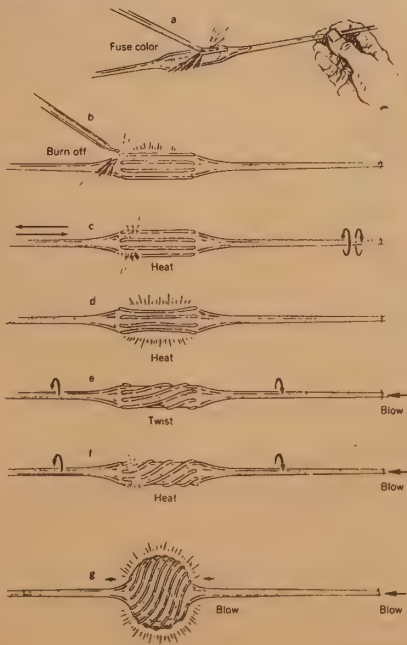
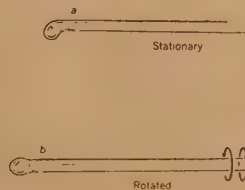
Creative Glass Blowing
James E. Hammesfahr, Clair L. Stong
1968; 196 pp.

\$8.00 postpaid

from:
W.H. Freeman & Company
660 Market Street
San Francisco, Ca 94104

or
WHOLE EARTH CATALOG

Here, then, is the first skill you must develop in the course of becoming a glass blower: the knack of rotating hot glass at a rate that precisely counteracts the force of gravity. The trick is not difficult to master if you follow a few simple rules. First, never soften more glass than you need for making a desired form. If you intend to impart a rounded shape to the end of a rod, heat only the tip. Second, never soften the material more than necessary to accomplish your objective. Obviously, stiff glass is easier to control than runny glass. Watch the work as it softens and changes form. Alter its position in the fire to take advantage of gravity, or to offset the effect of gravity, as the case may be. This is accomplished by rotating the work.



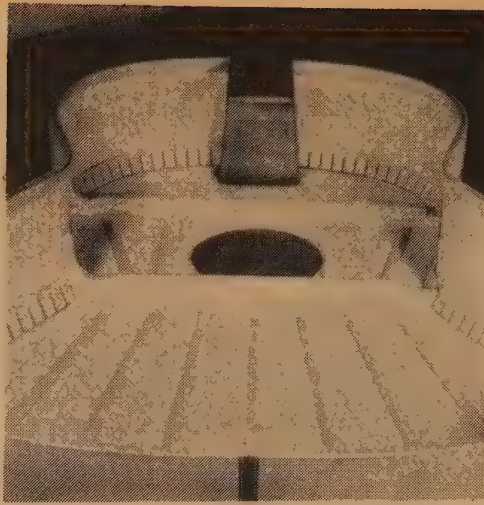
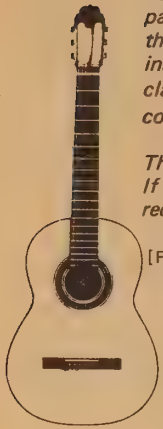
Classic Guitar Construction

To build a decent classic guitar, you must make several. The first one should take at least six months in a well-equipped shop with controlled humidity. Special jigs and clamps are required, which you make yourself. The order of craftsmanship and musical sensitivity involved will keep the dilettante out of the picture.

If you've gotten through those gates, then this is really how to do it, no jive. The text and illustrations (including patterns) are elegant, even inspiring. Sloane takes you through all the steps, no gaps, towards a superior instrument. Talk about sacred lines -- that's what a classic guitar is made of. It's all conscious decision, a continuous dialogue with the universe.

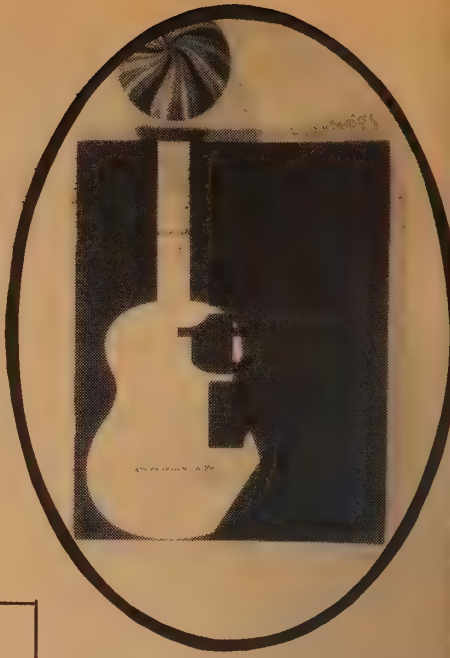
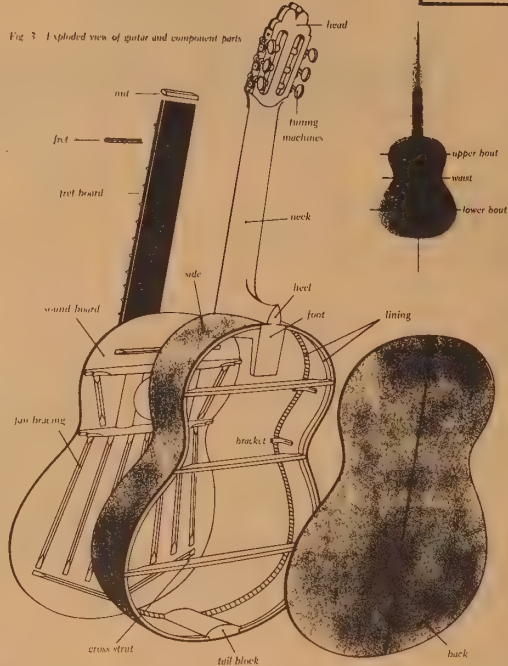
The book won't talk you into or out of making a guitar. If you're the person, it's your book. Follow Sloane's recipe and the world will beat a path to your door.

[Reviewed by Dave Guard]



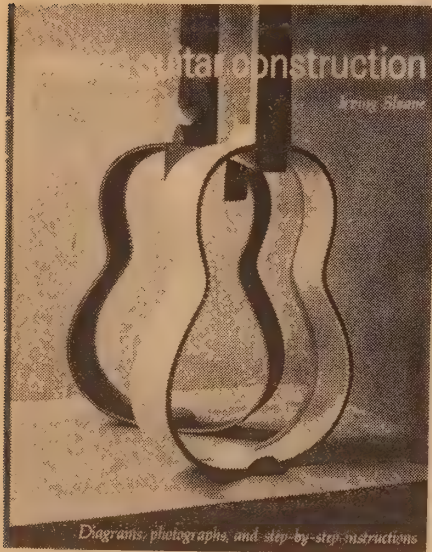
Apply varnish with a soft-hair 1" flagged-and-tipped brush. Twirl a new brush between your palms to shake out loose hairs. Do not use a varnish brush for anything but varnish.

Fig. 3 Exploded view of guitar and component parts



Also worth having if you're building guitars is No. 28 of *Guitar Review*: "Guitar Construction from A to Z."

\$3.00 from
The Society of the Classic Guitar
409 East 50th St.
New York, N.Y.



Guitar sales are soaring as factories in the United States and abroad work at top speed to fill the demand. Unfortunately, fine guitars cannot be made at top speed and mediocrity is the rule. In Spain, \$120 will buy a guitar of a quality that cannot be duplicated in the United States at any price except by a few private luthiers. Hand-made guitars start at about \$500.

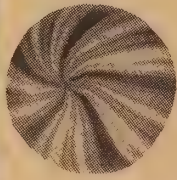
Classic Guitar Construction

Irving Sloane
1966; 95pp

\$5.95 postpaid

from
E.P. Dutton
201 Park Ave.
New York, N.Y. 10003

or WHOLE EARTH CATALOG



Creative Photo Micrography

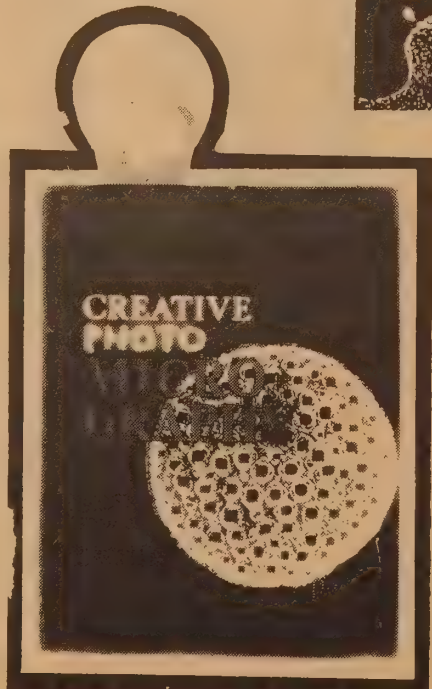
Closer.
Closer still.
Still closer. Now open your eyes. Welcome to the perspective of the 21st Century.

This book gives photographic technique as well as snapshots of the new landscape.



The two adjusting screws on the body of a microscope. The larger one is for coarse focusing and the smaller is for sharp focusing.

The influence of the thickness of the cover glass on the sharpness of the image. The rays of light are refracted at the surface of the cover glass on emerging from the latter. This gives rise -- similarly to halation -- to an unsharp zone which spreads over the details in the preparation under consideration (see the dotted lines). The thicker the cover glass the greater will be the superposition, as a comparison of a thin glass (above) with a thicker one (below) will show. As a rule the cover glass should have a thickness of 0.17 mm.



Creative Photo Micrography

O. R. Croy
1968; 151 pp.

\$9.95 postpaid

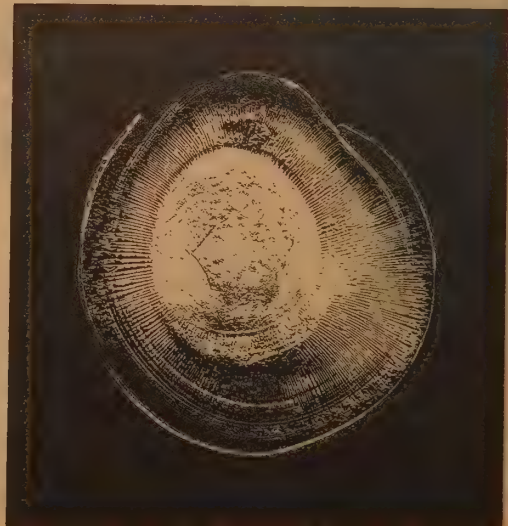
from
Amphoto
915 Broadway
New York, N. Y.

or WHOLE EARTH CATALOG



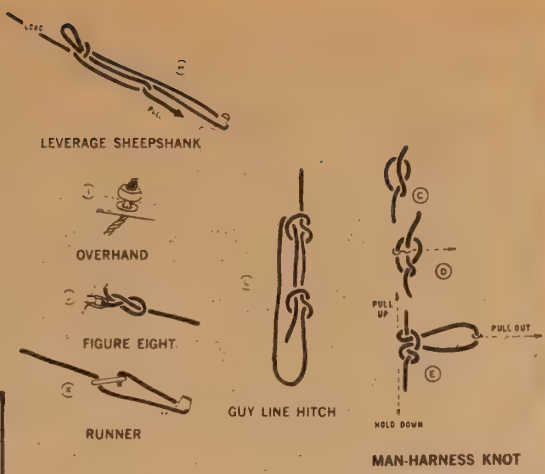
For those who do not wish to replace the ground-glass screen by one of clear glass, there is a simple way of focusing on the aerial image without having to dispense with the ground-glass screen focusing.

The procedure is as follows: A drop of Canada balsam is placed in the middle of the rough side of the ground-glass screen and covered with a cover glass (like those used for microscope preparations). It is advisable to leave the cover glass for 1 to 2 days with a small weight placed on top of it so as to make the layer of balsam as thin as possible. This treatment renders the ground-glass screen perfectly transparent under the cover glass, and thus, at this spot, with a magnifying glass placed on top of it, it is possible to focus just as sharply on the aerial image as when a transparent clear-glass screen is used.



Knots

Being handy with knots is like having a good pocket knife; you use it so much you scarcely notice it. Without it you're forever having to apologize for your uselessness. Well sir, be embarrassed no more. Right over here we have not one but three answers to your problem—books culled by exhaustive research from the far corners of the publishing industry, books practical in outlook, terse in style, vivid in illustration, fit companion to the Holy Bible as well as the Journeyman's Handbook. With the aid of these simple texts, priced to suit the country trade, you'll soon become adept at the many methods of the master knotsman, equally at home with the Chain Sinnet and the Bowline Knot, the Butterfly Knot and Clove Hitch, the Carrick Bend and the True-Lovers Knot.



Knots and Spices

Percy W. Blandford
1962; 79 pp.; 80 good knots
\$0.95 postpaid

from
Arco Publishing Company
219 Park Ave. South
New York, N. Y. 10003
or
WHOLE EARTH CATALOG

Handbook of Knots

Raoul Graumont
1945; 194 pp.; 428 good knots
\$1.75 postpaid

from
Cornell Maritime Press, Inc.
Box 109
Cambridge, Md. 21613
or
WHOLE EARTH CATALOG



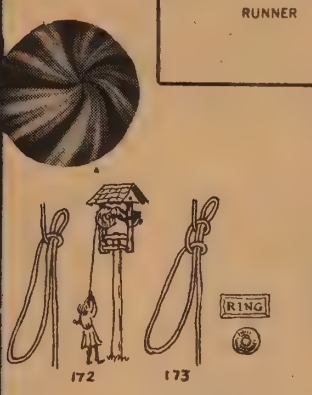
The Ashley Book of Knots

Clifford W. Ashley
1944; 260 pp.; 3900 incredible knots

\$13.95 postpaid

from
Doubleday & Co., Inc.
501 Franklin Ave.
Garden City, N. Y. 11531

or
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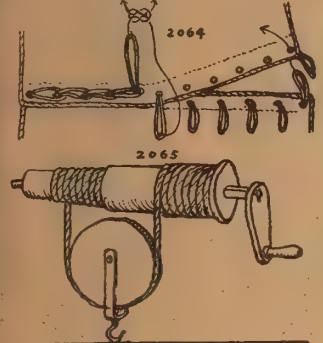
The Bell Ringer
172. The BELL RINGER'S KNOT is mentioned in Hutton's Dictionary of 1815. It is actually the first half of the ordinary SHEEPSHANK (#1153) and is probably a knot of considerable antiquity. Its purpose is to keep a long end of rope from lying on the belfry deck when not in use. The same knot is used in sail and rigging lofts and in ship chandleries to keep the ends of new rope off the floor.
173. If the rope is long and heavy two hitches are sometimes used instead of one, and, if necessary, several round turns may be taken instead of the single turn illustrated.

For dragging, you can get your shoulder into a bowline at the end of the rope, but if someone is needed to help you, you have to make a loop in the rope without using its ends. This can be a man-harness knot. Take up enough for the loop (Fig. 4C), and start to make an overhand knot in it (Fig. 4D). Instead of completing the overhand knot, grasp the opposite side of the loop through the part-knot and pull it through (Fig. 4E). To keep the knot in shape while doing this, hold one part of the rope under your foot while pulling upwards on the other part, and outwards at right angles on the loop.

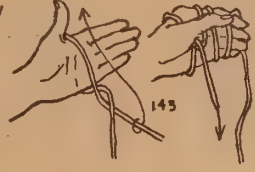
Fig. 108' A: The Single Fisherman's Knot is ordinarily used to tie gut, which is less likely to slip when tied with this form of knot than when joined with a reef knot or sheet bend. It is tied with the underhand loop on the left overlapping the underhand loop on the right in the manner shown. The bight is then pulled through as the drawn in line indicates.

B: Illustrates the knot after the operation has been completed. This knot is often called an Englishman's, true lover's or waterman's knot.

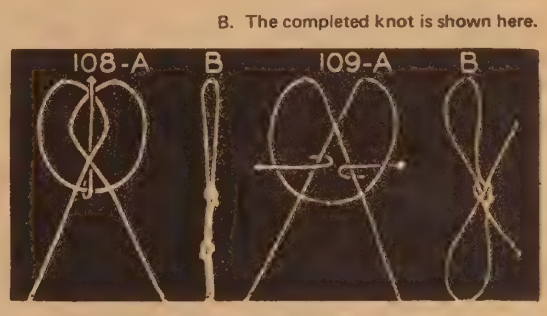
Fig. 109 A: The Tom Fool's Knot or Arizona Handcuff Hitches, also known as a Conjuror's Knot, is said to have been used as a rope handcuff in the early days of the West. It can also be used as a jar or pitcher sling. It is tied by forming a loop in the manner shown, with one part of the line crossing over and the other part crossing under the knot. The bights are then pulled through as indicated.



2064. **Latching** is an old method of attaching a drabber to a jib, or a bonnet to a fore and aft sail. Nowadays it is the method employed by circus in assembling the canvas sections of the tents. A series of eyelets in the upper section of the sail are opposite a series of loops, termed "keys," in the headrope of the bonnet. Starting at one side, a key is rove through the opposite eyelet and hauled to the next eye. The next key is rove through its opposite eye and through the key that was first led. This process is continued until the center is reached. The process is then repeated, beginning at the other edge of the sail. The two center loops, being twice as long as the rest, are reef knotted together. Captain John Smith described them in 1627, calling them "latches."
2065. The **Chinese windlass** is the grandfather of the present-day differential chain hoist. One end winds, while the other unwinds, and the right end of the barrel, being larger than the left, winds or unwinds a greater length of rope than the left end, with each revolution of the crank.



143. To break a heavy cord or string, take a turn of the cord around the left palm. Revolve the left hand so the cord is twisted in front of the palm, and wind the standing part several times around the fingers. Wrap the end (which is longer than illustrated) several times around the right hand; hold everything firm and jerk stoutly. In each of the two methods given the string crosses itself at right angles, one part being held rigidly while the other part is strongly jerked.
My first impression was that the weakening effect of this harsh crossing was the important factor in causing the string to break invariably at this point. One of the "laws" quoted in dictionary and encyclopedia knot discussions is that "the strength of a knot depends on the ease of its curves," and of course a right-angle crossing provides the uneasiest curve that is possible within a knot.



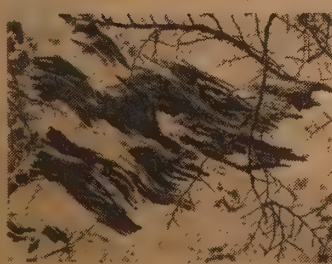
Zone System Manual

This invisible book contains the essence of Ansel Adams' zone system of photography distilled by Minor White, who has his own mastery. The term for the process is pre-visualization, which is looking at reality through an accurately imagined photographic print, then knowing how to make the calculations and mechanical and chemical adjustments so that the print has what you saw. It's all here.

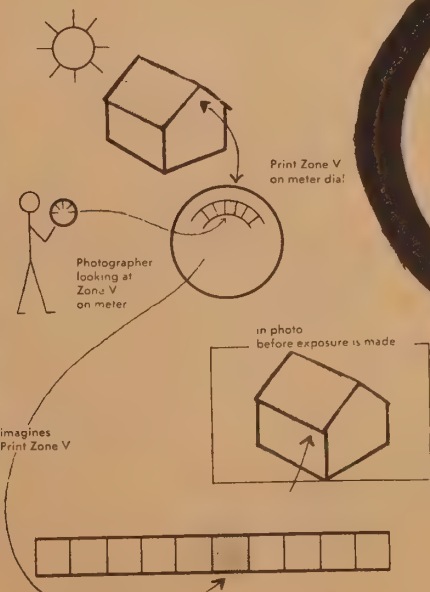
ZONE
a "Zone" as a visual unit of measurement is arrived at by altering a standard exposure by one "stop" more or one "stop" less. For example all the values in a scene exposed at f/11 at 1/25 second would print one "zone" lighter than a print of the same scene exposed at f/16 at 1/25 second. (Providing

of course that the two negatives were given identical development time and the same exposure time in the enlarger.)
This "one Stop" or "one Zone" alteration, links the "zone" to the classic 1:2 exposure ratio used in photography to calibrate shutter speeds and diaphragm openings or "stops."

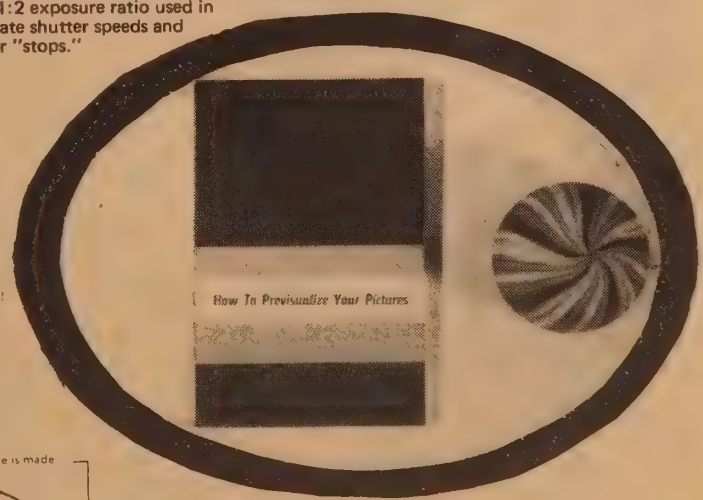
EXTEND PREVISUALIZATION UNTIL THE NEGATIVE IMAGE BELOW CAN BE SEEN IN YOUR OWN EYE



WHILE LOOKING AT THIS



THE 1st STAGE IN PREVISUALIZATION



Zone System Manual
Minor White
1965; 112 pp.

\$1.95 postpaid

from:
Morgan & Morgan, Inc.
25 Main Street
Hastings-on-Hudson, N.Y. 10706
or
WHOLE EARTH CATALOG

Macramé, the Art of Creative Knotting

The craft of knotted lacemaking has long been practiced by sailors passing lonely hours making belts and fringes for folk back home, by nuns devising decorations for ecclesiastical vestments and altar cloths, and by indigenous peoples working ornamentation on their costumes. Although designs for knotted pieces differ according to locale and use, there are very few individual knots. Virginia I. Harvey has collected photographs of traditional knotted pieces throughout the world and presents them in a book called *Macramé, the Art of Creative Knotting*. She carefully diagrams the half-knot, square knot, double half-hitch, diagonal double half-hitch, vertical double half-hitch and other knots. The basic knots are described in detailed instructions for making a sampler. Following the pattern for the sampler will give the beginner experience in doing the knots, and show how combining just a few types of knots can offer large pattern variation. Those willing to suffer through the tedium of learning a few basic knots by duplicating the sampler undoubtedly will find enjoyment in seeing a design grow out of a few lengths of string, besides having a pleasant tactile experience. If not, macramé is not the craft for you.

This book is the best reference manual of knotting technique available. It offers information on all facets of macramé, including discussion on planning, mounting, shaping and finishing a knotting project. Tools and materials are displayed. There are photos exhibiting how different fibers worked in the same pattern can vastly alter visual and textural effects. The pictorial history of macramé and examples of contemporary knotting projects offer plenty of design ideas for more advanced macramé craftsmen.

Knotters interested in explicit directions for traditional macramé purses can obtain patterns by sending \$1.10 to: Pesch Art Studio, 28 Colonial Parkway, Dumont, N. J. 07628 with a request for 'Macramé Bags,' Booklet A.

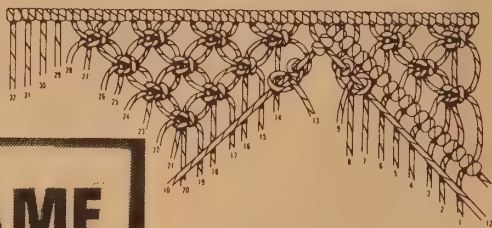
[Reviewed by Sue Boyle.
Suggested by Alexandra Jacopetti.]

Macramé, The Art of Creative Knotting

Virginia I. Harvey
1967; 128 pp.

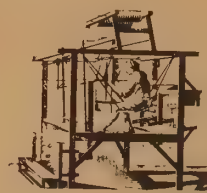
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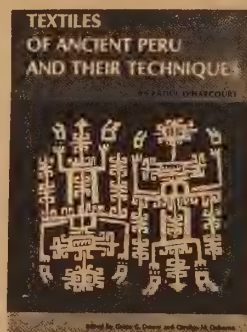
A COMPLETE CATALOG OF
WEAVING, SPINNING, KNOTTING, TAPES-
TRY, EMBROIDERY, AND OTHER CRAFTS
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1968 128

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[Suggested and reviewed by
Sarah Kahn.]

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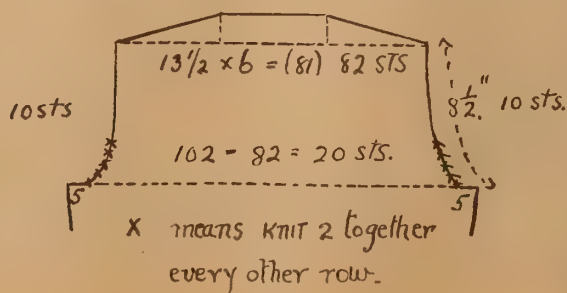
The Complete Book of Progressive Knitting

This is the most complete knitting book that I have seen. It discusses yarn, its qualities and history, and gives clear instructions on the basics of knitting. Where other books only give directions cryptically written as 'K1, *Y.O., K2 together *K1 repeat this row for the desired no. of rows,' this book tells you how to figure out the desired number of rows for all types of garments from sweaters to suits. The only real drawback I could see was the book's illustrations.

3. Armhole Formation

The shoulder to shoulder measurement is 13½ inches.
13½ × 6 sts to the inch = 81 sts.

An even number of stitches is always better in calculating any change of shape in knitting, therefore we shall use 82 sts for the required number across the shoulders.



Buttonholes are knitted as the fabric is being made, not slashed as in sewing. Therefore, it is advisable when knitting garments, to knit the side on which the buttons are to be fastened first. In this way the position of the buttons may easily be ascertained and marked, and hence be a guide for the buttonholes. This is important especially where the last buttonhole should be at the neck line. Decide upon the size of the button. If bands are used, the buttonhole is made in the center of the band. The width of the band usually depends upon the size of the buttonhole, that is, if a buttonhole requires 4 stitches, the band should be at least 8 stitches wide, allowing ½ the width of the button on each side of the buttonhole.

Method. The position and size of each buttonhole having been ascertained, bind off the necessary number of stitches at this point. Continue to complete the row as previously, and back again to where the stitches have been bound off. The stitches are added the same way as the second method in the Chapter on Fundamentals.

Note. Turn the work to the wrong side to add the stitches and back again to the right side after they have been added.

After the garment is completed, the buttonholes should be finished with buttonhole stitches, using the same yarn if possible, or should be reinforced with binding on the wrong side.

Garments of pure wool yarns are hard to ignite even with an open flame, because wool is slow to oxidize. This is a great protection in the home, especially where there are young children.

Wool may be knitted or woven into fabrics of delicate sheerness, unsurpassed by any other fiber, and lightness is one of the essentials of modern attire.

THE COMPLETE BOOK OF PROGRESSIVE KNITTING

IDA RILEY

The Complete Book of Progressive Knitting

Ida Riley Duncan
1966; 384 pp.

\$5.95 postpaid

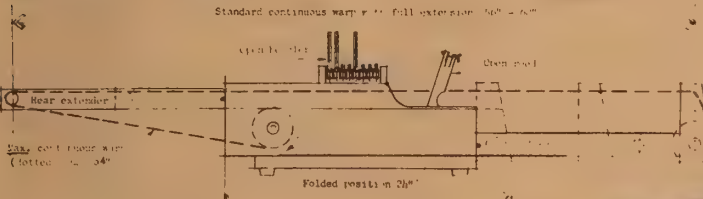
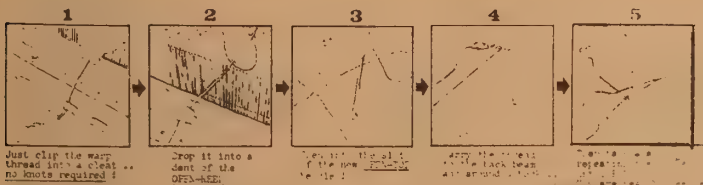
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or
WHOLE EARTH CATALOG

Leclerc Loom

Leclerc Industries offers a large catalog of weaving accessories & looms of all types and sizes. Highly recommended by owners & users (these looms are found in the weaving depts. of many schools).

[Suggested by Janet Grosser]

Free catalog from Leclerc Industries P.O. Box 267 Champlain, N. Y.



Pioneer Loom

A breakthrough. Table looms 10", 15", or 20"; available with 2, 4, 6 or 8 harnesses. A unique warping system which saves time and permits great flexibility in design. Since the heddles & reed are open, and the frame is extendable, the warp can be one continuous thread taken directly from a ball of yarn. The usual warping sequence is simplified into one operation that takes only minutes to complete. No extra equipment is needed; the loom itself can displace warping board, lease sticks, hook, & raddle.

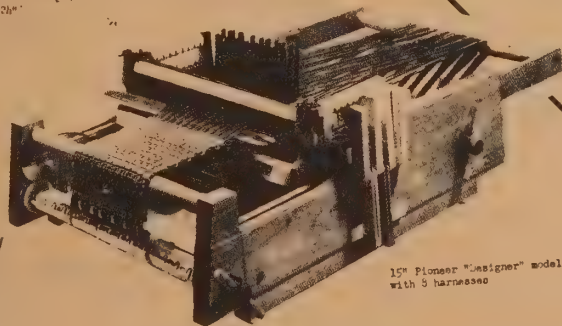
Because the warp can be one continuous thread (or several continuous threads used alternately), design can occur spontaneously without previous exacting calculations. Warp threads can be adjusted from one dent to another & from one heddle to another even after weaving has begun.

Why haven't looms always been made like this?

Prices range from \$94.50 for 10" 2-harness 'Sampler' to \$169.50 for 20" 8-harness 'Craftsman.'

[Suggested by Rose Sargent. Reviewed by Sarah Kahn.]

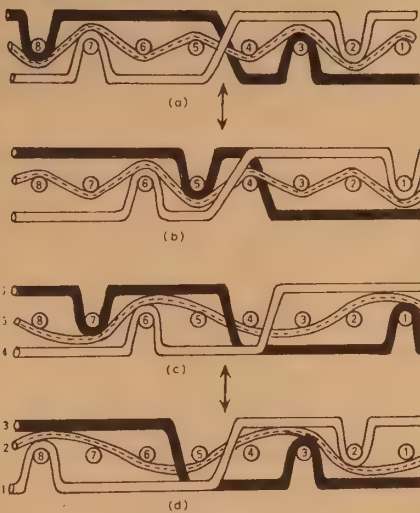
Loom or additional information from Craft & Hobby Book Service Box 626 Pacific Grove, CA 93950 or Northwest Looms Box 241 Coburg, Ore. 97401



15" Pioneer "Designer" model with 5 harnesses

PETER COLLINGWOOD

The Techniques of Rug Weaving



The Techniques of Rug Weaving

Peter Collingwood 1966; 480 pp.

\$17.50 postpaid

from Watson-Guption Publications 165 West 46 2160 Patterson Street Cincinnati, Ohio 45214 or WHOLE EARTH CATALOG

The Techniques of Rug Weaving

Here at last and it's ALL here! Like some fantastic teacher—gives you just what you need to know—being thorough, comprehensive, scholarly, inspiring (I'M GOING TO WEAVE A RUG!) Over 400 lucid diagrams, 174 illustrations, only 4 in color but how much can one ask? Detailed coverage of every aspect of rug weaving from fundamentals to most advanced & formerly obscure techniques; from ancient methods to Collingwood's own inventive technical developments. As further application beyond rugs can be made for most of the weaves, this is a book for all weavers. Formidable!

[Reviewed by Sarah Kahn]

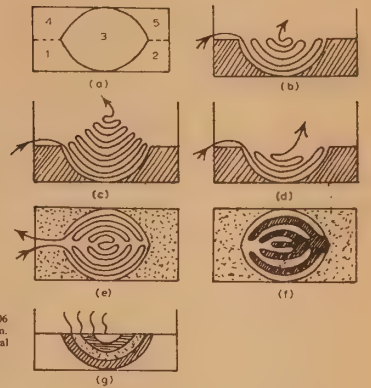


Fig. 106 Kilim. Weaving an oval

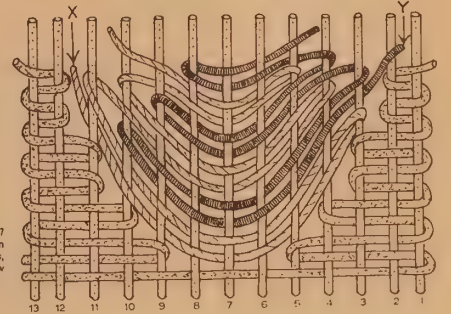


Fig. 107 Kilim. Weaving an oval with two wefts, detailed view



CUM Yarn Samples

Though one can stockpile free & usually mediocre yarn catalogs, \$3 sent to CUM brings a large binder filled with sample-cards of handweaving yarns of finest quality, large color range, yet cheaper than dime-store knitting worsted.

CUM is now set up to handle U.S. orders; their catalog/price list is in English, gives price per pound in dollars unlike other European yarn houses. Samples include 1 & 2-ply woolen yarn, rug, tapestry & knitting yarns, 2/20 worsted, cotton & linen yarns, rug warps, twine. All yarns are mothproofed; prices average less than \$3/lb. for yarns of high quality, esthetically and structurally. Orders answered promptly; delivery time approx. 6 weeks by ship, less than 2 weeks by air.

Catalog and Binder of samples

\$3.00 postpaid

from CUM Textile Industries, Ltd. Rømersgade 5 1362 Copenhagen K Denmark



[Suggested and reviewed by Sarah Kahn.]

Intelligent Life in the Universe

Methodically blow your mind. The information in this book, mutually massaged by the American and Soviet co-authors, proceeds from superb introductions to evolutionary astronomy and biology, through a complete presentation of recent discoveries of astronomy and space science, to brilliant speculation on the parameters of inter-civilization communication. It's the best general astronomy book of recent years but that's nothing next to its impact on all the biggest questions we know.

The existence of more than one universe is impossible, by definition.

In our discussion up to this point, we have considered only interstellar radio contact among civilizations at or just slightly beyond our present state of technical advance. Yet the bulk of technical civilizations in the universe may be immensely more advanced than ours—perhaps even billions of years beyond. The Soviet astrophysicist N.S. Kardashev, an associate of I.S. Shklovskii at the Sternberg Astronomical Institute, has considered the possibility of the detection of signals from such greatly advanced civilizations. He classifies possible technologically advanced civilizations in three categories: (I) A level of technological advance close to that of the contemporary terrestrial civilization. The rate of energy consumption is about 4×10^{19} ergs sec^{-1} . (II) A civilization capable of utilizing and channeling the entire radiation output of its star. The energy utilization would then be comparable to the luminosity of our Sun, about 4×10^{33} ergs per second. In Chapter 34, we will consider a specific proposal for the harnessing of such power. (III) A civilization with access to the power comparable to the luminosity of an entire galaxy, some 4×10^{44} ergs per second.

Taken at face value, the legend suggests that contact occurred between human beings and a non-human civilization of immense powers on the shores of the Persian Gulf, perhaps near the site of the ancient Sumerian city of Eridu, and in the fourth millennium B.C. or earlier. There are three different but cross-referenced accounts of the *Apkallu* dating from classical times.

Almost any other of the many accounts of alleged contacts of human beings with the crews of flying saucers—accounts which regale the flying saucer societies—follow the same pattern and stress the same points. The extraterrestrials are human, with few even minor physical differences from local cosmetic standards. (I know of no case of Negro saucerians, or Oriental saucerians, reported in the United States; but there are very few flying saucer reports made in this country by Negroes or by Orientals.)

Human Biocomputer

John Lilly has worked for a long time with sensory deprivation, pursuing the notion that relieving the computer (mind) of many of its environmental-survival chores frees it to attend more fully to self-investigation. Of late he's added LSD to the process and has found ways to flourish and discover within this doubly floating condition.

The paper Human Biocomputer is the best internal guidebook I've seen—far more practical and generalized than transcendent Eastern writings or wishful Underground notes. Though it's not the whole story by any means, it makes an open start on fresh language and powerful technique for the frontier.

An additional advantage the paper offers is the opportunity to learn and explore computers without requiring money or administrative approval. You inherited and grew everything you need, and it's free.

For example, the term 'reprogramming substances' may be appropriate for compounds like lysergic acid diethylamide. For substances like ethyl alcohol the term 'metaprogram-attenuating substances' may be useful.

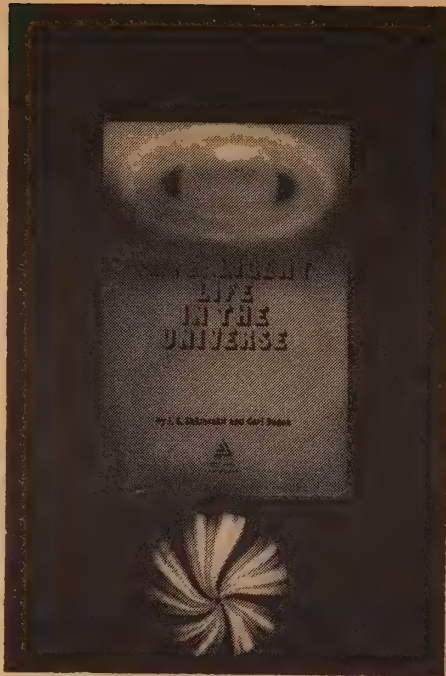
I believe that by using certain methods and means some of which are presented in this work that truly talented and dedicated individuals can forge, find, and devise new ways of looking at our minds, ways which are truly scientific, intellectually economical, and interactively creative. Consider for example, the case of the fictitious individual created by the group of mathematicians masquerading under the name of "Dr. Nicholas Bourbaki."

This group of mathematicians in order to create a mathematics or sets of mathematics beyond the capacity of any one individual, held meetings three times a year and exchanged ideas, then went off and worked separately. The resulting papers were published under a pseudonym because the products of this work were felt to be a group result beyond any one individual's contribution.

The major problems of the research of interest to the author center on the erasability, modifiability, and creatibility of programs. In other words, I am interested in the processes of finding metaprograms (and methods and substances) which control, change, and create the basic metaprograms of the human computer. It is not known whether one can really erase any program.

The boundary of the brain, of course, may be considered as the limits of the extensions of the central nervous system into the periphery.

In the maximally attenuated environment (92 to 95 degrees F, isothermal skin, saltwater suspension, zero light levels, near-zero sound levels, without clothes, without wall or floor contacts, in solitude in remote isolation, for several hours), the addition of LSD-25 allows one to see that all the previous experiences with 'outside screens' are evasions of deeper penetration of self (and hence are "screens" in the sense of 'blocking the view behind,' as well as 'receiving the projected images').



Intelligent Life in the Universe
I.S. Shklovskii and Carl Sagan
1966; 509 pp.

\$2.95 postpaid

from:
Delta Books
c/o Montville Warehousing Co., Inc.
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Pine Brook, N.J. 07058
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Elk Grove Village, Illinois 60007
1104 S. Lawrence Street
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WHOLE EARTH CATALOG

But how can a natural satellite have such a low density? The material of which it is made must have a certain amount of rigidity, so that cohesive forces will be stronger than the gravitational tidal forces of Mars, which will tend to disrupt the satellite. Such rigidity would ordinarily exclude densities below about 0.1 gm cm^{-3} . Thus, only one possibility remains. Could Phobos be indeed rigid, on the outside—but hollow in the inside? A natural satellite cannot be a hollow object. Therefore, we are led to the possibility that Phobos—and possibly Deimos as well—may be artificial satellites of Mars.

"Well, ladies and gentlemen," Struve concluded, "it was pretty dull on Epsilon Eridani and Tau Ceti eleven years ago."

With 10^{11} stars in our Galaxy and 10^9 other galaxies, there are at least 10^{20} stars in the universe. Most of them, as we shall see in subsequent chapters, may be accompanied by solar systems. If there are 10^{20} solar systems in the universe, and the universe is 10^{10} years old—and if, further, solar systems have formed roughly uniformly in time—then one solar system is formed every $10^{10} \text{ yr} = 3 \times 10^3$ seconds. On the average, a million solar systems are formed in the universe each hour.

[Suggested by Ralph Metzner]

The information contained in a single human sperm cell is equivalent to that of 133 volumes, each of the size and fineness of print of Webster's Unabridged Dictionary.

So, by an interesting coincidence, the distances between the stars in interstellar space, relative to their diameters, are just about the same as the distances between the atoms and molecules in interstellar space, relative to their diameters. Interstellar space is as empty as a cubical building, 60 miles long, 60 miles wide, and 60 miles high, containing a single grain of sand.

Radio astronomers may be interested to know that the so-called "brightness temperature" of the Earth at television wavelengths is some hundreds of millions of degrees. This is 100 times greater than the radio brightness of the sun at comparable wavelengths, during a period of low sunspot activity.

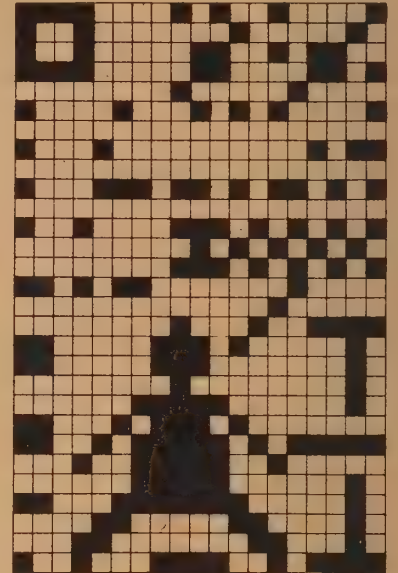
▽ An advanced technical civilization is trying to communicate with us. But how can we possibly understand what they are saying? They are not likely to speak English or Russian. They have had a different evolutionary history. They are on a planet with perhaps an entirely different physical environment. Their thought

Decode this:

```
1111000010100100001100100000010000010100
1000001100101100111000001100001101000000
00100000100001000010001010100001000000000
0000000000100010000000001011000000000000
0000000100011011010110101000000000000000
00001001000011101010101000000000101010101
00000000011101010111010110000001000000
000000000010000000000000100010011111000
0011101000001011000001110000000100000000
100000001000000011110000001011000101110
100000001100101111010111100010011111001
000000000001111000000101100011111100000
10000011000001100001000011000000011000101
001000111100101111
```

FIGURE 30-1. A hypothetical interstellar message due to Frank Drake. The 551 zeros and ones are representations of the two varieties of signals contained in the message. The problem is to convert this sequence of 551 symbols into an intelligible message, knowing that there has been no previous communication between the transmitting and receiving civilizations.

into this:



Now decode this for physiological, astronomical, chemical, mathematical, social, historical, and linguistic information.

Later with higher motivational energy the subject returned to the problem of the lock, the doors and the rooms somewhat refreshed by the experiences in the other realms.

The essential features and the goals sought in the self-analysis is the metaprogram "make the computer general purpose". In this sense we mean that in the general purpose nature of the computer there can be no display, no acting, or no ideal which is forbidden to a consciously willed program. Nor is any display, acting, or ideal made without being consciously programmed.

"Mathematical transformations" were next tried in the approach to the locked rooms. The concept of the key fitting into the lock and the necessity of finding the key was abandoned and the rooms were approached as "topological puzzles." In the multidimensional cognitional and visual space the rooms were now manipulated without the necessity of the key in the lock.

The Mind of the Dolphin

Lilly knows that it is to everybody's advantage for one kind of computer to link up with another, and that's his program with dolphins. This book reports his speculations and experiments with dolphins in recent years. Included is a thorough account by a girl, Margaret Howe, who lived alone with Peter Dolphin for 10 weeks. As usual with research on communication, everything discovered has broad implications.

Sometimes I feel that if man could become more involved in some problems of an alien species, he may become less involved with his own egocentric pursuits, and deadly competition within his species, and become somehow a better being.

We are often asked, "If the dolphins are so intelligent why aren't they ruling the world?" My very considered answer to this is—they may be too wise to try to rule the world. The question can be easily turned around, Why does man or individual men want to rule the world? I feel that it is a very insecure position to want to rule all of the other species and the vast resources of our planet. This means a deep insecurity with the "universes" inside of one's self. One's fears and one's angers are being projected on others outside of one's self; to rule the world is, finally, to rule one's inner realities.

Thus a given dolphin can carry on a whistle conversation with his right side and a clicking conversation with his left side and do the two quite independently with the two halves of his brain.

Conservatively, we estimate that the dolphin can put out ten times the sonic physical information per second that a man produces.

The information does not exist as information until it is within the higher levels of abstraction of each of the minds and computed as such. Up to the point at which it becomes perceived as information, it is signals. These signals travel through the external reality between the two bodies, and travel as signals within the brain substances themselves. Till the complex patterns of traveling neuronal impulses in the brain are computed as information within the cerebral cortex, they are not yet information. Information is the result of a long series of computations based on data signal inputs, data signal transmissions to the brain substance, and recomputations of these data.



The Mind of the Dolphin
John Cunningham Lilly, M.D.
1967; 286 pp.

\$.95 postpaid

from
Avon Books
250 West 55 Street
New York, N. Y. 10019
or
WHOLE EARTH CATALOG

By long and hard work I found that the evil label "negative" should not be tied to any mode or any kind of thinking at all.

I found that bodily sources of discomfort, pain, or threat tend to program the mind in the negative mode and keep it there as long as the discomfort continues. As long as pain, even at a very low level, continues, the computer (which is one's mind) tends to program a negative pall.

Once one has been through deep experiences in tune with the vast forces of the universe, the vast forces within ourselves, we see that the need for conflict, the need for hostility, and the need for hatred become less intense. One finds the universe inside and the one outside so vast and so lonely that any other living thing that loves or shows any signs of loving is precious and close.

The human participant's assumptions, i.e., those of Margaret C. Howe, in her own words are as follows:

1. Dolphins are capable of communication with man on the level of high intelligence.
2. Dolphins are not only capable of this communication but are eager for it and are willing to cooperate with man to achieve it.
3. Possibly the best way to go about establishing this communication is to set up a situation where the man (woman) and a dolphin live together as closely as possible for an extended period of time.
4. This is a long process and involves many steps, each of which must be recognized and encouraged. The attempt to communicate with a dolphin in English involves two main parts: (1) the dolphin must learn how to physically say the words, and (2) he must learn the meaning of what he is saying. These two parts may be worked out out individually or simultaneously.
5. One first step is the creation and the maintenance of the mutual trust and reciprocal rewards one for the other.

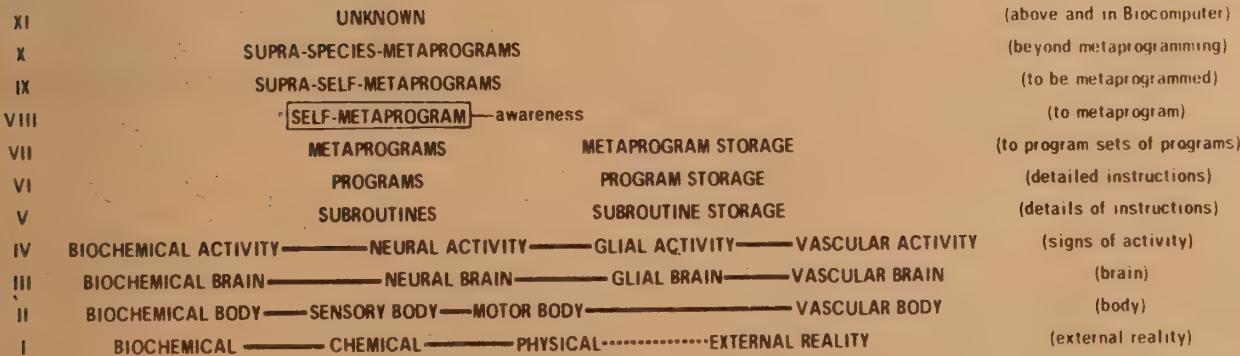
In the analysis of the effects of LSD-25 on the human mind, reasonable hypothesis states that the effect of these substances on the human computer is to introduce "white noise" (in the sense of randomly varying energy containing no signals of itself) in specific systems in the computer

The increase in "white noise" energy allows quick and random access to memory and lowers the threshold to unconscious memories ("expansion of consciousness"). In such noise one can project almost anything at almost any cognitive level in almost any allowable mode.

The noise introduced brings a certain amount of disorder with it, even as white noise in the physical world brings randomness. However, the LSD-25 noise randomizes signals only in a limited way: not enough to destroy all order, only enough to superimpose a small creative 'jiggling' on program materials and metaprograms and their signals.

In the complete physical absence of other external computers within the critical interlock distance, the self-directed and other-directed programs can be clearly detected, analysed, recomputed, re-programmed, and new metaprograms initiated by the solitudinous computer itself. In the as-completely-as-possible-attenuated-physical-reality environment in solitude, a maximum intensity, a maximum complexity and a maximum speed of re-programming is achievable by the self.

LEVELS

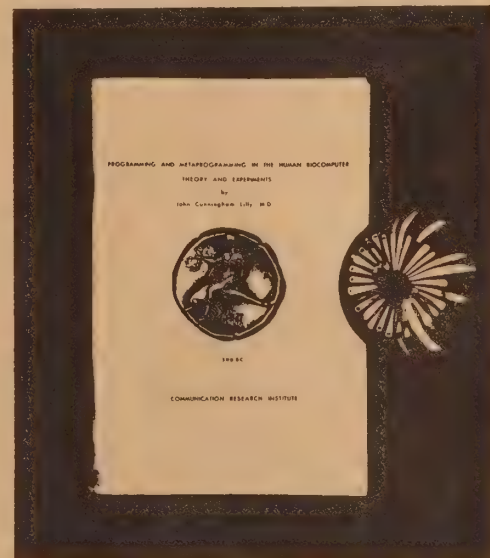


(John C. Lilly, 1967)
REVISIONS as of February, 1968

Figure 1. Schems of the Levels of the Functional Organization of the Human Biocomputer

Each part of each level has feedback-control relations with each other part, indicated by the connecting lines. Each level has feedback-control with each other level. For the sake of schematic simplicity, many of these feedback connections are not shown. One example is an important connection between Levels VI through IX and X; some built-in, survival programs have a representation at the Metaprogram Level which places a representative at the Supra-Self-metaprogram Level as follows. "These programs are necessary for survival; do not attenuate or excite them to extreme values, such extremes lead to non-computed actions, penalties, illness, or death." After construction, such a Metaprogram is transferred by the Self-metaprogram to the Supra-self-metaprograms and to the Supra-species-metaprograms for future control purposes. The boundaries between the body and the external reality are between

Levels I and II, certain energies and materials pass this boundary in special places (heat, light, sound, food, secretions, feces). Boundaries between body and brain are between Levels II and III, special structures pass this boundary (blood vessels, nerve fibers, cerebro-spinal fluid). Levels IV through XI are in the brain circuitry and are the software of the Biocomputer. Levels above Level X are labeled "Unknown" for the following purposes: (1) to maintain the openness of the system, (2) to motivate future scientific research, (3) to emphasize the necessity for unknown factors at all levels, (4) to point out the heuristic nature of this schema, (5) to emphasize unwillingness to subscribe to any dogmatic belief without testable reproducible data, and (6) to encourage creative courageous imaginative investigation of unknown influences on and in human realities, inner and outer.



Human Biocomputer
John C. Lilly, M.D.
1967; 160 pp.

\$7.95 postpaid

from
Esalen Institute
Big Sur, CA 93920

or
WHOLE EARTH CATALOG

(Note. See text and glossary for definitions of terms used.)

Understanding Media

Everybody talks about McLuhan, and everybody does something about him, and that makes it subjectively harder to get at him. He's got other insights than what you hear about, so it's worth the trouble to track him down, both his current sayings and his prime collections. An excellent set of recent sayings was in a *Playboy* interview a few months ago (he foresaw the imminent demise of language into global telepathy: 'The body of Christ'). For prime collection the primest is *Understanding Media*.

[Suggested by Gerd Stern, then.]

Understanding Media

Marshall McLuhan
1964; 318 pp.
\$.95 postpaid

from
Signet — New American Library, Inc.
1301 Avenue of the Americas
New York, N. Y. 10019

or
WHOLE EARTH CATALOG



Eventually the method of the counting board gave rise to the great discovery of the principle of position in the early centuries of our era. By simply putting 3 and 4 and 2 in position on the board, one after another, it was possible to step up the speed and potential of calculation fantastically. The discovery of calculation by positional numbers rather than by merely additive numbers led, also, to the discovery of zero. Mere positions for 3 and 2 on the board created ambiguities about whether the number was 32 or 302. The need was to have a sign for the gaps between numbers. It was not till the thirteenth century that sifr, the Arab word for 'gap' or 'empty,' was Latinized and added to our culture as 'cipher' (ziphirum) and finally became the Italian zero. Zero really meant a positional gap.

'Work,' however, does not exist in a nonliterate world. The primitive hunter or fisherman did no work, any more than does the poet, painter, or thinker of today. Where the whole man is involved there is no work.

If the phonetic alphabet was a technical means of severing the spoken word from its aspects of sound and gesture, the photograph and its development in the movie restored gesture to the human technology of recording experience.

Man the food-gatherer reappears incongruously as information-gatherer. In this role, electronic man is no less a nomad than his paleolithic ancestors.

Said the Duke of Gloucester to Edward Gibbon upon the publication of his *Decline and Fall*: 'Another damned fat book, eh, Mr. Gibbon? Scribble, scribble, scribble, eh, Mr. Gibbon?'

Language does for intelligence what the wheel does for the feet and the body. It enables them to move from thing to thing with greater ease and speed and ever less involvement.

As W. B. Yeats wrote of this reversal, 'The visible world is no longer a reality and the unseen world is no longer a dream.'

Even slight changes in the environment of the very well adjusted find them without any resource to meet new challenge. Such is the plight of the representatives of 'conventional wisdom' in any society. Their entire stake of security and status is in a single form of acquired knowledge, so that innovation is for them not novelty but annihilation.

Everybody experiences far more than he understands. Yet it is experience, rather than understanding, that influences behavior, especially in collective matters of media and technology, where the individual is almost inevitably unaware of their effect upon him.

It is a principal aspect of the electric age that it establishes a global network that has much of the character of our central nervous system. Our central nervous system is not merely an electric network, but it constitutes a single unified field of experience. As biologists point out, the brain is the interacting place where all kinds of impressions and experiences can be exchanged and translated, enabling us to react to the world as a whole.

Not only does the visual, specialist, and fragmented Westerner have now to live in closest daily association with all the ancient oral cultures of the earth, but his own electric technology now begins to translate the visual or eye man back into the tribal and oral pattern with its seamless web of kinship and interdependence.

Meantime, the countryside, as oriented and fashioned by plane, by highway, and by electric information-gathering, tends to become once more the nomadic trackless area that preceded the wheel.

Cybernetics

McLuhan's assertion that computers constitute an extension of the human nervous system is an accurate historical statement. The research and speculation that led to computer design arose from investigation of healthy and pathological human response patterns embodied in the topological make-up of the nervous system. Insights here soon expanded into generalizations about communication that permitted the building of analogous electronic devices physically separate from the Central Nervous System. But they're just one artifact of these new understandings about communication. Society, from organism to community to civilization to universe, is the domain of cybernetics. Norbert Wiener has the story, and to some extent, is the story.

transmission of information. It is possible to give a sort of measure to this by comparing the number of decisions entering a group from outside with the number of decisions made in the group. We can thus measure the autonomy of the group. A measure of the effective size of a group is given by the size which it must have to have achieved a certain stated degree of autonomy.

Thus small, closely knit communities have a very considerable measure of homeostasis; and this, whether they are highly literate communities in a civilized country or villages of primitive savages. Strange and even repugnant as the customs of many barbarians may seem to us, they generally have a very definite homeostatic value, which it is part of the function of anthropologists to interpret. It is only in the large community, where the Lords of Things as They Are protect themselves from hunger by wealth, from public opinion by privacy and anonymity, from private criticism by the laws of libel and the possession of the means of communication, that ruthlessness can reach its most sublime levels. Of all of these anti-homeostatic factors in society, the control of the means of communication is the most effective and most important.

To predict the future of a curve is to carry out a certain operation on its past.

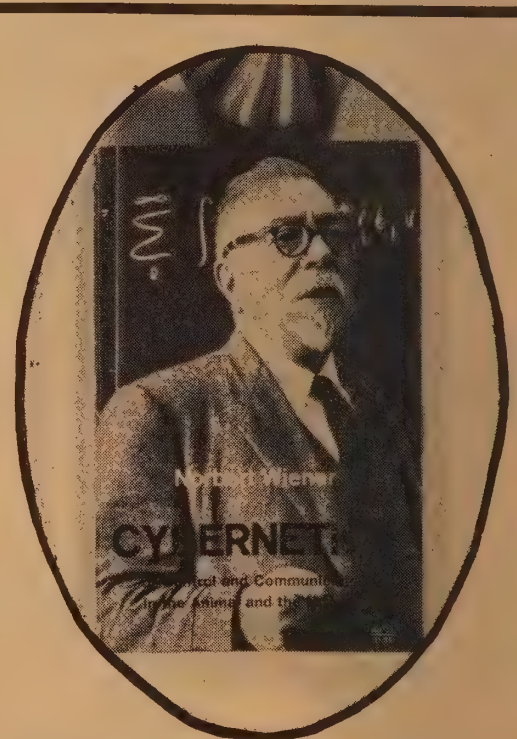
The central nervous system no longer appears as a self-contained organ, receiving inputs from the senses and discharging into the muscles. On the contrary, some of its most characteristic activities are explicable only as circular processes, emerging from the nervous system into the muscles, and re-entering the nervous system through the sense organs, whether they be proprioceptors or organs of the special senses. This seemed to us to mark a new step in the study of that part of neurophysiology which concerns not solely the elementary processes of nerves and synapses but the performance of the nervous system as an integrated whole.

The mongoose begins with a feint, which provokes the snake to strike. The mongoose dodges and makes another such feint, so that we have a rhythmical pattern of activity on the part of the two animals. However, this dance is not static but develops progressively. As it goes on, the feints of the mongoose come earlier and earlier in phase with respect to the darts of the cobra, until finally the mongoose attacks when the cobra is extended and not in a position to move rapidly. This time the mongoose's attack is not a feint but a deadly accurate bite through the cobra's brain.

In other words, the snake's pattern of action is confined to single darts, each one for itself, while the pattern of the mongoose's action involves an appreciable, if not very long, segment of the whole past of the fight. To this extent the mongoose acts like a learning machine, and the real deadliness of its attack is dependent on a much more highly organized nervous system.

The feedback of voluntary activity is of this nature. We do not will the motions of certain muscles, and indeed we generally do not know which muscles are to be moved to accomplish a given task; we will, say, to pick up a cigarette. Our motion is regulated by some measure of the amount by which it has not yet been accomplished.

To use a biological analogy, the parallel system had a better homeostasis than the series system and therefore survived, while the series system eliminated itself by natural selection. We thus see that a non-linear interaction causing the attraction of frequency can generate a self-organizing system.....



Cybernetics — or Control and Communication in the Animal and the Machine

Norbert Wiener
1948, 1961; 212 pp.

\$2.45 postpaid

from:
The M.I.T. Press
Cambridge, Mass: 02142
or
WHOLE EARTH CATALOG

Cybernetic Serendipity

This book started life as an exhibit at the Institute of Contemporary Arts in London last year. Simultaneously it was an issue of *Studio International* magazine. It must have been an Event. Certainly it is the best collection of computer art yet, the only one not dismissable as engineers kidding themselves. There's been talk for years (e.g. *The New Landscape*, 1956) of how art and science are gonna come together, and indeed communications have improved. But there was no direct avenue, no real mutual domain. Not until computers got common enough for funky hands to lay hold of them to do tricks for funky heads. That's happening now, and this book is good evidence. Ahead, deep space.

Cybernetic Serendipity
1969; 100 pp; 260 illustrations

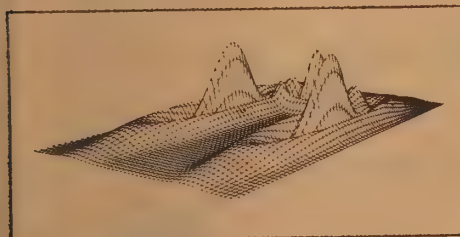
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New York, N. Y. 10003

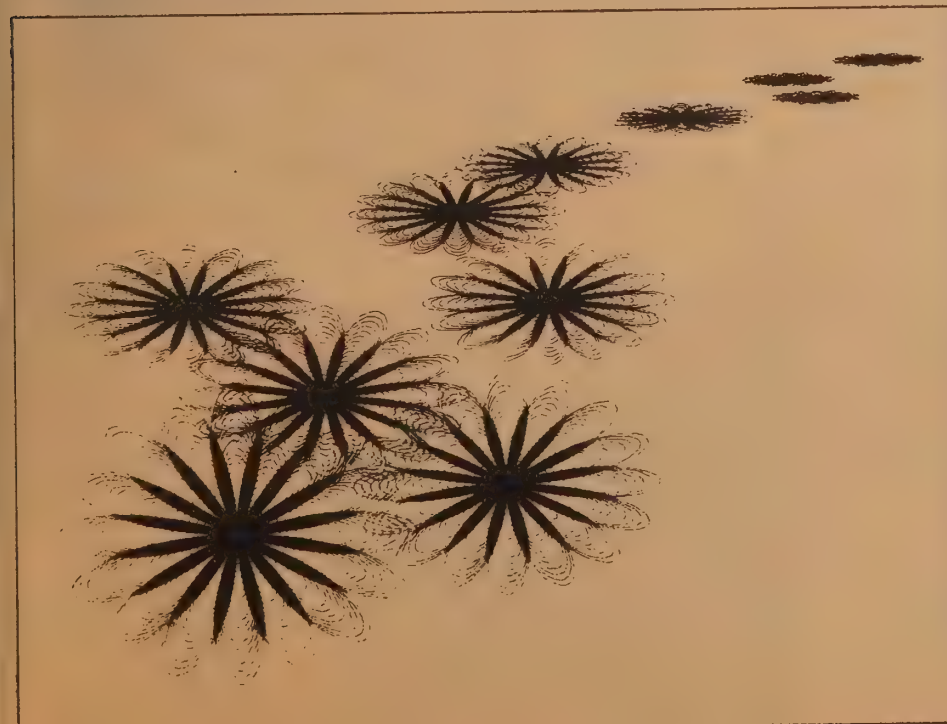
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- 1 Poem
eons deep in the ice
I paint all time in a whorl
bang the sludge has cracked
- 2 Poem
eons deep in the ice
I see gelled time in a whorl
pffftt the sludge has cracked
- 3 Poem
all green in the leaves
I smell dark pools in the trees
crash the moon has fled
- 3 Poem
all white in the buds
I flash snow peaks in the spring
bang the sun has fogged

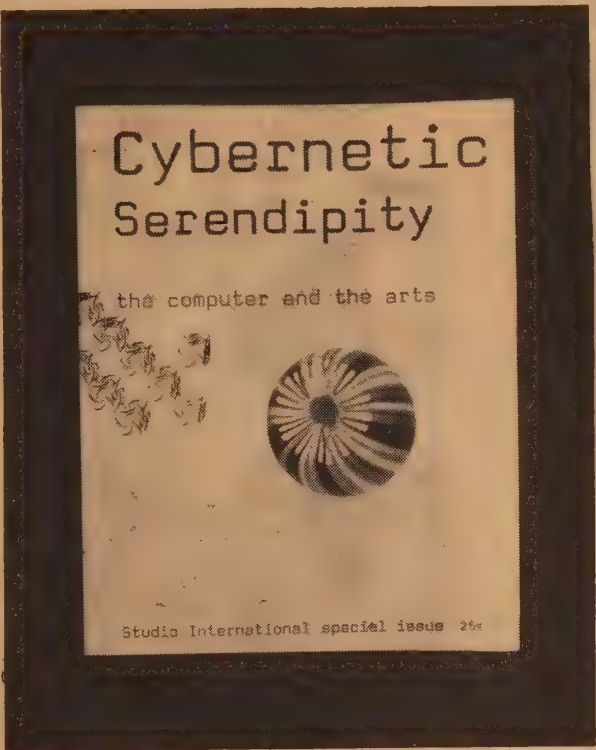
(Art, if you want a definition of it, is criminal action. It conforms to no rules. Not even its own. Anyone who experiences a work of art is as guilty as the artist. It is not a question of sharing the guilt. Each one of us gets all of it.)



To co-operate or even to orient themselves and to engage their programmes, the mobiles must communicate. They do so in a simple but many-levelled language of light flashes and sounds. You may engage in this discourse if you wish to, though your goals may be alien to the goals of the mobiles; for example, you might be trying to achieve a configuration that you regard as pleasing.



Running cola is Africa



A sustained image of the visual world around us is maintained by the brain's continual coordination of a great flux of varying sensory input. Much of this co-ordination is achieved by the series of voluntary and involuntary eyemovements which serve to scan the image of the pattern across the retina. When these eyemovements are eliminated or controlled, a remarkable collapse of the perceptual process occurs in which visual patterns disintegrate—but in non-random fashion, and according to 'rules' which appear to be common to all humans. The device, which we have called the CYBERNETIC INTROSPECTIVE PATTERN-CLASSIFIER—because that is as good a description as any—is not really the exhibit itself: it is by means of this device that the human brain can be turned into its own exhibit. People looking into the CIPC will be given a brief, bright flash of a pattern which plants an image on the retina in such a way that it can be seen, with eyes closed, for one or two minutes. Since the image is fixed on the retina, eyemovements are irrelevant, and the perceptual system collapses as described above. The pattern can be seen to fragment and change its form, and these forms are probably the basic perceptual units used by the brain in recognising the pattern. This exhibit therefore allows people to watch their own cerebral processes actually in action.

A Model of the Brain

Inside every brain there is a model of the world. How does all the elaborate wiring help us, or any other creature, make our model of the world? A noted British anatomist, J. Z. (Jay Zed) Young has spent many pleasant summers in Naples studying the behavior of octopuses, and has also done a great deal of work on the anatomy of their nervous system. The result is a fascinating picture of how to teach octopuses to do things, and some interesting—though not yet very deep—speculation on how cybernetics might help us to relate brain structure to external behavior. Especially interesting are the many hypotheses about the building of networks which can learn. At this early stage all such models are wrong, but we learn from our mistakes. One approach to all this is mental introspection. Here, on the other hand, we learn what we can learn about learning by literally introspecting: looking inside the head of an octopus to see what networks there could possibly change as the animal learns.

[Reviewed by Michael Arbib.
Suggested by David Evans.]

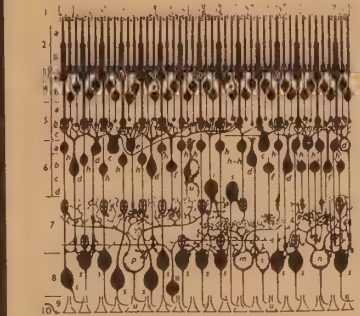


Fig. 28. Scheme of the structure of the primate retina as revealed by the Golgi staining method. Light enters from the bottom of this diagram. The layers and zones are: a, pigment layer; 2a, outer zone of rod and cone layer; 2b, inner zone of rod and cone layer; 3, outer limiting membrane; 4a, b, outer zone, inner zone of the outer nuclear layer; 5a, b, c, outer, middle, and inner zones of the outer plexiform layer; 6, inner nuclear layer with its four zones; 7, inner plexiform layer; 8, layer of ganglion cells; 9, layer of optic nerve fibers; 10, inner limiting membrane; 11, 12a, b, c, d, e, f, g, h, bipolar cells; 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100. (From Hubel, 1977.)

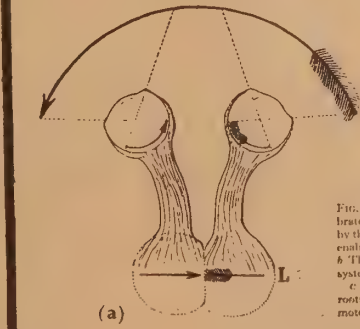
A Model of the Brain

J.Z. Young
1964; 348 pp.

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First we may compare the genetic method of obtaining an adequate representation of the environment with the method provided by 'adaptational' changes and learning in the nervous system. Both systems operate by selection from a code. Indeed, it is basically the same DNA code in the two cases. However, in neural learning, as we have seen, the symbols among which selection is made may be more complex products of the genetic code, such as the dendritic trees of the neurons. The important difference between the two methods of acquiring information seems to be that a random selective element enters into one, but the nervous system functions with rapid and precise feed-backs. These are themselves designed by the hereditary instructions to provide precise information about the results of each action, whether it is good or bad for the organism, whether it yields pleasure or pain.

This presumably means that the nervous system can make representations of the environment much faster than can the genetic system. Yet the nervous system has the limitations that we have considered, it needs repair and cannot proceed indefinitely alone. We have, therefore, to discover how the homeostat is adjusted to ensure that both methods are used, with an effective timing.

It is clear enough that the two methods must stand in some reciprocal relationship. The better the means of repair, adaptation, and learning, the less often will it be necessary to undertake a basic revision of the instructions of the homeostat. And indeed, it seems to be a rough general rule that types of organism that learn better live longer.

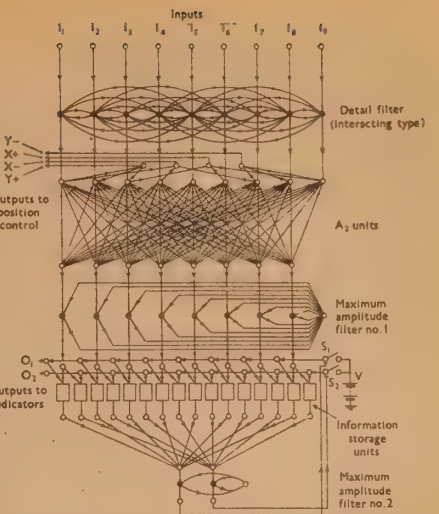


Fig. 107. Signal flow diagram of experimental automatic pattern-recognition apparatus. The inputs to the nine detail filter terminals are supplied by photoelectric multipliers arranged in a 3x3 matrix. Patterns are centred automatically by combining outputs of the detail filter to form position controls. The filtered inputs are then connected to eight 'A2' units, one of these will show a maximum amplitude filter for each pattern (Fig. 108) and this is selected by the first maximum amplitude filter. The outputs of these supply eight pulse generators and these in turn sixteen capacitor storage units. During the teaching process the switches S1 and S2 are closed manually or by means of some artificial external classification system. After learning the switches are closed by electromagnets supplied by the outputs of maximum amplitude filter 2. In both cases the closed switch applied the voltage V' to one of the output terminals O1 or O2. The same voltage is also connected to an input of the information-storage unit. (After Taylor, 1959.)

Every organism, in order to survive, takes actions that are appropriate to the surrounding conditions. It does this because it contains in its nuclei a controlling system that adequately represents the environment. The surroundings change and this representation is continually brought up to date. We may define the information that flows into the organism as the feature of any change within that serves to increase the correspondence between the organism and the environment it represents. This correspondence is achieved by selection of certain among the possible states of the system, states that have been set by its previous history.

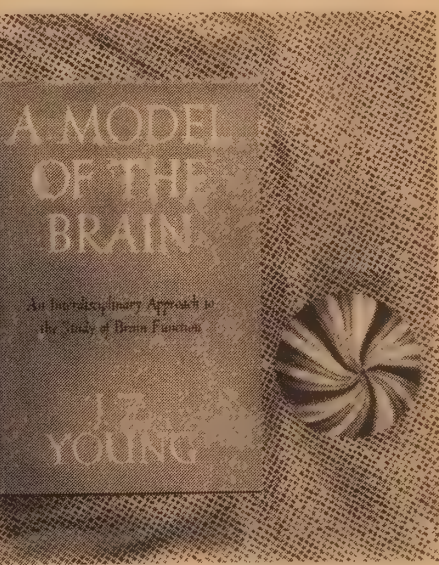
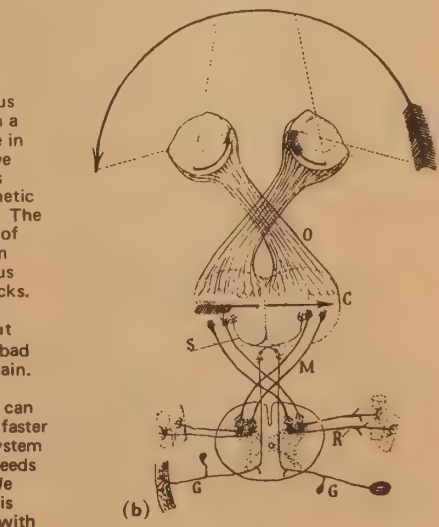


Fig. 32. Cajal's theory of the significance of the optic chiasma of vertebrates. If there were no crossing then the 'panoramic field' represented by the arrow would be divided, as shown in a. The complete chiasma enables its parts to be brought together across the tectum, as shown in b. This then entails the further crossings of the motor and skin receptor systems shown below. (From Cajal.)

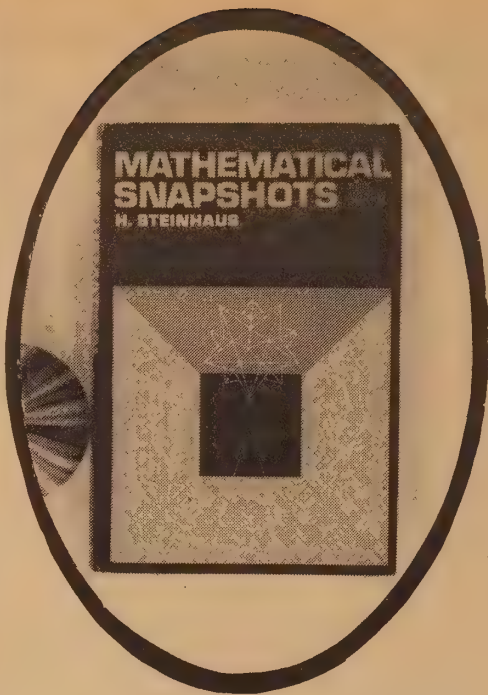




The patterns we observe on the shore of a river when the mud has been dried up by the sun (98) seem to be quite irregular; nevertheless as a rule they show right angles. This can be explained by assuming the cracking to be an effect of contraction; the line appearing as a fissure has, by a principle of mechanics, to make the work of disjunction as small as possible. The work is proportional to the areas of the sections and the lines must have a course such as to minimize the surfaces laid open by the fissure. This procedure gives right angles if the clay is homogeneous; the varying thickness of the layer accounts for the curvature of the lines. This remark supplies in many cases a means of deciding which line appeared earlier and which later: the older of the two splits passes right through the point of junction. Thus we can follow the genealogy of splits and eventually find the ancestors of the whole system.



Suppose the pattern was composed initially of two regions, A. and B. A new line appears, joining two points of two already existing arcs and giving rise to a new region C (100); since the new line breaks up two arcs into two parts each, the number of arcs increases by three. After n steps we have n more regions and $3n$ more arcs. Since there were initially two regions and three arcs, we now have $n+2$ regions and $3n+3$ arcs.



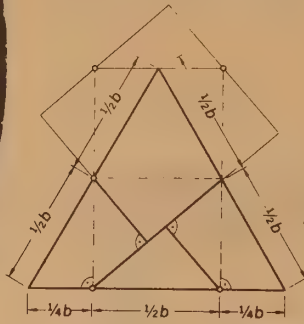
Mathematical Snapshots

H. Steinhaus
1950,69; 311 pp.

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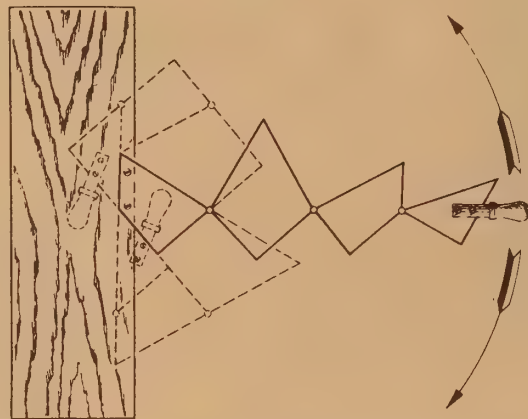
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2

From these four small boards (1) we can compose a square or an equilateral triangle, according as we turn the handle up or down. The proof is given by sketch (2).



1

Mathematical Models

H. Martyn Cundy & A.P. Rollett
1961; 286 pp.

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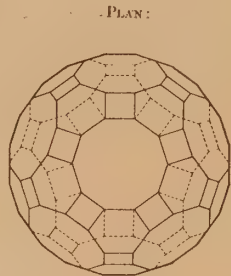


Fig. 138

F_4, F_6, F_{10}, V, E
30 20 12 120 180

POLYHEDRA

3.9.4. Great stellated triacontahedron. $V(3, \frac{5}{2})^2$

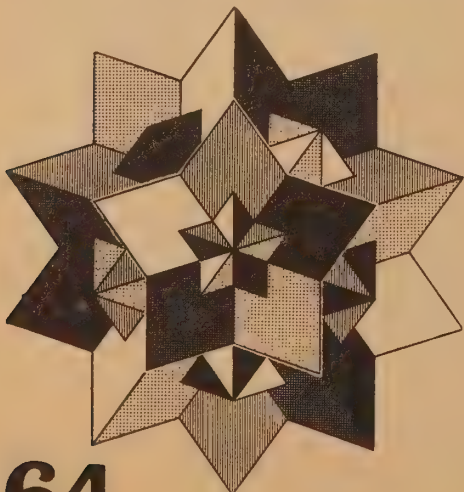


Fig. 153

Obviously, for any model which is to be at all permanent, cardboard will be used.

The card should be white with a good surface, and fairly thin, about the thickness of a plain postcard. Thick cardboard makes ugly corners, and allowance ought to be made for its thickness in drawing the net. It is useful, however, to cut flat sheets of thick card for internal strengthening in some of the stellated and interpenetrating polyhedra.

POLYHEDRA
3.7.12. Great rhombicosidodecahedron (cont.)

NET:

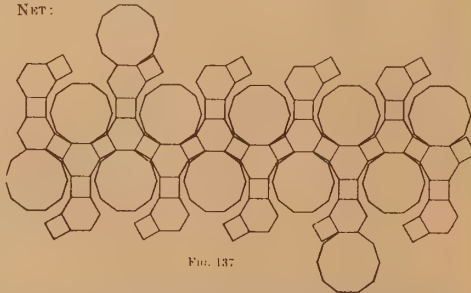
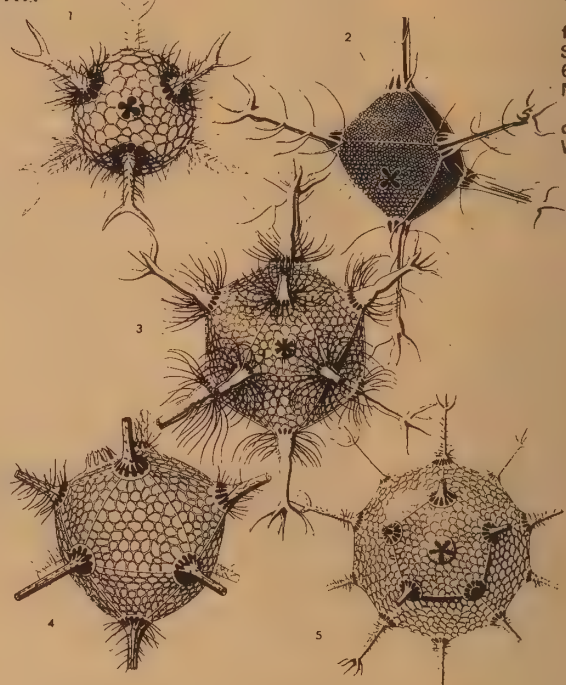


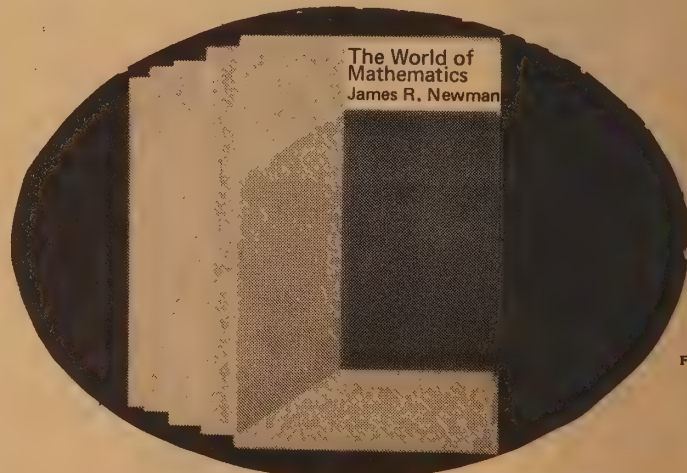
Fig. 137

When the dimensions of the model have been decided on, the net can be constructed on the cardboard. In the case of a complicated net this is facilitated by pricking through vertices from a template drawn on tracing paper, but it must be done very accurately. Tabs are then added to alternate outside edges, care being taken to ensure that the angle at the shoulder of the tab is small enough to admit of the tab's being cemented to its appropriate face. The net can now be cut out with a razor-blade and the edges scored half-through for bending. (Where edges have to be scored on the back—in the stellated polyhedra—this is indicated in the diagrams.) The face of the net becomes the outside of the polyhedron.

For joining, a quick-drying cement, such as balsa-wood cement as used for model aircraft, is essential. After the cement has been applied to a tab, the edges to be joined are brought together, and the tab can be held down with a small wire paper-fastener while the cement dries. This is particularly useful in small models when the fingers cannot easily get inside, and near the finish of any model when there are several edges to be joined at once. A thin wire probe is sometimes useful in getting the last face to adhere.



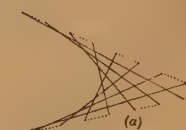
Here (Figure 45) is a page from Haeckel's Challenger Monograph showing the skeletons of several Radiolarians. Numbers 2,3, and 5 are octahedron, icosahedron, and dodecahedron in astonishingly regular form; 4 seems to have a lower symmetry.



The World of Mathematics
James R. Newman

FIGURE

2.5. CURVE
One very old method of... and one which affords a we...



pencil and paper', is that of originated in a book by Mrs. ... mic Approach to Mathematic... has recently been revived, b... Basically it consists of co... by stitching with coloured... pricked in cardboard.

The exterior perimeter of a net of a polyhedron which is all in one piece becomes a 'tree' of edges on the solid. This tree may be branched, but every edge is double and occurs twice on the perimeter of the net. It is evident that if these edges are numbered consecutively round the net every even edge will be joined to an odd edge in the final solid. This means that tabs need only be attached to the even edges. In the nets which follow, tabs are not shown unless there is special need to do so. In all other cases the rule is: attach tabs to alternate edges round the net.

There is an exception in the case of the last face, which is best left free of tabs. The missing tabs must be added to the other edges, and are best made large, so that a platform can be built up to which the last face can be stuck.

The World of Mathematics IS history and anecdotes, an infectious multi-faceted telling of math stories -- pure, applied, ancient, recent: a fine and complete collection. Math seen from outside.

Mathematics: Its Content, Methods, and Meaning. Math from inside. A Russian-compiled technical run-down of everything of concern in mathematics today.

The Graphic Work of M.C. Escher is geometry set at its own throat via the images of dreams. The subjective frontier.

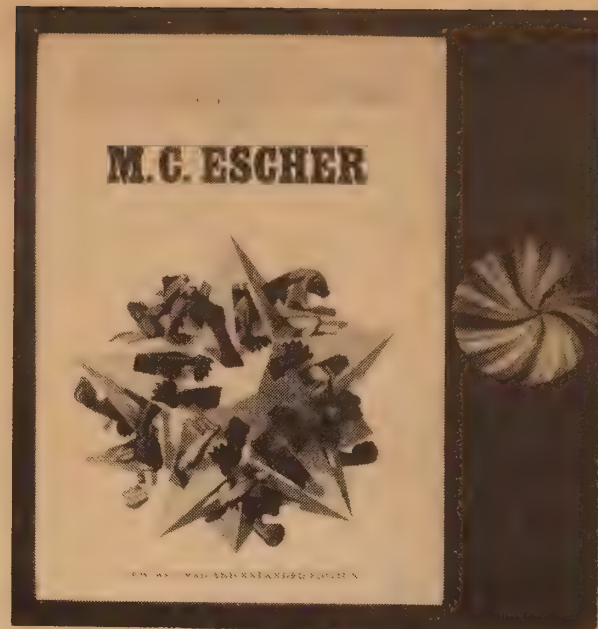


The Graphic Work of M.C. Escher

M.C. Escher
1960,68; 76 plates
\$7.95 postpaid

from
Meredith Press
1716 Locust St.
Des Moines, Iowa 50303

or
WHOLE EARTH CATALOG



57. DOUBLE PLANETOID, wood-engraving printed from 4 blocks, 1949, diameter 37.5 cm

Two regular tetrahedrons, piercing each other, float through space as a planetoid: The light-coloured one is inhabited by human beings who have completely transformed their region into a complex of houses, bridges and roads. The darker tetrahedron has remained in its natural state, with rocks, on which plants and prehistoric animals live. The two bodies fit together to make a whole but they have no knowledge of each other.

...AS our mental eye penetrates into smaller and smaller distances and shorter and shorter times, we find nature behaving so entirely differently from what we observe in visible and palpable bodies of our surrounding that no model shaped after our large-scale experiences can ever be 'true'. A completely satisfactory model of this type is not only practically inaccessible, but not even thinkable. Or, to be precise, we can, of course, think it, but however we think it, it is wrong; not perhaps quite as meaningless as a 'triangular circle,' but much more than a 'winged lion.'

Mathematics: Its Content, Methods, and Theory

A.D. Aleksandrov, A.N. Volmogorov, R.A. Lavrentev
1956,63; 1144 pp; 3 vols.

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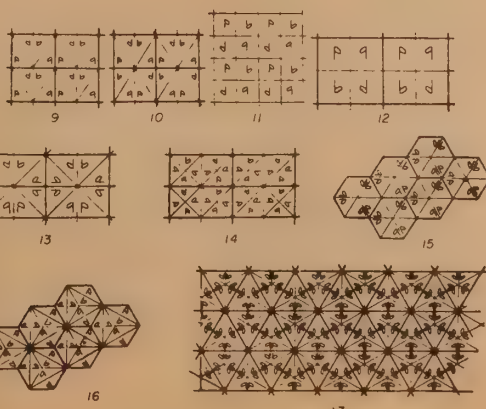
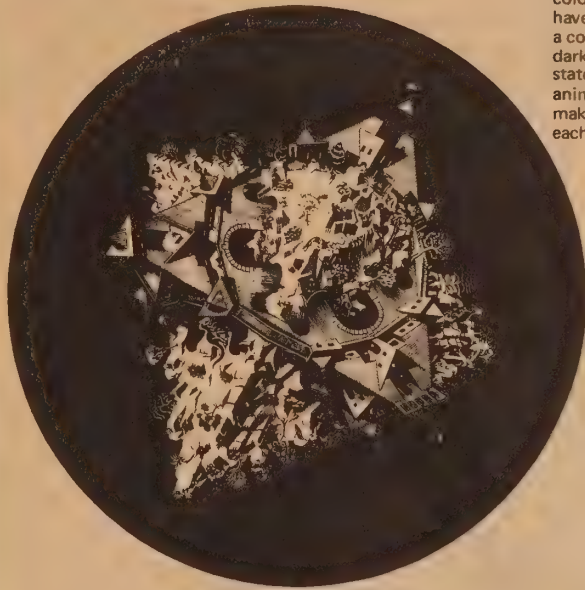
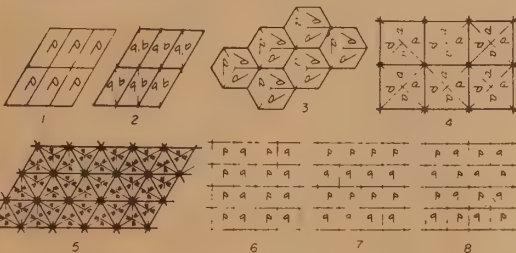
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III. There exists neither a point nor a line in the plane that is carried into itself under all the transformations of the group. Groups of this type are called *plane Fedorov groups*. They are the symmetry groups of infinite plane ornaments. There are altogether 17 of them: five consist of motions of the first kind only, and twelve of motions of the first and second kind.

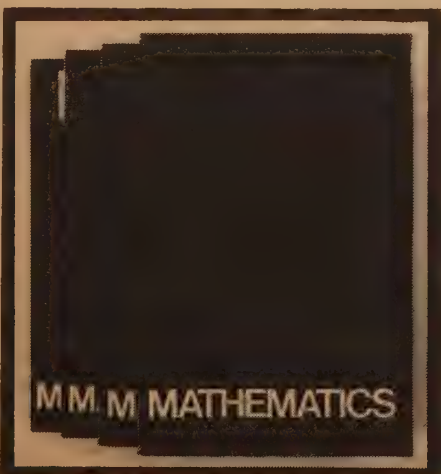
In Table 3 we have given examples of ornaments corresponding to each of the seventeen plane Fedorov groups; every group consists of precisely those motions that carry an arbitrary flag drawn in the diagram into any other flag of the same diagram.

It is interesting to note that the masters of the art of ornamentation have in practice discovered ornaments with all possible symmetry groups; it fell to the theory of groups to prove that other forms do not exist.

Crystallographic groups. In 1890 the eminent Russian crystallographer and geometer E.S. Fedorov solved by group-theoretical methods one of the fundamental problems of crystallography: to classify the regular systems of points in space. This was the first example of a direct application of the theory of groups to the solution of an important problem in natural science and made a substantial impact on the development of the theory of groups.

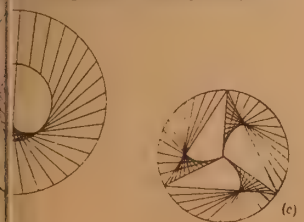


- 8. $\frac{x^2}{a^2} - \frac{y^2}{b^2} - 2cz = 0$ Hyperbolic paraboloid
- 9. $\frac{x^2}{a^2} + \frac{y^2}{b^2} - 1 = 0$ Elliptic cylinder
- 10. $\frac{x^2}{a^2} + \frac{y^2}{b^2} - 1 = 0$ Imaginary elliptic cylinder
- 11. $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 0$ A pair of intersecting imaginary planes
- 12. $\frac{x^2}{a^2} + \frac{y^2}{b^2} - 1 = 0$ Hyperbolic cylinder
- 13. $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 0$ A pair of intersecting planes
- 14. $y^2 - 2px = 0$ Parabolic cylinder
- 15. $x^2 - a^2 = 0$ A pair of parallel planes
- 16. $x^4 + a^4 = 0$ A pair of imaginary parallel planes
- 17. $x^2 = 0$ A pair of coincident planes.



-Which points of the plane are inside this polygon?

STITCHING
pression work in mathematics,
he change from 'the tyranny of



ve-stitching. It seems to have
L. Somervell, entitled *A Rhyth-*
d published in 1906. The idea
n America and in this country.
ucting straight-line envelopes
ads through a pattern of holes

Data Study

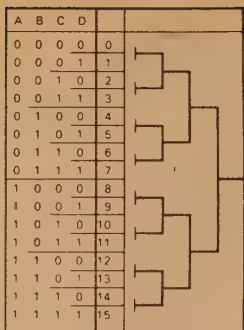
Information that isn't organized isn't signal in your life, it's noise. You waste yourself searching the full length of a file for something, feeling as stupid as a driver in crosstown New York, and for the same reason: your access is brute linear and laborious. This book can help you if not New York. It presents theory and practice on how to keep stuff straight, at least in terms of organization. Display is another matter, however, in which the information sciences are still poor.

Data Study

J. L. Jolley
1968; 254 pp.

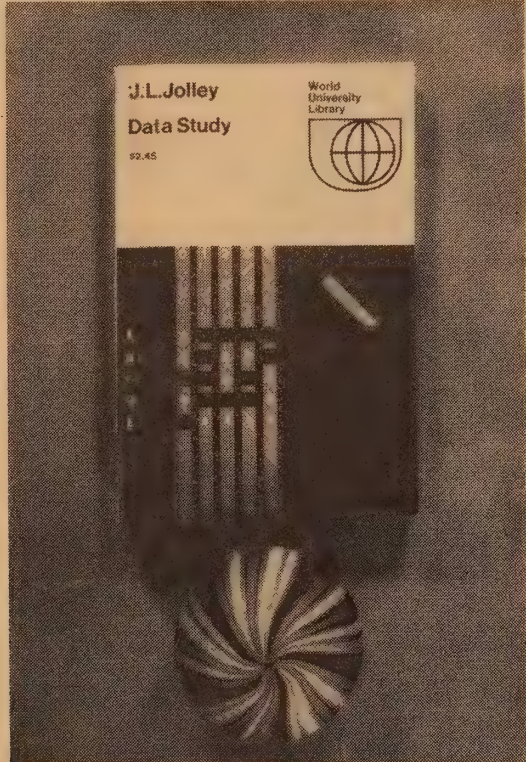
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	A	B	C	D	
Ø	0	0	0	0	Ø
A	1	0	0	0	A B C D
B	0	1	0	0	
C	0	0	1	0	
D	0	0	0	1	
AB	1	1	0	0	A B C D
AC	1	0	1	0	
AD	1	0	0	1	
BC	0	1	1	0	
BD	0	1	0	1	A B C D
CD	0	0	1	1	
ABC	1	1	1	0	
ABD	1	1	0	1	
ACD	1	0	1	1	A B C D
BCD	0	1	1	1	
ABCD	1	1	1	1	



The decimal system of numerals begins with 0, if its ten characters are arranged in ascending order. Binary, octal, and other systems also begin with 0, for 0 is the origin, zero, the place we start from before some change in the situation gives us some information.

Information, whose handling is the topic of this book, is generated by change, and whatever is our unit of change is our unit of information.



A succession of activities

A great deal of information handling is concerned with the succession of operations mentioned above: identify, translate, retrieve, describe, search, identify, translate, retrieve - the succession can continue repeating itself in this way. We may exemplify these activities by imagining an indexer using a pack of punched feature cards to find a number of individuals in a personnel records system. He or she may think and act as follows:

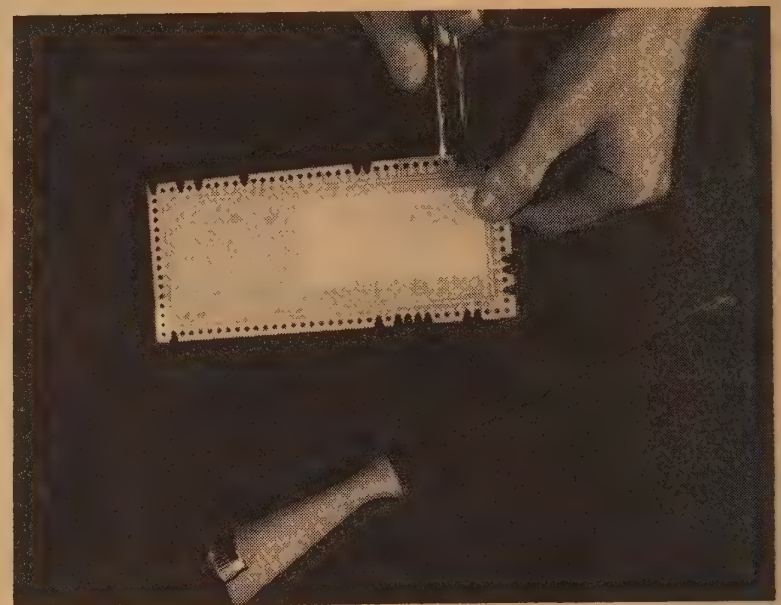
- identify** I need the ideas 'masculine' and 'personnel' ...
- translate** but they are known as 'male' and 'staff' ...
- retrieve** so I find the cards bearing these titles ... (we may take them to be in alphabetical order)
- describe** and stack them ...
- search** and look for the coincident holes ...
- identify** which are in positions 32 and 457 ...
- translate** which refer to Jim Robinson and Patrick Lucas ... (we take it that these are listed against the numbers in a register)
- retrieve** so I find their record cards ... (we again assume these to be in alphabetical order)
- describe** one at a time ... (a single card is a stack of one)
- search** and look for their features individually ...
- identify** which are as follows ...
- translate** from which I deduce ...

a mutually exclusive set	an overlapping set	a cumulative set	an equivalent (identical) set
hotel is : in France in Spain in the United States in Germany in Switzerland	hotel possesses : a ballroom tennis courts a swimming pool a bowling green a skittle alley a golf course	hotel is : more than 50 years old more than 100 years old more than 200 years old	hotel has : first class food excellent cuisine top quality refreshments

McBee Keysort System

What do you have a lot of? Students, subscribers, notes, books, records, clients, projects? Once you're past 50 or 100 of whatever, it's tough to keep track, time to externalize your store and retrieve system. One handy method this side of a high-rent computer is McBee. It's funky and functional: cards with a lot of holes in the edges, a long blunt needle, and a notcher. Run the needle through a hole in a bunch of cards, lift, and the cards notched in that hole don't rise, they fall out. So you don't have to keep the cards in order. You can sort them by feature, number, alphabetically or whatever: just poke, fan, lift, and catch. In addition the cards have a feature which will print an address (or whatever) per card with two swipes of a hand-held strong-smelling gizmo—about 50 good copies before the print returns to primordial fuzz. Doug Engelbart tells us that animal ear notches are better and cheaper for card notching than the nippers McBee sells.

[Suggested by Doug Engelbart & Joe Bonner]



Costs go like this:

- 1000 (print-type) keysort cards — 35.75
- 1000 Hecto carbon black (for printing) — 3.60
- 1 Keysorter (needle) — 5.05
- 1 Handpunch — 9.55
- 1 Handprinter (gizmo) — 41.40

Check your phonebook for McBee or write
Litton Automated Business Systems
600 Washington Avenue
Carlstadt, N. J. 07072



Here's Hal sorting the cards of all the items currently confirmed for the Spring CATALOG. He's needed the No. 4 hole (notched if we stock the item), and everything already stocked is falling out. He'll needle again through the No. 2 hole (notched if unavailable from us), and what remains on the needle will be the new items he needs to order for the store.

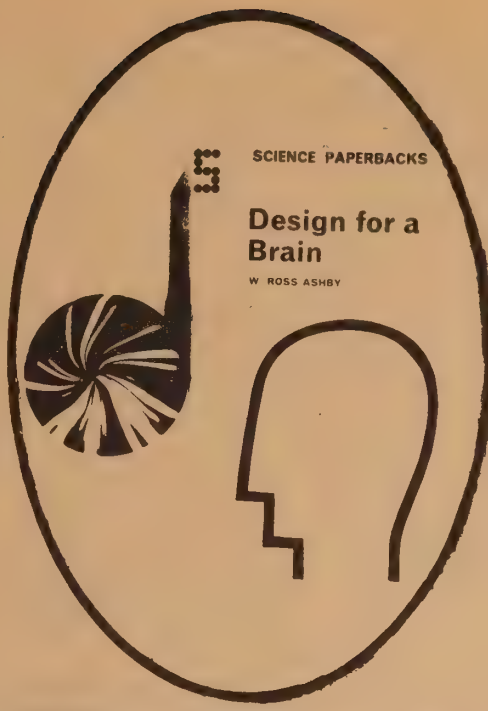
Design for a Brain

This is a reputation review. Ashby's book is found prominent in the bibliography and footnotes of every text we've seen on computers and the mind. It's technical going to read but worth it for the insights of prime work.

Finding an optimum is a much more complex operation than finding a value that is acceptable (according to a given criterion). Thus, suppose a man comes to a foreign market containing a hundred kinds of fruit that are quite new to him. To find the optimum for his palate he must (1) taste all the hundred, (2) make at least ninety-nine comparisons, and (3) remember the results so that he can finally go back to the optimal form. On the other hand, to find a fruit that is acceptable he need merely try them in succession or at random (taking no trouble to remember the past), stopping only at the first that passes the test. To demand the optimum, then, may be excessive; all that is required in biological systems is that the organism finds a state or a value between given limits.

The development of life on earth must thus not be seen as something remarkable. On the contrary, it was inevitable. It was inevitable in the sense that if a system as large as the surface of the earth, basically polystable, is kept gently simmering dynamically for five thousand million years, then nothing short of a miracle could keep the system away from those states in which the variables are aggregated into intensely self-preserving forms.

This is the learning mechanism. Its peculiarity is that the general pattern delegates part of its control over the organism to the environment. Thus, it does not specify in detail how a kitten shall catch a mouse, but provides a learning mechanism and a tendency to play, so that it is the mouse which teaches the kitten the finer points of how to catch mice.



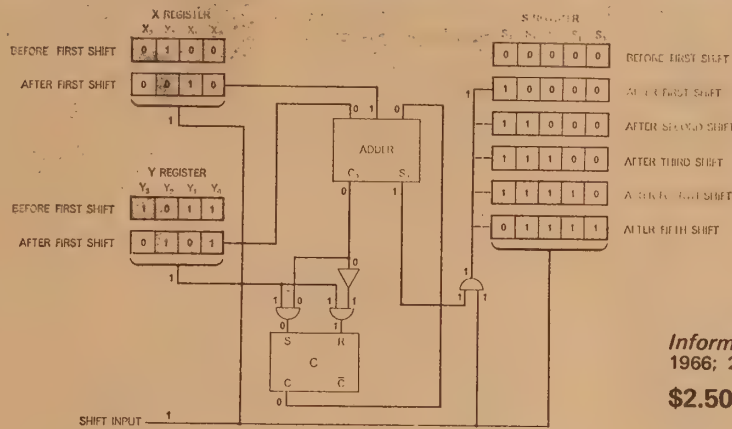
Design for a Brain
W. Ross Ashby
1952, 1960; 286 pp.

\$2.50 postpaid

from:
Barnes & Noble, Inc.
105 Fifth Avenue
New York, N.Y. 10003
Economy Bookstore
171 W. Madison
Chicago, Illinois 60602
or
WHOLE EARTH CATALOG

Information

The September 1966 issue of *Scientific American* was devoted entirely to the new technology of information. Now available as a paperback book, it is the best introduction we've seen to computer science. Articles include: "Computer Logic and Memory", "Computer Inputs and Outputs", "Systems Analysis and Programming", "Time-sharing on Computers", "The Transmission of Computer Data", "The Uses of Computers in Technology", "The Uses of Computers in Organizations", "The Uses of Computers in Education", "Information Storage and Retrieval", and "Artificial Intelligence".



Information
1966; 218 pp.

\$2.50 postpaid

from:
W.H. Freeman & Company
660 Market Street
San Francisco, California 94104
or
WHOLE EARTH CATALOG



10. Simulated waterfall spills over the edge of a cliff and splashes into a pool in this computer experiment performed by John P. Shannon at the Los Alamos Scientific Laboratory as part of a study of dynamic behavior of fluids with the aid of numerical models.

The computer is almost exactly what man is not. It is capable of paying undivided attention to unlimited detail; it is immune to distraction, precise and reliable; it can carry out the most intricate and lengthy calculation with ease, without a flaw and in much less than a millionth of the time that would be required by its human counterpart. It is emotionless, or so we suppose. It suffers neither boredom nor fatigue. It needs to be told only once; thereafter it remembers perfectly until it is told to forget, whereupon it forgets instantly and absolutely.

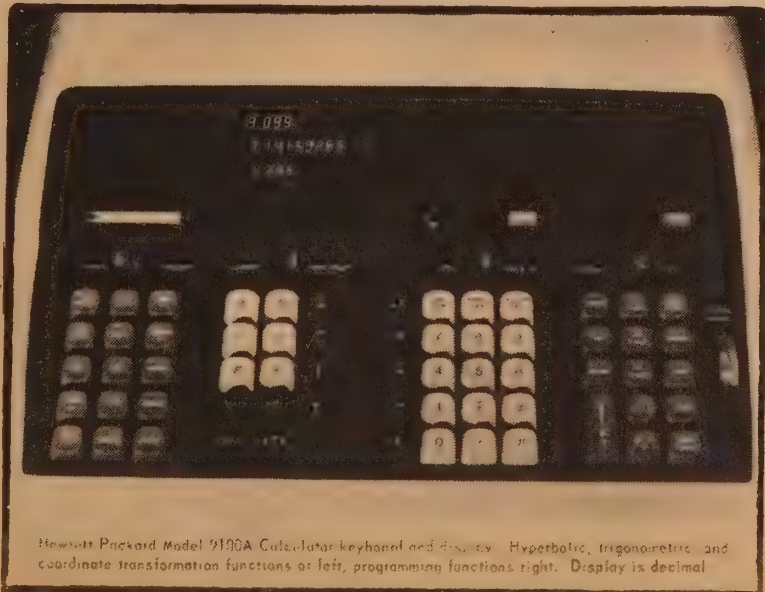


9100A Calculator

The best of the new table-top number crunchers is this Hewlett-Packard machine. It is programmable, versatile, and silent—more so than its competition. Portola Institute currently is using the 9100A to help kids gain early mastery over computers—it is a superb inquiry machine.

Specs: 9100A can do addition, subtraction, multiplication, division, square root $\log x$, $\ln x$, e^x , $\sin x$, $\cos x$, $\tan x$, $\sin^{-1}x$, $\cos^{-1}x$, $\tan^{-1}x$, $\sinh x$, $\cosh x$, $\tanh x$, $\sinh^{-1}x$, $\cosh^{-1}x$, $\tanh^{-1}x$, polar to rectangular and vice versa co-ordinate transformations. Number range is 10^{-99} to 10^{99} . The magnetic core memory has 19 registers: 3 display and 16 storage. Display is decimal or floating point. Program capacity is 196 steps. Programming is done by pressing keys in proper sequence (no special language required). Programs may be stored on wallet sized magnetic cards. Typical operations take 2-280 milliseconds. Weight of the machine is 40 lbs, dimensions 8"x16"x19" deep. Reportedly the following accessories will be available soon: printer, xy plotter, input/output interface.

[Suggested by Robert Albrecht]



Hewlett-Packard Model 9100A Calculator keyboard and display. Hypothetic, trigonometric, and coordinate transformation functions at left, programming functions right. Display is decimal.

HP 9100A

\$4900.00 65 lbs shipping weight

from:
P.O. Box 301
Loveland, Colorado 80537

There's rumors that a new machine coming from Wang may slightly top the HP: the Wang 700. For inquiries:

Wang Laboratories, Inc.
836 North St.
Tewksbury, Mass 01876

Thinking With a Pencil

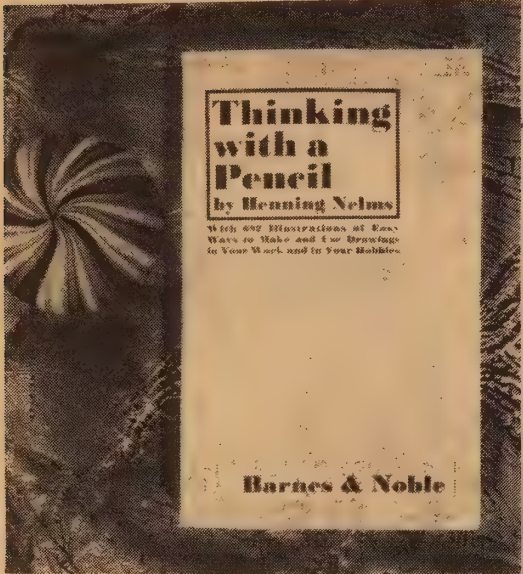
This book is a good pragmatic introduction to the full range of image-representation. Whether you plan to top Zap comics or use computer-generated diagrams to expand your intellect, these are basics you can use, if only to depart from. [Suggested by Dave Guard]

Thinking With a Pencil

Henning Nelms
1957, 64; 348pp.; 629 illus.
\$2.25 postpaid (Canada \$2.50)

from
Barnes & Noble, Inc.
105 Fifth Avenue
New York, N.Y. 10003

or WHOLE EARTH CATALOG



TRICKS OF THE TRADE

If you think you can't draw a straight line, try one of the easy methods shown here.

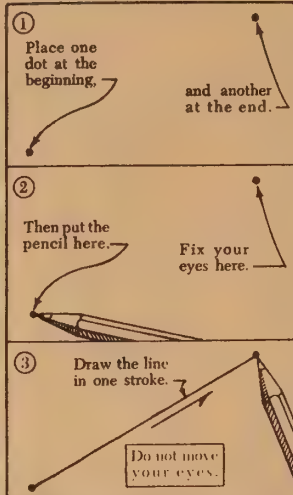
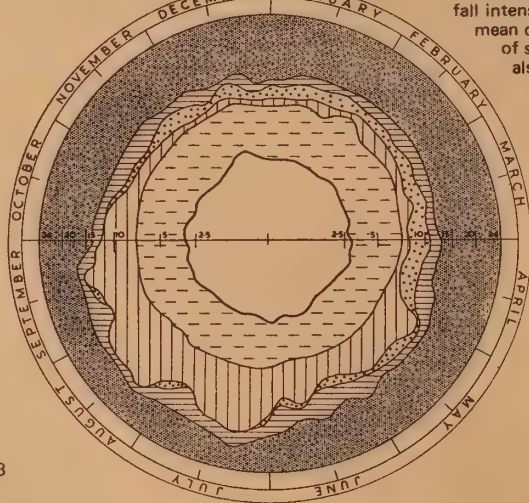


FIG. 16. ONE-STROKE METHOD

Star-Diagrams, sometimes called 'clock-diagrams', 'roses', or 'vector-diagrams', are a form of graph in which values are plotted as radii from a point of origin. This is especially useful where vector values are involved as in wind-roses (see p. 189 and Fig. 90). Instead of using rays of proportional length, they may be drawn of proportional thickness, radiating in the correct direction, possibly to the actual destination, in respect, for example, of movement of commodities or of population.

Isoleths can be used effectively to show the distribution of places experiencing a similar duration of particular mean weather conditions. For example, the mean duration of a growing season can be illustrated in this way, as revealed by the number of days when the average daily temperature exceeds 42°F. The growing season of any particular crop can be mapped in the same way, for example, cotton, where the critical temperature is 63°F. Similarly, the mean duration of the season of killing frosts, the mean duration of snow cover, the mean duration of special rainfall intensities, and the mean daily duration of sunshine, can also be illustrated by isopleths.

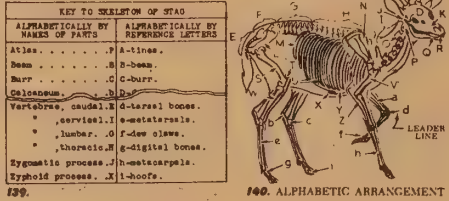
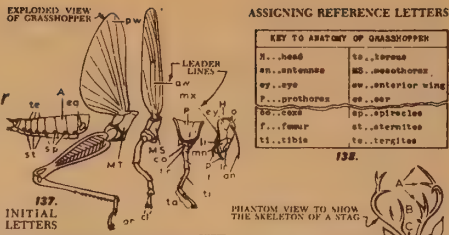


DOMESTIC WORK
ANIMAL HUSBANDRY
FIELD ACTIVITIES
FOREST PURSUITS
OTHER ACTIVITIES
SLEEP

FIG. 127. AN EROGRAPH

Compiled by W. R. Mead, from statistical data derived from M. Sipilä, *Maatalouden työajankäyttö ja työnäkömuks* (Helsinki, 1946). This diagram has been drawn to show employment of working hours on a weekly basis for a group of sample farms in Finland.

ASSIGNING REFERENCE LETTERS

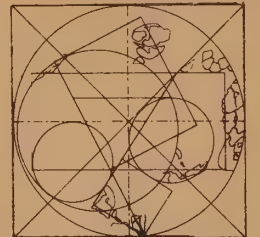


Omitting the useless is as important as including the essential. Aristotle stated a fundamental truth when he said that everything which does not add will detract.

Practical drawings are mental tools. Once you have learned to make them, you will find that they are as useful in solving problems as saws and hammers are useful in carpentry.

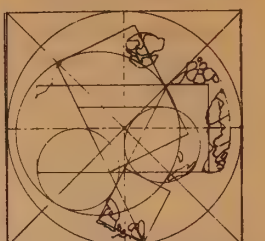


Compare shaded details in Steps 1 and 2 with the corresponding areas in the source [Fig. 361].

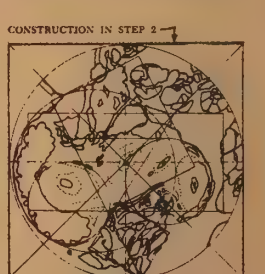


Compare rough construction with source and make corrections. This is easier when the drawing shows only simple shapes and there are no details to mislead the eye.

DRAWING WITH MICROSCOPE



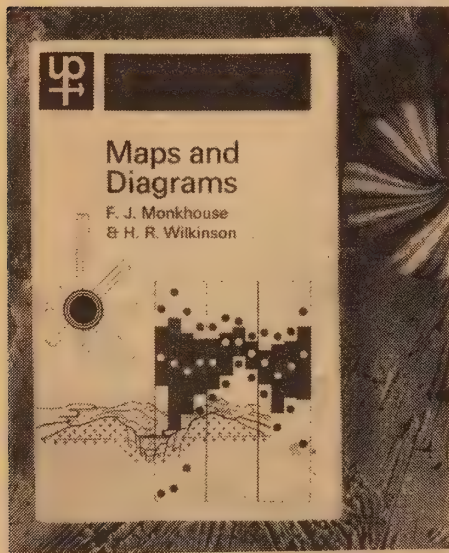
Begin with a circle to represent field of microscope. Add square, diagonals, and center lines. Then draw geometric shapes to fix main elements of sketch.



COMPLETED DRAWING

Maps and Diagrams

Intellectuals who can't make their thoughts graphic are a drag to read. Furthermore they've got a language governor on their head power. It's the tradition of esoterica: (let's talk in code; if we draw pictures or do geometry, everybody will see through us to the subject and we won't be magicians anymore.) Gripe. Grumble. Sorry. This book is a splendid introduction to the techniques of mapping and diagraming, the art of multi-directional clarity.



Maps and Diagrams

F. J. Monkhouse
and H. R. Wilkinson
1952, 63
432 pp.; 235 illus.

\$4.25 postpaid

from
Barnes & Noble, Inc.
105 Fifth Avenue
New York, N. Y. 10003

or WHOLE EARTH CATALOG

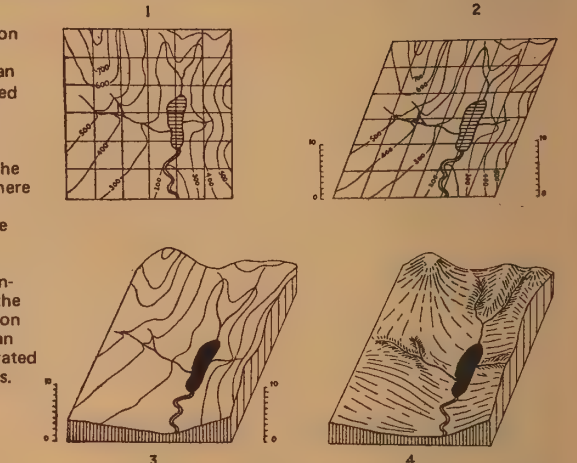
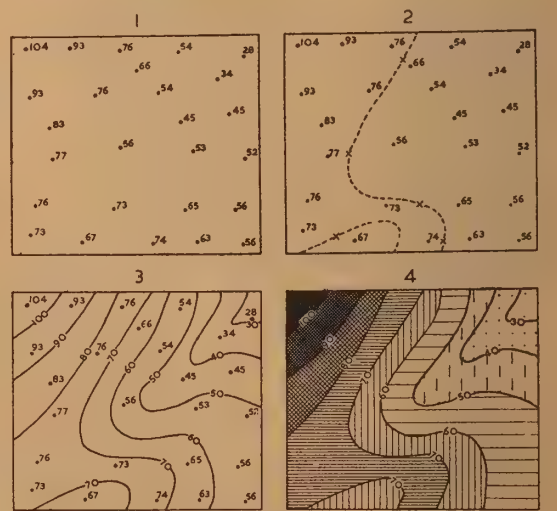


FIG. 54. THE CONSTRUCTION OF A BLOCK-DIAGRAM BY THE LAYER METHOD

1. Contour tracing, with grid; 2. projection into a rhombus, with vertical scale-lines (in hundreds of feet); 3. each contour is drawn in at its correct scale-altitude; 4. completion of diagram with shading.



FIGS. 11-14. THE INTERPOLATION OF ISOPLETHS

1. The point-values are located; 2. the critical isopleth of value 70 is interpolated, with the aid of crosses placed between pairs of values at a distance proportional to the value of each; 3. other isopleths are similarly interpolated; 4. a system of density shading is applied for clarity between the isopleths.

Hornung's Handbook of Designs and Devices

This is not an appealing book (so much for sales), but it may be a useful one. A jillion (1,836) specific mandalic figures are presented in boring black and white, devoid of explanation of origins. What you make of the images is strictly what your head gives you, and that turns out to be a lot.

[Suggested by Dave Guard]

Hornung's Handbook of Designs and Devices

1932; 216 pp.

\$2.20 postpaid

from
Dover Publications, Inc.
180 Varick Street
New York, N. Y. 10014

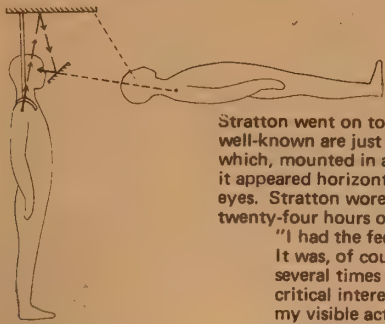
or WHOLE EARTH CATALOG

the use of over eighteen hundred illustrations appearing in this volume has resulted from a close study of those art cultures of the past wherein the geometric and abstract phase of design have been dominant. The arts of design in ancient Egypt, Greece, Arabia, and Japan have contributed liberally to the material upon which this work is based.



Eye and Brain

I can't think of another book as well-made as this one. It is well designed, illustrated, and diagrammed. The writing is excellent, the subject matter important and new. The book is inexpensive. Altogether Eye and Brain lets you see how crappy most books are.

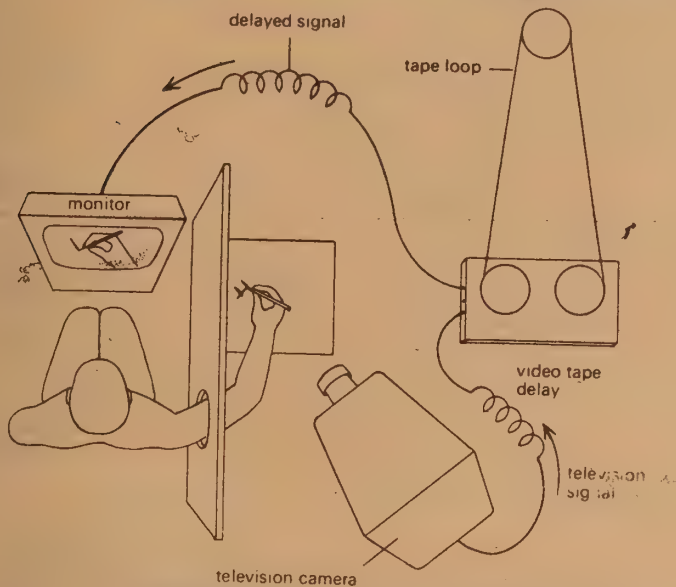


Stratton went on to perform other experiments which though less well-known are just as interesting. He devised a mirror arrangement which, mounted in a harness, visually displaced his own body, so that it appeared horizontally in front of him, and at the height of his own eyes. Stratton wore this mirror arrangement for three days (about twenty-four hours of vision) and he reported:

"I had the feeling that I was mentally outside my own body. It was, of course, but a passing impression, but it came several times and was vivid while it lasted. . . . But the moment critical interest arose, the simplicity of the state was gone, and my visible actions were accompanied by a kind of wraith of themselves in the older visual terms.

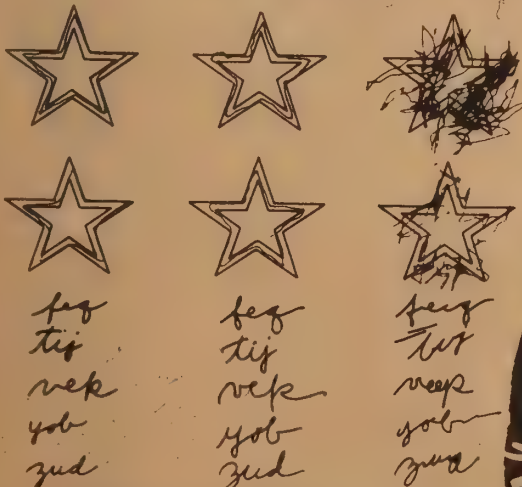
Why should the perceptual system be as active in seeking alternative solutions as we see it to be in ambiguous situations? Indeed it seems more active, and more intellectually honest in refusing to stick with one of many possible solutions, then in the cerebral cortex as a whole—if we may judge by the tenacity of irrational belief in politics or religion. The perceptual system has been of biological significance for far longer than the calculating intellect. The regions of the cerebral cortex concerned with thought are comparatively juvenile. They are self-opinionated by comparison with the ancient striate area responsible for vision.

Held found that only the active kitten developed perception, the passive animal remaining effectively blind. He thus suggested that active touch is essential to perceptual development.



An elaboration of the television technique makes it possible to displace retinal images not only in space, but in time. Temporal delay of images is a new kind of displacement, and promises to be of the greatest importance. The method is to use a TV camera and monitor, with an endless tape loop so that there is a time-delay between the recording from the camera and the playback to the monitor. The subject thus sees his hands (or any other object) in the past; the delay being set by the gap between the Record and Play-back heads.

This situation is not only of theoretical interest, but is also of practical importance because controls used in flying aircraft, and operating many kinds of machine, have a delay in their action: if such delay upsets the skill, this could be a serious matter. It was found that a short delay (about 0.5 seconds) made movements jerky and ill co-ordinated, so that drawing became almost impossible, and writing quite difficult. Practice gives little or no improvement.



Eye and Brain - The Psychology of Seeing
R.L. Gregory
1966; 254 pp.

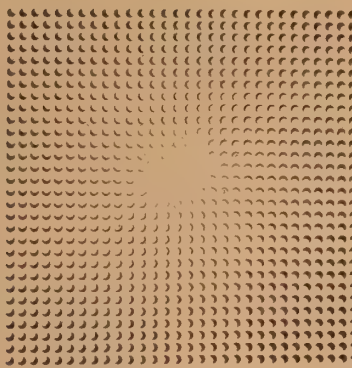
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Hightstown, N.J. 08520
Manchester Road
Manchester, Missouri 63062
8171 Redwood Highway
Novato, California 94947
or **WHOLE EARTH CATALOG**



C/A Magazine

We're all into communication arts, so this well-made magazine is generally useful. As Gordon Ashby used to explain, 'Far-out is fine. Who's minding the store?' These guys are, and they're pretty good.

[Suggested by ONYX.]



*So leap with joy, be blithe and gay,
Or weep, my friends, with sorrow,
What California is today
The rest will be tomorrow.*



C/A Magazine
\$15.00/yr. (Bimonthly)
U.S. & Canada

\$16.00/yr. foreign

from
P. O. Box 10300
200 California Ave.
Palo Alto, CA 94303



Behrend's Book

One disadvantage of mail order is that you don't get to rap with the clerk and find out how to use the thing you're buying. That disadvantage is somewhat overcome in this catalog of film equipment (sales and rental). They explain matters more than is usual with remote merchants.

Behrend's Book

1969; 108 pp

free
from
Behrend's Incorporated
161 East Grand Ave.
Chicago, Illinois 60611

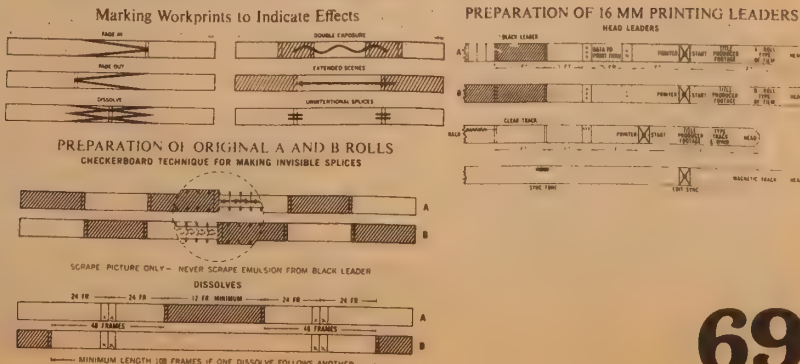
2. Moving one step and several hundred dollars up, we come to the production camera. This camera is best typified by the Arriflex and Eclair. Both have registration pin movements to assure rock-steady image quality. Both are widely adaptable, by means of accessories, to cope with varying assignments.

In cameras of this type, you will always find electric motor drives, usually interchangeable, to allow an extra-ordinary range of speeds and applications.

Also, cameras of this type have interchangeable magazines, so the film maker can shoot whatever emulsion he chooses, switching as the need occurs, without inconvenience.



Behrend's Information for Film Editors



Accurate, specific information on what's new in equipment, techniques, standards, and the attitudes of technicians using them. Also gossip and news about who's doing what where. Covers all aspects of professional filmmaking from Hollywood Super Panavision 70mm to 8mm educational loops.

The ads, fully as important as the text, are mouthwatering for those with an appetite for Eclairs and such.

If you read it regularly you'll never need Baddeley—you'll know how it's really done. Often the information is directly and simply usable; sometimes it stimulates visions of the super-cinema of the future. When in school I consulted back issues for a psychology paper on perception. The articles are really interesting and, best of all, there is no film criticism, so you avoid all those negative emotions.

Director Joseph Sargent realized that there was dramatic potential intrinsic to the equipment itself, and he proceeded to make good use of it: By having two different segments of the cast pre-rehearsed and deployed on two totally different sets (on the same sound stage), he was able to have the actors on one set simultaneously play out the scene with the actors on the other set. This was conducted with overlapping dialogue via video cameras, video receivers and a sophisticated sound playback and recording system—and two complete sound crews. To capture all this activity on film we placed our 35mm Panavision camera on one set or the other as the scene required.

[Suggested by Gordon Ashby
Reviewed by Sandra Tcherepnin]

The key to the system is 1/4-inch recording tape imprinted on the back with a synchronization pattern equivalent to frames of film (Figure 1.) The tape, now designated HATCHMARK SYNCTAPE, has been produced in 24 and 18 frame per second formats at 7 1/2 and 3 3/4 inches per second tape speeds. Through use of the visible markings, the tape can be cut and spliced at any desired frame to precisely match the film, or vice versa. The marking pattern

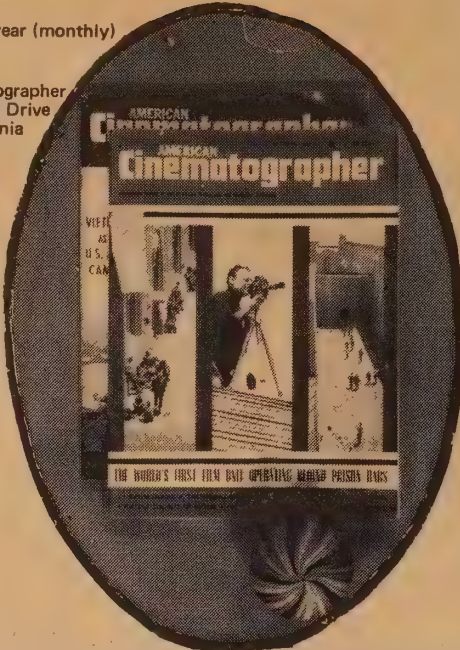


CINE 60-PRENZEL SHOULDER POD



\$6.00 for one year (monthly)

from:
American Cinematographer
1782 North Orange Drive
Hollywood, California
90028



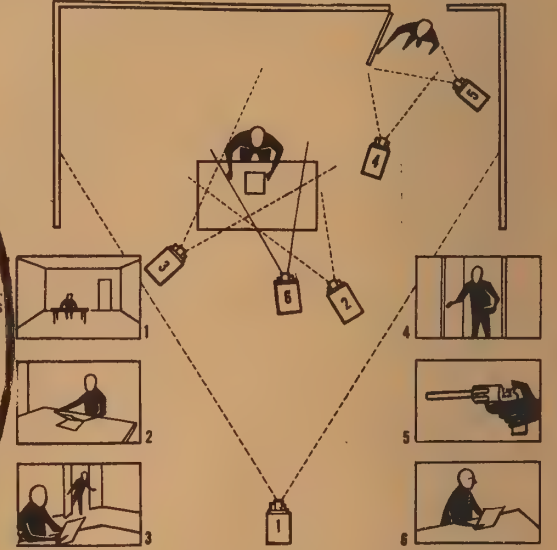
QUESTION: In what unusual ways did you utilize the telephoto lenses you mentioned earlier?

WEXLER: The 400mm lens was especially useful in the polo sequence because it focuses down to 15 feet. We were able to focus on something very sharply at 15 feet and then, by throwing the focus back to something at infinity, make the foreground object literally disappear. We used that effect, forward and in reverse, several times. For example, the opening scene of the polo sequence is a shot of thundering horses' hooves, over-cranked for slow motion, with heat waves shimmering through the frame. Then, as they come toward you, the focus goes to a polo ball which literally fills the frame, and there's a sharp "whack" as the mallet drives it out of frame. It makes a pretty good beginning for the sequence.

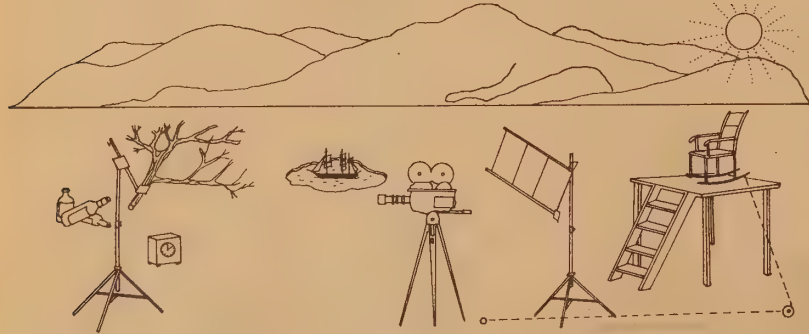
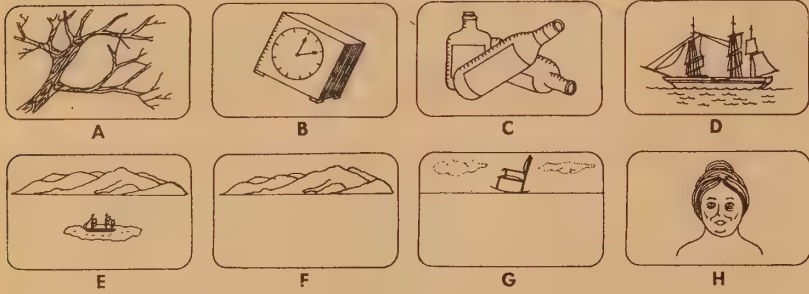
Try not to be put off by the word "documentary."

This is a book for times when you are starved for some lean and specific information. It covers all conventional aspects of filmmaking: subtle items, which can really best be learned by the experience of seeing and working on films (use of dissolves, effect of different lens lengths, etc.); necessary conventions, like systems of marking workprints, and technical facts about equipment; and the hundreds of little hints and tricks, some whimsical some incredibly mundane, which technicians have hit upon by trial, error and inspiration over the years. All of these are discussed in the same thorough, detached, insensitive way. But at least the basic information is there so you can get it if you need it. This book will not help you to learn filmmaking—you'll have to bring along the enthusiasm and involvement—so start filming and then use it when you have to.

[Reviewed by Sandra Tcherepnin]



CONVENTIONAL CUTTING ROOM SIGNS. 1. Unintentional join. 2. Unintentional joins made to insert a patch replacing a damaged portion of work-print. Ignore when matching master. 3. Extended scene. 4. Fade out and fade in. 5. Dissolve. These signs are drawn on the work-print by the editor, usually with a Chinagraph pencil, to guide the person matching the master.



Diagrams illustrating one of the most complicated continuous scenes in the film, a dream fantasy photographed in Death Valley. (TOP) A—Dissolve in to out-of-focus bush, which then racks into focus. B—Focus racks through bush to big closeup of clock. C—Camera pans to bunch of bottles in snow. D—Camera pans to close shot of yacht in water. E—Zoom lens racks back to reveal yacht as miniature model floating in puddle-sized desert pond. F—Camera pans landscape through series of three progressively denser 85 orange gels. G—Camera comes to rest on ghostly sunset shot of chair rocking on horizon. H—Scene dissolves to "Oedipus type" closeup of character's mother. (BELOW) Diagram of the complicated set-up for filming scene in Death Valley. Remote cord arrangement made possible rocking of chair from camera position.

us. We got down there and I took about three deep breaths and said, "It's melting! It's melting! It's melting! The light is just right. Strip, baby!" I climbed into all this camera equipment and this poor young lady went running in the nude in about a 33° temperature and we got the thing in one take.

"The Film Works" in San Francisco

Groot Productions and Patterson & Hall have formed "The Film Works," San Francisco's newest and possibly most complete establishment for "source-in-depth" creative film production for television, business and education. Offices are at 425 Bush Street, San Francisco, Calif. 94108, telephone 362-5230.

The Technique of Documentary Film Production

Hugh Baddeley
1963; 268 pp.

\$10.00 postpaid

from
Communications
Arts Books
Hastings House,
Publishers,
Inc.
151 East 50th St.
New York, N.Y.
10022

or
WHOLE EARTH CATALOG

If we see a man in medium shot and then take a closer look at him in close-up, he must be in the same position in both shots—or, to be more precise, he must be in the same position at the end of the medium shot as when we cut to him at the beginning of the close up. In real life this would automatically be so; when we film him we must somehow ensure that it is so despite the fact that, in changing our lens or camera position, there has been a lapse of time. On the face of it, this point appears obvious. It is all the more surprising, therefore, that many beginners fail to appreciate it and assemble their shots with serious continuity errors between them, thinking that the audience will not be bothered by them.

Avoiding Paper Rustle

There is, for instance, that very basic requirement of ensuring that the turning of pages or the rustling of the script is not picked up by the microphone. This is usually got around by mounting the pages of the script separately on cardboard. There is still the problem of how to attach the sheets to the boards. Rubber bands are commonly used, but they can become caught in the adjacent board and emit a loud "twang"! Paper clips are an alternative, but there is a great tendency for one board to become attached beneath the clip on the next just at the moment when it is necessary to move quickly to a fresh page. A possibility is to use an adhesive such as Cow gum, but this may take longer. An ingenious alternative is to type the script on blotting paper which will not, of course, rustle. The drawback here is that it is not easy to take a carbon copy when typing on blotting paper—unless the blotting paper is the carbon copy, in which event the commentator may not find it clear enough to read.

For the film-maker on a budget—a way to make equipment serve a double-duty purpose

Anyone who edits film may be interested in the mechanical 16mm system I use. It is simple and economical.

American Cinematographer Manual

Indispensable data book, used by American cinematographers. Expensive, because it is absolutely comprehensive, up to date, from Hollywood, and has no competitors.

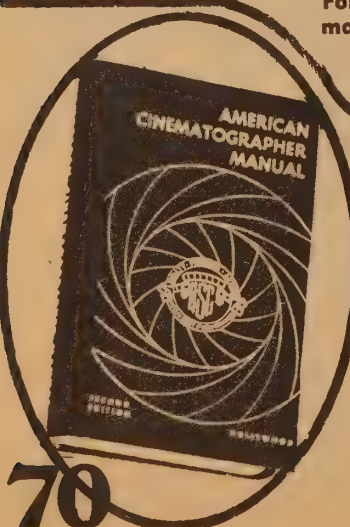
American Cinematographer Manual
Joseph V. Mascelli, A.S.C., ed.
600 pp.

\$12.50 postpaid

from:
The American Cinematographer Manual
P.O. Box 2230
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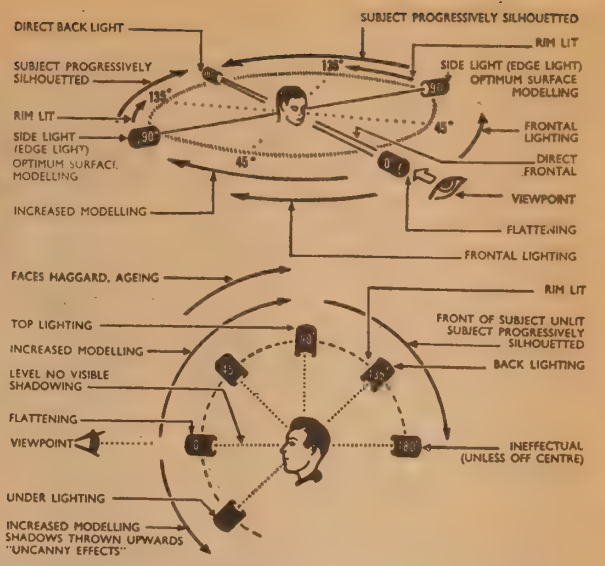
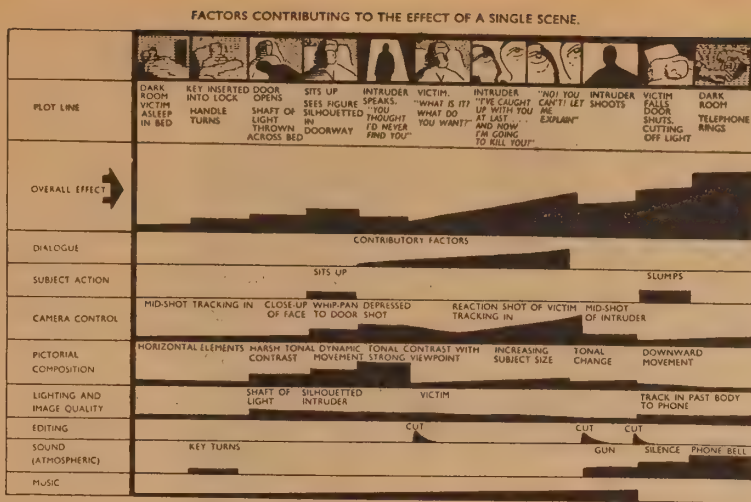


More than 600 pocket-size pages of concise, practical, informative text, tables, charts, diagrams, drawings and listings of all the latest production equipment and filming techniques in use today!
Key word printed on the edge of every right-handed page provides INSTANT INDEX for quickly locating desired data!



The Techniques of Television Production

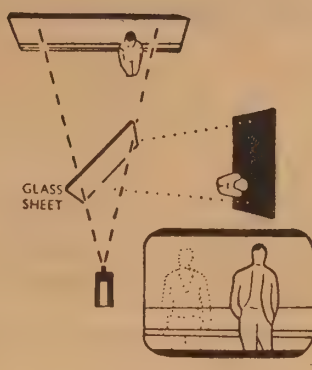
I'm coming to believe that good how-to writing mostly depends on good diagramming. Millerson has mastered that, so you're inclined to believe that he knows his television. Certainly he covers the ground in a thorough fashion: studio layout, TV picture and camera, TV lighting, sound, film reproduction, sets, make-up, organization, imagery, camera control, editing, sound composition, production method, titling, effects, and color. The book can make a more critical viewer of you. Or it can give you some skill to go with the power when you demand and get some control of the half-hour educational program about your scene.



LIGHTING ANGLE. The lighting angle we choose depends on which particular features we want to display, e.g. roundness, surface-texture, relief.

INSTRUCTIONS TO SWITCHER (vision mixer)

Instructions	Meaning
Take one: Cut to One: Cut One	Switch to Camera 1's picture.
Fade-up Two	Turn Camera 2's video-fader up from zero to full.
Stand by to fade Two: Ready to fade Two	Prepare to fade Camera 2's picture out.
Fade: fade.out: fade to black	Turn transmitted camera's video-fader down from full, to zero.
Stand by to mix: dissolve Two	Warning before mixing-cue.
Mix to Two: dissolve to Two	Mix from present camera being transmitted, to Camera 2's picture.
Superimposing Three: ready to super Three	Warning before superimposition-cue.
Superimpose: add Three	Fade Camera 3's picture up, adding it to existing sources.
Take Two out: lose Two	Remove (usually fade) Camera 2's picture from transmission; leaving the rest.



The Technique of Television Production

Gerald Millerson
1961; 1968; 440 pp.
\$7.20 postpaid from:
Communication Arts Books
Hastings House, Publishers Inc
10 East 40th St.
New York, N.Y. 10016
or **WHOLE EARTH CATALOG**



CROWDS can be simulated by using selective viewpoints (left) and carefully positioned subjects crowded together along the lens axis (centre). Also by augmenting subjects with a background of a crowd scene (moving back-projection, photo-mural, painted cloth) or using dummy or cut-out foreground figures (right).

Picture leading to sound—one tape recorder—improvised commentary and dialogue

This method is placed first because it is the easiest and the most flexible.
1 The film is edited and completely finished.
2 The film is viewed a number of times and discussed in detail.
3 The group then sits round a tape recorder to improvise a dialogue or make individual comments as the film is being projected. Background music is provided by a radio or record player. Mixing the dialogue and music is achieved by using the volume controls of the radio or record player.

A scratch must be made on the leader of the film and a plap recorded on the tape at the beginning of a session when the scratch appears on the screen. To replay tape and film:

- (i) Thread up the tape recorder and locate the plap.
- (ii) Adjust the tape so that the plap is aligned to the replay head. (See tape cutting.)
- (iii) Start projector.
- (iv) When the scratch appears on the screen, start recorder.

The main problem with this method is avoiding the noise of the projector being recorded on to the tape.

To prevent this happening the projector is put in a corridor or another room. The picture is projected through an open door into the room which has the screen and tape recorder. This cuts out most of the projector noise but it is of course better to allow a cupboard as a projection booth and cut a hole in the door. The ideal layout for this type of recording is described in the film workshop section.

Sound to vision—one tape recorder

Film making started by making a sound tape.
1 All recordings are made at the same tape speed, preferably 7 1/2 in. per sec. They can be interviews, comments, dialogue or straight commentary.
2 Listen to the tapes, select relevant passages and note down the numbers on the counter so that they can be easily found again.

- 3 Reply the tapes, cut the passages required, lining up the shorter pieces and spool the longer ones on to plastic reels. At 7 1/2 in. per sec. it is possible to select accurately a specific word or noise. The word "tape recorder" is 5 in. long at 7 1/2 in. per sec. so that single words can be taken out as well as false starts, coughs or irrelevant gruffs by an interviewer. Speech can be followed by music, music by speech, and effects inserted quite clearly. Mixes between passages cannot be made but fades can be inserted if they are provided in the original recording. That is if the volume control has been turned up or down at the beginning and end of each recorded passage.
- 4 The tape is joined up in the correct sequence.
- 5 Listen to the finished tape and write down all the comments in sequence. This now forms a tight shooting script.
- 6 The visuals are now planned carefully and the student can walk round various environments to find the most suitable location and shots.
- 7 The tape is timed, with a stop-watch. Individual comments need not be timed, only groups of comments that are to parallel the visuals.

Script

Tape	Time	Shooting script
I like London as a city . . . to . . . going home.	7 secs	Shots of traffic. Nelson's Column
It is so alive with it! Hip!		Zoom in to Big Ben. Houses of Parliament (If possible with bowler-hatted gentlemen)
Music.	9 secs	Shots of the Thames
I used to like the boat trips best of all.	4 secs	Boat setting off

Film Making in Schools

Hot ziggety zag. A good introductory film book at last. What's remarkable is that it gives aid in thinking film as well as making film, and all the perspective is around kids and what trips them instead of what used to trip Hollywood. The book is edited and illustrated with good film sense; it moves, and it moves you. Every other page you want to chuck it and go make a film. How many instructional books do that for you?

Film Making in Schools from Douglas Lowndes 1968; 128 pp; 353 illus. \$8.95 postpaid from Watson-Guptill 2160 Patterson Street Cincinnati, Ohio 15214 or **WHOLE EARTH CATALOG**



The purpose of this book is to examine the value of practical film study in the context of education. That is, to see how still cameras, movie cameras and tape recorders can be used to extend powers of observation and comment and to help young people develop an understanding of contemporary society.

The tape recorder is one of the most valuable tools in education today. Schools cannot have too many of them in service and young people should be able to use recorders with the same skill and ease that they exhibit when using bicycles for transport or power tools for woodwork.

Sound and Vision

First stages that link camera and tape recorder and yet cannot be considered as film production.

Stage 1

Students who have had little opportunity to use audio/visual equipment can start by comparing abstract sounds and images. whoooooooooooooooooooooooooooo



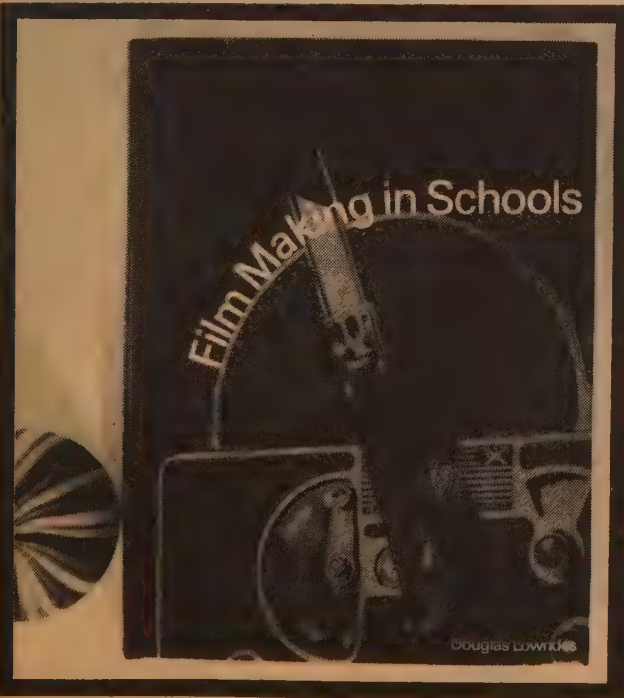
First by recording noises and then painting or drawing the visual equivalents when the recordings are played.

Stage 2

This aims at a performance using sounds and visuals. Special slides are made by photographing the drawings, these are then shown to the accompaniment of the noises recorded on tape.



crehrrrrr crehrrrrrrrrr crehrrrrr crehrrrrrrrrrrr



Moog Synthesizer

New instruments → new music, and nothing can be done about it except fight or flow. Multi-channel sound recording studios are one new instrument. The Moog synthesizer is another. The following are excerpts from Edmund O. Ward's excellent review of Moog in the 3 May 69 Rolling Stone.

[Suggested by Lloyd Kahn.]

It is the complete music machine, capable of imitating any known musical instrument (even the human voice in the more sophisticated models), and able to produce any known sound, provided the operator knows how to set the machine up correctly. The basic elements of this process may be learned in a few hours by anyone with a small amount of musical knowledge, but it should be stressed that the Moog Synthesizer is a genuine musical instrument, and, like all genuine musical instruments, feeling out the nuances and mastering them may take a lifetime. Although Moog Synthesizers have been used for Bach, rock, and television commercials, their main function so far has been for the composition of electronic 'serious' music, but if you have a musical idea that you can conceptualize clearly enough, whatever it is the Synthesizer can help you realize it.

Basically, then, the Moog Synthesizer provides a very compact version of what is known as the classical electronic studio, which consists of various types of signal generators (frequency producers), modifiers, and mixers. Moog instruments employ a system known as voltage control in all of their operations. Voltage controlled instruments produce a voltage as a signal that may be controlled by other voltages from other instruments—and which varies in step with them, permitting rapid amplitude (loudness) and frequency change, making calculation and calibration a veritable snap.

Music by Computers

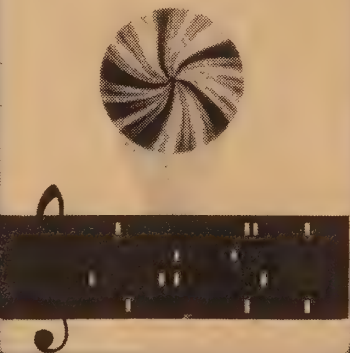
Music by Computers. Goddamn right. When can we get our hands on them without having to tiptoe around some 18th century Department Chairman? This book and four records edited by the worthy Von Foerster and others assembles James W. Beauchamp, Herbert Brun, M. David Freedman, Lejaren Hiller, M. V. Mathews, J. R. Pierce, J. K. Randall, Arthur Roberts, L. Rosler and Gerald Strang. What I want to know is, can Frank Zappa use it?

Biologically speaking, all auditory systems serve primarily one and only one purpose: to infer from the sounds that are perceived the sources that produced these sounds.

In this example 'The British Grenadiers' is gradually converted to 'When Johnny Comes Marching Home' and back, a nauseating musical experience but one not without interest, particularly in the rhythmic conversions. 'The Grenadiers' is written in 2/4 time in the key of F major. 'Johnny' is written in 6/8 time in the key of E minor. The change from 2/4 to 6/8 time can be clearly appreciated, yet would be quite difficult for a human musician to play. The modulation from the key of F major to E minor, which involves a change of two notes in the scale, is jarring, and a smaller transition would undoubtedly have been a better choice.

Only the opinions of listeners can evaluate these factors. Limited opinion sampling, with both experienced and inexperienced listeners, indicates that professional performers prefer a higher level of regularity and accuracy than nonperformers. Neither type appears to approve of the maximum level of computer 'perfection.' Listeners object to the 'electronic organ sound' or the 'machine sound' and ask for more warmth or spontaneity.

Music by Computers



Music by Computers

Heinz von Foerster and James W. Beauchamp, ed. 1969; 139 pp., 4 records

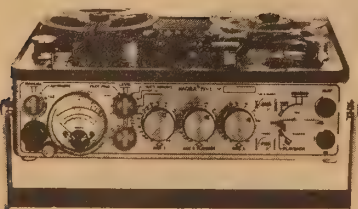
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West: 1530 South Redwood Road Salt Lake City, Utah 84104

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Tape recorders

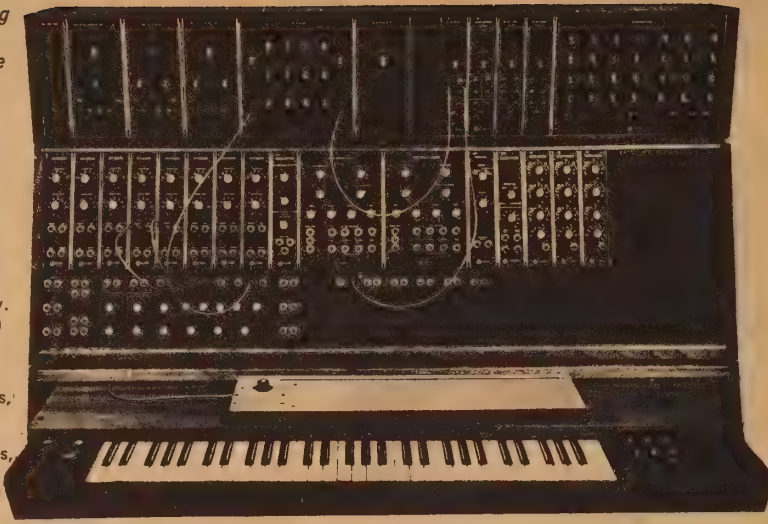


The top of the heap in sound recording is Nagra. Their prices start at \$1123.



For general purpose high-quality mobile recording, the Uher 4000 L is still in front of everyone else for reliability and economy (approx \$440). The new Uher 1000 Report Pilot, designed for sound/film synchronization, costs about \$695.

For access, try local dealers and compare with Behrend's (p. 69).



Fifteen years ago, Moog started out with a handful of people—about a dozen or so. Today, the company is still very modest, employing about three dozen people. The Synthesizers are built slowly with a great deal of care, and before each one goes out it is left on for a week and then dropped on the floor. 'This procedure,' a company representative told me, 'helps to locate any construction flaws and insures that the instrument is rugged.' Prices on Moog Synthesizers range from about \$3500 to \$8000 for a giant mother with all kinds of special features, but they won't sell you one unless you've had ample opportunity to play with one and fondle it. To find out how this might be best accomplished, you can write to them (R.A. Moog Co., Trumansburg, N. Y.), or go to Trumansburg yourself (phone ahead) and talk with them.

\$3500 is a steep commitment. To find out more about the Moog capabilities inexpensively you can get these recent records: 'Switched-On Bach' Columbia MS 7194 (suggested by Larry McCombs) and/or 'The Nonesuch Guide to Electronic Music' Nonesuch HC-73018 (suggested by John Lilly).



Even if extensive opinion sampling were carried out, we would know only what listeners think now, based on conventional literature in conventional performance. There is no reason to believe that such judgments will remain unchanged after listeners have been exposed to much more synthetic sound. Perhaps they prefer 'imperfection' primarily because they have never heard anything else.



Portable listening is another matter entirely than recording. Here I'm inclined to agree with Bob Fass that cassette is the medium and Sony the manufacturer. Specifically, the TC 124 (stereo, w/o extra speakers): \$149.

Colour Guitar

If you've ever wanted to play a guitar without memorizing all the chords first, then get *Colour Guitar*, stick the colour tone location labels (paired with the 12 notes of the major scale) on the fingerboard and go to it. For example, a yellow tone location label shows you where to fret a string to make an F tone; a combination of 'sunset-colours' for an F major chord. Besides the colour labels, *Colour Guitar* includes a colour key to patterns; pictures, charts and positioning diagrams; the colour matrix board (to be used with punched overlay charts for fingering patterns); exercises, and an explanation of the musical theory and playing techniques you will be exploring.

Once you recognize the patterns your fingers make as they move up and down the fingerboard you're playing with a tone-model of universal relationships that are repeated everywhere in some form—from waves of sound to whitecaps in the ocean. But Dave Guard is his own best reviewer of a heuristic system related to math, art, physics, etc. Here is what he has to say:

Colour Guitar just enables you to visualize the patterns on your instrument because patterns put you on an associative plane where you can store the facts that you discover by happy accident and can also predict. Your meaning patterns will be mutually self-consistent if you're able to recognize pattern on your instrument. To memorize the topography, the piece where your fingers are to dance to elicit these tones that you cast into meaning patterns you have to have an access to the surface of the area you work on and it has to be networked in such a way so that your muscles can reach it without too much conscious decision. Otherwise you have a mechanical performance rather than being inspired by subverbal considerations. You can let the universe push you around once you've trained yourself. Like a cat will play a song on a piano or a guitar or a trumpet, while a musician will play in the thing. That's his yard, you know?

Pattern is just shorthand for assimilating large groups of data. Once you get into the territory it's a funny place, really. It's a way of thinking that the frets are hurdles and the strings are high tension wires above. The idea is to pay attention to the interfacial detail. In other words, where acetylene meets the oxygen is where your fingers touch the wood. How hard, when and where.

The Colour Guitar system puts a map of the territory on the territory. This is one of the few anti-entropic scenes you can go through. If your finger is down on a yellow note you don't know what it means, but if you can look up the board and see another yellow note and say I wonder what happens if I go up to that next yellow you find that scene that'll be the same sensation. So I have sound, tactile, the logical thing that yellow (or red, or purple) gives me because I put that on my 12-colour map. It's a truth table, which nothing exists outside of, except the people who throw the aberrations and cultural values on it. If you could just lead them to that note they'll wiggle it, play it long, and play it short.



I played fifteen years following books, but I was never able to grab onto the regular guitar. I couldn't play in it, I could play on it, memorizing certain routines, but I was never able to use my thinking processes, because the tuning wasn't symmetrical. The difference in pitch between the strings goes 4th, 4th, 4th, 4th, 3rd & 4th. It's like showing a picture on a warped screen. The way I tune mine is 4th, 4th, 4th, 4th, 4th, 4th, so that the motions your hands make have the same meaning no matter where you are on the fingerboard. Patterns of tones is music. A guitar is a tone-producing instrument, but the patterns are up to the people to give them meaning. The guitar is ruled into little cross-hatched areas, like a matrix which has tone-producing locations your hands must grab. To play in a thing you want to be able to think with your fingers. You want to get to the point where your fingers lead you around. You're playing when you're doing that.

I got several good theory books—one by George Russell that really just blew the whole thing into proper perspective. He said that there are only 12 notes of music and they might as well be like on the face of a clock. You can look at them all you want to right there and anything you can ever play is going to be on the face of the clock. That got to be a home for me.

The best way to know it is to hook it into something else that you know, that you've already followed down. If you have new information, it must have an address. In psychological terms it's cross-modality. You want an automatic pilot for the times you're not inspired.

Play with models and maps to see if structural similarities—the planes which present themselves to you—make you think about your music in a way to try something on your instrument that will yield a new tune, a new idea, a whole fresh insight. What if I play triangles or something like that? The guitar with the colored stickers on it drags you down into that jungle if you're going to go at all. It depends on your time and propensity. Some people just see wallpaper, others say WOW, the thing is a hundred billion miles deep. The book is a blueprint for action—a kind of sliderule. Once you log the consciousness of pattern, you've got it.

[Reviewed by Dave Guard and Annie Helmuth.]

CONTENTS AND BIBLIOGRAPHY

COVER PANELS The contents of the Cover Panels are described in the Introduction. *Refers to covers written for Spanish Guitar which are generally adaptable to Colour Guitar.	MATRIX BOARD To serve as a background for the punched overlay lessons.	INTRODUCTION Definition of the Colour Guitar. Contents of Cover Panels. Design of the chapters. Purpose of volume.	TONAL RELATIONSHIPS Physical design of the Colour Guitar. The impulse of the Staff names. Syllable names. Scale numbers.
ONE VOICE General finger board pattern for the Major scale. Major scale exercises over a range of two and a half octaves. Proper position of the hand when practicing scales. Beginning Melody: segregated scale studies. *The Liver Maintenance Book of Daily Exercises. Francis Day and Hunter Ltd., London W2C, England. Developing a continuous flow of melody.	TWO VOICES Explanation of the system of fingering numbers for left hand. Two-part exercise for C and F. Finger style and with plectrum. *The Study of Counterpoint from Johann Joseph Pux's Gradus ad Parnassum. translated by Alfred Mann, W. W. Norton, New York. The Classical progress of composition.	THREE VOICES Preliminary exercise using the Barre or Capris. Three-part exercise for right hand. *The George Van Elpo Guitar Method. Plymouth Music Co., New York. A constructive program towards virtuosity.	Musical notation errors need to be avoided. Fingering symbols and position for both hands. Musical examples. Musical examples. Musical examples. Musical examples. Musical examples.
FOUR VOICES Diatonic and Chromatic hand progression. The Lullaby Concert. Three-part patterns. Learning to Hear: George Russell's Lydian Chromatic Concept of Tonal Organization. Concert Publishing Co., 10 Riverside Ave., New York. The relationship of melody and harmony.	PREPARING TO PLAY FROM SHEET MUSIC Translating musical notation into fingerboard movements. *The George M. Smith Modern Guitar Method. Guitarists Publications, Hollywood, California. Includes a useful shorthand notation for chords.	SCALES FROM FOLK MUSIC Extended scale patterns made evident by the symmetrical design of the Colour Guitar fingerboard. Four-part patterns. Ensemble work: Rehearsing an instrumental group. Improving Jazz by Jerry Colker. Prentice-Hall Inc., Englewood Cliffs, New Jersey. Includes a large appendix of chord progressions.	Musical examples. Musical examples. Musical examples. Musical examples. Musical examples.
MAJOR CHORDS GLOSSARY Reading Rhythmic exercises in 2/4 and 4/4 time. The two types of three-part patterns used for the chords in the book.	MINOR & DIMINISHED CHORDS GLOSSARY Symbols for dynamic markings. Comparing chords. Reading Rhythmic exercises in 4/4 time.	DOMINANT CHORDS GLOSSARY Other important performance markings. Counting practice. Slurs. Ties. Bending. Sliding.	Major triad exercises over a range of two and a half octaves. Major scale exercises. Major scale exercises. Major scale exercises. Major scale exercises.

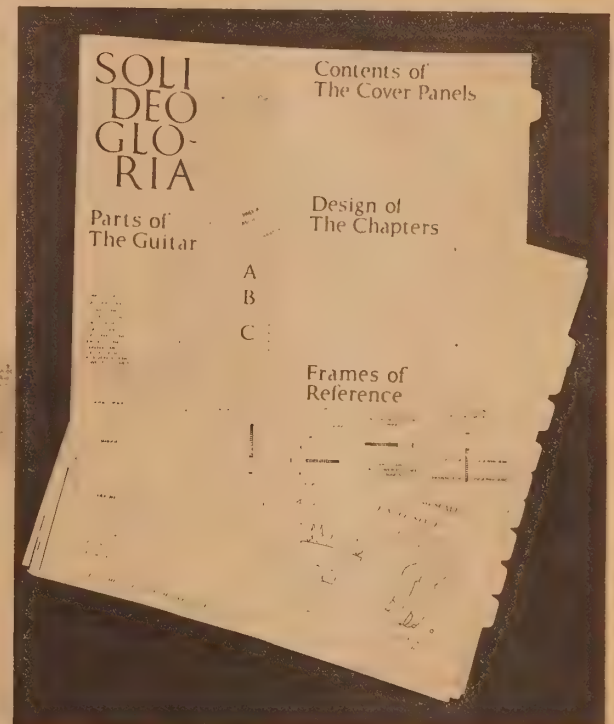
Colour Guitar

Dave Guard
1967; 23 pp.; illus.

\$15.00 postpaid

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[Suggested by Lloyd Martin.]

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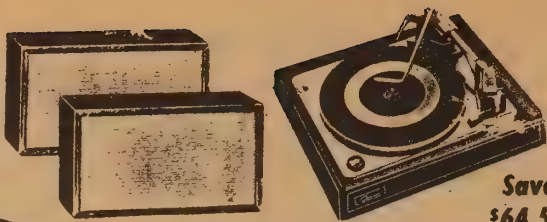
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Allied Radio

After considerable mail and discussion by CATALOG users, it seems clear that Allied is the best mail order source for electronic gear. They also print an industrial electronic catalog that is particularly rich in components, (especially noteworthy: integrated circuit components). Plug in, link up, incorporate.

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Heathkit

Eico kits feature better engineering, but use some old, 'surplus' parts. Heathkits always have fresh, recently manufactured parts; and the customer service (at least in 1958-60) gave patient, thorough advice and exchanged parts which the customer believed defective, with no questions asked. Best Heathkit buys are items designed by other manufacturers (e.g. the Magnecord tape deck; I own the 1960 model Heath-designed TR-1E tape deck and it's a lemon). On the other hand, Heath test instruments are thick in the test/quality control sections of precision-instrument manufacturers such as Tektronix, so the engineering must not be all bad (Heath copied the Tektronix panel for their oscilloscopes—cheap and fine, if not ethical, engineering). [Reviewed by Larry Greisel Suggested by Arthur Brand]

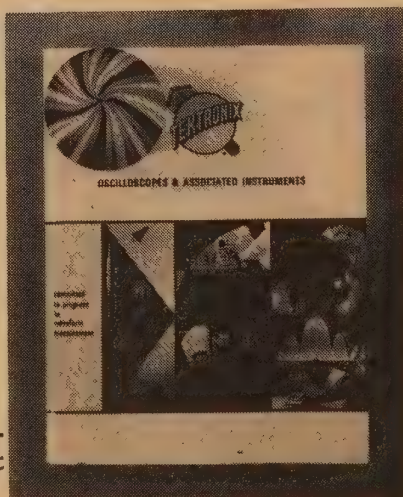


Free Heathkit Catalog 1969; 115 pp.

from: Schlumberger Products Corporation P.O. Box 167 St. Joseph, Michigan 49085

11 Tektronix Catalog

11a Textronix has become the electronics industry standard for oscilloscopes. They are consistently ahead of the competition and their attention to "user" features in functions and control design make the instruments a joy to use. This catalog includes the complete line of scopes and of their other test equipment, particularly pulse generators and amplifiers, all solidly designed.



[Reviewed by Bill English. Suggested by Mike Brand.]

74

11b The equipment is expensive - \$735 for the cheapest scope - but well worth its price.

TYPE 310A OSCILLOSCOPE . . \$725

Alligator Clips

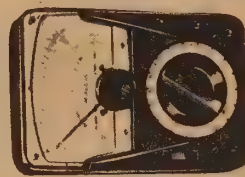
Adapt banana plug to clip, or accept wires. Screw terminals. 3/8" steel. Wt., 3 oz. 24 C 9266, Red. 4/39¢ 24 C 9267, Black. 4/39¢



Camera and Recorder \$1250.00

Portable Recording Outfit

DVK-2400/VCK-2400. Hand-held camera and video recorder outfit lets you shoot "live" action anywhere. DVK-2400 Battery-Operated Video-corder can be carried over your shoulder, weighs only 11 lbs. Easy to operate with one-touch start/stop, automatic video and audio level controls. Records up to 20 minutes on 5" reel at 7 1/2 ips. Rechargeable batteries operate 1 hr. 11 1/4 x 11 1/2 x 4 1/4". VCK-2400 Hand-Held Camera has trigger switch, 1" screen viewfinder, 16-64 mm Zoom f2 lens, top-mounted dynamic microphone, shoulder strap. 2 3/4 x 5 x 8 1/4". With charger. Japan. 15 C 7663 Z. 20 lbs. 1250.00



Accurate VOM has mirrored, wide-view scale, bold numbers, D'Arsonval meter movement. 30,000 ohms/volt DC; 15,000 ohms/volt AC sensitivity. Reads AC and DC volts to 1200; DC current to 300 mA; ohms to 16 meg. -20 to +63 dB. Recessed nylon range selector. 5 1/2 x 3 1/2 x 1 1/2". Leather case, leads, battery, Japan. 24 C 9372. Shpg. wt., 1 lb. 14.95

30,000 Ohms/Volt VOM \$14.95



B&K "Cobra V" CB Solid-State 5-Watt 5-Channel Mobile 2-Way Radio

\$99.95 • 0.5 µV Sensitivity • Speech Compressor • Adjustable Squelch \$5 monthly

A compact mobile transceiver with a lot of power and punch. Full 5-watt input with 100% modulation on 5 switch-selected crystal-controlled channels. Dyna-Boost speech compression for better intelligibility, maximum range. Receiver features ANL, adjustable squelch, 0.5 µV sensitivity for 10 dB S/N ratio. Twin-pi output. With ceramic mike, Channel 11 crystals, mtg. bracket, 2x6 1/4 x 9 3/4". For 12 VDC neg. gnd., 6 lbs. 17 C 6920 X. \$5 Monthly..... 99.95

Heathkit Visual-Aural Signal Tracer . . . Speeds Trouble-shooting

• Ideal for trouble-shooting transistor & tube-type AM receivers & audio equipment • Traces RF, IF, and audio signals • Locates troublesome noisy or intermittent components • Convenient audio/ RF probe with switch • Doubles as a test amplifier or speaker

A QUICK, SAFE WAY TO TROUBLE-SHOOT TRANSISTORIZED CIRCUITRY . . . applies no voltage to circuit under test. Safe for delicate transistor circuits easily damaged through ordinary vacuum tube testing procedures. And even the minute signals of phono pickups, etc., can be checked out, since the IT-12 features a high-gain amplifier with adjustable level control. A worthwhile investment for time-saving test facilities.

Kit IT-12, 6 lbs. Export model available for 115/230 VAC, 50-60 Hz; write for prices. \$26.95

IT-12 SPECIFICATIONS—Power supply: Transformer operated. Power requirements: 117 volts 50/60 Hz AC, 25 watts. Tube complement: 12AX7, 12CA5, 1629. Speaker: 3 1/2" PM. Probe and test leads: 4' input lead for RF and audio with switch on probe body, 2-3' panel test leads with alligator clips. Dimensions: 4 1/2" W x 7 1/2" H x 4" D.



Kit IT-12 \$26.95

Use Heath's Free Technical Consultant Service—Write Them On Any Kit Subject

5-Channel, 5-Watt CB Transceiver . . . Choice Of Fixed Or Mobile

• 5-crystal-controlled transmit & receive channels • Superhet receiver with RF stage • Built-in squelch & automatic noise limiter • Push-to-talk microphone • Easy to build A HOST OF OPERATING CONVENIENCES like 5 crystal-controlled transmit and receive channels . . . sensitive superhet receiver with RF stage . . . built-in squelch and automatic noise limiter . . . built-in speaker plus external connectors for adding an extra speaker if desired . . . relayless push-to-talk circuitry and rugged two-tone brown metal cabinet. Includes PTT microphone, power cable and crystals for one channel (specify frequency). Choose the AC model for "fixed," and the DC version for "mobile" operation. Choose them both and save an extra 5%. Use must comply with FCC regulations.

Kit GW-22A (117 v. AC), 13 lbs. \$56.50 Kit GW-22D (6 or 12 v. DC), 13 lbs. \$58.50

GENERAL DESCRIPTION—Receiver: 5-tube superheterodyne with RF stage, crystal-controlled, on up to 5 of the 23 channels as determined by the particular crystal(s) installed. Sensitivity: 1/2 microvolt for a 10 dB signal-to-noise ratio. Transmitter: Power input to final RF amplifier, nominal 5 watts. Nominal power requirements: GW-22A—117 volts, 50/60 Hz AC, 50 watts. GW-22D—6 volts DC, 8.0 amperes; 12 volts DC, 4.5 amps. Dimensions: 9 1/4" D x 6 1/4" H x 9 1/4" W.

GW-22A \$56.50



Kit GT-18, Trail Bike, 140 lbs., no money dn., \$19 mo. \$199.95

3 The Radio Master

3a A collection of advertising material from manufacturers of electronic parts and equipment. It primarily covers components and test equipment and is a good reference to what is available. In many cases prices are not given and you may have to hunt for a local supplier of some items.

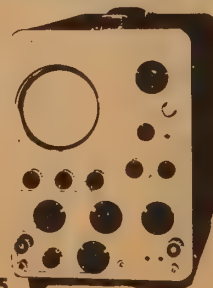
3b The Master is available from major distributors of parts and equipment, free if you are a good customer. [Bill English]

Tektronix

1968; 336 pp.

free

from Tektronix, Inc. P.O. Box 500 Beaverton, Ore. 97005



DC-to-4 MHz PORTABLE OSCILLOSCOPE

10 The Radio Amateur's Handbook

10a This has been the practical guide for radio amateurs for 43 years. It begins with the fundamentals of electric circuits and follows a simple development of the radio theory necessary to understand communications. There is brief section on laws governing amateurs and references to other books that are valuable aids in obtaining a license.

10b Throughout the book actual circuits are shown, always with enough information to build them. Later sections cover complete construction details for various transmitters and receivers but don't be misled by their apparent simplicity. It takes a lot of time and know-how to make these things work and unless circuit building is your thing you are better off to buy commercial equipment or kits. (Heathkit is one of the best sources for ham gear.)

[Reviewed by Bill English. Suggested by Arthur Brand]

The above review was prepared and printed on a computer by Bill English -- as you can see, the fluidity of computer interaction makes spelling more casual than with direct hard print.

The Radio Amateur's Handbook may be of interest to the communities and enclaves who've been fantasizing an underground radio net. Like a night of the week or month when all the world's long-hairs are on the air, vibing to each other and the stars.

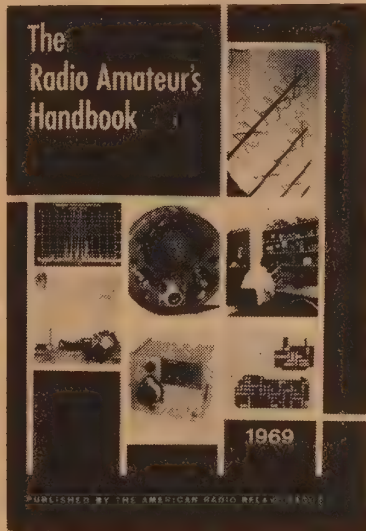


The Radio Amateur's Handbook

American Radio Relay League
1925...1969; 611 pp

\$4.00 postpaid; \$4.50 Canada; \$5.50 elsewhere

from
The American Radio Relay League
Newington, Conn. 06111



A FEATHERWEIGHT PORTABLE STATION FOR 50 MC.

Fig. 19-6—The 50-Mc. transistor station, complete with microphone, battery and antenna system, weighs in at under 3 pounds. The antenna coupler built in a small plastic parts box is used with random "long wires." Coax-fed antennas connect directly to the BNC fitting on the top of the case.

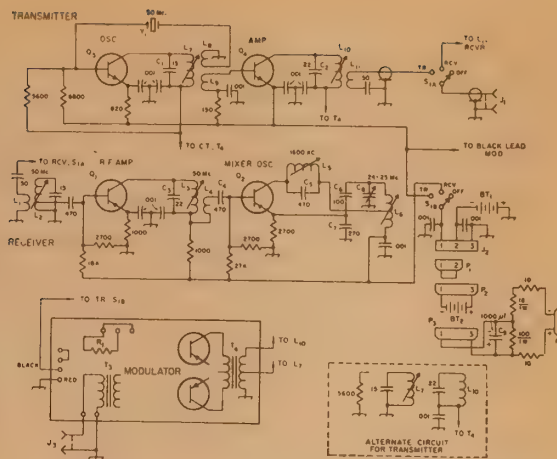
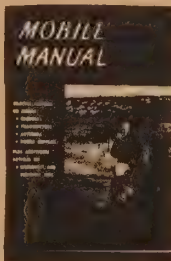


Fig. 19-8 Schematic diagram and parts information for the complete 50-Mc. station. Resistors are composition, 1/2-watt or less unless specified. Capacitors C₁ through C₇ are dipped silver-mica. Others are ceramic unless indicated. Decimal values are in μf; others in p.f. unless indicated.

The important thing in beginning to study code is to think of it as a language of sound, never as combinations of dots and dashes. It is easy to "speak" code equivalents by using "dit" and "dah," so that A would be "didah"

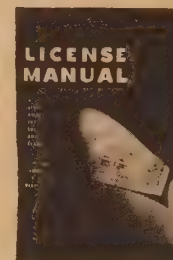
- QRG Will you tell me my exact frequency (or that of.....)? Your exact frequency (or that of.....) is.....kc.
- QRH Does my frequency vary? Your frequency varies.
- QRI How is the tone of my transmission? The tone of your transmission is....(1. Good; 2. Variable; 3. Bad).
- QRJ Are you receiving me badly? Are my signals weak? I cannot receive you. Your signals are too weak.
- QRK What is the intelligibility of my signals (or those of...)? The intelligibility of your signals (or those of...) is..(1. bad; 2. poor; 3. fair; 4. good; 5. excellent).



UNDERSTANDING AMATEUR RADIO Written for the beginner, it explains in simple language the elementary principles of electronic and radio circuits, tells how transmitters, receivers and antennas work, and includes complete how-to-build-it information on low-cost gear—receivers, phone and code transmitters up to 150 watts, v.h.f., measurements, and easy to build antenna systems. A "must" guide for the newcomer in setting up and operating his station. \$2.50 U.S.A., \$3.00 Elsewhere.

HOW TO BECOME A RADIO AMATEUR The standard elementary guide for the prospective amateur. Tells what amateur radio is, and how to get started. Special attention is given the needs of the Novice class licensee. It features equipment which is simple in construction, yet with a high degree of flexibility; this permits the various units to fit into the more elaborate station layouts, which inevitably result as the amateur progresses. \$1.00.

THE RADIO AMATEUR'S LICENSE MANUAL Tells how to get your amateur radio license. In addition to a large amount of general information, it contains typical questions and answers such as are asked in the government examinations. If you know the answers to the questions in this book, you can pass the examinations without trouble. \$1.00.



ELECTRIC AND MAGNETIC FIELDS

When something occurs at one point in space because something else happened at another point, with no visible means by which the "cause" can be related to the "effect," we say the two events are connected by a field. In radio work, the fields with which we are concerned are the electric and magnetic, and the combination of the two called the electromagnetic field.

A field has two important properties, intensity (magnitude) and direction. The field exerts a force on an object immersed in it; this force represents potential (ready-to-be-used) energy, so the potential of the field is a measure of the field intensity. The direction of the field is the direction in which the object on which the force is exerted will tend to move.

- TMW Tomorrow
- TNX-TKS Thanks
- TT That
- TU Thank you
- TVI Television interference
- TXT Text
- UR-URS You; you're; yours
- VFO Variable-frequency oscillator
- VY Very
- WA Word after
- WB Word before
- WD-WDS Word; words
- WKD-WKG Worked; working
- WL Well; will
- WUD Would
- WX Weather
- XMTR (TX) Transmitter
- XTAL Crystal
- XYL (YF) Wife
- YL Young lady
- 73 Best regards
- 88 Love and kisses

Education
Automation

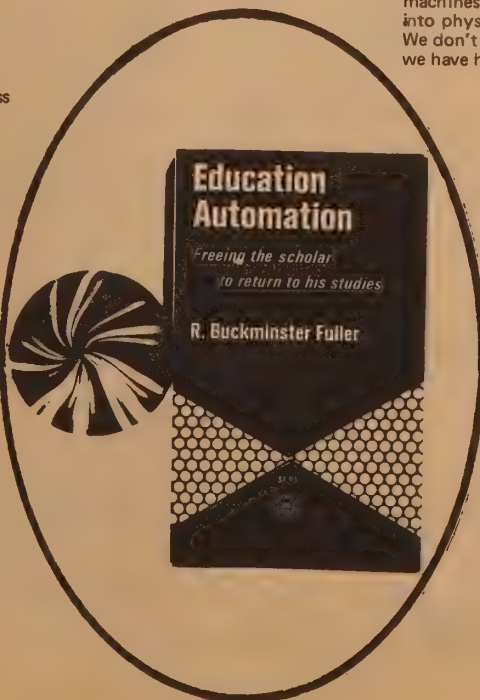
This book is listed under "Communication" rather than "Learning" because Fuller is mainly concerned with access in this book: designing ready access to comprehensive and replicable information and designing mobility as the basis of education.

He developed a hypothetical working assumption that there was a drive of the new life to demonstrate competence, and began working with his own child when she was two and one-half years old. He took an electric typewriter and colored the keys to correspond with the touch system. He then colored his child's fingernails to correspond with the keys each finger should operate. He had a hidden electric key, and when she didn't match the correct finger to the typewriter key the circuit was not closed. When she put the correctly colored finger on it the key worked, and quickly she learned to match her fingers to the proper keys. Every time she touched a key with the proper finger, not only did it print on the paper, but a big letter also came up in a window. By the time the child was three she was typing swiftly with the touch system the stories that were generated in her imagination. She seemed to find it just as easy to communicate this way as by talking.

Education Automation
R. Buckminster Fuller
1962; 88 pp.

\$1.95 postpaid

from:
Southern Illinois University Press
600 West Grand
Carbondale, Illinois 62903
or
WHOLE EARTH CATALOG



You don't need a detailed drawing; we do not make that kind of communication to a craftsman anymore; but all the schools go on teaching that we do. The data no longer goes to the craftsman; it goes to the tools. The idea of drafting measured details is going to become obsolete. We don't want any more measured detail drafting. What we want is the man who gets the fundamental concept, the information significance and can do some comprehensive thinking regarding that information. He will put the data into the information machines, and it will be processed by automation into physical realization of his effective thinking. We don't need many of the myriad of "things" we have had in schools.

The point is that we — both as individuals and as society — are quite rapidly uprooting ourselves. We never were trees and never had roots, but due to shortsightedness we believed blindly and behaved as though we did. Today we are extraordinarily mobile. In this last election, 10 per cent of the national electorate were unable to vote because they hadn't been in their new places long enough. The accelerating mobility curve that I just gave you indicates that by the next election 25 per cent of America will not be able to vote due to recentness of moving, and in the following election possibly less than the majority will be able to vote. We are simply going to have to change our political basis. We are now at the point where the concept of our geographically-based representation — which assumes that it realistically represents the human beings — is no longer valid. The political machine alone will continue to stay local. It sees the people as statically local. So those who are politically ambitious just stay put while society moves on, and, therefore, the static politicians become invisible to the swiftly moving body politic, which cannot keep track of their static machinations since society does not stay long enough in any one place to be effective in reviewing the local political initiations. The political machines soon will have no one to challenge realistically their existence validity except the local newspapers, whose purely local political news becomes progressively of less interest to a world-mobilizing society.

We also find that generally speaking The geographically larger the physical task to be done, the duller the conceptual brain that is brought to bear upon the integration of the scientific discoveries and their technically realized applications. Finally, we get to international affairs, and you know what is happening today.

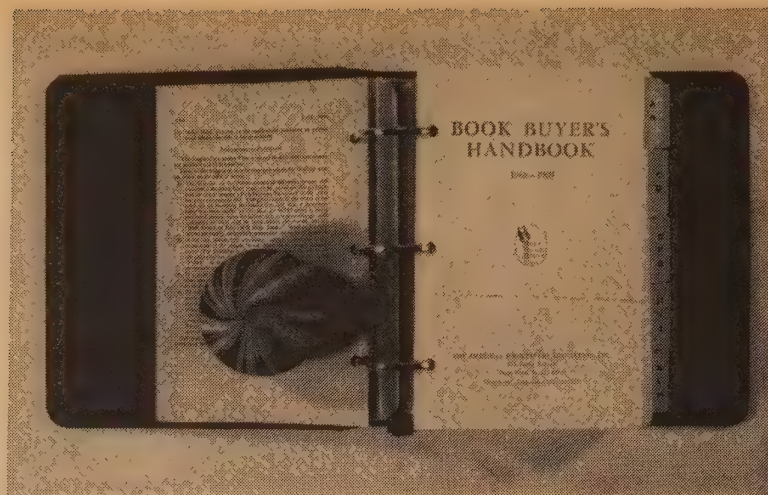
I would counsel you in your deliberation regarding getting campuses ready now to get general comprehensive environmental controls that are suitable to all-purposes like a circus. A circus is a transformable environment.

American Booksellers Association

If you're thinking about retailing books, there's a service you should know about. For \$25 (first-year rate) you can join The American Booksellers Association (ABA) and get two very useful things. 1) *The Book Buyer's Handbook*, which lists all the publishers and all the necessary trade information—addresses, discounts, credit terms, returns policies, officers, etc. 2) *Single Copy Order Forms*, which facilitate orders for single books and get approximately the same discount you would expect for an order of five books. Among other things, the form makes it possible to have a book sent straight from the publisher to the customer.

[Suggested by The Checkered Frog]

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Area Code 212 WAtkins 4-2270

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ABA BOOK BUYER'S HANDBOOK

Subject Guide to Books in Print

Subject Guide to Books in Print
Annually in the Fall; 2724 pp. (1967)

\$18.25 postpaid

Subject Guide to Forthcoming Books

\$7.50 for one year (bi-monthly)

from:
R.R. Bowker
1180 Avenue of the Americas
New York, N.Y. 10036

Crafts

- Adventures in Scrap Craft. Dank, M. Dec 9, 1968. pap. 1.75. Dover.
- American Art & Crafts Movement. Freeman, J. C. Oct 15 1968. pap. 1.95. Century House
- America's Knitting Book. Taylor, G. Nov 29, 1968. 9.95. Scribner.
- Art of Blacksmithing. Bealer, A. W. Mar, 1969. 7.95. Funk & W.
- Art of Papier-Mache. Kuykendall, K. Oct, 1968. 8.95. Hearstside.
- Art of the Oriental Rug. Aanavi, D. Nov, 1968. 17.50. Corinthian.
- Basic Crafts. Lindbeck, J. et al (Eli). Oct. 1968. price not set; prep. 5.96. Bennett Co.
- Blanc De Chine The Porcelain of Tehua in Fukien. Donnelly, P. J. Feb, 1969. 27.50. Praeger.
- Boatbuilding Manual. Steward, R. M. Oct 31, 1968. 9.50. Posadon.
- Book of Rockwood Pottery. Peck, H. Oct 31, 1968. 7.50. Crown.
- Bronzes of West Africa. Underwood, L. Nov 15, 1968. 3.50. Transatlantic.
- Buffalo Pottery. Altman, S. & V. Feb, 1969. 10.00. Crown.
- Buttons. Epstein, D. Oct 23, 1968. 3.50. Walker Weath.
- Candle-Making. Stroese, S. (J). Dec. 1968. 2.95; PLB 2.69. Sterling.
- Carlo Zauli. Argan, G. C. & Fratini, F. R. Dec 9, 1968. 5.00. Wittenborn.
- Chess Sets. Graham, F. L. Oct 23, 1968. 3.50. Walker Weath.

We use it; maybe you can. In one fat book are all the titles in print, along with cost and publisher, listed by subject category. Addresses or publishers are given in the front of the book. Outside of a library, there's no better way to find out what's available in a particular area. If you're trying to stay current in your field, the bi-monthly Subject Guide to Forthcoming Books may be preferable.

- Coffers & Cabinets. Record, N. II. by Record, N. (J). Oct 15, 1968. 2.95; PLB 3.95. Lerner Pubns.
- Common Sense Guide to Refinishing Antiques. Higgins, A. Jan, 1969. 5.95. Funk & W.
- Concise Encyclopedia of Continental Pottery & Porcelain. Haggart, R. G. Oct 24, 1968. 18.50. Praeger.
- Contemporary Design in Woodwork, Vol. 3. Glenister, S. H. Nov, 1968. 6.95. Transatlantic.
- Crafts of the Modern World. Slivka, R. et al Oct 1968. 17.50. Horizon.
- Creative Ceramics for the Beginner Step by Step. Taylor, D. W. & Hart, A. B. Nov, 1968. 6.95. Van Nostrand.
- Creative Play with Fabrics & Threads. Carter, J. Feb 28, 1969. 5.95. Taplinger.
- Crown Jewels of Iran. Meen, V. B. & Tushingham, A. D. Oct 5, 1968. 20.00. U of Toronto Pr.
- Dolls & Dollmakers. Hillier, M. Oct 29, 1968. 15.00. Putnam.
- Early New England Pottery & Their Wares. Watkins, L. Oct, 1968. 15.00. Archon. Shoe String.
- English Desks & Bureaux. Victoria & Editors, A. M. Oct, 1968. .pap. 2.50. British Inf.
- English Slipware Dishes Sixteen Fifty to Eighteen Fifty. Cooper, R. G. Nov, 1968. 18.00. Transatlantic.
- Exotic Flower Arrangements. Yam, L. B. Dec, 1968. 7.95. Funk & W.
- Ferroelectric Ceramics. Deri, M. Nov, 1968. 9.00. Transatlantic.
- Flame Working: Glassmaking for the Craftsman. Schuler, F. W. Oct, 1968. 12.50. Chilton.
- Flower Making. Lobley, P. Feb 28, 1969. 4.95. Taplinger.
- Formulas, Methods, Tips & Data for Home & Workshop. Swezey, K. M. Feb, 1969. 6.95. Popular.
- Greek Geometric Pottery: A Survey of Ten Local Styles & Their Chronology. Goldstream, J. N. Dec, 1968. 40.00. Pub. by Methuen. B&N.
- How to Make Something from Nothing. Egge, R. S. Dec 16, 1968. 5.95. Coward.
- Investing in English Pottery & Porcelain. Morely-Fletcher, H. Oct, 1968. 7.95. Potter.
- Japanese Armour. Anderson, L. T. Nov, 1968. 4.95. Stackpole.
- Japanese Prehistoric Arts: Jomon Pottery. Kidder, J. E. Oct 18, 1968. 35.00. Kodansha.
- Kilns: Design, Construction & Firing. Rhodes, D. Oct, 1968. 10.00. Chilton.
- Linen Heirlooms. Gallagher, C. R. Nov 1, 1968. price not set. Branford.
- Making Contemporary Rugs & Wall Hangings. Meilach, D. Z. Oct 31, 1968. 8.95. Abelard.
- Making Paper & Silk Flowers. Wilder, C. Nov, 1968. 4.95. Hearstside.

- Metal Thread Embroidery. Dawson, B. Feb 28, 1969. 12.95. Taplinger.
- New Handicraft - Processes & Projects. Griswold, L. Rev. 10th ed. Jan, 1969. price not set. Burgess.
- Origami: The Art of Paper-Folding. Harbin, R. Mar, 1969. pap. 1.25. Paperbooks. Funk & W.
- Patchwork Today. Marston, D. E. Oct 28, 1968. 3.50. Branford.
- Pottery. Wymer, N. (YA). Feb 17, 1969. 3.25. Roy. Pottery & Porcelain 1700-1914: England, Europe, & North America. Hillier, B. Nov 8, 1968. 12.95. Meredith.
- Puppets for Play Production. Fenoff, N. Nov, 1968. 6.95. Funk & W.
- Revision Exercises in Needlecraft, Vol. 1: Theory. Nuttall, B. M. Nov, 1968. 2.50. Pergamon.
- Ritual Vessels of Bronze Age China. Loehr, M. Oct 10, 1968. 13.75. Asia Hse Gallery.
- Royal Art of Alchemy. Federmann, R. Mar, 1969. 8.95. Chilton.
- Scrap Craft for Youth Groups. Fleming, G. Jan, 1969. 5.95. John Day.
- Sculpture with a Torch. Rood, J. Oct, 1968. pap. 2.95. U of Minn Pr.
- Staffordshire Blue. Little, W. L. Feb, 1969. 10.00. Crown.
- Sunset Crafts for Children. Ed. by Sunset Editors. E. b. & May, M. (J). Nov 20, 1968. pap. 1.95. Sunset. Lane.
- Sunset Woodworking Projects. Ed. by Sunset Editors Nov 20, 1968. pap. 1.95. Sunset. Lane.
- Table Decoration: Yesterday, Today, & Tomorrow. Smith, G. R. Oct 15, 1968. 15.00. C E Tuttle.
- Tin Craft for Christmas. Sargent, L. Oct 21, 1968. 6.95. Morrow.
- Toby Jugs. Bedford, J. Oct 24, 1968. 2.95. Walker Weath.
- Universal Bead. Erikson, J. M. Nov, 1968. 10.00. Norton.
- Weaving as a Hobby. Ickis, M. Nov, 1968. 3.95; PLB 3.99. Sterling.
- Wedgwood by Rathbone. Rathbone, F. Oct 1, 1968. 10.00. Buten Mus.
- Woodcarving. Durst, A. Feb, 1969. 5.95. Studio. Viking Pr.
- World Ceramics. Ed. by Charleston, R. J. Nov 1, 1968. 25.00; prep. pre jan 1: 22.50. McGraw.
- Your Book of Modelling. Stade, R. (J). Nov, 1968. 3.25. Transatlantic.

Graphic Arts

Subject Guide to Forthcoming Books

Art Prints

Since 1949 UNESCO has been trying to update and internationalize the world of Art Prints. They have a central archives of prints, and a committee of experts who decide which prints to include in their catalogs. The criteria are: quality of print, significance of the painter, and importance of the painting.

There are two UNESCO print catalogs: *Catalogue of Colour Reproductions of Paintings Prior to 1860* and the same of paintings from 1860 to 1965. Both are understandably limited in scope by what quality prints are available, and the choice of painters and paintings is often poor. Too much trivial or repetitive work by minor painters takes the place of better paintings by major artists. The catalog does function as a useful access device, and includes reproductions of many inspired paintings, not all of which are expensive. Each entry includes the artist's name, dates, a black & white photo of the painting, its title, date, medium, size and collection in which it rests. In addition, there are lists of publishers and printers, and information on purchasing prints.

Catalogs are trilingual in French/English/Spanish and print dimensions are given in both inches and centimeters. But price conversions are not given so you must deal with each foreign price. [Reviewed by Joe Bonner & Annie Helmuth]

If you want good prints of Giorgione, Van der Weyden, Klee etc., see the UNESCO catalogs at your library or:

Catalogue of Colour Reproductions of Paintings Prior to 1860

1968; 451 pp.

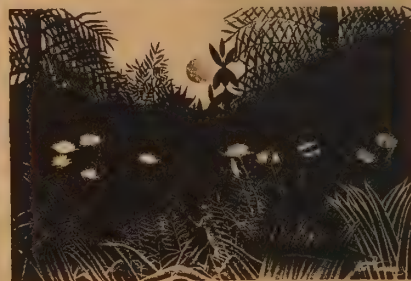
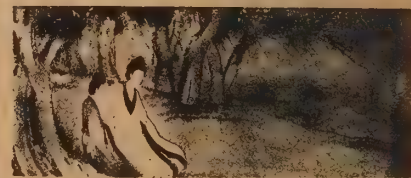
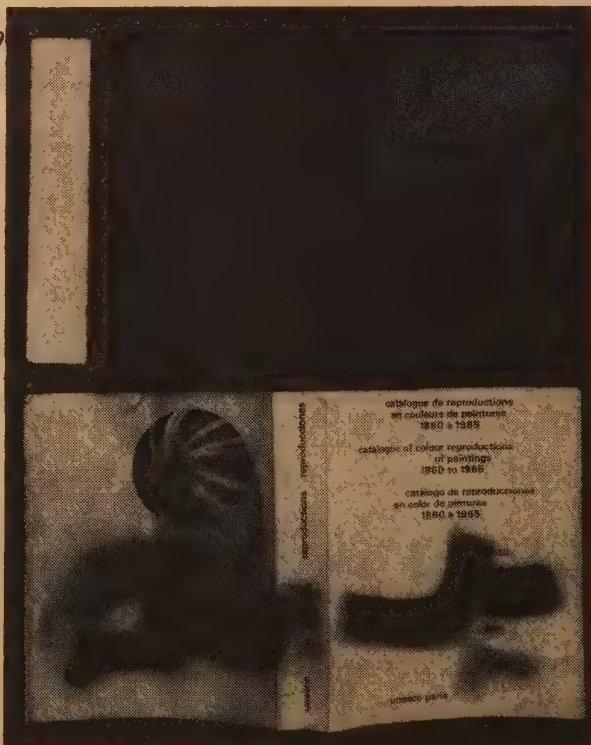
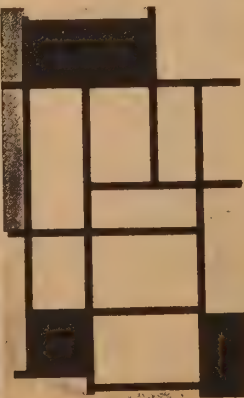
\$8.50 postpaid

Catalogue of Colour Reproductions of Paintings 1860-1965

1966; 561 pp.

\$7.00 postpaid

both from
International Publications
Service
303 Park Avenue South
New York, N.Y. 10010



Bookmaking

A textbook for book designers.

Should enable anyone from author to customer to communicate intelligently about any aspect of the design or production of a book. Probably the only existent reference for someone who needs to deal with printers and publishers, and isn't quite sure he knows an offset from a castoff. Perhaps the best thing that can be said about this book is that it is beautifully designed, but by the time you finish reading it you'll probably know enough to start criticizing its design.

[Reviewed by Larry McCombs]

The readability of a page is affected by no less than 9 factors:

- (a) typeface,
- (b) size of type,
- (c) length of line,
- (d) leading,
- (e) page pattern (which includes "margins"),
- (f) contrast of type and paper (which includes color),
- (g) texture of paper,
- (h) typographic relationships (heads, folios, etc.), and
- (i) suitability to content.

Color has 3 aspects: (a) hue, (b) intensity, and (c) value.

Hue—This is the 'color' of the color (red, blue, yellow, green, orange-red, etc.).

Intensity—This is the purity of the color (intensity is lowered as the color is grayed or 'softened').

Value—This is the darkness of the color (even in pure primary colors there is variation in value—yellow is lighter than blue, blue is lighter than red, etc.; however, an intense yellow may be darker than a blue whose intensity [and value] has been lowered by the addition of white).

Bookmaking
Marshall Lee
1965; 399 pp.

\$12.75 postpaid

from:
R. R. Bowker Company
1180 Avenue of the Americas
New York, N.Y. 10036



There are many considerations involved in matching printer to job, but the main ones are:

- (a) the kind of presses he has (letterpress, offset lithography, gravure),
- (b) the size presses he has,
- (c) the number of presses he has (this relates to capacity to produce),
- (d) the kind of work he has done,
- (e) the quality of his work,
- (f) his schedule, and
- (g) his prices.

Printing as a Hobby

Most books that deal with printing are of a highly technical nature; aimed at the professional printer, or someone aspiring to be one. This book, on the other hand, is aimed specifically at the beginner with very little money. With this book and \$10 you can set up your own private print shop. And if you want to graduate later to a small printing press, Mr. Lieberman explains the processes involved with that also.

[Suggested and reviewed by Lloyd Martin.]



Close-up of composing stick showing a full line of type already set.

Printing as a Hobby

J. Ben Lieberman
1963; 128 pp.

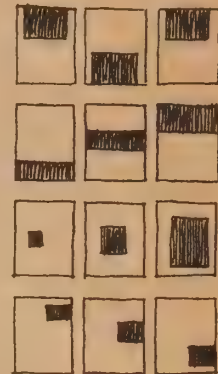
\$0.95 postpaid

from
Signet-New American Library
1301 Avenue of the Americas
New York, N. Y. 10019
or
WHOLE EARTH CATALOG

PROOFREADERS' MARKS

Marginal sign	Mark in text	Meaning	Corrected text
3	Proofreading	Delete, take out letter or word	Proofreading
(e)	Legibility is	Delete and close up	Legibility is
first	the requirement	Insert marginal addition	the first requirement
()	of a proofreader's marks.	Close up entirely	of a proofreader's marks.
()	Symbols should be	Less space	Symbols should be
	made neatly and	Push space down to avoid printing	made neatly and
#	in line with	Add space	in line with
eg. #	the text to which	Space evenly	the text to which
¶	they refer. Place	New paragraph	they refer.
no ¶	marks carefully. Paragraphs may be	No new paragraph	Place marks carefully. Paragraphs may be

Illustrations scattered through text



Four kinds of development in sequence.



Electra Italic
[Oblique]
Electra Cursive

Janson Janson
Baskerville Baskerville
Caslon Caslon
Granjon Granjon

Spartan
Metro
Erbar Light Condensed
Optima
News Gothic
Vogue
Gothic Condensed No. 2
GOTHIC NO. 31

Memphis
Cairo

Spacing type
These lines of 24-point Caslon have been set with type-high spaces and leads to show how spacing is done. One lead (2 points thick) was inserted between each two lines. The paragraphs are indented one em. Between words is the normal "3-em space" (3 to the em). Additional spaces were used as necessary to make the lines come out even. Some 1-em and 2-em "quads" were used at the ends of paragraphs. Here is some letter-spacing.



ANYONE
who would
letterspace lowercase
would steal sheep

FRED GOUDY

Recently a simple new press—known by its commercial trademark as the 'Liberty' press—was introduced around the world for rudimentary printing, and it is the availability of this press which makes printing feasible on the level described in this book. While the press can be purchased from the manufacturer (see Appendix, page 118), it is so simple you can make it yourself. (The developer of the press has granted permission for the description of the press here, so that individuals can make it at home for their own use. However, commercial rights are retained under a pending patent.)

The easiest way to buy materials, therefore, is to write for the catalogue and type and paper-stock sample books of Popular Printing, Inc., 1010 South Weinbach Avenue, Evansville, 14, Indiana, U.S.A. (It has, among other kits, a special \$10 starter pack [as of 1963] which includes all needed items which you cannot make or find around the house.)





Authority in the Bushman band rests with a headman who is responsible for controlling food and water resources. Headmanship involves no special regalia, titles, military or juridical power, and the headman receives no particular rewards; the job is inherited by the previous headman's eldest son, unless the latter chooses to renounce it by moving to another band. The principal task of the headman, apart from that of controller of natural resources, is the choosing of the site for a new settlement and the kindling of the ceremonial fire there. If he is too young, too weak, or too old to exercise office, the actual role of leadership may devolve on another man of demonstrated ability. The headman of a Bushman band is therefore only first among equals, and in many ways his function is merely that of inventory-keeper in an area where the miscalculation of resources is tantamount to disaster.

The Nias village plan is not merely modeled on the cosmos; it has all the symbolic attributes of the world. For example, the stone stairways leading to the village are carved with images of crocodiles, lizards, and other symbols of the lower world, some of them devouring fish, dogs, and other animals. This end of the village (jou) is regarded as 'downstream,' which is synonymous with death, commoners, aquatic animals, 'west' and 'north.' Sibalo, or 'river source, upstream,' corresponds to life, chieftainship, aerial creatures, 'east,' 'south,' and the sun. The village axis is further conceived of as the sky-river, or world axis, which runs between upper world and underworld. This sky-river is both the cosmos and the world snake (i.e., the Milky Way) that rings the world (or village). The world tree grows at the center of the 'universe,' the Fuso Newali, at which spot the fusion of opposing forces is believed to take place. Such joinings or reconciliations characterize the climactic moments in Nias thought.

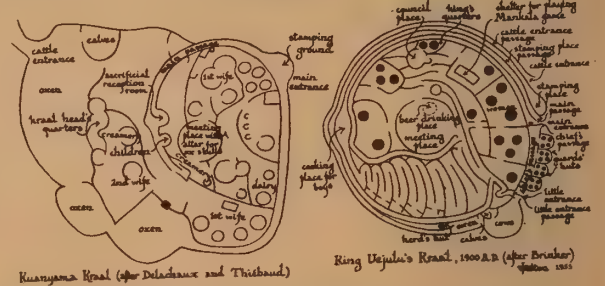
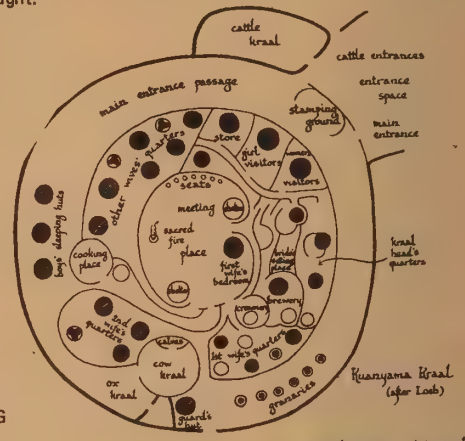
Another Cheyenne ceremony of comparable significance was the Sun Dance, which was known throughout the Plains. The purpose of this rite was world renewal. During the ceremonies the priest symbolically recreated the five worlds of the Cheyenne cosmology, beginning with a barren earth which has to be stocked successively with water, vegetation, buffalo, and healthy, happy Cheyenne. Another ritual, the Animal Dance, followed a similar pattern, although during it there was much clowning and good fun. These ceremonies were not necessarily given annually but depended on the presence of an individual who pledged himself (particularly when he or a relative faced death) to undertake the responsibilities of sponsoring a particular rite.



Village Planning in the Primitive World

Douglas Fraser
1968; 128 pp.
\$5.95 postpaid

from
George Braziller
One Park Ave.
New York, N. Y. 10016
or
WHOLE EARTH CATALOG



Village Planning in the Primitive World

Successful small community design must fit the local physical environment and at the same time render clear the community's social system and its religious system. This book has 78 pictures and eight detailed written accounts of village systems that have worked for bushmen, Cheyenne Indians, Trobriand Islanders, the Yoruba, Mbuti pygmies, and others. The systems are diverse, compelling, and mind-opening for approaching the design of one's own community.

Kibbutz: Venture in Utopia

This book is a straight forward description of one Kibbutz. It is the history, the problems, and the moral codes of a community which began in 1920 and has grown steadily since that time. Over a span of several generations it has grappled with problems, both economic and social, which are similar to problems faced by the community movement in the United States today.

The book examines critically and sympathetically the issues of property, marriage, education, comfort, and communication as it has been dealt with over the various periods of this Kibbutz.

While the book is of limited practical value as a how-to-do-it text, it offers a long term perspective on the difficulties and advantages of the community way of life.

[Reviewed by James Fadiman]

This is a community which was founded, for the most part, by middle-class intellectuals who deliberately chose to be workers. . . . Instead of aspiring to "rise" in the social ladder, they aspired to "descend". . . . This Tolstoyan attitude toward work could be evolved, it is not hazardous to say, only by romantic, urban intellectuals.

...the moral postulates of Kiryat Yedidim. . . are important not only because they constitute the basis for the social structure of the Kibbutz, but because they provide a clue to an important premise of its living: the premise that life is serious. It is serious because the realization of these values, rather than immediate pleasure or self-seeking, is taken to be the purpose of living.

The notions of the movement were simple. They included a revolt against tradition; a love of nature; a love of nation, which seemed to consist of a vague mystique of the "folk"; self-expression; emphasis on the emotional aspect of life; the gospel of "joy in work."

But this emphasis on youth and on the equality that exists between the young and the old create a potentiality for a condition of inequality—an inequality in which the young assume the superior, and the old the inferior, status.



Dune

A more recent Hugo Award winner than *Stranger in a Strange Land*, *Dune* is rich re-readable fantasy with clear portrayal of the fierce environment it takes to cohere a community. It's been enjoying currency in Berkeley and saltier communities such as Libre. The metaphor is ecology. The theme revolution.

Kibbutz: Venture in Utopia
Melford E. Spiro
1956, 1963; 266 pp.

\$2.25 postpaid

from:
Schocken Books, Inc.
67 Park Avenue
New York, N.Y. 10016
or
WHOLE EARTH CATALOG

"These things are so ancient within us," Paul said, "that they're ground into each separate cell of our bodies. We're shaped by such forces. You can say to yourself, 'Yes, I see how such a thing may be.' But when you look inward and confront the raw force of your own life unshielded, you see your peril. You see that this could overwhelm you. The greatest peril to the Giver is the force that takes. The greatest peril to the Taker is the force that gives. It's as easy to be overwhelmed by giving as by taking."

"And you, my son," Jessica asked, "are you one who gives or one who takes?"
"I'm at the fulcrum," he said. "I cannot give without taking and I cannot take without...."
He broke off.

His job becomes more than a job and more than a way of making a living. It becomes a sacred task, a calling, in the religious sense of the term, dedicated, not to the greater glory of God but to the welfare of the group.

Instead of cooking and sewing and baking and cleaning and laundering and caring for children, the woman in Kiryat Yedidim cooks OR sews OR launders OR takes care of children for eight hours a day. She has become a specialist in one aspect of housekeeping. But this new housekeeping is more boring and less rewarding than the traditional type.

The kibbutz, it will be remembered, was originally conceived as a means to an end—the creation of the new man. Instead of the selfish, aggressive personality created by urban capitalism, there would emerge, as a result of the new social order, a kindly, altruistic personality. This end has not been achieved.

Dune
Frank Herbert
1965; 544 pp.

\$1.95 postpaid

from:
Ace Books, Inc.
1120 Avenue of the Americas
New York, N.Y. 10036
or
WHOLE EARTH CATALOG



The Politics of the Barrios of Venezuela

This is a book that concerns itself with one of the major ways that people in Venezuela have assured their survival as a community and effectively forced their government to deal with environmental problems on a rational, human level.

The barrios are incredible collective neighborhoods that can spring up almost overnight in the middle of any suitable South American metropolis. One moment there's a park public ground, or vacant lot of some kind snuggled securely into the heart of the city—and the next time you turn around there's a teeming collection of 'houses' made of cardboard, plywood scraps, tin foil, or whatever else may be at hand; there is an ebb and flow of solemn-eyed men and women carrying baskets; there is an absolute eruption of near-naked children playing everywhere—and the place is immovable by sheer weight of numbers. These people are campesinos, rural peasants who've come to the City in search of jobs, schooling, and a better way of life than mere subsistence.

The more articulate 'brios' (leaders) will bend your ear for hours talking in very simple terms about very complex political maneuvers. They want integration into the life of the city for their people, and they have their own ways of getting it. They know that the success of any demand they make to improve their life style (i.e. paved streets, piped water, electricity, etc.) depends entirely on the combined force of the barrio to sufficiently threaten the power holders so that needs will be met. Up until very recently, a tight lid was kept on the potential power locked into the twisted streets of the barrios. Efficient use of secret police, the inability of most campesinos to vote, and the lack of focus which made every attempt at collective threats via collective violence fall flat, all combined to keep the people under the thumb of the dictator Perez Jimenez.

Since no educational services were directed toward the 'lower' class (an educated populace always leads to trouble) and since the barrio youth are in essence like young people all across the globe; their needs escalated to an explosion into the public consciousness, and once again street power was employed by large sections of an alienated populace to force changes in both the political world and the environment.

American use of this book is quite clearly as an instruction manual.

Our barrios are large ranches, old ghost towns, government giveaway land and other such pieces of property that are lying about here and there, uninhabited and unused. Just last year Eric Nord was hot to buy a whole town in North California and populate it with people who wished to be free of the cities. Holy City in the Santa Cruz mountains will soon be up for grabs, and there are other opportunities about to develop in Southern California.

But it is at this point where a translation of goals and ideals (but not necessarily methods) must be made. The barrio dweller in Venezuela is forced from the country to the city in search of jobs, education, and a better life. The potential barrio dweller in North America is being forced from the city, to the suburban area, to finally the rural countryside in his search for a better way of living—and despite the outward differences, the same group factors and political strategy hold true.

The distance from the barrios of Venezuela to a mountain settlement of geodesic domes is not as far as one might think—and there is much that each can teach the other.

[Reviewed by Jon Buckley]

For one accustomed to the orthodox expansion of urban centers by the gradual extension of paved streets, water mains, and sewer systems, and the construction of buildings and houses, it is difficult to imagine a community of 3-5,000 persons being

The Politics of the Barrios of Venezuela

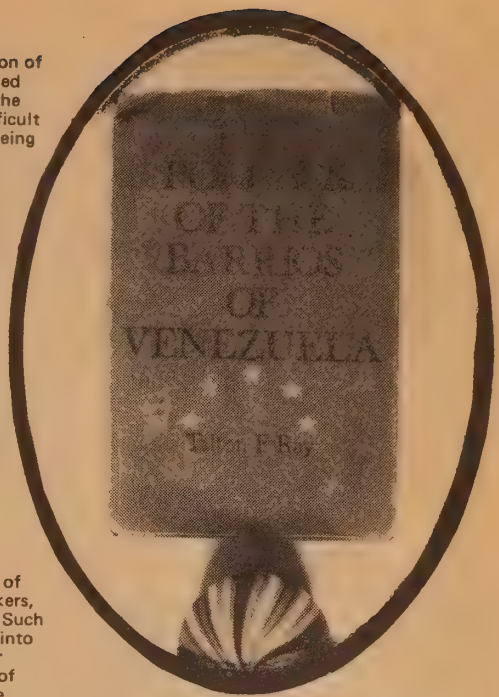
Talton F. Ray
1969; 211 pp.

\$7.00 postpaid

from
University of California Press
2223 Fulton St.
Berkeley, CA 94720
or
Room 701
25 West 45 Street
New York, N. Y. 10036
or
WHOLE EARTH CATALOG

annexed to a city almost overnight without any of the city's surveyors, architects, contractors, bankers, and carpenters participating in its development. Such is the case with most barrios, which are brought into existence, autonomously as it were, with little or no help from the outside business world. Much of the material for the ranchos is scavenged; if some must be purchased, the seller is often another barrio resident who makes a small profit on scraps he has managed to collect. Any planning deemed necessary for distributing lots and locating streets is carried out spontaneously by several settlers equipped with a long tape measure. The building of streets themselves requires only machetes and picks, and the work can be handled easily by the new dwellers. In short, a community of 500 separate homes can be constructed within two or three days without the city's commercial interests being any more than visually aware of it.

...a barrio dweller does not assume that another man automatically deserves his respect simply because he is an official, a wealthier or more educated person, or a foreigner from one of the 'advanced' countries.



Unlike the typical slum quarters of industrialized cities in northern countries, in which old buildings with once-satisfactory facilities have deteriorated over the years, the conditions in most barrios improve with age. In the first stage of development, a barrio consists only of shacks; there are no roads and no water. As time passes, however, such facilities are installed, and houses, instead of degenerating further, assume a more stable appearance as their owners invest in improvements. Each new effort adds something that was lacking before. Understanding this feature is essential for understanding barrio culture and for appreciating the difference between living in shantytowns and in traditional slums, where people typically dwell in rented tenements and conditions deteriorate, rather than improve, with time.

Some barrios do reflect a considerable degree of cohesiveness, but there are usually unique explanations for this. For instance, in small, compact, and semi-isolated communities sociability can be high. One also finds a greater degree of familiarity in barrios where there are only one or two entrances, for families frequently meet each other as they walk in and out. Some communities have been closely knit since their formation because most of the residents are the original settlers who had known each other from an earlier barrio. Finally, regardless of the particular characteristics of the barrio, a certain amount of warmth can be generated among the neighbors by their involvement in community projects.

Instead of waiting a few weeks to choose a new name for the barrio, as was customary, the leaders immediately posted large signs boldly announcing the formation of 'Barrio Raul Leoni,' named, of course, after the newly inaugurated President. They figured that if the whole community openly declared itself in favor of the President, who was the national leader of the party which governed in Maracaibo, the municipal authorities would not dare offend it.

The eagerness with which people seize land for settlement and the extreme informality with which parcels are allocated would seem to indicate that within a community one would have to be continually on guard lest one's own parcel be stolen. Actually the opposite is true. The people have an extraordinary respect for the land and dwellings of other barrio residents, and once a piece of land has a specific 'owner,' they will not touch it.



Children playing in a barrio in Venezuela. The children are playing in a dirt area.

M. Agui



Two families are at it. Posts to parcels of land in a newly formed barrio in Maracaibo by erecting two poles and stretching out their hammocks.

F. F. Ray

Communitas



Men and children of a hillside barrio in Caracas cooperate, casapa style, to build much-needed stairs.

Acción en Venezuela

This book has been around for a good while, and it's still holding its own as a lucid gathering of the elements to think and design with on the subject of community.

Communitas

Paul and Percival Goodman
1947, 60; 248 pp.

\$1.65 postpaid

from
Random House
Westminster, Md. 21157
or
WHOLE EARTH CATALOG



Shelter in a small town



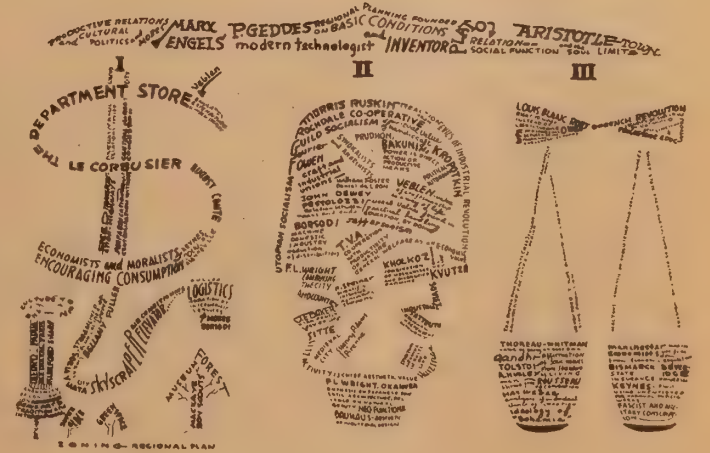
Shelter in the woods

Where the user understands nothing and cannot evaluate his tools, you can sell him anything. It is the user, said Plato, who ought to be the judge of the chariot. Since he is not, he must abdicate to the values of engineers, who are craft-idiots, or—God save us!—to the values of salesmen.

A major problem of every intentional face-to-face community is its 'cash-crop,' its economic role in the great society that has no integral way of life but has a most integrated cash nexus. Usually the problem is not enough money or credit to buy needed mass-produced machinery. But let us mention a touching example of a contrary problem. The Macedonia (pacifist) community made pedagogic toyblocks for cash, and distributed them, at cost of production, to like-minded groups like progressive schools; but the blocks became popular and big commercial outfits wanted a large number. Macedonia was then faced with the following dilemma: these commercial jobbers would resell at a vast profit; yet if Macedonia itself charged them what the market would bear, the community would itself be contaminated by commercialism.

Yet perhaps the very transitoriness of such intensely motivated intentional communities is part of their perfection. Disintegrating, they irradiate society with people who have been profoundly touched by the excitement of community life, who do not forget the advantages but try to realize them in new ways. People trained at defunct Black Mountain, North Carolina, now make a remarkable little village of craftsmen in Haverstraw, N. Y. (that houses some famous names in contemporary art). Perhaps these communities are like those 'little magazines' and 'little theaters' that do not outlive their first few performances, yet from them comes all the vitality of the next generation of everybody's literature.

Bibliography for these wings of the today

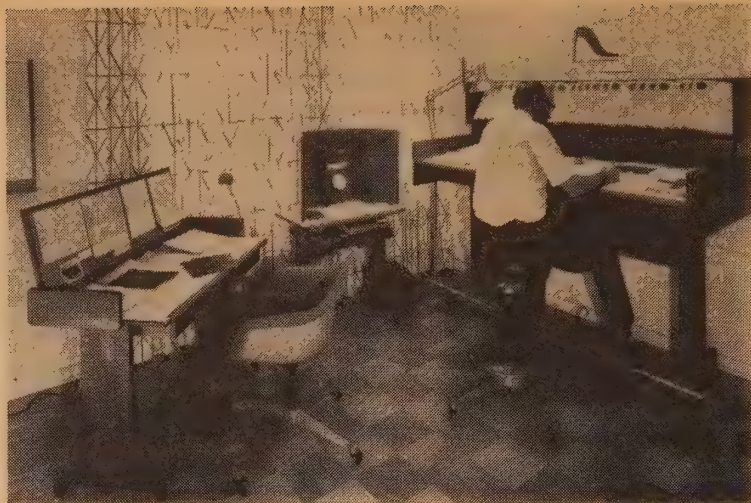


But now comes—what is proper to great cities—a season of carnival, when the boundaries are overridden between zone and zone, and the social order is loosed to the equalities and inequalities of nature. 'A holiday,' said Freud, 'is a permitted, rather than a proscribed, excess; it is the solemn violation of a prohibition.'

The Office: a facility based on change

Nobody involved in this book is an architect, which is pretty interesting, because most of its implications are architectural. The design principles here apply splendidly to any work or living area which traffics in information or human interaction, from offices to small communities. It's a fine presentation of new theory, and Herman Miller, Inc. now has a line of office hardware behind it. We bought the book and hammered our own furniture out of scrap doors and 2x4's.

[Suggested by Dave Evans]



The management of symbolic representation of reality is the function of offices.

The office in its short evolution has adopted every kind of communication abstraction. Resultantly, we are concerned with reality simulation.

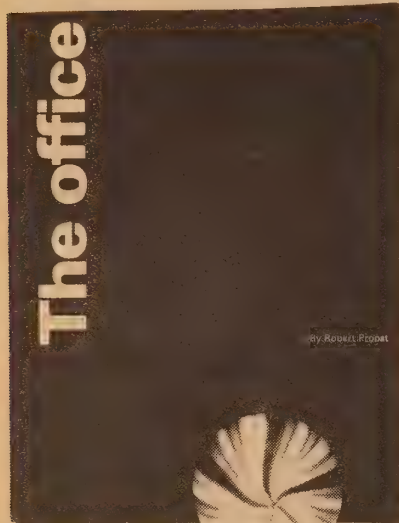
Wiring is part of the office environment and since it is so abundant and must frequently be changed, it has to be a successful, visible design detail.

Face to face across a surface maintains formality and a tone of discretion. Ninety degree location, the most natural of all conversational positions, encourages exchange. Side by side positioning allows joint viewing of papers or objects intelligibly.

The Office: a facility based on change

Robert Propst
1968; 71 pp.

\$8.00 postpaid from
Taplinger Publishing Co., Inc.
29 East 10 Street
New York, N. Y. 10003
or
WHOLE EARTH CATALOG



The most serious health problem in offices is its sedentary nature. Compelled by lack of choice, we are forced to conduct most office activity in a sitting position. The result, as medical studies and insurance data make clear, is a steady decline in vitality, energy and general body tone.

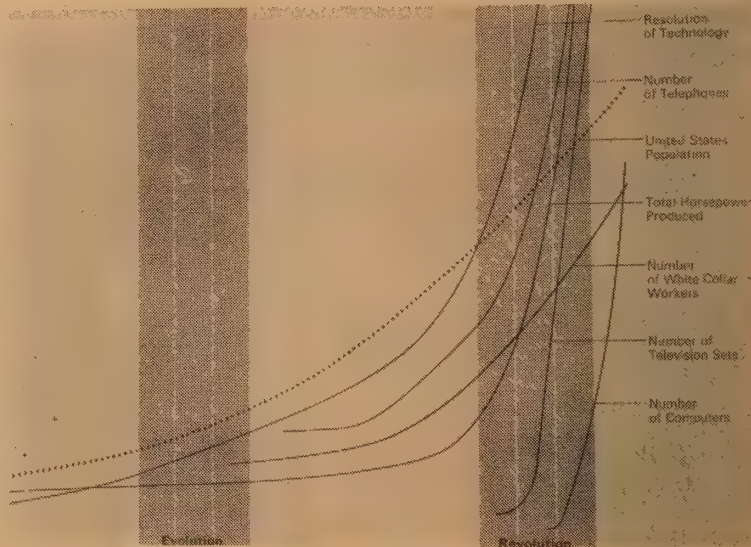
Of even greater significance is the importance of sight as a window to mental recall. An office with no relevant visual display deprives the human performer of a spectacular recall tool: the human eye as a receptor for the mind.



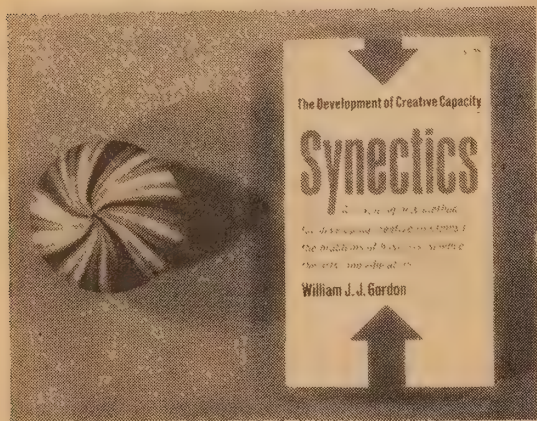
The concept of limitation is perhaps the most important new expression. Action Office II provides no place for paper to hide and die. Essentially, it places all papers in capacity limited display. You can see it, it is all signalled or marked and it will feed back a strong purge signal when it becomes overabundant.

Three sides with a slightly widened opening appears to be the best enclosure of all as a generality. There is good definition of territory or domae . . . privacy is well expressed and the ability to survey or participate is well maintained.

Existing officer patterns often disastrously train us to indulge in unlimited intention involvement without requiring subsequent results. Too many people are allowed to assume a performance fantasy, never following up on many actions they endorse or initiate. They are surrounded by papers they never read, people they never really influence and they frequently live in a blizzard of involvement well beyond their ability to relate to and implement. With certainty, how well we live and function in our offices determines the economic health of people and organizations. The degree to which we have survived in unfavorable circumstances is a tribute to human adaptability. However, the fact that we can adapt does not mean that we do not also pay the penalties for forced fits.



Synerctics



An outline of a method for training creative groups and maintaining their creativity in the business environment. This book provides both the theoretical and experimental background and the practical details of how to put the method to work. Although written for use by business executives, the applications to other situations are obvious and important. Anyone attempting to create a commune or other group of people who will work together creatively will find many useful ideas here. The problem of interface between the creative group and the workaday world is also treated in some detail. Extensive examples of the method in operation, and a lengthy bibliography on creativity.

[Reviewed by Larry McCombs.
Suggested by Jane Burton.]

Synerctics

William J. J. Gordon
1961; 180 pp.

\$1.25 postpaid from
Collier Books
866 Third Avenue
New York, N. Y. 10022
or
WHOLE EARTH CATALOG

The three communication networks inherent in every organization are:
a. General information network.
b. Instructional network.
c. Opinion network.

Now we draw from the data collected an optimum graphic representation of the total organization, its facilities and how individuals function and relate. This graphic representation is rather directly translatable to real life physical facilities.

The word Synerctics, from the Greek, means the joining together of different and apparently irrelevant elements. Synerctics theory applies to the integration of diverse individuals into a problem-solving, problem-solving group. It is an operational theory for the conscious use of the preconscious psychological mechanisms present in man's creative activity.

In Synerctics theory, play with apparent irrelevancies is used extensively to generate energy for problem-solving and to evoke new viewpoints with respect to problems. Play generates energy because it is a pleasure in itself, an intrinsic end.

What do I want? I want a spring...well, I want it to run the dial, the outside dial, and of course the real problem is how to get a band out of this motion. Let me look at the motion again. How do you get inside that spring? If I...if there were an enormous spring...a spring as big as a house, and I hold onto it and it goes in and out, in and out.

What happens to me? Well, let's see, I can put a little drop of ink on the thing. Now I wind it in and out. Look. If I get a spring big enough, as the spring tightens . . . the blob of ink will move in . . . and out as the spring relaxes. . . .
"Funny . . . now I have the feeling that this thing is on its own, completely outside me . . . that the whole idea is no longer . . . no longer anything to do with being mine, my idea . . . it's just like flying now because if I put a spot on the spring and tighten it up, it performs an arc which is exactly the band I'm looking for [cf. Fig 4 (a), (b), (c)]. It's amazing, and this is no longer I . . . it's as though it was taken away from me. . . . This must be what people mean when they say you start writing a play and the people you've put in the play just go on by themselves."



The mechanism of Personal Analogy is easily understood after exposure to Synerctics technique. However, its application demands extensive loss of self. Some individuals habitually are so wed to rigid inner control and rational behaviour that any alternative behaviour is anxiety inducing. To evoke this mechanism the 'teacher' sets the example of Personal Analogy (e.g., in the above example, he is the first to enter the transfer box) so that the novice loses his fear of loss of control. The novice needs to see what happens to someone else first. Then hesitatingly and finally with relaxed confidence the novice will begin to use the mechanism himself.

A: Couldn't there be a mouth which was trained so that it wouldn't dribble?

E: Maybe, but it would be contrived as hell...and if the human mouth can't keep itself clean with all the feedback in the human system....

D: When I was a kid I grew up on a farm. I used to drive a hayrack behind a pair of draft horses. When a horse would take a crap, first his outer...I guess you'd call it a kind of mouth, would open. Then the anal sphincter would dilate and a horse ball would come out. Afterwards, everything would close up again. The whole picture would be as clean as a whistle.

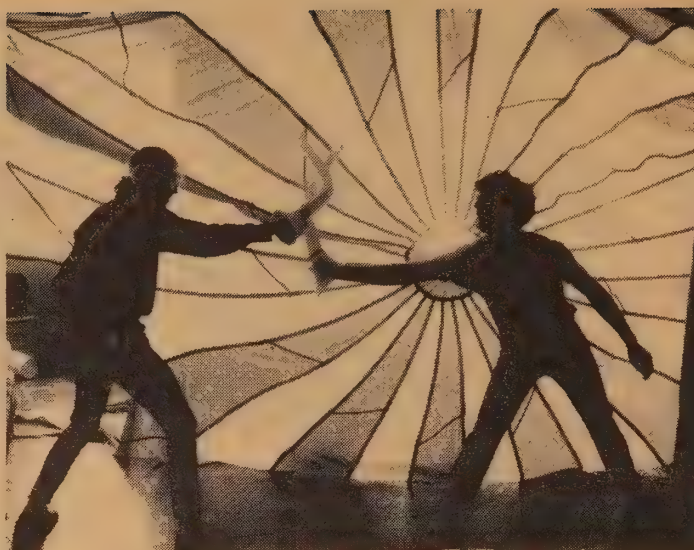
E: What if the horse had diarrhea?
D: That happened when they got too much grain... but the horse would kind of wink a couple of times while the anal mouth was drawn back...the winking would squeeze out the liquid...then the outer mouth would cover the whole thing up again.

B: You're describing a plastic motion.
D: I guess so...could we simulate a horse's ass in plastic?

Boffers

We hereby nominate Jack Nottingham for a Nobel Peace Prize for the first significant advance in weaponry since the encounter group. As Gerd Stern used to say a lot, 'contact is the only love,' and these foam swords permit contact—with an un-pulled punch and no corporal damage. However the release of interpersonal energy is only one of the uses of boffers. They are a fine game, builder of psychic and physical skill. For one thing you learn about temper: it's an obstacle and a hazard—you get cut to pieces every time. You learn about other stuff as well, no teacher required; the wisdom is inherent in the doing. As the inventor proclaimed at the end of a public boffing match at the Fillmore West recently: 'The sword is mightier than the pen.'

[Suggested by Heliotrope]



1 set boffers
(2 foam swords, 2 hand protectors, 2 goggles)

\$11.00 postpaid

from
Jack Nottingham
190 Emmet Ct.
San Francisco, CA 94110
or
WHOLE EARTH CATALOG



Person to Person

Barry Stevens is a lady with one of the best popularization formats going. She's taken significant papers of current action in humanistic psychology, and embedded them in a rich collection of her own non-professional living and applying. The papers are by Carl Rogers, Eugene Gendlin, John Shlien, and Wilson Van Dusen. Most of the excerpts below are from Barry Stevens.

[Suggested by Barry Stevens]



Person to Person

Carl Rogers & Barry Stevens
1967; 276 pp.

\$3.00 postpaid

from
Real People Press
939 Carol Lane
Lafayette, CA 94549
or
WHOLE EARTH CATALOG

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I saw the Hopi look at Cab so equally that he drew Cab down to his own level—precisely, and not one bit lower—so that they seemed to be two people eye-to-eye. I was so impressed by this that I looked up to the Hopi as though he were some sort of god. The Hopi turned to me with that same strong equalness in his gaze, and I felt myself being drawn up until we were on the same plane.

'You must have a career,' they said.
'I don't want a career,' I said. 'I want a career,'....

he made the poets whom I knew seem suddenly like phoney copies of themselves, as far from real as the man who saw in a Rorschach blot where most people see two men, 'The shadows of the silouettes of the ghosts of two puppets.'

Abstract talk seems to me not only 'in front of the face' but not even in this room or this world. It is like rumors about something real.'

Sidney Cohen says 'Our visual mechanism must have evolved with the goal of keeping the organism viable rather than with the aim of seeing things as they are.' Do I sometimes see things more nearly as they are? If I do, is this 'hallucination'?

Sauna

The only book available on Saunas: what they are, the history, how to use and enjoy, and how to build one. Although the construction details are not extensive, there is a list of about 20 Sauna manufacturers who will send you free construction plans, in hopes that you'll buy a heating device from them.

[Suggested by Stan Gould.]



The whole purpose of the sauna is to induce perspiration.

The simplest form of the family sauna is a one-room hut built of logs, with a large rudimentary stove upon which rocks are placed.... The heat of the sauna is non-radiant: that is, it does not radiate directly toward the bather but rather is absorbed in the stones which emit the heat into the air. The indirect heat is gentle and constant.... The stones are heated until they become red hot...ideal temperature 190-200 degrees...water is thrown on the stones but the air remains dry because moisture is instantly absorbed by the wooden walls... traditional sauna includes beating with leafy birch branches, washing, and a plunge in a nearby lake or roll in the snow outside. Then follows a necessary rest while the body cools down completely.

The need for a perspiration bath has arisen in those countries where people have had to do exceptionally heavy physical work.... After heavy work the limbs had to be made supple and strengthened before work could be continued.

There are several different kinds of platform. In some, a series of steps of which the top one is wider than the rest, where there is room to both sit and lie. In others, a wooden stairway leads up to the platform which is like a gallery on which stools and benches are placed.

If possible the sauna should face west, as people usually go into the sauna in the evening, very often at sunset. Then the rays of the setting sun streaming into the sauna room give one a feeling of intense calm. And, lying on the platform, looking out to the lake, one experiences a delicious foretaste of what the cool waters will offer the bather who plunges from the heat of the sauna into their depths.

Sauna: The Finnish Bath

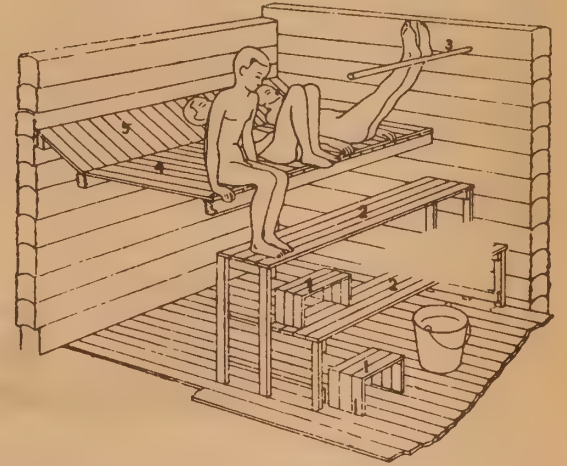
1965; 87 pp.

\$3.95 postpaid from
Stephen Greene Press
120 Main Street
Brattleboro, Vt. 05301
or
WHOLE EARTH CATALOG

Interior walls and ceiling are often built of kiln-dried, unfinished redwood, which does not shrink, does not warp, and is a poor heat conductor. Another excellent wood is cedar, which not only shares redwood's good properties but also emits a pleasant odor and does not stain with moisture.

Nailing should be done with hot-dipped galvanized nails to avoid stains from rust; nails should be counter-sunk whenever it is likely that a bather will touch them in the hot room. Tongue-in-groove paneling disposes of this problem in wall construction; benches can be screwed from below.

BUILDING A FINNISH SAUNA



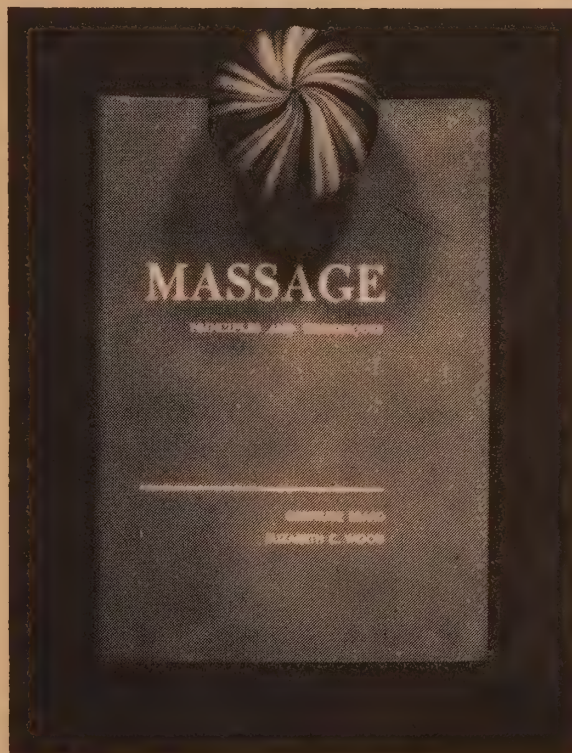
A practical arrangement: 1) small stools used as steps; 2) steps; 3) rail for propping up feet; 4) platform; 5) headrest.

Massage

People rubbing people is always nice. People rubbing people with skill is an order of magnitude nicer. The problem is acquiring skill; there don't seem to be books that really enter the subject in a friendly way. Ida Rolf, I gather, teaches good technique, but you can't get her through the mail. So, until something better is inspired, this is the best massage book we've seen. It's medical, thorough, somewhat textbooky, but the illustrations are many and informative and what they teach feels very good indeed.



Certain persons seem to possess a natural ability to relax their hands and to move them rhythmically, and they will learn the technique of massage more readily than others. However, anyone who conscientiously spends sufficient time in practice will learn contact and rhythm and acquire good technique.



Massage: Principles and Techniques

Gertrude Beard and Elizabeth Wood
1964; 163 pp.

\$6.00 postpaid

from W. B. Saunders Company
West Washington Square
Philadelphia, Pa. 19105
or
WHOLE EARTH CATALOG

In some instances, a fine unscented talcum powder or French chalk may be substituted for cold cream as a medium to prevent irritation of the patient's skin, but usually it does not permit as satisfactory a grasping of the tissues as does a cream lubricant.



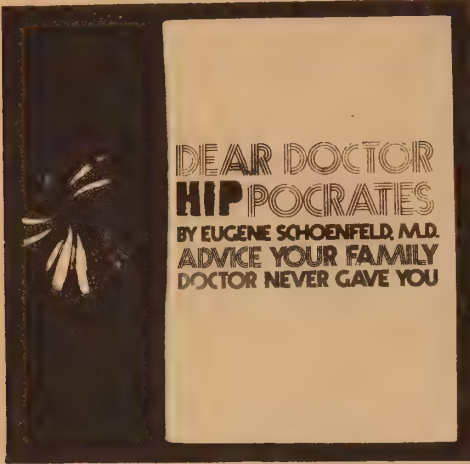
(a) The thumbs remain in the air, and the finger tips [without breaking the contact they have maintained at the temples in (2), (3), (4), (5), and (6)] simultaneously knead in small circles, starting at the temple (Fig. 134) and, following the hairline, continuing back of the ears until the fingers meet at the cervical spine (Fig. 135).



For the limbs, the stroke is usually in the centrifugal direction. The growth of hair naturally falls in this direction, and stroking performed in an opposite direction is unpleasant. The direction of the movement, once established, should be continued throughout the treatment.

Dear Dr. Hippocrates

Long-hairs are doing new stuff with their bodies and nervous systems that occasionally needs medical attention or perspective. Communication was blocked, however, by the social understanding that they aren't supposed to be doing that stuff. Dr. Schoenfeld and his medical advice column in the underground press cut through the blockage, and here came a spout of information as wierd as it was useful. Good answers made the questions good.



Dear Doctor Hippocrates

Eugene Schoenfeld, MD
1968; 112 pp.

\$5.00 postpaid

from
Grove Press, Inc.
315 Hudson Street
New York, N. Y. 10013
or
WHOLE EARTH CATALOG

Tell us about 'speed.' What happens to the body and brain when 'meth' (crystals and tabs) is taken in small and large doses?

'Meth' (methamphetamine) is used in medicine for appetite control, mood elevation, and to raise blood pressure when indicated. The drug is usually ingested in five-milligram tablets one to three times a day. Medical reasons for injecting methamphetamine are specific and few.

Tolerance to the amphetamines develops rapidly and increasingly large amounts must be used to achieve the same results. When large amounts are used, blood-pressure may be raised sufficiently high to blow out a blood vessel in the brain, thus causing a stroke.

True addiction, as well, seems to occur. Recently a patient in a drug-abuse clinic stated that it was harder for him to kick the 'meth' habit than it was to get off heroin. At the time he was shooting up two hundred milligrams of 'crystals' every two hours. He was found dead a few weeks later, apparently from an overdose.

An eighteen-year-old boy on methamphetamine climbed out of a third-story window in Berkeley not long ago. He is now confined to a neurological institute, completely paralyzed from the effects of a broken back.

Both general and student hospitals are seeing increasingly greater numbers of sixteen-to-twenty-five-year-old people who have caught hepatitis from a needle used to inject methamphetamine. Neither boiling water nor soaking in alcohol will necessarily kill the hepatitis virus found in too many spikes.

Speed kills.

For cosmetic reasons and sex appeal, I have been interested for some time in removing my pubic hair. I initially tried scissors which left stubbles; a safety razor leaves red marks and bumps which are both unattractive and painful. An electric razor is better but still unsatisfactory. I called an electrologist who removes hair, but she found my request most peculiar and refused to undertake the work.

Can you suggest a solution to the problem? Is there any reason to believe removal of pubic hair would be either unhealthful or dangerous?

Most Middle Eastern women routinely shave their pubic hair but I leave to you and your chafed friends the question of whether this practice will enhance your sex appeal. It does not seem medically dangerous.

Cautious use of a depilatory or one of the newer electric razors would seem the best solution to your problem. I would advise against permanent removal since you might someday move to a colder climate.

(Note: Judging from the volume of mail received in response to the preceding question and answer, shaving pubic hair is definitely not confined to the Middle East. Excerpts from three letters follow.)

A leading manufacturer of safety razors (Gillette) recently placed on the market something called a 'Scairdy Kit.' The ad dealt with the problem of very brief bathing suits but the letter from the girl who shaves made me wonder. Perhaps she needs instruction in the use of lather or brushless cream.

She will have far better results if she uses an electric hair clipper such as the ones barbers use. The OOOO blade is the finest one and will not leave unsightly stubble, irritate the skin or cause abrasions.

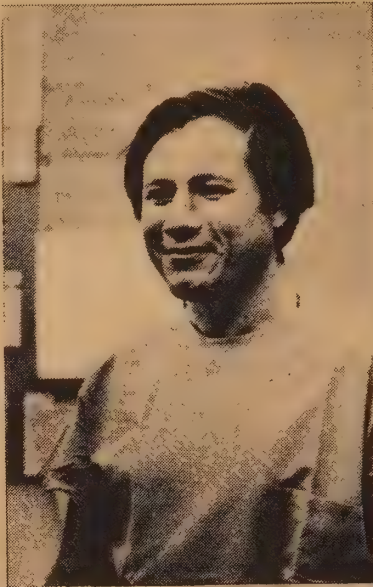
For shaving, use alcohol - it eliminates abrasions and little bumps. This was told to me by a psychiatrist.

Have you ever heard of something called a 'hum' job? During fellatio or cunnilingus one vigorously hums a tune such as 'Jingle Bells.' What do you think of this?

Hmmm. Merry Christmas.

Can infectious hepatitis be contracted through cunnilingus?

This is an excellent way—if the recipient of your affection has the disease.



There's been a lot of talk lately about a new drug called MDA. What are its effects? Do the initials MDA mean anything or are they another put-on like the STP initials?

MDA is methylenedioxymphetamine, a mind-altering drug derived from amphetamine. Both drugs were first synthesized (amphetamine in 1933) by Gordon Alles, who died recently in California.

MDA is an example of a mind-altering drug apparently specific to certain functions of the brain. If the LSD experience can be described as one including both perceptual or sensory changes and inner experiences such as insight, the effects of MDA could be said to be similar to LSD with few of the sensory changes. In other words, illusions and other changes in perceiving 'reality' are infrequent or absent with the use of MDA. The drug is said to promote harmonious interpersonal relationships.

MDA has not been extensively tested in humans and may have unrecognized harmful effects, as with any unproven drug. Moreover the MDA available on the black market may contain impurities.

Some men find that the application of an anesthetic ointment to the head and shaft of the penis half an hour or so prior to intercourse allows them to prolong their coital experience. Nupercainal is one such anesthetic ointment available without a prescription.

The Merck Manual

In 1850 type-packed pages this book covers most of the possible illness and injuries that can occur to human beings. Each difficulty is described, symptoms are discussed and suggested treatments are indicated.

The writing is extremely technical and is designed as a ready reference for practicing nurses and physicians. Unless you are at ease with the unusually colorful language of modern medicine you will need a medical dictionary to fully understand this book.

While a considerable portion of the advice given is sensible and does not require a doctor's presence, much of the book will not be of use to persons who do not have access to medical supplies. This book is not intended in any sense for primitive or simple living conditions; it does not describe alternatives if medical treatment is not available nor does it suggest folk treatments in lieu of hospitalization. However, if you want to understand what is going on when a member of your family or community is seriously ill, this volume can be helpful. There is an excellent index as well as a special section devoted to specific prescriptions and special therapies. The excerpts given below illustrate both the common-sense and the technical aspects of this volume.

[Reviewed by James Fadiman]

[Innovator reports that many prescription drugs can be obtained without a prescription and at low cost from veterinary supply houses. —SB]

DYSPEPSIA ("indigestion")

Treatment

General: The patient should eat a balanced diet (see DIETS, Normal Diet). At least 1 hr/meal should be allowed. Food should be chewed thoroughly without haste and not constantly 'swilled down' with liquids. When possible meals should be taken in a pleasant, quiet, relaxing environment. Smoking immediately before meals should be prohibited. Food should be properly cooked, appetizing and eaten in moderate amounts. Following a meal, the patient should avoid excitement.

HEAT HYPERPYREXIA (sunstroke, heatstroke, thermic fever, siriasis)

Etiology: prolonged exposure to excessively high temperature or the direct rays of the hot sun, combined with exercise and lack of air circulation are the responsible factors. . . .

Symptoms and Signs: Onset may be sudden or may follow complaints of weakness, headache, vertigo, anorexia, nausea and precordial distress. . . .

The temperature rises rapidly to 105 or 106 F. or higher. Convulsions and projectile vomiting may develop and are of serious import. . . .

Treatment: heroic measures are indicated and must be instituted immediately. If the rectal temperature is 106 F. or over, an ice water tub bath or a blanket soaked in water is indicated, and the skin should be rubbed vigorously until the temperature falls. . . .

DISTURBANCES IN ELECTROLYTE

(Mineral) METABOLISM

Dilutional hyponatremia will occur when excessive water is given to a patient in whom antidiuretic hormones activity (postoperatively, or in bronchogenic carcinoma, head injuries, or porphyria) or a low glomerular filtration rate is present. Movement of the water from cells in E.C.F. with a high glucose concentration may produce a temporary hyponatremia.



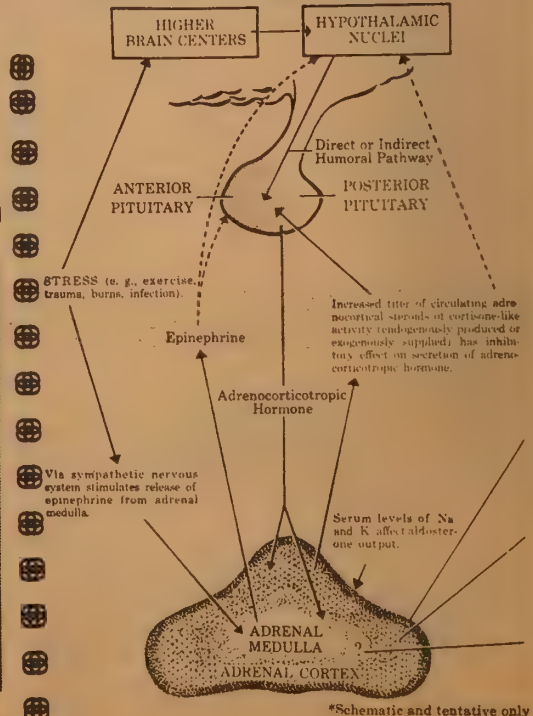
The Merck Manual

11th edition 1966; 1850 pp.

\$7.50 postpaid

from:
Merck & Company, Inc.
Rahway, New Jersey 07065

PITUITARY-ADRENAL



The Merck Index

1968; 1713 pp.

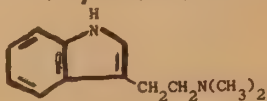
\$15.00 postpaid

from
Merck & Co., Inc.
Rahway, N. J. 07065

We've been told that the Merck Index can be even more useful than the Merck Manual. The Index is an encyclopedia of chemicals and drugs, now in its 8th edition since 1889.

[Suggested by William Bonner]

N,N-Dimethyltryptamine. DMT; 3-[2-(dimethylamino)ethyl]indole. C₁₂H₁₆N₂; mol wt 188.26; C 76.55%, H 8.57%, N 14.88%. Occurs naturally in plants with hallucinogenic properties. Isolin from the leaves of *Prestonia amazonica* (Benth.) Macbride (*Haemadictyon amazonicum* Spruce & Benth.), *Apocynaceae*: Hockstein, *Paradies, J. Am. Chem. Soc.* 79, 5735 (1957). Synthesis: Szára, *Experientia* 12, 441 (1956) using the method of Speeter, Anthony, *J. Am. Chem. Soc.* 76, 6209 (1954). Relationship between hallucinogenic activity and electronic configuration: Snyder, Merrill, *Proc. Natl. Acad. Sci. U.S.A.* 54, 258 (1965).



Crystals, mp 44.6-46.8°. pK_a 8.68 (ethanol-water). Freely sol in dil acetic and dil mineral acids. Picrate, mp 169.5-170°. Methiodide, mp 216-217°.

Emergency Medical Guide
Family Medical Encyclopedia

No book can substitute for a physician's care. Self-treatment of disease can be worse than no treatment at all. But the proper use of a home health manual may be invaluable in recognizing serious diseases and emergencies, rendering first aid, and treating common medical problems which do not require a physician's assistance. Outdoorsmen and members of isolated farms and communes, especially, should have on hand as much medical information as possible.

Henderson's *Emergency Medical Guide* is a useful book, including illustrated sections on bandaging techniques, mouth to mouth resuscitation, injuries to extremities, poisoning, snake bites, emergencies of infancy and childhood, and home care of the ill. Emphasis is placed on the prevention of accidents and disease. Some situations are covered which are not generally considered emergencies (except by the patient) such as painful menstruation. A chapter on normal human anatomy and physiology is included in order to make the rest of the book more intelligible to those giving first aid.

Schiffers' *The Family Medical Encyclopedia* is a medical dictionary and medical encyclopedia. Emphasis is placed on adult health (Pocket Books also publishes Benjamin Spock's *Baby and Child Care*). The format of the book is as its title implies, but instructions are given for its use as a first aid manual.

Emergency Medical Care contains a section on civil disasters and both books describe home deliveries, which are becoming increasingly common as people flee the disasters we know as cities.

[Suggested and reviewed by Eugene Schoenfeld, MD]



FIG. 4-1. Ejecting a foreign body stuck in child's windpipe by a sharp blow between the shoulder blades.

Those who are accustomed to handling epileptic seizures make little of the convulsions and do not become excited.

It is important to keep the victim of the attack from aspirating or choking on vomited matter, but since most attacks will terminate harmlessly by themselves, regardless of what you do or do not do, just protect the victim from injury and bide your time. When he recovers, do not be unduly sympathetic—you may only embarrass him. Give him a drink of water or tea, protect him from curious onlookers, and be sure that he is well enough to go on his way or that he is taken home. If the condition is more serious, see that he gets to a hospital.

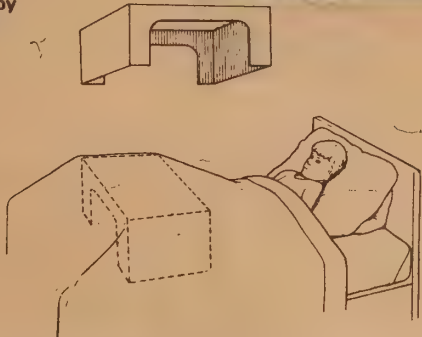


FIG. 15-1. A cradle to keep bedclothes off legs and feet, made from a cardboard carton.

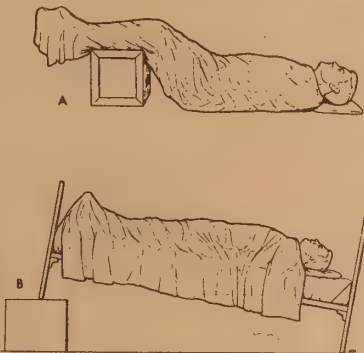


FIG. 6-1. Two methods of placing a victim in the shock position. A. Under emergency conditions, use a box or other device to elevate the legs. B. Under hospital or home conditions, use 'shock blocks' under foot of bed.

The Family Medical Encyclopedia

Justus J. Schiffers
1959; 619 pp.

\$0.75 postpaid

from
Pocket Books
Simon & Schuster, Inc.
630 Fifth Avenue
New York, N. Y. 10020
or
WHOLE EARTH CATALOG

CANCER
Cancer is a frightening word, but fear of cancer often outruns the facts. One should have respect for the risk of getting cancer, but panic is unwarranted.

Can cancer be cured or is it always fatal? Cancer can be cured. It is not universally fatal. About 1/4 to 1/2 of all cancer patients are now being cured. Again as many could be cured if adequate treatment was begun in time. Delay in seeking treatment makes cancer fatal to a great number of people who could otherwise be saved. The curability of cancer—in the present state of knowledge—is highlighted in the following table set forth by the former medical and scientific director of the American Cancer Society:

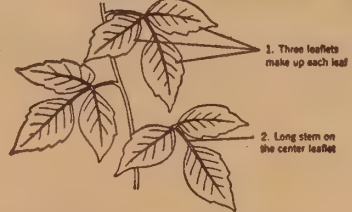
Site of cancer	Present cures in	Cures are possible in	Site of cancer	Present cures in	Cures are possible in
Skin	85%	95%	Larynx	40%	65%
Uterus	30%	70%	Mouth	35%	65%
Rectum	25%	70%	Stomach	5%	60%
Breast	35%	70%	Lung	5%	50%

OBSTETRICAL TABLE TO ESTIMATE WHEN BABY WILL BE BORN

The date on the top line is the first day of the LAST menstruation before pregnancy. The date immediately underneath it is the theoretical date when the baby should be born. Practically, however, the theoretical date will rarely be hit. The baby will usually arrive within two weeks before or two weeks after this date. Thus, if the date of the last menstruation was Jan. 1, the baby will be born somewhere between September 24 and October 23.

Jan.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Nov.
Oct.	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7	Dec.
Nov.	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	1	2	3	4	5	6	7	Jan.	
Dec.	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	Feb.
Jan.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Mar.
Feb.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	Mar.	
Mar.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Apr.
Apr.	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7	May
May	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	June
June	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	July
July	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Aug.
Aug.	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7	Sept.
Sept.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Oct.
Oct.	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7	Nov.
Nov.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Dec.
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Mar.	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7	Apr.
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Aug.	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7	Sept.
Sept.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Oct.
Oct.	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7	Nov.
Nov.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Dec.
Dec.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Jan.
Jan.	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7	Feb.

POISON IVY



Poison ivy can be distinguished from other shrubs and vines by these two characteristics.

SUMMARY AND CHECK LIST OF IMMEDIATE MEASURES

Always treat the most dangerous and urgent condition first. Remember the four B's: breathing, bleeding, broken bones, and burns.

A summary and check list of the fundamental general procedures follow:

1. Make sure that the injured person is conscious. If he is not, begin artificial respiration immediately.
2. If breathing is satisfactory, see whether he is bleeding. If the bleeding is profuse, take measures to control it immediately.
3. When breathing is satisfactory and there is no evidence of bleeding, look for signs of shock and fractured bones.
4. Obtain medical aid quickly—phone a doctor, get someone else to phone him, or get the injured person to a doctor or hospital.
5. Work quickly, but carefully.
6. Loosen tight clothing—collar, waistband, or belt.
7. If the victim vomits, lower his head and turn it gently to one side so that the vomitus will not be aspirated.
8. Remove any loose objects, such as artificial dentures, from the mouth of an unconscious person.
9. Keep the victim quiet and warm. Do not over-heat.
10. Don't give an unconscious person anything to drink.
11. Don't aggravate an injury by unnecessary movements.
12. Don't allow a person with a fracture or suspected fracture to be moved until splints have been applied or he has been fixed to an adequate back board in the case of possible spinal injury.
13. Never urge an injured person to sit up, stand up, or walk until you are sure he can safely do so.



FIG. 4-11. Correct position of hands for external cardiac massage, using the heel of the hand to exert pressure on the breastbone.

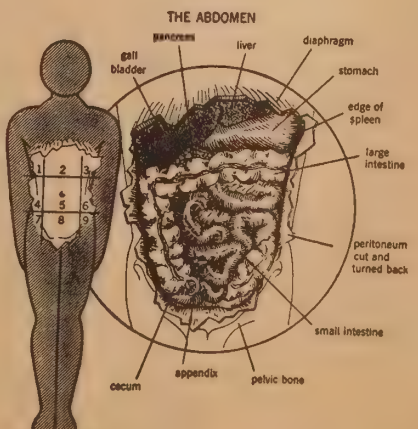
In the typical case the first definite symptom is usually a gripping, colicky pain in the pit of the stomach, followed in two to four hours by nausea and vomiting, which may be accompanied by a diarrhea-like feeling. After another four hours or so the pain shifts to the right lower side of the abdomen, which becomes acutely tender and spastic to touch. This latter symptom, following the above sequence of events, very strongly suggests the presence of acute appendicitis.

The treatment is prompt surgery. Never give anyone suspected of having appendicitis anything to eat or drink, except possibly little sips of water. Never give a laxative or any other medication by mouth until the true diagnosis has been clarified by a physician.

The patient should be placed in a semireclining position, head and trunk raised about 30 degrees from horizontal, with a pillow under his knees to keep them flexed, and an ice bag, wrapped in a towel, applied to the lower right side of the abdomen.

The patient should be seen by a doctor as quickly as possible and arrangements should be made to get him into a hospital.

The symptoms of ivy poisoning usually occur from 24 to 48 hours after exposure, but may appear in 6 hours or be delayed as long as a week. The skin itches and burns. Red patches and, later, blisters appear. Rapid scratching the affected area, as this may spread the damage. See ITCANCO.



The 9 regions of the abdomen: 1. right hypochondriac, 2. epigastric, 3. left hypochondriac, 4. right lumbar, 5. umbilical, 6. left lumbar, 7. right inguinal or iliac, 8. hypogastric or pubic, 9. left inguinal or iliac.

Champagne Living on a Beer Budget

If your vision of an alternate life style includes a dome in the mountains, raising your own food and making your own clothes from homespun wool, you probably ought to pass this book up and wait til somebody writes Beer Living On A Bay-Rum Budget.

But if you are pioneering in or near a city, and if money passes through your hands with some regularity; if, that is, you consider yourself what I have come to think of as a 'suburban guerrilla,' then Champagne Living On A Beer Budget would be a handy tool to have around your camp.

(Someday, after I've lived in the suburbs longer, I'd like to write an essay about my vision of the suburban guerrilla. He's a definite phenomenon. There's a sizeable population of them here in the San Francisco Bay area, men and women out to enjoy the advantages of town life without paying the customary penalties. Every suburban guerrilla probably has his own definition of himself, but my own sense of him is this: he has a job, but not a career. He likes the comforts, but doesn't want to go into debt for them. He makes distinctions between things that are good and things that are merely expensive. He may go in for elegance, or he may dig the funky scene. Hippies, after all, are urban guerrillas. But hippies are kids mainly grooving on each other in special enclaves; and that isn't quite what I'm talking about. I'm talking about people who see the possibility of a rich and abundant adult life within the context of those same suburban communities generally condemned as such hopeless wastelands that 'real' life cannot be supported there. The suburban guerrilla I have in mind is of the suburbs, as well as in them.

He challenges the assumption that the suburban context is hard, absolute, impenetrable, like plastic. To him, more like a piece of cheesecloth, full of holes to breathe through, and to wind in and out of, like a morning glory, or a pole bean. He borrows much of his point of view from the orientals. He realizes that life goes on in the suburbs just like every other place, even if most of the people there are too blind and deaf to see and hear it. The guerrilla lives by his wits, one day at a time. This makes him alert and alive. He has a talent for cultivating the holes in his cheesecloth. One hole might simply be the way the world is at six a.m. Another might be first-hand knowledge of all the footpaths in the neighborhood. He creates his freedom here and there and now and then, and by diligence winds up with as much as any conscious man

anywhere. His landscape is small and patterned, but there are discoveries to be made on it, discoveries that can feed his own life at the same time they are important to the culture. I know of one elderly couple that subsists almost entirely on the food they raise in their organic garden in the backyard of their home in suburban Menlo Park. As far as I'm concerned, the trip those two people are on, the life they are proving possible, is the most inspiring radical activity in all of San Francisco's radical environs).

One needn't romanticize his life as much as all that, however, to find the book we're talking about a worthwhile manual. Anybody interested in bargains ought to have it. It's loaded with facts, tips and information on good deals in all the important categories. Food, clothing, shelter, real estate, automobiles, household appliances, medical things, taxation, funerals, recreation, retirement, consumer co-ops, travel, babies, insurance, charities, and more. It's entertainingly written; yet the rhetoric never gets in the way of the information. The people who wrote it obviously want to beat the money rap as much as any of us. They also want to live well. Their book will be of considerable help to other people trying to do both, simultaneously.

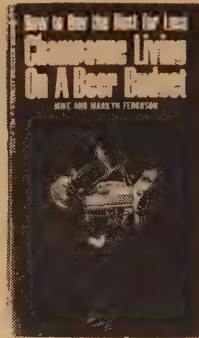
[Reviewed by Gurney Norman]

Champagne Living on a Beer Budget

Mike and Marilyn Ferguson
1968; 247 pp.

\$0.75 postpaid

from
G. P. Putnam's Sons
200 Madison Ave.
New York, N. Y. 10016
or
WHOLE EARTH CATALOG



For a dollar a year, you can subscribe to Our Public Lands, a quarterly magazine telling how to buy public lands, where to hunt, fish, or camp; also details of 'Alaskan opportunities.' Order from the Superintendent of Documents, Washington, D. C. 20402

Finally we called eight establishments under Typewriters, Rental. For comparable models of a Smith-Corona electric portable, two companies wanted \$25 per month; two wanted \$22.50; three were asking \$20; one, \$15; one, \$12.50. We finally rented a nearly new machine from a firm that charged \$9 monthly on a two-month basis.

'Overexposed steaks' are a find for those who will literally look beyond the surface of things. The fluorescent lighting used in grocery store meat shelves darkens the steaks quite rapidly. Once a steak turns maroon, it's usually marked down by 25 percent or so—and it's fine.

Some expensive canned fruits, like Elberta peaches and fine Bartlett pears, can be bought in cans of 'chunks and pieces' for a fourth or less than you'd pay for canned halves.

Or, if you'd rather, the National Association of Housing Cooperatives, Inc., invites your query. Address: 465 Grand Street, New York City, N. Y. 10002. Latest information on new cooperatives would be available from the United Housing Foundation, same address; or from the Association for Middle Income Housing, 217 Park Row, New York; or the FHC Company, 322 Main, Stamford, Conn. (FHC International, 1001 15th Street NW, Washington, D.C., is an affiliate of the FHC Company and helps develop housing cooperatives overseas.

Homes in the paths of proposed freeways have usually been bought by the city or county and are rented on an annual lease basis until time for demolition. Friends of ours are renting a \$30,000 home for \$85 a month—until the bulldozers claim it. They simply called the city switchboard and asked to speak to someone about renting city-county-owned homes.

Homes being rented are often not due for demolition for eight or ten years. They're bought up in advance of need so there won't be last-minute snags or holdouts.

Avoid the cheap \$10-\$17 brake jobs advertised by some service stations and shops. At the price, the linings are most likely of inferior quality, and wheel cylinders won't be rebuilt.

When it comes to air travel you can avail yourself of bargains if you'll fly major airlines on weekdays, regional airlines on weekends...fly by night...forgo the two glasses of champagne in first-class quarters...buy a 'run-of-the-airline' ticket on a regional western carrier if you live in the eastern half of the country...travel to Europe in off-seasons...fly a triangle, with a stop at an intermediate glamour city thrown in for a few dollars extra...travel a heavy-volume, frequently scheduled commuter flight...forgo reservations and fly for half fare, on a standby basis, on at least one airline...or register as a first-time airline rider on another and make any round trip in the system for \$25...buy a package which wraps up hotel, entertainment, and air fare.

To locate a Memorial society in your area, or for bequeathal information, write to:

Continental Association
39 East Van Buren Street
Chicago, Ill. 60605

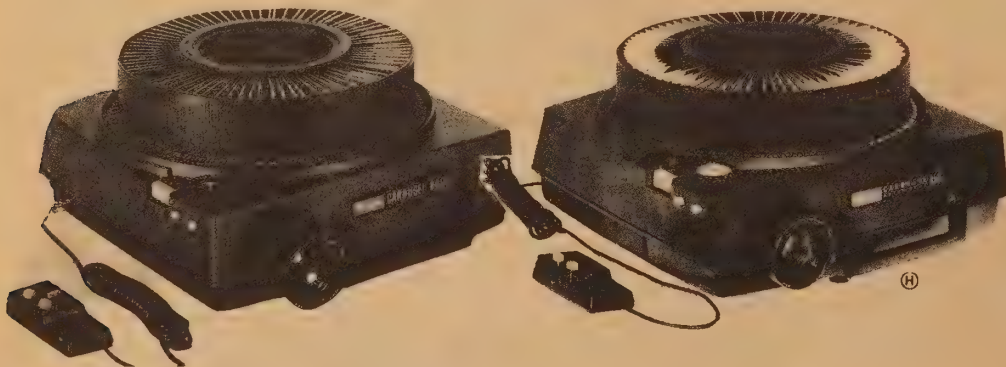
For \$1, this nonprofit organization will send you A Manual of Simple Burial (64 pages).

For 25 cents, the Continental Association will send you Memorial Associations: What They Are and How They are Organized. The association will also be happy to inform you if any societies are newly active in your area.

Unity Buying Service

All my life I heard about factory prices, always mentioned in hushed tones or resentful tones, depending on whether one had been obtained or not. But I never saw one in person til this catalog came along, and, by god, there they are: factory prices, half or two-thirds of store prices. This catalog has slick pictures of mostly slickery items, with a truthful store prices, and then—over here in this plain jane book—the factory prices for same. You add 5%, order, wait two weeks, and here comes all right stuff, righteous cheap.

[Suggested by Muldoon Elder]



Kodak Carousels are THE standard of the image projection world. We've seen nowhere a better price than here.

Ⓒ **KODAK 800 CAROUSEL PROJECTOR WITH 5" F/3.5 LENS** Has 11 basic features plus fully automatic remote slide control: focus; advance; reverse; stop slides by 12 ft. cord. Automatic slide change at 5, 8, or 15 second intervals for unattended continuous projection. Slide change, forward and reverse by buttons at projector. 4 position switch including Hi-Low brightness control. Ship. wt. 19 lbs.
3698A11740 *store* \$154.50

SAME AS ABOVE WITH 4" TO 6" ZOOM LENS.
3699A13640 *store* \$179.50

Ⓓ **KODAK 850 CAROUSEL PROJECTOR WITH 5" F/2.8 LENS** Incorporates 11 basic projector features with automatic focus. Focuses slides automatically after the first slide. 3 way slide control. Remote—change, forward, reverse, stop by 12 ft. cord, push button controls at the projector and automatically at 5, 8, or 15 second intervals. Tungsten-halogen (quartz) lamp for longer life. Ship. wt. 19 lbs.
3700A13640 *store* \$179.50

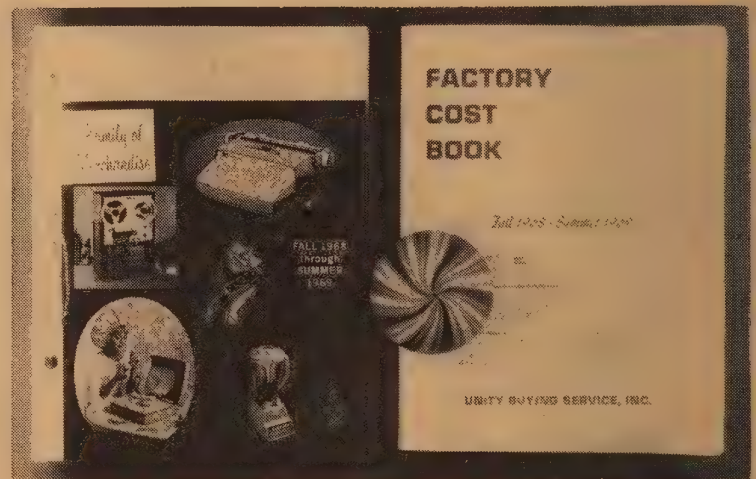
SAME AS ABOVE WITH 4" TO 6" ZOOM LENS.
3701A15540 *store* \$204.50

86



Ⓔ **A HEAVY DUTY SWIVEL BASE MACHINIST'S VISE** Jaws 4" wide open to 3 1/2". Ship. wt. 13 lbs. Size: 9" x 5 1/4" x 5 3/8".
2417A420

store \$7.95 \$2.90 + 5% = \$3.05



Unity Buying Service

costs I think \$5.00

for membership from
Unity Buying Service, Inc.
Mount Vernon, N. Y. 10551

Ⓒ **DRAFTSMAN'S DRAWING SET** Deluxe mechanical drawing set is an invaluable aid for everyone: student; artist; instructor; etc. 19 professional quality tools packed in a smart leatherette case. Special straightening device on compass' and dividers. Set contains: 1-6" compass; 1-4 1/2" compass; 5/16" ruling pen; 6" Swedish detail ruling pen; 6" hairspring divider; 5" drop bow with pen and pencil parts; 3/4" steel spring bow pen, pencil and divider with center screw. Case size: 12 x 5 1/2 x 1".
6277A1650 *store* \$26.00 Ship. wt. 2 lbs.

- Office-size, 84-character keyboard
- Touch-Set margin controls
- Calibrated paper bail
- Rugged, all-metal construction

Economy portable comes with your choice of Pica or Elite type styles. Convenient "console" carrying cover included. Shipping weight 11 lbs. Attractive smooth gray finish. *Store*

6976A3900 Pica \$49.95
6977A3900 Elite \$49.95

Unity \$32.44 + 5% = \$34.06



Unity
\$12.25 + 5% = \$12.86

Sears/Wards mail order

If you live away from cities, where telephone calls and quick car trips aren't possible, the Sears and Wards catalogs are indispensable. Clothes, tools, building materials all via mail and service is rapid. Both catalogs are intelligently organized. Although we take such for granted, the Sears catalog was on display in the US pavilion at the Brussels Worlds Fair and continually mobbed by people of other countries.

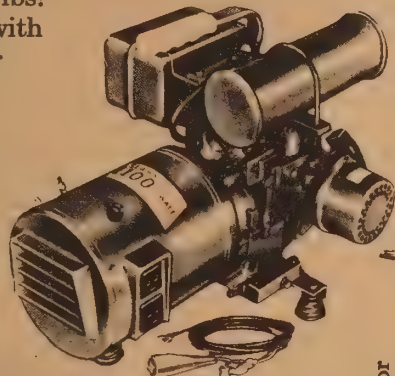
Both have farm catalogs, with contractor's and light industrial equipment and all types of farm equipment, including live poultry. Until last year Sears had a separate catalog for Craftsman tools; now however these are included in the general catalog. Most electric tools have a year's guarantee and other tools are unconditionally guaranteed. If you break a hammer handle after three year's use, they'll give you a new hammer.

Order from nearest Sears or Wards store. Two catalogs a year: spring-summer and fall-winter. Free. To stay on the mailing list you must make two orders every six months.



Delivers 1100 watts . . . weighs only 60 lbs! Camper's pal with battery charger and large spark-arrestor muffler

\$149.50 cash or \$5 monthly



Sears lightest weight alternator for camping and home use. Pick it up by handle, tote it to house, campsite, garage or dock. Two 110-120 volt outlets, 60-cycle AC, for lights, fry pan or single phase motor. Built-in charger, with cables, provides 8 amps. DC for 12-volt car or boat battery. Large, sound-softening muffler with spark arrestor, designed for use in public camping grounds. Engine: 3-HP, 4-cycle, 3600 RPM. Permanent magnetic core. Spring mount. Size: 17x17x16 inches high. 32 AF 32005N—Shipping weight 60 pounds. . . . \$149.50

Shipping Note for Both Pages: All power plants sent freight (rail or truck) or express, "R" items (such as F32 AF 32024N) from factory near Milwaukee, Wisconsin. Allow extra time for factory shipment.



With 3 HP engine \$134.95 cash or \$11 monthly

Compost Shredder

Handles dry leaves, straw, foliage, small twigs. Expanded metal screen. Shreds a bushel of material in 1 to 1 1/2 minutes, depending on type. Damper keeps rocks or large pieces of material from being thrown out of hopper. . . . may be removed for faster feeding of light material. Engine pulley included.

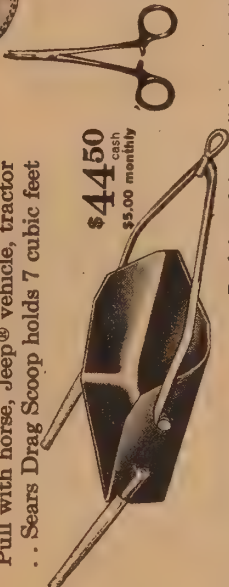
Use with 3 to 6-HP gas engine or 3/4 to 1 1/2-HP electric motor (use 5-in. diam. pulley for 3/8-in. belt on motor; not included). Shpg. wt. 88 lbs. \$9.00 monthly. 32 AF 28504N. . . . Cash \$92.95 With 3-HP engine and pulley. Shipping weight 110 pounds. 32 AF 28505N. . . . \$134.95 With 6-HP engine and pulley. Wt. 137 lbs. \$12.50 monthly. 32 AF 28506N2. . . . Cash \$174.95



Well Digging Supplies

- 24 Pitcher Pump. Full swing handle. Anti-freezing. Cast iron. For 22-ft. lift. 17 in. high. 1 1/4 in. suction. 42 AF 2570C—Shipping wt. 19 lbs. . . . \$12.95
- 25 Driving Cops. Malleable iron. 42 AF 23121—1 1/4 in. Wt. 12 oz. . . . \$1.49 42 AF 23122—1 1/2 in. Wt. 1 lb. . . . 1.89 42 AF 23123—2 in. Wt. 1 lb. 10 oz. . . . 2.69
- 26 Drive Couplings. Galvanized steel. 42 AF 1247—1 1/4 in. Wt. 1 lb. 4 oz. . . . \$1.19 42 AF 1248—1 1/2 in. Wt. 1 lb. 4 oz. . . . 1.35 42 AF 1249—2 in. Wt. 1 lb. 8 oz. . . . 2.09
- 27 Pressure Switch. For piston or jet pumps. 3/4-inch threads. 42 AF 2372—Shipping wt. 1 lb. 8 oz. . . . \$4.49
- 28 Pressure Gauge. Readings from 0 to 100 lbs. For 3/4 to 1-inch pipe. 42 AF 2373—Shipping wt. 8 oz. . . . \$1.49

29 Scissor Clamps. Use as heat sinks, for handling small parts. Straight end, serrated jaws. Locking notches. 5 inches long. Shipping weight 4 ounces. 9 AT 45018. . . . \$4.99



Pull with horse, Jeep, Scoop holds 7 cubic feet . . . Sears Drag Scoop holds 7 cubic feet

\$44.50 cash or \$5.00 monthly

Bowl formed from solid plate of thick 10-gauge high-carbon steel. Alloy-steel cutting edge welded to bowl for greater strength. Steel runners reinforce bowl and keep scraper in line. Steel bail with heavy swivel lugs and hook-up link. Steel socket welded to bowl. Hardwood handles included. Overall size: 33 inches long, 31 inches wide, 10 inches high. Shpg. wt. 102 lbs. F10AF7860N—From factory near Springfield, Ill. \$44.50



Safety helmet only 6.95

Cap-style polyethylene safety helmet for dependable head protection. Four point suspension has an upper cradle that fits safely clear-ance between wearer's head and shell. Sweat-band adjust, fits any size. Bright orange color. 89 FR 24301—Ship. wt. 2 lbs. . . . \$6.95



A hot attic makes a hot house . . . cool it with Wards wind-powered turbine ventilator

- It's inexpensive and easy to install—costs nothing to operate
- It runs even in sporadic winds—23 blades catch the gentlest breeze
- It reduces humidity as well as heat—prevents mildew and rot

22.95

Powered by the wind, Wards turbine ventilator cools your attic and your house, significantly reduces load on air conditioner. Rust-free all-aluminum construction; oil-impregnated bronze bearings; compact, adjustable base fits any roof pitch from 0 to 6/12. Rotor diameter 17 3/4 in.; 16 in. high. Flashing included. Ship. wt. 15 lbs. 74 FR 44500 R. . . . \$22.95

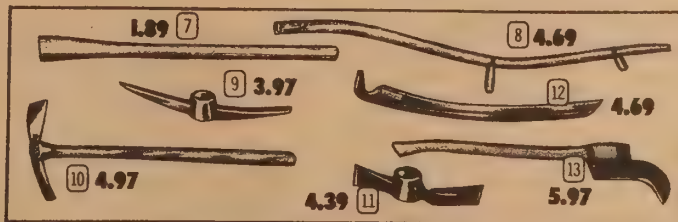
Black polyethylene

State number of rolls wanted (not number of feet).

Ga.	Width	Length	Catalog number	Ship. wt.	Roll price
4 Mil	10 ft.	50-ft. roll	89 FR 21233 M	11 lbs.	4.99
	12 ft.	50-ft. roll	89 FR 21232 M	12 lbs.	6.50
	16 ft.	50-ft. roll	89 FR 21191 M	16 lbs.	7.99
	20 ft.	50-ft. roll	89 FR 21192 A	21 lbs.	9.95
6 Mil	6 ft.	100-ft. roll	89 FR 21146	17 lbs.	8.50
	10 ft.	50-ft. roll	89 FR 21204 M	14 lbs.	7.49
	10 ft.	100-ft. roll	89 FR 21147 M	29 lbs.	14.25
	12 ft.	100-ft. roll	89 FR 21148 B	34 lbs.	17.00
	16 ft.	50-ft. roll	89 FR 21211 M	24 lbs.	11.95
	20 ft.	50-ft. roll	89 FR 21232 A	30 lbs.	14.99
	20 ft.	100-ft. roll	89 FR 21242 A	59 lbs.	28.50
	28 ft.	100-ft. roll	89 FR 21240 R	84 lbs.	39.95
32 ft.	100-ft. roll	89 FR 21237 R	96 lbs.	45.50	
40 ft.	100-ft. roll	89 FR 21238 R	127 lbs.	56.95	

10 Mil	20 ft.	100-ft. roll	89 FR 21200 R	103 lbs.	47.00
	32 ft.	100-ft. roll	89 FR 21201 R	153 lbs.	75.00

40-in. wide black polyethylene. Ideal mulch. Conserves moisture. Lightweight, flexible, tough. Place between crop rows, or over them and slit for plants. Easy to install. 1 1/2 mil. 89 FR 21199 M—(104-ft. roll). Ship. wt. 2 lbs. . . . roll 1.99 89 FR 21190 M—(1000-ft. roll). Ship. wt. 23 lbs. . . . roll 11.99



- 7 Pick or mattock handle. Made from extra strong hickory wood. 36 in. long. 89 FR 1915 M—Ship. wt. 2 lbs. . . . 1.89
- 8 Snath. Fits scythe blades like (12) at right. Made of ash. About 55 in. long. 89 FR 1909 M—Ship. wt. 5 lbs. . . . 4.69
- 9 Railroad pick. Heat treated, forged steel. Approx. 24 in. long. Use handle (7). 89 FR 1916 M—Ship. wt. 6 lbs. . . . 3.97
- 10 Cutter-mattock. One end 3 1/2 in., other 1 3/4 in. forged blades. 54-in. wood handle. 89 FR 1914 M—Ship. wt. 3 lbs. 3 oz. . . . 4.97
- 11 Mattock blade. 3 1/2-in. hoe blade and 2 3/4-in. cutter blade. Forged steel construction. Use handle (7) at left. 89 FR 1917 M—Ship. wt. 5 lbs. . . . 4.39
- 12 Scythe blade. Made of tempered, forged steel. Approximately 26 in. long. Fits snath (8) at left. 89 FR 1904 M—Ship. wt. 2 lbs. . . . 4.69
- 13 Bush hook. Eliminates heavy brush and tree seedlings. Blade approx. 3 3/4 x 13 in. Wood handle. 36 in. long. 89 FR 1910 M—Ship. wt. 5 lbs. . . . 5.97

Repair, customize with small job kit! 2 sizes!

Enough fiber glass cloth and 1 pt. polyester resin to cover 450 sq. in. Cuts, fills, sticks, instruct. To color, order 1 tube of (3) below. 60 B 9260—Ship. wt. 1 lb. 6 oz. . . . \$1.19 Larger Repair Kit Covers 1368 sq. in. 60 B 9261—1 qt. resin. Wt. 3 1/2 lbs. . . . \$1.69



Sears Premium Flexible Pipe is approved safe for drinking water by the National Sanitation Foundation. Withstands even severe pressure surges. . . . adjusts to soil shifts. Has maximum shock and abrasion resistance. Glass-smooth interior surface means low friction loss, more water delivered. Can be flexed indefinitely. Most useful and popular for many types of pump installations and sprinkling systems. . . . or for any cold water line where the working pressure will not exceed 80 pounds per square inch. Lengths weighing over 70 pounds sent freight (rail or truck) or express.

Size	Coil feet	Catalog Number	Wt. lbs.	Coil'	Size	Coil feet	Catalog Number	Wt. lbs.	Price
1/2-in.	25	42 AF 24112C	2	\$1.37	1-in.	100	42 AF 24135N	12	\$13.76
1/2-in.	50	42 AF 24113C	3	2.74	1-in.	400	42 AF 24136N	45	54.95
1/2-in.	100	42 AF 24115C	6	5.48	1 1/2-in.	Per Ft.	42 AF 24141C	3 oz.	Fr. 24c
1/2-in.	500	42 AF 24118N	28	27.40	1 1/2-in.	100	42 AF 24145N	20	23.00
3/4-in.	25	42 AF 24122C	2	2.19	1 1/2-in.	400	42 AF 24147N	78	89.95
3/4-in.	50	42 AF 24123C	4	4.38	1 1/2-in.	800	42 AF 24149N	152	175.00
3/4-in.	100	42 AF 24125C	8	8.76	1 1/2-in.	Per Ft.	42 AF 24151C	4 oz.	Fr. 33c
3/4-in.	500	42 AF 24127N	35	42.95	1 1/2-in.	100	42 AF 24155N	27	31.95
3/4-in.	2000	42 AF 24129N	136	169.95	1 1/2-in.	400	42 AF 24158N	104	127.75
1-in.	25	42 AF 24132C	3	3.44	2-in.	Per Ft.	42 AF 24161C	7 oz.	Fr. 55c
1-in.	50	42 AF 24133N	6	6.88	2-in.	100	42 AF 24165N	46	52.95
					2-in.	200	42 AF 24166N	86	99.00

2-lb. Package of Bees with one bred Italian Queen. Good choice for hobbyist. F32 AF 55441V One Package. Postpaid. (Ship. wt. 7 lbs.) . . . \$8.50

The Armchair Shopper's Guide

This cheerful book is an uncommonly practical compendium of access. Listed here are all of the major and many of the minor mail order shippers in the world. To a large extent the shippers carry items not available locally. Each source is very well described and compared with its competitors. *The Armchair Shopper's Guide* is more general than us, and geared to wealthier readers, but if you use the *WHOLE EARTH CATALOG* very much, you can almost certainly use the *Shopper's Guide*.



You'll have to pay the sales tax if the mail-order house is located in your own state or municipality, but you aren't required to pay it to firms in other states, nor may they charge you their local sales taxes. Although this has always held true for most mail-order firms, in the past such big houses as Sears, Roebuck and Co. made a practice of collecting the various local sales taxes from their customers and passing them on to the state or city involved. However, a recent court ruling has declared this illegal. So, if you live in a place such as New York City you can save a pretty penny (5 percent) by buying by mail from out-of-state firms.

The Oilech and Wajs Watch Co., 8039, Zurich, Switzerland (catalog free) deals mainly in specialty watches for sportsmen and technicians. Men's watches begin at \$13 for a 17-jewel skindivers' shockproof model that has a revolving bezel for giving time in two zones simultaneously or for counting elapsed time. There's a watch that doubles as a slide rule and, most expensive of all, the 'SMT Roboter 17-jewel Pilot and Diving Chronograph,' which looks like something out of the future with its revolving bezel, telemetric scale, five-minute yacht racing calibration, and whatnot, costing \$65. (Only one style is offered for women at this house, a 17-jewel diving watch at around \$13, \$33 if you want a self-winding model.)

Pine Hills Herb Farm, P. O. Box 307, Roswell, Ga. 30075 (brochure free) also has an extensive collection of herbs, all organically grown. In addition, they put out a book for tyro herbalists which is \$1 by itself or 50¢ with an order.

The Armchair Shopper's Guide

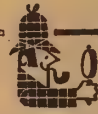
Delphine C. Lyons
1968; 218 pp.

\$1.50 postpaid from:
Essandess Special Editions
Simon and Schuster, Inc.
630 Fifth Avenue
New York, N.Y. 10020
or
WHOLE EARTH CATALOG

Orientalia Bookshop, Inc., 11 East 12th Street, N. Y., N. Y. 10003 (catalogs free): This house specializes in books on Asia and the East, in all areas (and many languages).

Eddie Bauer, 417 East Pine St., Seattle, Wash. 98122 (catalog free): Although some items of trail equipment are available here, notably sleeping bags manufactured by the firm, clothes are the main offering. Handsomely styled casuals, as well as outfits for the serious outdoor man and woman, featuring insulated garments made in the firm's own plant, are available, as well as some festive long underwear. Hall Boot Co., P. O. Box 17246, El Paso, Texas 79917 (catalog free) has a huge selection of made-to-measure Western and English type boots, both American-made and imported, including unusual as well as traditional styles.

For used encyclopedias and other reference books, free price lists are available from The Reference Book Center, 159 West 33 St., N. Y., N. Y. 10001, and The Literary Mart, 1265 Broadway, N. Y., N. Y. 10001.



CU'S KEY FINDINGS

If you're in the market for a crowd-sized coffee-maker, we found five good models to choose among: the **Mirro-Matic M0130** (a Best Buy \$13.95), the **General Electric CU1**, the **Wards 45516**, the **West Bend 7210** and the **Sunbeam AP50A**. All were checked and all could make good coffee, as CU defines it, over their entire capacity range. Among the small, five- or six-cup pots, on the other hand, CU found none that we could unreservedly recommend. We think you're more likely to be satisfied with a somewhat larger pot, such as the **Corning Ware P80EP**, **Universal UP8**, **Proctor-Silex 70501** or **Wards 45426**. We reported approvingly on those last September.

Consumer Reports

Consumer Reports is a comfort. When the time is come to buy some goodie—color television, or a hi-fi, or a sewing machine—CU (Consumers Union) is there with the information on what's the best, or the best buy, or the healthiest of the brands available. I.e.: how not to get burned (one anticipates the CU research on brand-name psychedelics). *Consumer Reports* is a monthly magazine with articles on various classes of products and various cases of marketing misbehavior; the December issue is the *Buying Guide*—a dense compendium of all the quality/price information, available separately for \$1.95. I only wish the magazine would print ads, give the manufacturers a place to beef back, live up the *Liberal Hour*.



BUYING A USED CAR

ON-THE-LOT TESTS

1. Study highlights and reflections along body surfaces; areas that show ripples, bumps, or grainy surface indicate repaired sheet metal damage. Slight mismatches in color provide a clue to the extent of a damaged area, and extensive visible repairs dictate more basic inspection, such as the Shop Testing procedure recommended on page 405.
2. Examine lower edges of body, areas behind bumpers, and rocker panels below doors for rusted-out spots; also check door sills and surrounding floor and inside the trunk for rusted-through areas. Surface pimples, pitting, or blemishes may indicate rusting under paint, and gentle probing with a fingertip may reveal crumbling sheet metal. In general, an automobile that has extensive rusted-out areas should be rejected.
3. Operate all windows, door locks, and seat adjustments (power-adjusted seats and power windows should be avoided where possible, especially in an older car). Check doors for easy, solid closure.
4. Examine the car's interior for signs of hard use or abuse, such as depressions in the seats (especially the driver's), badly worn pedal pads or floor mats, paint worn off steering wheel rim, stains on upholstery indicating leaks, and badly worn tires, including the spare. Uneven wear on any tire may indicate trouble in the front end; repairs, \$10 to \$100.
5. Step down on the brake pedal, holding pressure steady for at least a minute. If the pedal continues to sink, even gradually, repair of this malfunction may cost from \$10 to \$60.
6. Start the engine, listening carefully for loud noises while the starter is operating and when the engine starts. See that all gauges or warning lights for oil pressure and generator go on when the ignition is turned on, that gauges work properly, and that warning lights go out after the engine starts running. If malfunction is noted, reject the car or reserve judgment on it until an independent mechanic sees it.
7. With the help of another person, check to see if the headlights (high and low beam), tail lights, brake lights, and turn indicators are in working order. Repair is usually inexpensive (50¢ to \$10) but can mean annoying trips to the shop.
8. Grasp a front wheel at the top with both hands and shake it to and from you vigorously. A lot of free play or clunking sounds are signs of loose or worn wheel bearings or of worn suspension joints; repairs, \$20 to \$100.
9. Push down rhythmically on each corner of the car in succession so as to set it bouncing. The car, when you release it, should move either up or down, not both ways, then stop at an equilibrium position. Freer motion suggests worn shock absorbers, which should be replaced for safety as well as comfort (at \$15 to \$20 a pair).

DRIVING TESTS

88 Never buy a used car without at least a short drive. Better still, conduct the following driving tests, which require no special driving skills and impose no undue strain on a car's machinery. Listen for all noises, squeaks, and rattles; if they are abundant, reject the car.



The Mirro-Matic M0130 at right (and most others) has a spigot high enough for a 3½-inch cup. The Westinghouse at left is one that would make you tilt the cup or set the urn at table-edge.

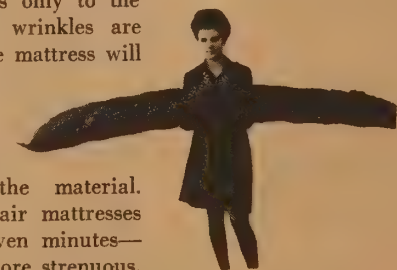
AUDIO SYSTEMS

I—HIGH-POWER ECONOMY SYSTEM, approximately \$515; \$745 with tape deck. Output power is adequate for rooms up to 7000 cu. ft.
Pickup Cartridge—**Grado BTE**, \$19.95. A Best Buy cartridge with elliptical stylus.
Turntable—**AR XA**, \$78. This was the only check-rated manual turntable in our most recent tests, and A Best Buy.
Changer—**Miracord PW 620**, \$89.50. You can have the added convenience of a changer for the added \$10 or so, but with somewhat higher flutter and rumble than in the **AR XA** turntable, but these faults will not be audible in most music.
Tape Deck—**Sony TC-355**, \$229.50.
Receiver—**Lafayette LR-1500T**, \$299.95 plus shipping.
Loudspeakers—**Acoustic Research AR-4X**, \$57 each. Alternative (where small speaker size is important): **ADC 404**, \$56 each.

President Nixon brought home from Europe last winter some news that may hit consumers squarely in the wallet. The President's news, couched as it was in dry-as-dust references to tariffs, import quotas and other intricacies of international trade, was scarcely meant to arouse public concern; it was, rather, intended to reassure American manufacturers who have been crying for protection against foreign competition. What Mr. Nixon said he had done was to urge European governments, in no uncertain terms, to cut back on the volume of certain goods their industries are selling in this country.

We'd advise that, to get the right amount of inflation, you blow up the mattress only to the point where the surface wrinkles are just smoothed out and the mattress will just stay straight on your outstretched arms. Inflating beyond that point would make the mattress too firm and strain the material.

You can inflate most air mattresses by mouth in three to seven minutes—but the process is a lot more strenuous, you'd find, than blowing up a balloon. We suggest a pump. We tested five air-mattress pumps and found three that could do a satisfactory job with all our mattresses: the **Comfy** accordion-shaped model, \$2.35; the **Wards 9494**, \$1.95 plus shipping; and the **Hirsch-Weis 2116**, \$1.75.



Lee Electric Flour Mills

The best bread is made from wheat ground just before baking.

This is a small electric grain grinder manufactured by an old dependable company. A unique feature of this machine is that it grinds the entire grain kernel, including the germ and bran, into fine flour. (Other mills generally discard the germ). You fill the hopper and an automatic feed admits the proper amount of grain into the stone grinding chamber. The corborundum grinding stone never needs redressing, the mill does not get warm enough to impair the nutritional value of the flour, and fresh stone ground flour...pass the bread!

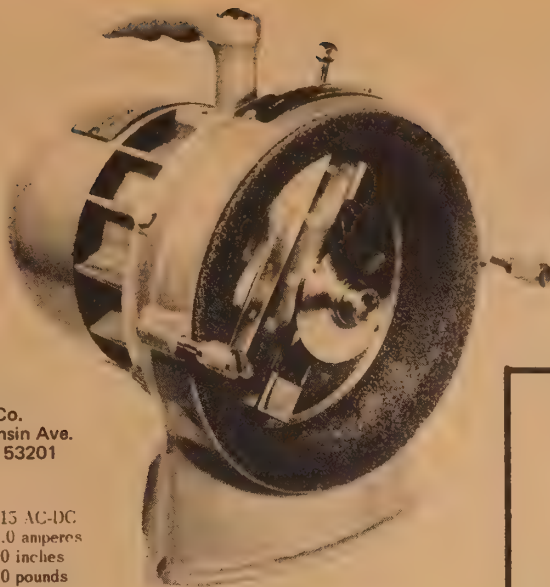
[Suggested and reviewed by Lloyd Kahn.]

MODEL	MOTOR SIZE	OUTPUT PER HOUR		PRICE
		FINI FLOUR	COARS. M.F.A.	
500	1/6 H.P.	3 TO 5 LBS.	NOT ADJUSTABLE	\$ 85.00
600	1/6 H.P.	3 TO 5 LBS.	20 TO 25 LBS.	110.00
S-500	1/4 H.P.	6 TO 10 LBS.	NOT ADJUSTABLE	145.00
S-600	1/4 H.P.	6 TO 10 LBS.	40 TO 45 LBS.	170.00

Catalog
free

from
Lee Engineering Co.
2023 West Wisconsin Ave.
Milwaukee, Wisc. 53201

Operating Voltage* 115 AC-DC
Current Draw 3.0 amperes
Overall Height 20 inches
Shipping Weight 20 pounds



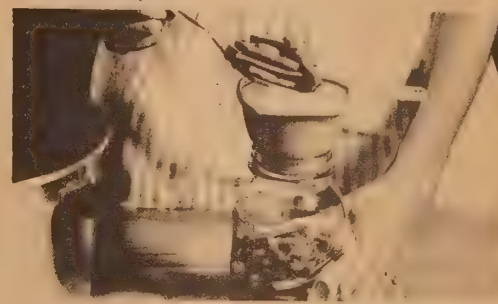
1 Check jars for nicks, cracks and sharp edges. Wash jars and caps in hot soapy water; rinse. Leave jars in hot water until ready to use. Use new lids and good hands.



2 Thoroughly wash freshly gathered beans, which are young, tender and crisp, in several changes of water. Lift beans out of water and drain.



5 Stand hot jar on wood or cloth. Add 1 teaspoon salt per quart; cover beans with boiling water, leaving 1-inch head space.



6 Wipe top and threads of jar with clean, damp cloth. Put lid on, red rubber sealing compound next to jar. Screw band down evenly and tight.



SCALDING TIME IN MINUTES*

VEGETABLE	PREPARATION FOR FREEZING	Small	Medium	Large
Asparagus	Sort stalks according to thickness. Wash thoroughly. Cut in jar-size or 2-inch lengths. Scald. Chill. Pack, leaving no head space.	2	3	4
Beans, Lima or Butter	Shell. Wash. Sort according to size. Scald. Chill.	2	3	4
Beans, Snap, Green or Wax	Wash. Remove ends. Cut as desired. Scald. Chill.	3	3	3
Beets	Wash and sort according to size. Trim tops, leave 1/2 inch of stems. Cook until tender. Chill. Peel and cut as desired.	30	45	45

Ball Blue Book

Though this guide to home canning has been in print since 1909, it easily avoids the Grandma image and gets you into your own canning. It has illustrated, step-by-step directions and recipes and handy guides for jar estimating. When something goes wrong, there's troubleshooting guides. If you have a good growing summer, this book can help you have a well-fed winter. A buy.

Ball Blue Book

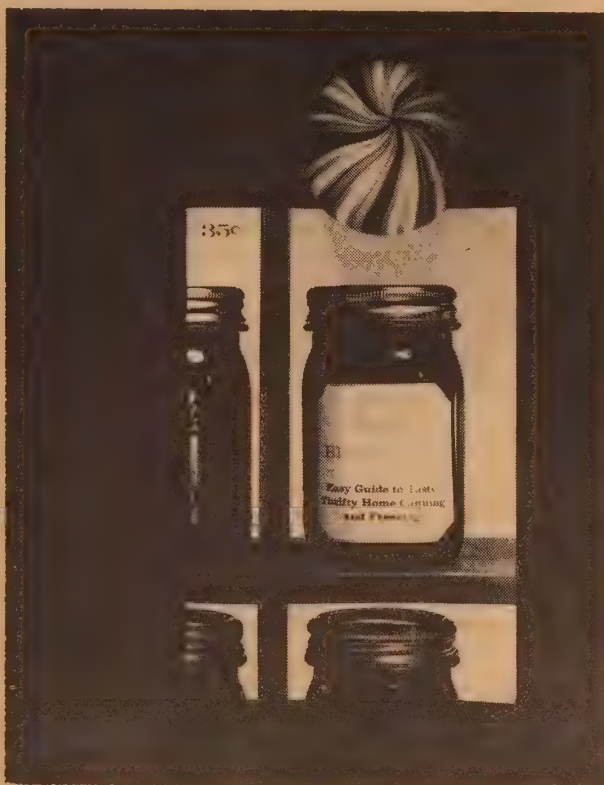
1966; 100 pp.

\$0.35 postpaid

from
Ball Bros. Co., Inc.
Muncie, Indiana

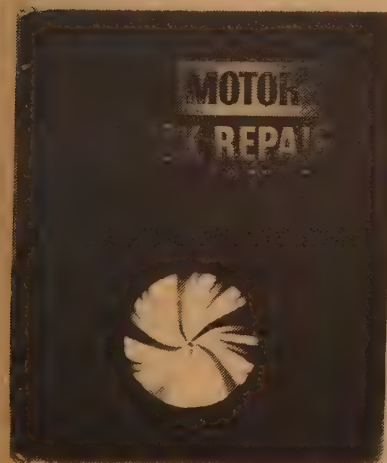
Applesauce

Wash, pare, if desired, quarter and core cooking apples. Simmer, covered, in a small amount of water, until tender. Press apples through sieve or food mill. Sweeten sauce to taste (about 1/4 cup sugar to 4 medium apples). Reheat to boiling. Pour, boiling hot, into hot Ball jars, leaving 1/2-inch head space. Stir with rubber bottle scraper or similar non-metal utensil to remove air bubbles. Adjust caps. Process pints and quarts 20 minutes in boiling-water bath.



Truck Repair Manual

If you have a truck, chances are marvelous you spend a fair amount of your time under it or in the front end of it. Judicious use of this book might save you some down-time. It covers the gamut of trucks and tractors, 1960-69, and has better than usual illustrations of how to get at what you're working on.



Motor's Truck Repair Manual

from

Motor Book Department
250 West 55 Street
New York, N. Y. 10019

or
WHOLE EARTH CATALOG

1969; 1154 pp.

\$14.00 postpaid

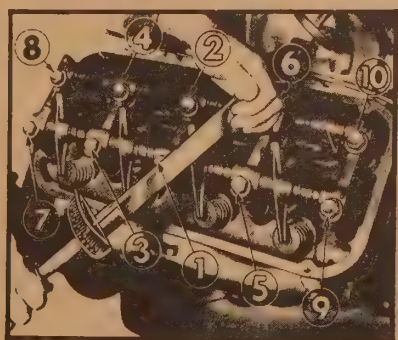


Fig. 1 Cylinder head tightening sequence Double rocker arm V8 engine



Fig. 13 Armature test for ground. Using test lamp, place test lead on armature core and the other lead on each commutator bar. If lamp lights armature is grounded and must be replaced

TRUCK & DIESEL ENGINE SECTION

Autocar Trucks	493	Divco Trucks	733	International Trucks	949
Brockway Trucks	496	Dodge Trucks	744	Jeep Trucks	1009
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Chevrolet Trucks	535	Ford Econoline Trucks	843	Mack Trucks	1040
Corvair Trucks	602	Ford Diesel Engines	864	Perkins Diesel Engines	1087
Cummins Diesel Engines	634	GMC Toro-Flow Diesel Engines	876	White Standard Trucks	1099
Detroit Diesel Engines	679	GMC Trucks	895	White PDQ Trucks	1117
Diamond Reo Trucks	718	International Diesel Engines	983		

GENERAL SERVICE SECTION

AXLES, DRIVING	305	ELECTRICAL	50	TRANSFER CASES	283
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Timken Axle Service	341	Dash Gauge Service	126	Clark Transmissions	179
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Front Wheel Locking Hubs	293	Electronic Ignition	36	New Process Transmissions	220
BRAKES		Generator Service	40	Spicer Transmissions	228
Adjustments	378	Ignition Coils and Resistors	8	Warner Transmissions	274
Air Brake Service	414	Starting Motor Service	98		
Electric Brake Service	425	Starter Switch Service	118	TRANSMISSIONS, Automatic	
Hydraulic System Service	372	Tune Up Service	3	Allison	463
Parking Brake Service	393	FUEL & EXHAUST		Powerglide (Aluminum Case)	481
Stomaster Brake Service	385	Crankcase Ventilation	11	Powerglide (Cast Iron Case)	482
Vacuum Brake Service	401	Exhaust Emission Controls	12	Powerglide (Corvair)	484
CLUTCHES		Fuel Pump Service	130	GMC Power-Flite	481
Air-Hydraulic Control	177	L.P.G. Carburetion	135	Dodge Loadflite	
Clutch Service	140	Turbochargers	137	(Aluminum Case)	489
		STEERING		Dodge Loadflite	
COOLING SYSTEM		Manual Steering Gears	427	(Cast Iron Case)	491
Variable Speed Fans	21	Power Steering Gears	433	Ford C4	486
				Warner	485

STOCK & FARM TRACTOR ENGINE SPECIFICATIONS

Allis-Chalmers	1140	Hercules	1125	Mosley-Ferguson	1148
Continental	1131	International Harvester	1146	Minneapolis-Moline	1151
Ford Tractor	1144	J. I. Case	1141	Oliver Power-Flite	1152
Heil-Scott	1133	John Deere	1142	Waukesha	1137

John Holt's list

John Holt, the author of How Children Fail and How Children Learn, has been a constant source of information for the CATALOG. Recently he sent us this list of schools which are trying educational methods other than the standard.

The lists are here in Community because this was a spare page, though a case can be made for making school and community one category. We'd like to know if publishing the list is useful. Our hypothesis is that new schools can use attention—whether by foundations, media, suppliers, parents, or other schools. We'll see.

Code:

Age N-K Nursery - kindergarten
E Elementary
G Grammar
JrH Junior High
H High
C College

Ind Independent

Pub Public

Rat Rating:

A Relatively high degree of student directed learning, i.e. few, or no, compulsory classes, little or no marking or grading, considerable student autonomy, independence.

B Somewhat more conventional in structure, i.e. graded classes, but more flexible, varied, low-pressured and humane than most schools, with more freedom for teachers.

NEW ENGLAND

Cambridge Free School
5 Howard Street
Cambridge, Mass. 02139
John Davis (N-K, E, Ind, A)

Cambridge Free School
Glendale, Mass. 10229
Micheline Schmitt (E, G, JrH)

East Hill Farm
Chester, Vt.
Dick Bliss (N-K, Ind, A)

74R Fayerweather Street
Cambridge, Mass. 02138
(N-K, E, G, JrH, A)

Franconia College
Franconia, N. H. 03580
Larry Lemel (C, Ind, A)

Goddard College
Plainfield, Vt. 05667
(C, Ind, B)

Hampshire College
Amherst, Mass. 01002
David Matz (C, Ind)

Hawthorne School
Roxbury, Mass. 02119
Dr. House (E, Ind)

Hawthorne School
Brattleboro, Vt. 05301
Mark Hopkins (Ind)

The Meeting School
Thomas Road
Rindge, N. H. 03461
Chis Ravndal (H, Ind, B)

Early Learning Center
12 Gary Road
Stamford, Conn. 06903
Mrs. Margaret Skutch (N-K, E, Ind, A)

New School for Children
27 Dudley Street
Roxbury, Mass. 02119
(N-K, E, Ind, A)

Prospect School
North Bennington, Vt. 05257
Mrs. Marian Taylor (N-K, E, Ind, A)

Roxbury Community School
Box 48, 1 Leyland Street
Dorchester, Mass. 02125
(N-K, E, G, Ind, A)

Shaker Mountain School
Box 74
Hinesburg, Vt. 05461
Jerry Mintz (A)

Sheffield Project
Sheffield, Mass. 02157
(JrH, H, A)

Highland Park
42 Hawthorne Street
Roxbury, Mass. 02119
Lester Seabrook (E, Ind, A)

Community Day
245 Porter Lake
Springfield, Mass. 01106
George Malloy (E, G, Ind, A)

West District
Unionville, Conn. 06085
John McNamara (E, Pub, B)

State Dept. of Education
Montpelier, Vt. 05602
Harvey Scribner (Pub)

Storefront Learning Center
90 W. Brookline
Boston, Mass. 02118
Johathon Kozol (E, G, JrH, A)

Whitby School
969 Lake Ave.
Greenwich, Conn. 06830
John Blessington (E, G, JrH, Ind, B)

Whitby School
Bucks Harbor, Me. 04618
Wm. Copperthwaite (Ind)

The School for Parents & Children
Box 22
S. Freeport, Me. 04078
Dick Watson

Adams Jr. High
Quincy, Mass. 02169
(Pub, B)

Blynman School
Magnolia, Mass. 10930
Mrs. Marshall (G, Pub, B)

Boardman School
Roxbury, Mass. 02119
(G, Pub, B)

Lewis Jr. High
Roxbury, Mass. 02119
Rollins Griffith (JrH, Pub, B)

Pierce School
Dorchester, Mass. 02124
Theresa Hanrock (H, Pub, A)

Davis Elementary
Newton, Mass. 02158
(E, Pub)

Harvey Wheeler
Concord, Mass. 01742
(E, Pub, B)

Meadowbrook
Newton, Mass. 02158
(JrH, Pub, B)

Murray Road
Newton, Mass. 02158
(H, Pub, A)

Timerlane Regional
Plaistow, N. H. 03865
(H, Pub, B)

Pinehenge School
Waterford, Me. 04088
Glenna Plaistad (E, G, H, Ind)

Community School
Plainfield, Vt.
Sam Clark (N-K, E, A)

Westledge School
Simsbury, Conn. 06070
Louis Friedman (JrH, H, Ind)

Williams School
Newton, Mass. 02158
Mrs. Carr (E, Ind, B)

Tufts Road School
Tufts Road
Winchester, Mass. 01890
Dick Young (Ind, Pub, B)

Appian Way
Harvard Graduate School of Educa.
Cambridge, Mass. 02138
Richard Wheeler (E, Ind)

Thomas A. Greene
New Bedford, Mass. 02741
Mary Kaharl (E, JrH, Pub)

Horace Mann
Newton, Mass. 02158
(Pub, B)

Underwood School
Newton, Mass. 02158
Mrs. Nadeau (N-K, E, Pub, A)

Central School
55 Austin Street
Cambridge, Mass. 02139
Lisa Pershouse (Ind, A)

NEW YORK

Addie May Collins Library
128th St. & Madison Ave.
N. Y., N. Y. 10035
Ned O'Gorman

Collaberg School
Thiell's Road
Stony Pt. N. Y.
Jane Burton (N-K, E, G, JrH, H, Ind, A)

East Harlem Block Nursery
Dept. of Psychiatry
N. Y. Medical College
5 East 102 Street
N. Y., N. Y. 10029
Suzy McKee (N-K, Ind, A)

East Harlem Day School
1712 Madison Avenue
N. Y., N. Y. 10029
Martin Greenhut (E, Ind)

Fiedel School
Gayview Long Island, N. Y.
(Ind, B)

15th Street School
206 W. 15th Street
N. Y., N. Y. 10011
Orson Bean (N-K, E, Ind, A)

Free School
20 East 14th Street
N. Y., N. Y. 10003
(H, Col, Ind, A)

Freegarden School
204 W. 83 Street
N. Y., N. Y. 10024
Phyllis Tower (N-K, E, Ind)

Friends World Institute
Mitchell Gardens
Westbury, N. Y. 11590
Arthur Meyer (Col, Ind, A)

Hampton Day School
Box 604
Bridgehampton, N. Y. 11932
Mrs. Warren Topping (E, Ind, A)

L.E.A.P.-(Lower East Side Action Project)
44 East 3 Street
N. Y., N. Y. 10003
(JrH, Ind, A)

Lewis-Wadhams School
RFD Westport, N. Y. 12993
Herb Snitzer (E, G, JrH, H, Ind, A)

Open Community School
508 E. 12 Street
N. Y., N. Y. 10009
Bob McCormick (E, Ind)

Perry Street Kids School
156 Perry Street
N. Y., N. Y. 10014
Bill Pigman
Sue Negrin (N-K, E, Ind, A)

Manhattan Country School
70 East 96 Street
N. Y., N. Y. 10028
Augustus Trowbridge (E, Ind, A)

Manhattan Country School
Foot Road
Rt. 2, Akron N. Y. 14001
Skip Venner (Ind)

Jamestown Public Schools
Jamestown, N. Y. 14701
Thomas Hassenflucht
(E, G, JrH, H,)

NYC Board of Education
110 Livingston
Brooklyn, N. Y. 11201
Dr. Elliott Shapiro

Honeoye Falls School
Rochester, N. Y.
David Maurer (JrH, H)

Old Westbury
Long Island, N. Y.
Harris Wofford (C)

MID AND SOUTH ATLANTIC

Centennial School
Lehigh University
Bethlehem, Pa. 18001
Tom Fleck (N-K, E, Ind)

Green Valley School
Box 606
Orange City, Fla. 32763
G. von Hilsheimer (JrH, H, Ind, A)

Holy Innocents Parish Day School
816 Mt. Vernon Highway
Sandy Springs, Ga.

Morgan Community School
Washington, D. C.
(Ind, A)

Pennsylvania Advancement School
5th & Lucerne Sts.
Philadelphia, PA 19140
Peter Butenwieser (JrH, H, Pub, A)

The School in Rose Valley
Rose Valley Road
Moyland, PA 19065
Grace Roizel (E, Ind, B)

Cordozo Model School District
Cardozo H.S.
Washington, D. C.
(JrH, H, Pub, B)

Nova School
Ft. Lauderdale, Fla. 33314
(G, E, JrH, Pub, B)

Parkway Project
c/o Philadelphia Board of Education
Dr. J. Bremer (Pub, A)

Miami Springs High School
Miami Springs, Fla. 33166
Jack Jenkins (H, Pub, B)

Chestnut Hill Academy
500 W. Willow Grove
Philadelphia, PA 19118

The Worden School
1932 17th St., N.W.
Washington, D. C. 20009
Alex Rode

MID-WEST

Antioch School
Yellow Springs, Ohio 45387
(A)

C.A.M. Academy
3932 Madison Street
Chicago, Ill. 60624
Mary Nelson (H, Ind)

Childrens Community
616 Felch
Ann Arbor, Mich. 48103
(N-K, E, Ind, A)

Clonlara
1408 Granger
Ann Arbor, Mich. 48104
Pat Montgomery

William J. Maxey
Training School for Boys
Ann Arbor, Mich.
(H, Ind)

Nursery School in Columbus
111 W. Norwich
Columbus, Ohio 43201
Florence Tager (N-K, Ind)

Greentree School
RFD
Waverly, Ohio 45690
Joyce Townsend (N-K, E, G, Ind)

Minnesota Summerhill Community School
Box 271, Spray Island
Spring Park, Minn. 55384
Corland Smith (E, G, JrH, H, Ind, A)

Minnesota Summerhill Community School
827 Bassett Road
Westlake, Ohio 44145
Joyce Townsend (E)

Bach School
Ann Arbor, Mich.
Robert Carr (JrH, B)

Douglas
Douglas, Mich. 49406
Claud Crawford (E, A)

Lamphire Public Schools
235 E. 13 Mile
Madison Heights, Mich. 48071
William Tilman (Pub, B)

Roeper City & Country School
2190 N. Woodward
Bloomfield Hills, Mich. 48013
(Pub, B)

Shaker Heights School District
Shake Heights, Ohio 44120
John Lawson (Pub, B)

State Department of Education
North Dakota
(B)

Detroit Country Day
22305 W. 13 Mile
Birmingham, Mich. 48010
Troy High
Detroit, Mich.
Joseph Bechard (H, Pub, A)

Worth Elementary
Worth, Ill. 60482
(Pub, B)

Decatur Lakeview High School
Decatur, Ill. 62526
William Fromm (Pub, B)

Early Learning
4552 McPherson
St. Louis, Mo. 63108
(N-K, E, Pub, B)

Experimental School Webster College
Webster Institute of Mathematics
Science & Arts
470 E. Lockwood Avenue
St. Louis, Mo. 63119
Adelaide Whitesitt (Pub, B)

SOUTHWESTERN

Celeste School
Corrales, N. M.
Mervyn Willard

Prescott College
Prescott, Arizona 86301

Cherry Creek School District
Denver, Colorado
Dr. Ed Pino

Santa Fe Community School
Santa Fe, N. M.
(E, A)

Chinguapin Branch Ranch School
1322 Antoine Drive
Houston, Tex. 77055

WEST COAST

Athenian School
5653 College Avenue
Oakland, CA 94618
Harrison Habitzelle (Ind, B)

Communtiy School
2518 E. Calhoun
Seattle, Wash. 98102
Bob Dunahee (E, G, Ind)

Couch Elementa
Portland, Ore.
Dr. Gilman (E, Ind, A)

The Little School of Seattle
6556 35th Street, N.E.
Seattle, Wash. 98115
Eleanor Siegel (N-K, E, Ind, A)

Yosemite High
Continuation School
P. O. Box 2207
Merced, CA 95340
Ellsworth Wolfe (H, Pub, A)

The Midtown School
44155 Russel Ave.
Los Angeles, CA 90021
Alice Bischarat (E, Ind, A)

Live Oak School
1388 Orange Road
Ojai, CA 93023
Bonnie Noyes (N-K, E, G, Ind)

Modern Play School
6063 Hargis Street
Los Angeles, CA 90034
Phyllis Fleishman (N-K, E, Ind)

New Education Foundation
1288 McAndrew
Ojai, CA 93023
David Young

One Room School House
88 Middle Rincon Road
Santa Rosa, CA 95405
Al Krauss (N-K, E, Ind)

Pacific High
Box 311
Palo Alto, CA
Stanley Bean (H, Ind)

Pinel
Box 1098
Walnut Creek, CA 94597
(E, Ind)

Pinel
3655 Reliez Valley Road
Martinez, CA 94553
Bill Kenney (N-K, E, G, JrH, Ind, A)

Santa Barbara Free School
Santa Barbara, CA
Harvey Haber (Ind, A)

Shire School
San Francisco, CA
(E, G, Ind, A)

Summerhill Day
4074 Vineland
N. Hollywood, CA 91604
Oliver Haskell (Ind, A)

Summerhill West
23859 Stagg Street
Canoga Park, CA 91304
Frank Lindenfield (E, G, H, Col, Ind, A)

Merced County School District
Old Court House
Merced, CA 95340
David Austin (Pub)

Urban School
1891 Centre W.
Tiburon, CA
Bill Myer (Ind, A)

Walden School
2446 McKinley
Berkeley, CA 94703
Denny Wilcher (N-K, E, Ind, A)

Surrey Downs
Bellevue, Wash. 98004
(N-K, E, Pub, B)

Ardmore
Bellevue, Wash. 98004
Dr. Les Abbenhouse (E, Pub, B)

Bellevue School District
Bellevue, Wash. 98004
(Pub, B)

Garfield High
Seattle, Wash.
(H, Pub)

Northshore School District
Bothell, Wash.
(Pub, B)

San Mateo School District
San Mateo, CA
(Pub, B)

Pacific Ackworth
Temple City, CA 91780
John May (E, G, JrH)

Pacific Oaks
Pasadena, CA
John May (N-K)

Beaverton Schools
303 S.W. Erickson Street
Beaverton, Ore. 97005
Harold Wik

The School House
3615 S.W. Kelly
Portland, Ore. 97201
John Kerr

McKinley High
Berkeley, CA

Martin Luther King Community
2320 Dana Street
Berkeley, CA 94704
Gerald Dupre (JrH, H, Ind)

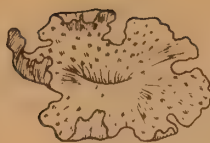
Los Angeles Free School
Eads Avenue
Los Angeles, CA 90031
Ed Moritz

Fieldbook for Boys and Men

The Scouts continue their tradition of excellent feedback from an increasingly enormous membership. The Second Edition (1967) of the *Fieldbook* may well be the best value around. Of course, the context is short term camping out in the continental U.S., but much more is afoot. In taking us sure-handedly from the root-hog-or-die survival situations through toward gourmet ecology, the *Fieldbook* shows how far we've come and certainly what to do next. The spirit of the Boer War appears to be giving way to that of enlightened naturalism (don't go blazing trees - the landowner will never have us back). Full of recipes, checklists, buying guides, patterns and plans, close-up photographs in how-to-do-it sequence. If you'll need to know something, it's there.

Having put us at home outdoors, the book opens up into biology, geology and astronomy, and what to do about them. I especially like two sections: one has pictures of wild plants to eat where you're starving to death, and the page that tells you not to apply the tourniquet except as a last resort.

[Reviewed by Dave Guard. Suggested by Eugene Schoenfeld]

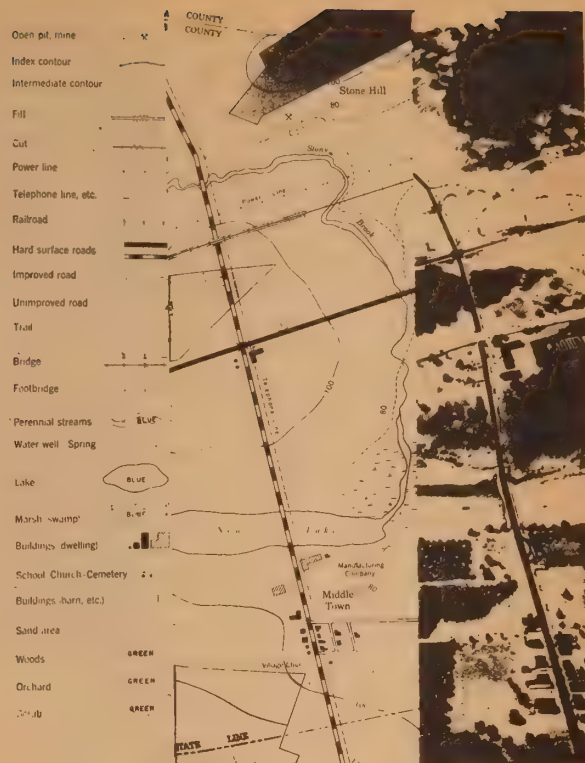


Rock Tripe (*Gyrophora dilleri*) can be scrambled like egg in a little water or fat.

Nosebleed is usually from a small vein in the middle partition of the nose. Fold a clean piece of paper into a pressure pad and tuck it under your upper lip. If the blood continues to flow, add to the thickness of the pad and press your index finger across your upper lip.



No time to wait to bring victim to shore. Start rescue breathing immediately. Tilt victim's head far back. Cradle his head with one hand and grasp his jaw with the other. Open your mouth wide and take a deep breath. Blow air into the victim through nose or mouth. Keep it up as you bring him to shore.



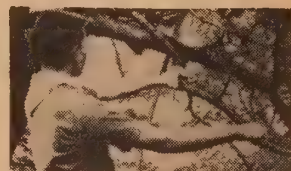
Fieldbook for Boys and Men

Boy Scouts of America. 1967; 565 pp.

\$1.95

from your local Boy Scout Dealer

KINDLING. In dry weather, there are plenty of dry sticks on the ground. Dead branches still on the tree - the so-called "squaw wood" - are better. Break off a couple of handfuls of pencil-thin sticks for quick fire making.



FUEL. For fuel for preparing a simple meal, use the heavier pieces of squaw wood or dead branches from fallen trees. You can break it easily underfoot. If it only bends, it's too green for use.



Tools for Progress

Great Britain does it again (I'm beginning to feel like a Loyalist) way ahead of the let-General-Motors-do-it U.S. Here in one tasty catalog are all the 'equipment and materials for small-scale development available in The United Kingdom.' Pictures, descriptions, prices, and detailed access information on all manner of do-it-ourself tools, from hand ploughs to air houses. There may be some outrageous bargaining here, or not, I don't know-find out for yourself; a pound equals \$2.40 these days.

الدكتور شومان الاقتصادي متخصص في شؤون الإنماء. وقد شغل وظيفة مستشار اقتصادي لمجلس الفحم الوطني في لندن منذ عام 1950، ثم أغير للاح المتحدة التي أوفده للعمل مستشارا اقتصاديا لحكومة يرب. وفي عام 1962 دعت حكومة لندن للعمل مستشارا لمجلس التخطيط الهندي في شؤون ومشاكل سياسة المشاريع الإنمائية في الهند. وفي عام 1966 قدم بتأسيس مجموعة الإنماء والتفوق الخدمية المتوسطة المستوى وأصبح مدبرا لها. وهو يتحدث في المقال التالي، التي تكثرت صحيفة "التيغز" بالسماح بنشره وإعادة طبعه. عن المكتبات استفادة الدول المتطورة على مساعدة انفسها بانفسها وذلك بتابع اساليب وقنون الخدمة المتوسطة المستوى.

Tools for Progress

1968; 192 pp.

\$2.64 surface postpaid to U.S.
\$5.00 air postpaid to U.S.
\$2.10 in London.

from
The Intermediate Technology Development Group Ltd.
9 King Street
Covent Garden
London, W.C. 2
ENGLAND



WATER SUPPLY, Storage and Purification

Butyl Products Ltd

The Butank Family Rainwater Tank provides a ready supply of water for the household and ensures ample water supplies during the dry season. Rainwater runs off the collecting basin straight into the tank and is suitable for washing, for watering the vegetable garden and similar uses.

Three sizes of tank are available: 1,000 gal (4,546 l), 2,000 gal (9,092 l), 3,000 gal (13,638 l).

The Butank is supplied in a do-it-yourself kit and can be constructed by unskilled labour under limited supervision.

Illustrated instructions adjacent

Long-life butyl rubber is flexible, completely unaffected by any weather conditions, chemical or mould. Other important butyl applications: low cost reservoir linings, water channel liners, river training, dams, weirs and static or transportable storage tanks for water and chemicals.



Adana (Printing Machines) Ltd

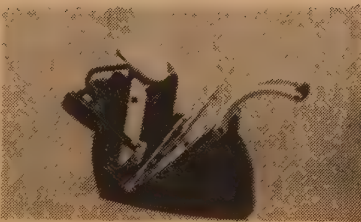
The Adana "Eight Five" Printing Machine Universally acknowledged to be the finest hand platen printing machine in the world. Smooth, rapid and easy in operation it produces printing of the highest quality. Sturdily built to stand heavy and constant use, it is small enough to occupy only a minimal space and light enough to be easily portable.

Two composition inking rollers. Duplex roller runners fitted with two diameters to counteract atmospheric changes and for heavy or light contact with type face.

Uses standard printers' type.

Weight complete: 33 1/2 lb (15.2 kg).
Overall size: 23 in. x 13 in. x 19 in.
(58.4 cm x 33 cm x 48.3 cm).

Price ex works: £25.10.0.
complete with fully illustrated instruction book.



AGRICULTURE, Cultivation

Ransomes Sims & Jefferies Ltd

The Emcot

Many thousands of these oxen draught ridging ploughs are being used in developing countries where crops are grown on the ridge to combat soil erosion.

The Emcot ridging plough is used for crops such as groundnuts, cotton, tobacco as well as for cattle feed and vegetables.

The Emcot has replaceable earth wearing parts and is of solid construction for long life.



Government Publications

This paperback is titled "Over 2000 publications," which is sort of true, but mainly gross boosting. Skip that. The book is a good, recent, cheap compendium of information easily available from the Government — inexpensive sometimes practical sometimes trivial sometimes precisely what you need for an important task. As far as we're concerned, this \$.95 book replaces the \$12 book on Government publications we used to list.

[Suggested by Michael Rosenthal]

Over 2000 Free Publications

Frederic O'Hara
1968; 352 pp

\$.95 postpaid

from
WHOLE EARTH CATALOG

\$1.05 postpaid

from
The New American Library
1301 Avenue of the Americas
New York, N. Y. 10019



Making Household Fabrics Flame Resistant (rev. ed. 1963). L454. Tells how household fabrics may be made flame-resistant by treating them in the home with various flame-retardant solutions. Describes how to prepare and apply these solutions.

Rope, Knots, and Climbing. Catalog No. I29.26:7. 15¢. Contains useful information on important knots and hitches, rope splices, the skill of throwing a rope, rope-climbing techniques, and other related subjects.

The Use of Sawdust for Mulches and Soil Improvement (1951). (Circular 891). 15¢. For sale only.

Hepatitis (rev. ed. 1966). PHS Publication #446.
Hepatitis (1967). Unnumbered PHS fact sheet.

Child's Self-Help Overall (1948). L251.

Hot Weather Comfort, HIS-3, 5¢; \$2.25 per 100.

Wood-Frame House Construction (1955). AH73. 65¢. For sale only. Textbook for house builder, from foundation to roof.

Solar-Type Farm Cottage, Plan No. 7148 (1965). M1001.

A-frame Cabins, Farm Building Plan Nos. 5964 5965 (1964). M981.

Concrete Manual (7th ed.—rev. reprint). \$3.25. Properties of concrete, investigation and selection of concrete materials, mixes, manufacturing, inspection, handling, placing, finishing, curing, weather precautions, concrete repair and maintenance, use of epoxy resins, special types of concrete and mortar, prestressed concrete.

Plumbing for the Home and Farmstead (1966). F2213.
Pole Building Construction, Type "B," Plan No. 5831 (1958). M750.

Portable Shade for Hogs, Plan No. 5947 (1964). M975.

Farmstead Sewage and Refuse Disposal (1963). AB274. All about septic-tank systems. Discussion of other refuse-disposal methods.

What You Should Know About Oysters, Clams and Mussels, PHSP-1393, 5¢; \$2.50 per 100.

Facts About Nutrition, PHSP-917, 25¢; \$18.75 per 100.

Conserving the Nutritive Value in Foods (1963): G90. Effects of storage, cooking. Tips on best procedures.

Recipes for Quantity Service (1958): HERR5. \$2.50. For sale only. O.P. Directions for quantities for twenty-five, fifty, or one hundred portions.

Rope on the Farm (1966). F2130. How to splice, tie hitches and knots. Care and use.

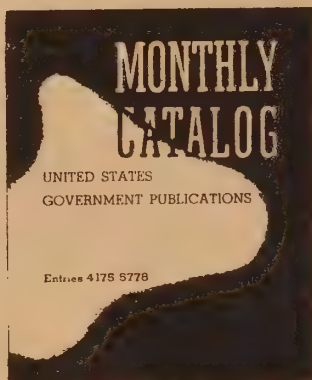
Day, Cyrus Lawrence. The Art of Knotting and Splicing (1955). 2d ed. Step-by-step photographs with accompanying descriptive text on facing pages, covering hundreds of knots, splices, bends, etc. It has 738 photographs. Bibliography and index. \$5.00.

Government Printing Office

O'Hara (above) doesn't begin to list all of what's available from the GPO. If you're really intersted in a particular area, you might as well get the **Free** list of publications in that area. Or you can get the **Free** biweekly list of "Selected U. S. Government Publications". Or, for totality, for \$6, the "Monthly Catalog of U.S. Government Publications." All, all from Carper Buckley,

Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402

- 10. Laws, Rules, and Regulations.
- 11. Home Economics. Foods and cooking.
- 15. Geology.
- 19. Army. Field manuals and technical manuals.
- 21. Fish and Wildlife.
- 25. Transportation, Highways, Roads, and Postal Service.
- 28. Finance. National economy, accounting, insurance, securities.
- 31. Education.
- 33. Labor.
- 33A. Occupations. Professions and job descriptions.
- 35. National Parks. Historic Sites, National Monuments.
- 36. Government Periodicals and Subscription Services.
- 37. Tariff and Taxation.
- 38. Animal Industry. Farm animals, poultry, and dairying.
- 41. Insects. Worms and insects harmful to man, animals, and plants.
- 42. Irrigation, Drainage, and Water Power.
- 43. Forestry. Managing and using forest and range land, including timber and lumber, ranges and grazing, American woods.
- 44. Plants. Culture, grading, marketing, and storage of fruits, vegetables, grass, and grain.
- 46. Soils and Fertilizers. Soil surveys, erosion, conservation.
- 48. Weather, Astronomy, and Meteorology.
- 50. American History.
- 51. Health and Hygiene. Drugs and sanitation.



- 51A. Diseases. Contagious and infectious diseases, sickness, and vital statistics.
- 53. Maps. Engineering, surveying.
- 54. Political Science. Government, crime, District of Columbia.
- 55. Smithsonian Institution. National Museum, and Indians.
- 58. Mines. Explosives, fuel, gasoline, gas, petroleum, minerals.
- 59. Interstate Commerce.
- 62. Commerce. Business, patents, trademarks, and foreign trade.
- 63. Navy, Marine Corps, and Coast Guard.
- 64. Scientific Tests, Standards. Mathematics, physics.



- 65. Foreign Relations of the United States. Publications relating to foreign countries.
- 67. Immigration, Naturalization, and Citizenship.
- 68. Farm Management. Foreign agriculture, rural electrification, agricultural marketing.
- 70. Census. Statistics of agriculture, business, governments, housing, manufactures, minerals, population, and maps.
- 71. Children's Bureau, and other publications relating to children and youth.
- 72. Homes. Construction, maintenance, community development.
- 78. Social Security. Industrial hazards, health and hygiene, safety for workers, pensions, workmen's compensation and insurance.
- 79. Air Force. Aviation, civil aviation, naval aviation and Federal Aviation Administration.
- 79A. Space, Missiles, the Moon, NASA, and Satellites. Space education, exploration, research, and technology.
- 81. Posters and Charts.
- 82. Radio and Electricity. Electronics, radar, and communications.
- 83. Library of Congress.
- 84. Atomic Energy and Civil Defense.
- 85. Defense. Veterans' affairs.
- 86. Consumer Information. Family finances, appliances, recreation, gardening, health and safety, food, house and home, child care, and clothing and fabrics.
- 87. States and Territories of the United States and Their Resources. Including beautification, public buildings and lands, and recreational resources.



Federal Domestic Assistance

The Catalog is a guide to Federal programs. It describes the purpose, eligibility requirements for an incredible variety of aids, along with the 'how-to-apply.'

I recommend it as a wishbook and as a tool. For the surprise is that many of the aids exactly fit the needs of the new communities (loans for home industries, for example, pp 27-28) and are specifically open to non-profit groups or low-income persons. Urban groups will find similar luck, I think, in linking their goals to an existing program.

The catalog has no cost. It can be requested from your Congressman/Senator or the Public Information Office in the Office of Economic Opportunity, HUD or HEW.

[Suggested and reviewed by Richard R. Reed.]

Catalog of Federal Domestic Assistance

1969; 610 pp.

free from

OEO Regional Offices

72 West 45 Street
New York, N. Y. 10036
(Conn., Me., Mass., N.H., N. J., N. Y., P.R., R.I., Vt., Virgin Islands)

Marsh Bldg.
1832 M Street NW,
Washington, D.C. 20506
(Del., D.C., Ky., Md., N.C., Pa., Va., W.Va.)

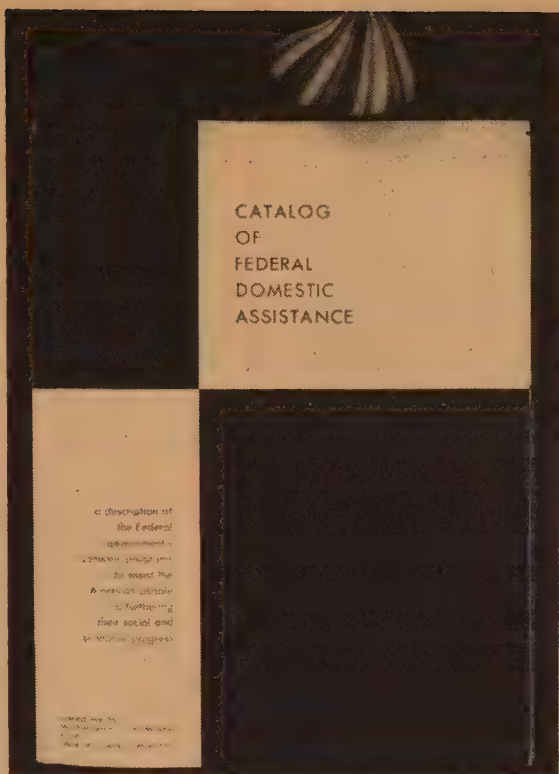
730 Peachtree Street, NE
Atlanta, GA 30308
(Ala., Fla., Ga., Miss., S.C., Tenn.)

623 So. Wabash Ave.
Chicago, Ill. 60605
(Ill., Ind., Mich., Minn., Ohio, Wisc.)

Lowich Bldg.
314 W. 11 Street
Austin, Tex. 78701
(Ark., La., N.M., Okla., Tex.)

911 Walnut Street
Kansas City, Mo. 64106
(Colo., Idaho, Iowa, Kan., Mo., Mont., Neb., N.D., S. D., Utah, Wyo.)

100 McAllister Street
San Francisco, CA 94102
(Alaska, American Samoa, Ariz., Calif., Guam, Hawaii, Nev., Ore., Wash., Trusts)



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PROGRAM TITLE	ECONOMIC OPPORTUNITY LOANS TO COOPERATIVES	POPULAR NAME
Nature and Purpose of Program	This program provides 30-year, 4 1/2 percent loans to cooperatives that furnish essential processing, purchasing, or marketing services, supplies, or facilities to low-income rural families. It also provides technical assistance in establishing, operating, and managing cooperatives. The loan may be used to: 1. Process products grown on members' farms 2. Assemble, market, and transport home-produced goods 3. Purchase and make available to members essential machinery and equipment for the production of goods and services 4. Provide services to market agricultural products 5. Purchase and make available to members farm operating and home industry items 6. Purchase land and buildings to carry out processing, purchasing, and marketing services 7. Pay costs of organizing cooperative associations 8. Refinance certain debts.	
Who Can Apply and How To Apply	Cooperatives may be eligible if (1) two-thirds of the members are from low-income rural families living in areas where the population is under 5,500; (2) they are unable to obtain credit on rates and terms they can meet; and (3) the services to be supplied are not otherwise being adequately provided in the community. Applications are made at local county offices of the Farmers Home Administration.	

PROGRAM TITLE	MORTGAGE INSURANCE FOR EXPERIMENTAL HOUSING	POPULAR NAME
Nature and Purpose of Program	This program provides mortgage insurance on individual homes and multifamily properties that incorporate new or untried construction concepts intended to reduce housing costs, raise living standards, and improve neighborhood design. It is designed to speed the development of new concepts by reducing the risks involved in underwriting mortgages on housing incorporating experimental materials, designs and techniques	
Who Can Apply and How To Apply	Interested sponsors able to prove that the property which is proposed is an acceptable risk for testing advance housing design or experimental property standards are eligible.	
For Information Contact	Application is made through a commercial lending institution approved by the FHA as an eligible mortgagee to the local insuring office. Federal Housing Administration or: Local FHA Insuring Office Department of Housing and Urban Development Washington, D.C. 20410	
Printed Information Available	FHA's Experimental Housing Program, HUD IP 30	
Authorizing Legislation	12 U.S.C. 1715x, National Housing Act, Sec. 233, as added by the Housing Act of 1961. See 103, Public Law 87-70, 75 Stat. 149, 158	
Administering Agency	Federal Housing Administration Department of Housing and Urban Development	

PROGRAM TITLE	MORTGAGE INSURANCE FOR LOW AND MODERATE INCOME HOUSING—MARKET RATE	POPULAR NAME

Surplus Defense Supply

Surplus stores are a handy source of general purpose stuff. Even more economical is buying the stuff straight from Uncle: The Defense Surplus Sales Offices scattered hither and yon through the U.S. and world. Whatever you pay at the downtown surplus stores, you can expect to pay considerably less buying where they buy. Also you can bid on large fantasy items: a mile of cable, a dump truck, a landing craft, one lot assorted propellers, etc.

[Suggested by Alan Kalker]

Pamphlet
How to Buy Surplus Personal Property

\$0.20 postpaid

from
GPO bookstores

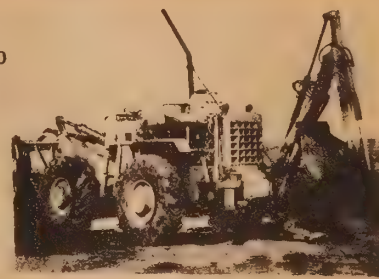
**ADDRESSES OF SALES OFFICES
DEFENSE SURPLUS SALES OFFICES
AND GEOGRAPHICAL AREAS SERVICED**

Mailing Address	Location
11. Defense Surplus Sales Office P.O. Box 8019, 30th Building 652, U.S. Naval Street P.O. Base Philadelphia, Pa. Philadelphia, Pa. 19101	
16. Defense Surplus Sales Office P.O. Box 660 Building #115 Newport, R. I. 02840 Naval Base, Gate 51 Portsmouth, R. I.	
18. Defense Surplus Sales Office P.O. Drawer 1 830 Third Avenue— Bush Terminal Sta.- 7th Floor Brooklyn, N.Y. 11232	

- 21. Defense Surplus Sales Office
P.O. Box 644 Atlanta Army Depot
Forest Park, Ga. Building 906
30050 Forest Park, Ga.
- 23. Defense Surplus Sales Office
P.O. Box 31261 Building 450
Jacksonville, Fla. U.S. Naval Air Station
32230 Jacksonville, Fla.
- 25. Defense Surplus Sales Office
Bldg. SDA-224, Naval Supply Center
South Annex Building SDA-224,
Hampton Roads South Annex
Branch Post Office Norfolk, Va.
Norfolk, Va. 23511

Sample prices in Oakland:
Soft arm chair: \$2
Plate glass 3 ft x 4 ft: \$2
Step ladder: \$2
Foam rubber mattress: \$2.50
Fatigue shirts: \$0.45
Overcoats: \$3
Wool pants: \$2
Parachute harness: \$2.50

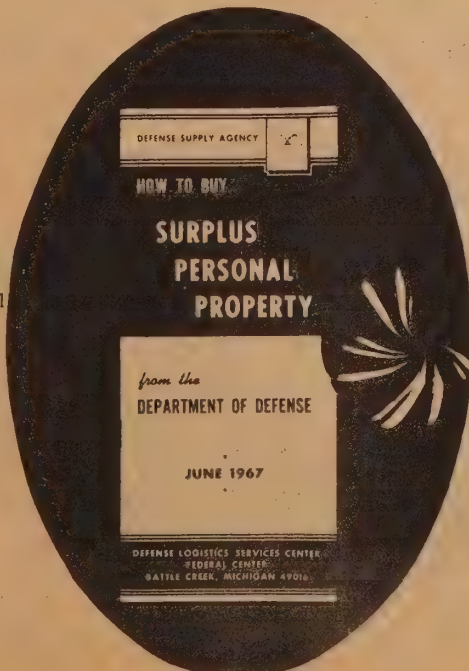
(CONTINUED)
TRACTOR, SCOP loader: 2 1/2 YARD, 1959, HOUGH MODI
H-90-D, CHASSIS 27AC-1381, TIRE SIZE 1600 X 24,
CUMMINS 6 CY IN-ER DIESEL ENGINE, BACKHOE MODEL
WRH90-R, USN 45-2137, condition
OUTSIDE BLDG. 127 - USEL - FAIR CONDITION - REPAIRS
REQUIRED.



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43213 Supply Center
Columbus, Ohio
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Fort Worth, Texas Hemphill Sts.
76115 Building 2
Fort Worth, Texas
- 41. Defense Surplus Sales Office
P.O. Box 58 Building 2A
Defense Depot Defense Depot Ogden
Ogden Station Ogden, Utah
Ogden, Utah 84401
- 44. Defense Surplus Sales Office
P.C. Box 4000 Naval Supply Center
Bayshore Station Building 502
Oakland, Calif. Oakland, Calif.
94623
- 46. Defense Surplus Sales Office
937 N. Harbor Drive 937 N. Harbor Drive
San Diego, Calif. (Bldg. 1, 2nd Floor)
92132 San Diego, Calif.
- 49. Defense Surplus Sales Office
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Tucson, Ariz. 85708 Davis-Monthan AFB,
Ariz.

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- (Kodiak)
Commanding Officer
U.S. Naval Station
FPO Seattle 98790
- Bermuda
Redistribution and Marketing Activity
Kindley Air Force Base
St. George, Bermuda
APO New York 09856
- Canada
Crown Assets Disposal Corporation (CADC)
219 Argyle Avenue
Ottawa 2, Ontario, Canada
- (Argentia, Newfoundland)
Commanding Officer
U.S. Naval Station
FPO New York 09597



Nomadics

The Complete Walker

Some of them old boys are into making houses out of chicken wire and condoms. Some of them can gather you a salad right off the forest floor. Some can make you a computer out of old Stromberg-Carlson radio parts and have enough wire and tubes left over for two laser death rays and a UFO. But Colin is into walking. His two previous books are mainly about walks: In *THE THOUSAND MILE SUMMER* he tells about one he took up the entire Sierra range, and in *THE MAN WHO WALKED THRU TIME*, he walks the whole Grand Canyon. This one is about walking, not walks. It's not full of lore and woodsiness. It doesn't tell you how to get back to nature, or cast civilization from your back and wander out with a bowie knife and a jock-strap. It gives a little walk philosophy, and then proceeds to discuss, in just the right detail, how to put a nice little well-equipped house and its fittings on your back, how to be able to go out and walk for a long time without having to come back for more stuff.

Besides just the stuff, what to take and what to leave behind, it also takes you on a trip through Colin Fletcher, which is quite and outing all by itself. It's hard to imagine a book on backpacking technique that will make you laugh out loud all the way through, but he does it. He really loves poking fun at himself. He gets completely hung up describing some gadget or technique which he then admits he's never tried. He'll spend a whole page defending what seemed at first an impossibly fussy personal idiosyncrasy, and at the end you'll be dying to go out and try it for yourself. He actually has a sizable section on how to urinate and defecate in the outdoors, and it's a fine description. He includes a very complete appendix on suppliers, a list of walking organizations, and even a series of inspiring quotations to read while walking or thinking about walking.

Most important, though, it's the only backpacking book I've ever seen which, if read carefully, will actually tell you how to do it in great enough detail to enable you to just go out and do it. It's also the only one that will really make you want to go out and walk for absolutely no ulterior motive.

(Also, it will tell you why you should have the Ski Hut in your catalog more.)

Be sure to dig pages 45-52, 123-132, 182-186, 213-218, the whole Furniture and Appliances section, and all the illustrations.

The only adverse comment I would make is that his food preferences seem pretty sanpaku. But he also quotes the old proverb about hell being a place where the politicians are French, the police German, and the cooks English.

[Reviewed by Roland Jacopetti]

There is a cardinal rule of travel, all too often overlooked, that I call The Law of Inverse Appreciation.

It states: "The less there is between you and the environment, the more you appreciate that environment."

Every walker knows, even if he has not thought very much about it, the law's most obvious application: the bigger and more efficient your means of transportation, the further you become divorced from the reality through which you are traveling. A man learns a thousand times more about the sea from the Kon Tiki than from the Queen Mary; euphorically more about space at the end of a cord than from inside a capsule. On land, you remain in closer touch with the countryside in a slow-moving old open touring car than in a modern, air-conditioned, tinted-glass-window, eighty-miles-an-hour-and-never-notice-it behemoth. And you come in closer touch on a horse than in any car; in closer touch on foot than on any horse.

In the United States, the only maps that really convey much detailed information of the kind useful to a walker are the U.S. Geological Survey topographical series. These maps come in various sizes and scales, though most new ones are either fifteen-minute quadrangles (covering fifteen minutes of both latitude and longitude; scale, 1:62,500, or roughly one inch to one mile; contour interval usually eighty feet) or 7½-minute quadrangles (scale: 1:24,000; contour interval usually forty feet). Both kinds of 'quad' are so detailed that you sometimes feel they would be adequate to guide you on a prowl around on hands and knees.

A selection of local quads is often available at retail outdoor equipment stores and in certain book stores. The price is likely to be around sixty cents. Direct from any U.S. Geological Survey map office, the quads are fifty cents each (20 per cent discount for orders \$20 and over; 40 per cent discount for orders \$100 and over).

The central distribution agency for maps covering areas east of the Mississippi River is: Distribution Section, USGS, Washington, D.C. 20242. For maps west of the Mississippi: Distribution Section, USGS, 520 Illinois Street, Fairbanks, Alaska.

There are subsidiary map distribution offices in Dallas, Texas; Salt Lake City, Utah; Spokane, Washington; Menlo Park and San Francisco, California; and Anchorage, Juneau, and Palmer, Alaska.

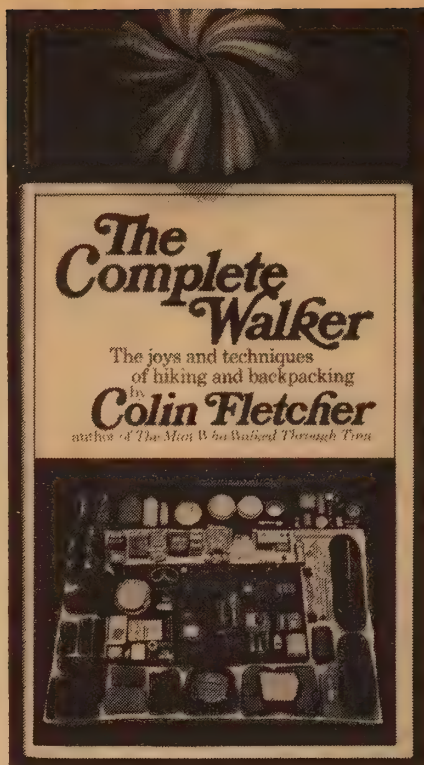
Any map office or distribution center will supply you, free, with an index map of your state or area. This map enables you to find the name of the quad or quads that cover the slice of country you are interested in. It also lists places within the state from which you can buy USGS topo maps.

In most big cities you can find out from the local USGS office (check in phone book) where to buy topo maps. Even if the office does not sell them itself, the staff will know the local retail outlets.

The Canadian equivalent of the USGS maps is the National Topographical Series, scale 1:63,360 (one inch to one mile). For these maps, and for information about their distribution, write: Map Distribution Office, Department of Mines and Technical Surveys, 615 Booth Street, Ottawa, Ontario, Canada.

When crowds assemble in Trafalgar Square to cheer to the echo an announcement that the government has decided to have them killed, they would not do so if they had all walked 25 miles that day.

Bertrand Russell
Nobel Prize Acceptance Speech



The Complete Walker
Colin Fletcher Alfred A. Knopf, Inc.
1969; 353 pp. 33 West 60 Street
New York, N. Y. 10023

\$6.95 postpaid

or
WHOLE
EARTH
CATALOG

First remove any obvious and rectifiable local irritant, such as a fragment of stone or a rucked sock. Then cover the tender place. Cover it even if you can see nothing more than a faint redness. Cover it, in fact, if you can see nothing at all. Being a 'hero' is being a bloody fool. The covering may only be needed for a few hours; if you take it off at night and let the air get at the skin you may not even need to replace it next morning. But if you do nothing at the first warning you may find yourself inside the hour with a blister that will last a week.

For covering, a piece of surgical tape or a Band-aid will do, provided its adhesive surface is efficient enough to prevent rucking—a requirement not always met when the trouble is on your toes. By far the best patches I know are those cut from 'moleskins' (one-ounce package, 45 cents). These oddly miraculous devices, available in most drug stores, are nothing more than sheets of thin white felt, adhesive on one side. They stick to skin like glue, even after your feet get wet. In fact, it is sometimes quite a business peeling the thin protective layer of plastic off new patches. (The makers leave a helpful projecting band of this layer and advise you to remove the plastic before cutting patches to the required shape. But in order to preserve the adhesive qualities—which can be rather easily damaged by handling—I shape the patch first with a pair of scissors, carefully beveling all edges, then lever up one corner of the plastic with the scissors' point, and peel it off.) But mere adhesion does not begin to explain the extraordinary efficiency of moleskins. I suppose their secret has something to do with the resilience and sideways-sliding quality of the felt. Anyway, I know for a fact and with gratitude that they can stop embryonic friction trouble dead; can stifle the pain from those deep, dismal, often invisible blisters that occasionally form under heel or ball of foot.

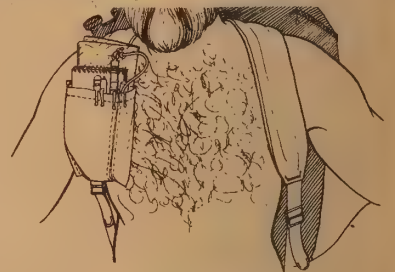
Office-on-the-yoke

Because I so often walk without a shirt and therefore without a front pocket, I have had a five-by-six-inch pocket sewn onto the front of my yoke strap, roughly where the shirt pocket comes. In it, I go notebook, map, and sunglasses when not in use. Pen, pencil, comb-hair lens brush (page 233), and metal-cased thermometer (page 239) clip onto the front of it. I cannot imagine how I ever got along without such a pocket. Mine is made of ordinary blue-jean material, but anything stout will do.
For which side to put your office, see page 64.



At this point, steam issues from the stew pot. You reduce the heat to dead-low or thereabouts (taking care not to turn the stove off in the process), stir the compound a couple of times, inhale appreciatively and replace the cover. While dinner simmers toward fruition you empty two ounces of dehydrated peaches and a little water into the small cooking pot and put it ready for breakfast, up alongside the pack. Then you jot down a few thoughts in your notebook, stir the stew and sample it, find the beans are not quite soft yet. So you study the map and worry a bit about the morning's route, put map and pen and pencil and eyeglasses and thermometer into the bedside boots, take off your shorts and slide halfway down into the mummy bag out of the wind, and stir the stew again and find all ready. You pour-and-spoon out a cupful, leaving the balance on the stove because the wind is blowing distinctly cool now. And then, leaning comfortably back against the pack and watching the sky and the black peaks meld, you eat, cupful by cupful, your dinner. You finish it—just. Then you spoon-scrape out every last possible fragment and polish-clean the pot and cup and spoon with a piece of toilet paper. You put the paper under the stove so that you can burn it in the morning. Then you put cup and spoon into the breakfast-readied small pot, pour the morning tea water into the big pot, set the big pot alongside the small one and the sugar and milk containers alongside them both, put the current day's ration bag into the pack (where it is moderately safe from mice and their night allies) and . . .

One of the surest ways to tell an experienced walker from a beginner is the speed at which he starts walking. The beginner tends to tear away in the morning as if he meant to break every record in sight. By contrast, your experienced man seems to amble. But before long, and certainly by evening, their positions have reversed. The beginner is dragging. The expert, still swinging along at the same easy pace, is now the one who looks as though he has records in mind. One friend of mine, a real expert, says, 'If you can't carry on a conversation, you're going too fast.'



And the Lord said unto Satan, Whence comest thou? Then Satan answered the Lord, and said, From going to and fro in the earth, and from walking up and down in it.

JOB 1, 7

Trout Fishing in America

There was nothing I could do. I couldn't change a flight of stairs into a creek. The boy walked back to where he came from. The same thing once happened to me. I remember mistaking an old woman for a trout stream in Vermont, and I had to beg her pardon.

"Excuse me," I said. "I thought you were a trout stream."
"I'm not," she said.

A little way from the shack was an outhouse with its door flung violently open. The inside of the outhouse was exposed like a human face and the outhouse seemed to say, "The old guy who built me crapped in here 9,745 times and he's dead now and I don't want anyone else to touch me. He was a good guy. He built me with loving care. Leave me alone. I'm a monument now to a good ass gone under. There's no mystery here. That's why the door's open. If you have to crap, go in the bushes like the deer."
"Fuck you," I said to the outhouse. "All I want is a ride down the river."



Trout Fishing in America from:

Richard Brautigan
1967; 112 pp.

\$1.95 postpaid

City Lights Books
1562 Grant Avenue
San Francisco, California 94133
or
WHOLE EARTH CATALOG

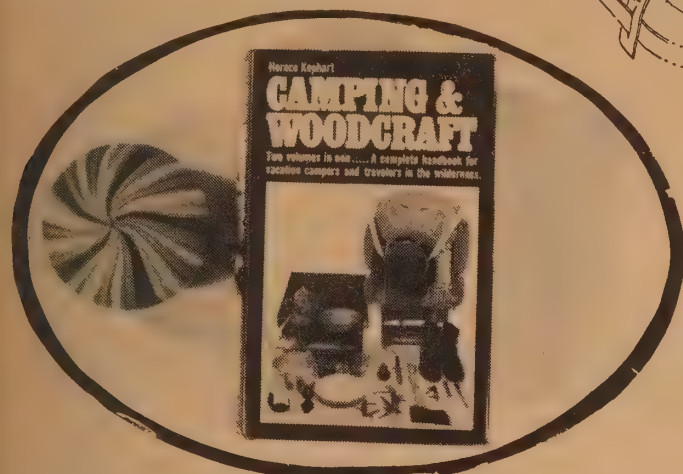
Sacred
To the Memory
of
John Talbot
Who at the Age of Eighteen
Had His Ass Shot Off
In a Honky-Tonk
November 1, 1936
This Mayonnaise Jar
With Wilted Flowers In It
Was Left Here Six Months Ago
By His Sister
Who Is In
The Crazy Place Now

Camping and Woodcraft

When friend Roland goes camping he takes his Bible and his Kephart. I generally leave home the Bible.

How could anything written in 1916 still be so useful? One, it is a masterwork. Two, in Kephart's day when you went camping you really disappeared, so there's a valid nostalgia factor. But the main thing is, the book survives on its wealth of specific practical lore. Game: find the information that is outdated, sort it from the information that is correct and available nowhere else.

Camping and Woodcraft from: The Macmillan Company, 866 Third Avenue, New York, N.Y. 10022
 Horace Kephart 1917, 1921, 1967; 479 pp. \$6.95 postpaid
 Or WHOLE EARTH CATALOG



The charm of nomadic life is its freedom from care, its unrestrained liberty of action, and the proud self-reliance of one who is absolutely his own master, free to follow his bent in his own way, and who cheerfully, in turn, suffers the penalties that Nature visits upon him for every slip of mind or bungling of his hand. Carrying with him, as he does, in a few small bundles, all that he needs to provide food and shelter in any land, habited or uninhabited, the camper is lord of himself and of his surroundings.

Men working hard in the open, and exposed to the vicissitudes of wilderness life, need a diet rich in protein, fats (especially in cold weather), and sweets. This may not agree with theories of dieticians, but it is the experience of millions of campaigners who know what their work demands. A low-protein diet may be good for men leading soft lives, and for an occasional freak outdoorsman, but try it on an army in the field, or on a crew of lumberjacks, and you will face stark mutiny.

Muddy Water.—I used to clarify Mississippi water by stirring cornmeal in it and letting it settle, or by stirring a lump of alum in it until the mud began to precipitate, and then decanting the clear water. Lacking these, one can take a good handful of grass, tie it roughly in the form of a cone six or eight inches high, invert it, pour water slowly into the grass, and a runnel of comparatively clear water will trickle down through the small end.

Trees and Lightning.—I have never seen, nor heard of, a beech tree that had been struck by lightning, although beeches are plentiful on many battle-scarred mountains where stricken trees of other species can be noted by the score.

One glance at a camper's fire tells what kind of a woodsman he is. It is quite impossible to prepare a good meal over a heap of smoking chunks, a fierce blaze, or a great bed of coals that will warp iron and melt everything else.

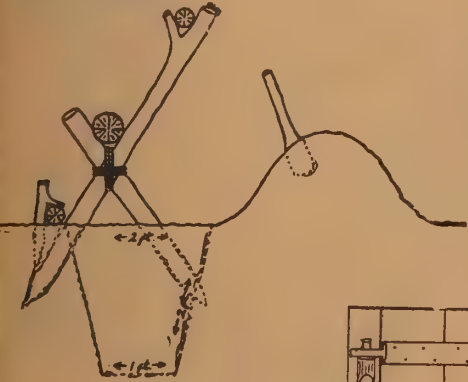


Fig. 113—Latrine



Fig. 49.—Splitting with a Froe

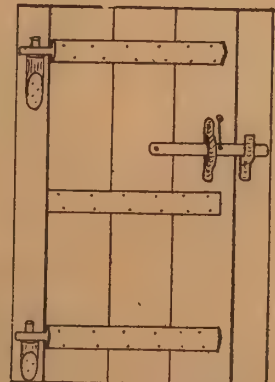


Fig. 77.—Cabin door (wooden hinges and latch)

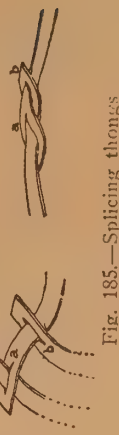


Fig. 185.—Splicing thongs



Light Weight Camping Equipment and How to Make It

It's all here: design, patterns, assembly techniques, light weight materials, and sources of the materials. Because of good information on what's needed for various environments, it's a useful book even if you aren't making your own stuff. An indispensable book if you are.

[Suggested by Roland Jacopetti]

Light Weight Camping Equipment from: Gerry Cunningham, Margaret Hansson, 1959; 130 pp. \$2.00 postpaid
 Or WHOLE EARTH CATALOG



Fig. 68.—A Masked Camp

In Alaska, all animals leave for the snow-line as soon as the mosquito pest appears, but the enemy follows them even to the mountain tops above timber-line. Deer and moose are killed by mosquitoes, which settle upon them in such amazing swarms that the unfortunate beasts succumb from literally having the blood sucked out of their bodies. Bears are driven frantic, are totally blinded, mire in the mud, and starve to death. Animals that survive have their flesh discolored all through, and even their marrow is reduced to the consistency of blood and water. The men who penetrate such regions are not the kind that would allow toil or privation to break their spirit, but they become so unstrung from days and nights of continuous torment inflicted by enemies insignificant in size but infinite in number, that they become savage, desperate, and sometimes even weep in sheer helpless anger.

BENDING WOOD.—Small pieces of green wood can be bent to a required form by merely soaking the



Fig. 54.—Spanish Windlass (for bending wood)

pieces for two or three days in water, but if it is desired that they should retain their new shape, they should be steamed.

Rabbits are unfit to eat in late summer, as their backs are then infested with warbles, which are the larvae of the rabbit bot-fly.

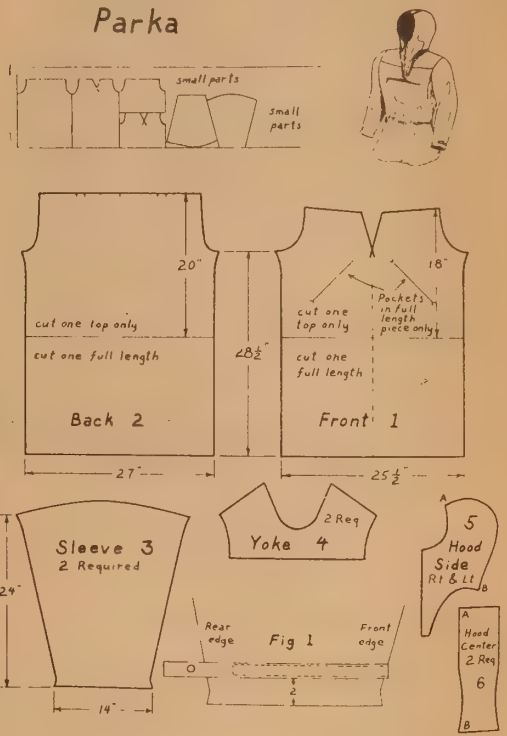
Green Corn.—If you happen to camp near a farm in the "Roasting-ear" season, you are in great luck. The quickest way to roast an ear of corn is to cut off the butt of the ear closely, so that the pith of the cob is exposed, ream it out a little, impale the cob lengthwise on the end of a long hardwood stick, and turn over the coals.

Skilligalee.—The best thing in a fixed camp is the stock-pot. A large covered pot or enameled pail is reserved for this and nothing else. Into it go all the fag-ends of game—heads, tails, wings, feet, giblets, large bones—also the left-overs of fish, flesh and fowl, of any and all sorts of vegetables, rice, or other cereals, macaroni, stale bread, everything edible except fat. This pot is always kept hot. Its flavors are forever changing, but ever welcome. It is always ready, day or night, for the hungry varlet who missed connections or who wants a bite between meals. No cook who values his peace of mind will fail to have a skilly simmering at all hours.

A woodsman, on the contrary, walks with a rolling motion, his hips swaying an inch or more to the stepping side, and his pace is correspondingly long. This hip action may be noticed to an exaggerated degree in the stride of a professional pedestrian; but the latter walks with a heel-and-toe step, whereas an Indian's or sailor's step is more nearly flat-footed. In the latter case the center of gravity is covered by the whole foot. The poise is as secure as that of a rope-walker.

It is not nearly so much the "make" of rifle as the load it takes that determines the gun's shooting qualities. So, choose first a cartridge, then a gun to handle it.

A more highly prized kinnikinnick is made from the leaves of the bear-berry or uva-ursi (Aretostaphylos-uva-ursi), called sacaommis by the Canadian traders, who sell it to the northern Indians for more than the price of the best tobacco.



Here is a list of sources of supply for the materials described. Following the addresses, the suppliers will be listed separately under various materials headings with the specific items they can supply.

- GERRY PO Box 5544, Denver, Colorado 80217
- HOLUBAR, 1215 Grandview, Boulder, Colorado—catalog available
- RECREATIONAL EQUIPMENT INC., 523 Pike St., Seattle 1, Wash. catalog available
- THOMAS BLACK & SONS, Scottish Industrial Estate, Port Glasgow, Renfrewshire, Scotland—catalog available.
- TRAILWISE (The Ski Hut), 1615 University Ave., Berkeley 3, California—catalog available.
- SEARS ROEBUCK—local store or mail order catalog
- MONTGOMERY WARD—local store or mail order catalog
- Tent and awning suppliers, yard goods shops, leather wholesalers, luggage shops, marine outfitters, sailmakers, shoe manufacturers and repair shops, harness and saddle shops, mattress and bedding manufacturers, army surplus stores, hardware stores, dry goods departments, handicraft shops, notions departments.

Kaibab boots

Kaibab boots are the real thing: traditional Indian desert moccasins. Made of deerskin and horsehide, they are light, attractive, and durable—just the right amount of improvement over bare feet. Unfortunately there are innumerable imitations of Kaibabs, all terrible. The giveaway is the seam between sole and top: if the sewing is visible on the outside the moccasins are frauds and will fall off your feet in a few weeks. Real Kaibabs will last six months of steady use, and when you finally come through the soles, you can send the tops to Tucson for new soles (\$12.00) and get another six months. (One warning. Kaibabs on wet slick sidewalk are sudden death.)



When ordering, send a pencil outline of your foot.

Kaibab boots

\$18.75 mens

\$17.75 ladies

from: Kaibab Buckskin, 271 North Stone, Tucson, Arizona 85703

Bean's Maine Hunting Shoe

Heavy Duty Grid

The Bean catalog is the model for the **WHOLE EARTH CATALOG**. Mr. Bean had a directness and integrity that shows through his catalog, his products, his service. The catalog has excellent items, especially outdoor clothing. An uncommonly pleasant company to do business with.

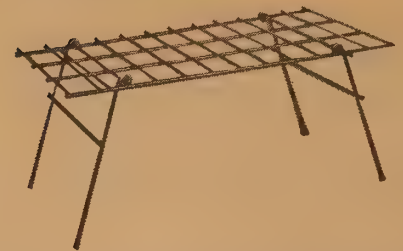
catalog Free

from:
L.L. Bean, Inc.
Freeport,
Me. 04032



Mr. Bean first developed this boot in 1912. He was tired of coming home with wet and sore feet from wearing the heavy leather woodsman boots then in common use. Rubber boots were clammy feeling and too clumsy for all day walking. He decided to combine lightweight leather tops with all rubber bottoms, incorporating the best features of both types of footwear and doing away with the disadvantages. He called his new boot the Maine Hunting Shoe.

The practical advantages of this design were readily apparent to hunters and woodsmen. For bare ground walking it was light in weight, snug fitting, had a cushioned innersole and a non-slip, chain tread outsole. For wet going and walking on snow, the waterproof bottoms were ideal. Mr. Bean invented the split backstay to eliminate chafing and by keeping all parts as light and flexible as possible he had a boot that could be used all day in perfect comfort. The Maine Hunting Shoe was an immediate success.



Made to hold cooking utensils over open fires. Has large cooking surface of heavy welded bars. Legs slope outward to stand rigidly on any flat surface and fold against grid for easy carrying. Will hold 250 lbs. Size 12" x 24" x 10 1/4" high. Weight 6 1/2 lbs. Price, \$5.60 postpaid.



	6 in.	8 in.	10 in.	12 in.	14 in.	16 in.	
Elk-tanned:	\$16.00	\$17.00	\$19.00	\$20.00	*	*	
Oil grain:	\$16.85	\$17.85	\$19.85	\$20.85	\$23.85	\$26.85	Postpaid

*14 in. and 16 in. heights come with brown oil grain tops only. For lacing hooks add 50c.

Recreational Equipment

Organized as a cooperative in 1938, Recreational Equipment, Inc. has grown to a membership of 79,000, with 2000 items listed in their catalog. These items are available at prices below most other suppliers (with the exception of a few items, we're told). They are particularly strong on mountaineering equipment. Life membership costs \$1.00.

[Suggested by Roland Jacopetti]

from:
Recreational Equipment, Inc.
1525 Eleventh Avenue
Seattle, Washington 98122



Mountaineering Medicine, a concise, handy guide to treatment of all sorts of ills and injuries in the mountains. By Dr. Fred Darville.

R389A75

1.00

Adjustable Tent Poles. Lightweight aluminum 2-piece telescoping poles. Folding down to average 4'. Ideal for tarps, tent awnings, etc.

E459C22	6' length, 18 oz.	1.85
E459C23	7' length, 20 oz.	2.10
E459C24	8' length, 22 oz.	2.45

[C] **Collapsible P-88 Tent Pole.** A four-section pole used with McKinley or Camper tents. Extends to 88" and collapses to 25" x 1 1/8" diameter. Weight 23 1/2 oz.

E657C4 4.95

CO-OP CRUISER PACKS



The Cruiser contoured aluminum frame is the latest improvement in pack frames incorporating the strength and lightness of aluminum plus a contoured shape that makes backpacking a pleasure. We have designed a packbag made from a special 9 oz. waterproof nylon that is the heaviest weight pack cloth available, and is exclusive with us.

Cruiser Pack Frame. Made from tubular aluminum with heavy web back bands, padded shoulder straps and waist strap. Exclusive with us is the extra top bar for more rigidity.

Senior size frame, 15" wide, 31" long, for most adults, 2 3/4 lbs.

C546A6 10.00

Senior Co-op Cruiser Bag. The bag is 6" x 15" x 21" deep with a center pocket 1 1/2" x 10" x 8" deep, two side pockets 2" x 5" x 6" deep and two other pockets on the side which are 2" x 5" x 11" deep. All Cruiser bags attach to the frame by two cups suspended on the top rung and by two straps at the bottom, and are doubly reinforced at all stress points.

C678A10 Red or Sage nylon, 1 3/4 lbs. 12.95

C678A11 Red or O.D. cotton, 2 lbs. 9.95

[C] **Velcro Tape Closure.** The pull-apart closure that takes the place of a zipper. Although sold separately, both halves are needed for a closure. Grey color.

N315B14	1" hook, per foot	.35
N315B15	1" pile, per foot	.35
N315B16	2" hook, per foot	.70
N315B17	2" pile, per foot	.70

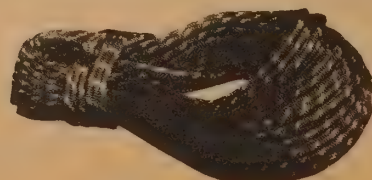
DYNAMIC ROPE

In recent years, the Europeans have developed a new climbing rope using a solid core of parallel strands of nylon surrounded by a woven sheath. This has been found to be very strong and easy to handle, having less tendency to kink in use. Called "Dynamic," it has an elasticity of about 80% at rupture, thus giving greater protection to the climber during a fall. The tensile strength is, however, somewhat less. This new rope has been given the stamp of approval by the U.I.A.A. (Union International des Associations d'Alpinisme), who, through their testing, have set standards for maximum safety to climbers. Note: 9mm rope is recommended for double-line use.

[B] **Mammut Dynamic Rope.** Swiss made, red.

9mm x 120', 5 lbs. B218A22 20.95

9mm x 150', 6 lbs. B218A21 24.95



BULK PACKED FREEZE-DRIED FOOD

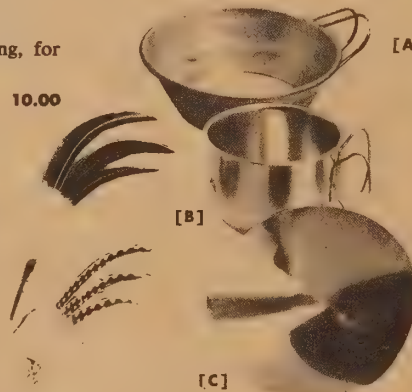
These larger quantities are suitable for expeditions. They must be re-sealed after only partial use to prevent spoiling.

3 Quarts in Polybags. Packed in cardboard cartons.

Corn, whole kernel, 16 oz.	K404A13	2.95
Peas, garden, 16 oz.	K404A14	3.50
Strawberries, 8 oz.	K404A15	5.50
Peaches, 8 oz.	K404A16	4.50
Beef Patties, #10 tin, 1 3/4 lbs.	K404A33	9.75

#2 1/2 SEALED TINS

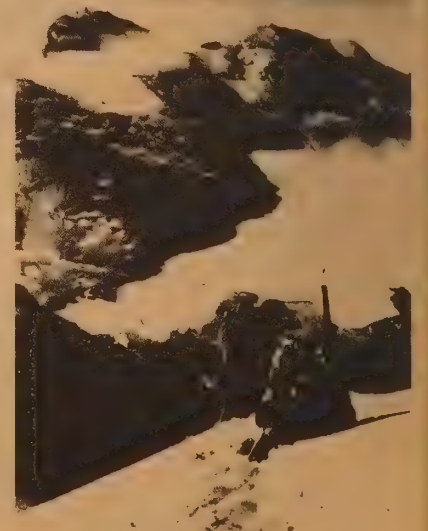
Alaska King Crab, net weight 4 3/4 oz. cooked.....K404A18 4.25



[A] **Sierra Cup.** Stainless steel, all-time favorite, wire handle, nesting, 3 oz.
H449C37 1.00

[B] **Nesting Aluminum Cup.** With folding wire handle, Swiss made.
3" diameter H206C22 .55
3 1/2" diameter H206C23 .60

[C] **Bob Lane Cup.** Unique stainless cup, folds completely flat, does not leak, sturdy, weight only 3/4 oz.
H536C7 1.25



Mount Kennedy, 14,000'. In 1965, our men and equipment were on the first ascent of the peak named for the late President, and on the subsequent mapping research done in the area.

Heavy Duty Belt

For hunters, fishermen and guides who require a solid leather belt for hard service. A fancy dress belt looks out of place on heavy hunting pants.



Made of high grade genuine cowhide with brass plated buckle
Two colors: Light Tan. Black. Sizes 24 to 48.

Width 1 1/4". Price, \$1.80 postpaid.



vented leather insole. Firm heel counters, bellows tongue and elasticized laces for snug, non-binding fit.

Color, Sand Suede.

Men's Ankle Height (above):

Sizes 7 to 13. Whole and half sizes. (No size 12 1/2.)
Medium width.

Price, Men's Ankle Height Wallabees, \$21.95 a pair postpaid.

Ladies' Low Cut (at right):

Sizes 5 to 10. Whole and half sizes.
Medium width.

Price, Ladies' Low Cut Wallabees, \$19.95 a pair postpaid.

Wallabees

(For Men and Women)

A new design by Clarks of England for complete walking comfort. Fit perfectly on the first wearing.

Special "Nature Form" lasts fit the natural contours of the feet. Do not restrict them in any way yet provide firm support.

Glove leather uppers of full grained European calfskin suede. Extra thick, soft and supple. Wedge type soles of Plantation crepe rubber have a resilience not found in synthetic crepes.

Moccasin construction with hand sewed toe piece. Molded, orthopedic-type arch support enclosed in sponge rubber and



Grommet Kits

For setting or replacing grommets on tents, tarpaulins, sails, covers, bags, lawn furniture. Each kit includes hole cutter and hardwood block, inserting punch and die, and brass grommets. Easy to use. Refills available.

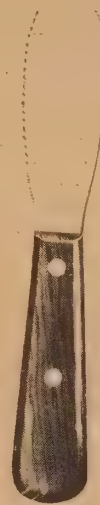
Five sizes: No. 0 (1/4" hole), \$3.35 postpaid.
No. 1 (5/16" hole), \$3.55 postpaid.
No. 2 (3/8" hole), \$3.85 postpaid.
No. 3 (7/16" hole), \$4.35 postpaid.
No. 4 (1/2" hole), \$5.00 postpaid.



Bean's Improved Sandwich Spreader

Professional quality of high grade stainless steel with mirror finish. Beautifully grained rosewood handle. Brass rivets. Blade is stiff enough to dig out thick spreads or for turning. Flexible enough for easy spreading and frosting. Sharp serrated edge cuts sandwiches, cheese, vegetables, etc. Overall length 7 1/2". Blade 3 1/2".

Price, \$1.25 postpaid

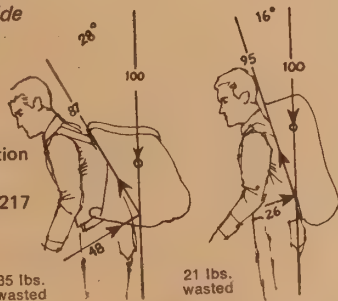


Gerry Outdoor Equipment

Gerry's been at good design of light weight camp gear for some years now. Their line has a wide reputation and wide distribution. The Gerry Kiddie Seat has made a lot of difference to a lot of parents.

Gerry catalog Free from:

Colorado Outdoor Sports Corporation
P.O. Box 5544
Denver, Colo. 80217



Gerry Kiddie seat

Lightest of all frame carriers • Aluminum tubing • Tough canvas duck seat supports baby snugly high • Can be used as car seat with adapter strap.

Number: P952
Weight: 1 lb. 3 ozs. Shipping Weight: 2 lbs. 10 ozs.
\$11.00

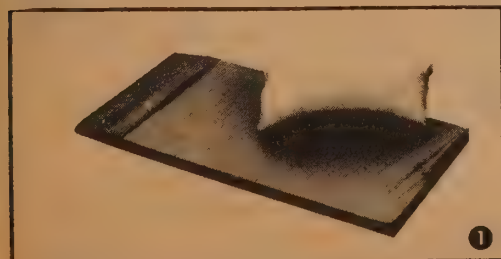
Foam pads

Lighter than an air mattress • Warmer than an air mattress • Can't leak and let you down • Compact — carries in same stuff sack as your sleeping bag • Pillow pocket at head end • Removable waterproof cover facilitates airing and drying.

Shortie 20-Pound Camp

Number: N609 Weight: 1 lb. 2 ozs.
Size: 36" long x 20" wide x 1 1/2" deep
Shipping Weight: 2 lbs.

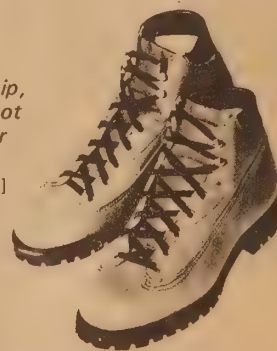
\$8.00



Sierra Designs

They are very, very nice people, and I truly believe they make the best available sleeping bags. Design, workmanship, materials, aesthetic beauty, all tops. Prices are high, but not that much higher than everyone else. If you're looking for the best, they've got it.

[Reviewed by Roland Jacopetti.
Suggested by Sandra Tcherepnin.]



GRETCHEN

A light-medium weight boot designed and lasted for women. A very strong shoe, giving comfort and protection, but easy to "walk-in." Uppers 6" high full-grain leather. Fully lined and padded ankle and tongue. Goodyear welt and steel shank. Full Vibram sole and heel. \$24.50 (includes handling and postage)



Catalog Free from
Sierra Designs
4th and Addison Sts.
Berkeley, CA 94710

TARP TENT



This versatile tarp will shelter as many as four persons, and can be pitched by taking advantage of materials at hand. With ingenuity the tarp tent can be made into variously shaped tents; either open and airy, or closed and snug. Tarp is 11' square and has 21 attaching points. Tie cords and tapes are provided; no pole is necessary. Fabric is coated ripstop nylon in 1.9 oz. weight — strong, waterproof. Weight: 2 1/2 lbs. w/ cords. COMES WITH 5"x10" CARRYING SACK. \$36.50
With 45" mosquito bar on three sides — for pitching with fourth side at ground level or on downed log. \$48.50



DOUBLE MUMMY

Matchless sleeping comfort for two. Double Mummy is lighter, cheaper and more efficient than any combination of zipped together singles. Its 6 1/2 lbs. is a tolerable pack weight. Packed size of 11"x21" allows the Double to be carried on almost any good pack frame, and your partner is freed of the largest single part of her pack. Each side of bag has its own 66" nylon zipper, and separate draw closure hoods allow individual ventilation control. Double Mummy comes in a single length — for persons to 6'3". It's not designed for single use, but quite a few heavyweights buy it for that. It provides luxurious space for really helly people. STUFF SACK INCLUDED

COLORS: Deep Blue or Forest Green \$126.50

SPECIFICATIONS:

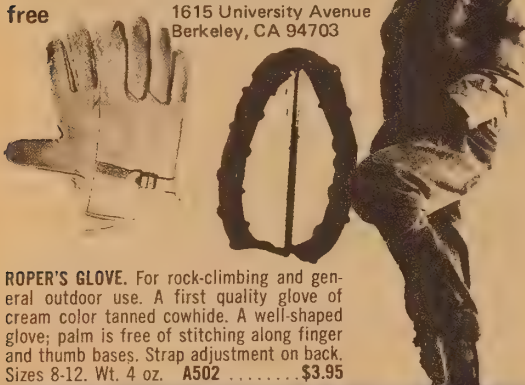
Construction: Stant wall, 6" tube width.
Weight: 6 1/2 lbs.
Filling: Prime Silver Gray goose-down.
3 lbs. 6 oz.
Stuffed Size: 11"x21"

Loft: 6"+
Estimated Min. Temp.: 10
Girth Shoulders: 99"
Girth Hips: 90"
Girth Foot: 57"

Ski Hut

Roland Jacopetti is our main source of information and judgment on outdoor equipment. He works at the Ski Hut, a supplier of outdoor equipment in Berkeley, which puts him in a conflict-of-interest bind around reviewing his employer. We shared the bind until enough evidence came in from elsewhere that Ski Hut is a source indeed competitive with others listed here. Colin Fletcher (Complete Walker) gives it top rating for comprehensiveness.

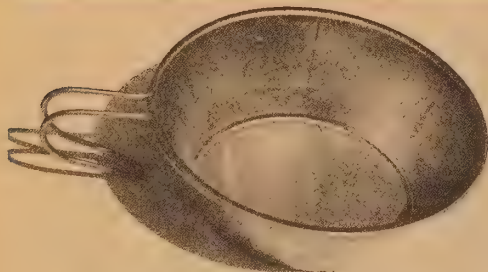
Ski Hut Catalog from
The Ski Hut
1615 University Avenue
Berkeley, CA 94703



ROPER'S GLOVE. For rock-climbing and general outdoor use. A first quality glove of cream color tanned cowhide. A well-shaped glove; palm is free of stitching along finger and thumb bases. Strap adjustment on back. Sizes 8-12. Wt. 4 oz. A502\$3.95



ski hut
68/69



SIERRA CLUB STAINLESS STEEL CUP. Stainless steel is far superior to other metals because it is less prone to heat up when filled with hot liquids. The open end steel wire handle remains cool and can be hooked easily onto belt. Multi-purpose design for holding stewed fruits, cereals, etc. as well as beverages. 4 1/2" diameter at top, 3 3/8" at base, 1 1/2" deep. Wt. 3 oz. U400\$1.00



CRUISER CONTOURED ALUMINUM FRAME. Low cost serviceable model aluminum frame with welded joints. Shoulder straps are 2" wide, padded, and nylon-covered. Back bands are 4 1/2" wide, of heavy cotton duck. This frame is superior in comfort to any other frame in its price range that we know. Two sizes: Large, for people over 5'5"; Medium, for those under 5'5". Weight: 34 oz.

Large Cruiser Frame: R400/L\$11.75
Medium Cruiser Frame: R400/R\$11.75

CRUISER #440 PACKSACK. Made of durable cotton duck, khaki in color. Two side pockets and one back pocket with tie-down cords. Sack fits on Cruiser frame in seconds. Two sizes fit the equivalent frame size.

Large #440 Packsack: 14" wide, 22" high, 7" deep. Wt. 20 oz. R401/L\$8.00
Regular #440 Packsack: 14" wide, 18" high, 6" deep. Wt. 18 oz. R401/R\$8.00

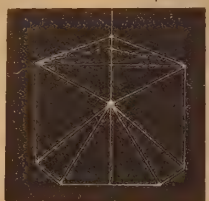
TRAILWISE LOGAN JACKET

Designed as an intermediate-weight, all-around down jacket for mountaineering, skiing and camping. We found this jacket to be just as useful at 19,000 feet on Mt. Logan as it is around Yosemite Valley, or on a Sierra ski-tour. The Logan Jacket has the warmth of several sweaters, with less weight—and is easily carried in a corner of your pack until needed. Filled with grey goose down, shell of tough Supernal, a 3 1/2" high down collar, and elastic knit cuffs. Down insulated pockets and optional down hood. This is the only jacket of its kind that solves the controversial question: Zipper vs. Snaps? The Logan Model has both heavy-duty snaps and a full nylon zipper with a 2" overlap. Colors: Royal blue, chianti, green. Weight: 21 oz. Sizes: small, medium, large. Stuffbag included.

A111\$30.00
A111-H Down hood for Logan Jacket\$6.00

ITISA SENIOR. Large enough for 2 adults and 2 children. Doors can be closed or pegged out during good weather. Mesh ventilator under shelter hood. Floor is 7' x 7'. Height is 5'; 12" walls with 4" eaves. Tent fabric is fine count Egyptian cotton approximately 3 oz. per square yd. With alloy pegs, stub plate, nesting aluminum center pole and sturdy carrying case. Tan or apple green as available. Wt. 5 lb. 10 oz.

T401\$59.50
Detachable floor of nylon. Wt. 16 oz.
T402\$17.50
Senior tent with sewn-in floor. Wt. 8 1/4 lbs.
T403\$83.50



COLLAPSIBLE WATER BAG. Thick, flexible vinyl container holds 11 quarts. Rolls up to 1" x 1 1/2". Removable spigot at bottom. Handles at both ends. Convenient water supply for an evening's cooking. Wt. 7 oz. U662\$3.50

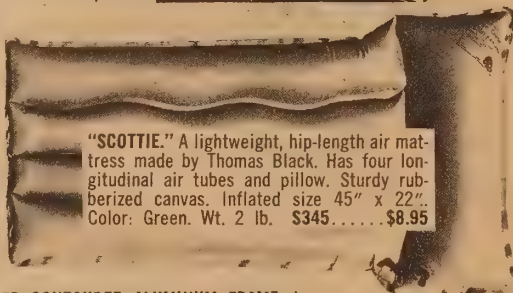
FOLDING HUNTER—Model 110

4" blade pivots on 1/4" bearing and has positive lock in open position. Handle is golden-grain Macassar ebony wood with solid brass bolsters and liner cast in one piece. May be carried in pocket or sheath. An ideal heavy-duty outdoor knife for those preferring a folding blade. Overall length when closed is 5". Weight with sheath, 8 oz.

J110\$16.00



"SCOTTIE." A lightweight, hip-length air mattress made by Thomas Black. Has four longitudinal air tubes and pillow. Sturdy rubberized canvas. Inflated size 45" x 22". Color: Green. Wt. 2 lb. S345\$8.95

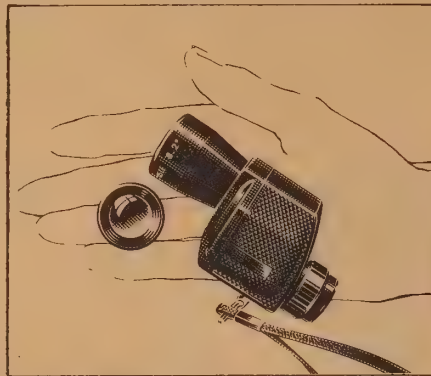


WILDERNESS COOKERY by Bradford Angier. A new cook book which combines all the good qualities of previous works on outdoor cookery with the knowledge and considerable experience of the author. Gathering, preparing, seasoning, cleaning up, a very large section dealing with tree eating, lists hundreds of wild fruits and vegetables. 256 pp.\$3.95

Haverhill's

Nifty items. High-rent personal furniture. Haverhill's carries sort of executive tools which because of their general lightness and handiness may be considered nomadic. The main drawback about Haverhill's is their customers, who brag a lot about the nifty little items. 'See. You turn it around and it rubs your back. Then in here it has a caché for pills. I carry it with me all the time now. Why don't you get one? It's only forty-two dollars.'

[Suggested by Alan Kalkér]



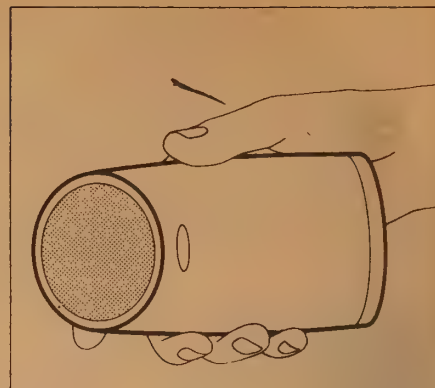
3981 M. V. MINISCOPE lets you "hold the world in your palm." It is a monocular of such startling performance that you won't believe it until you see it yourself. With its standard objective it is an 8x, 24mm, wide-angle (8.2°) telescope. For an even larger field, just quick-change objective and you have a 6x, 18mm super-wide angle (11°!) scope. As an added bonus, the objectives may be used as 3x and 5x magnifiers of unusual brilliance and crispness. All lenses coated, pinned prisms. Optics of the high quality you have come to expect of the finest Japanese cameras. Only 3 3/4 oz. In a neat, zippered case. A Haverhill's exclusive. \$16.95

MAXI-BALANCE & MINI-BALANCE are extremely accurate scales for all purposes. They come with transparent measuring cup, water level, and adjustment system for accuracy. Weighs liquids and solids. This lightweight elegant balance is indispensable, especially for craftsmen and in homes where special diets have to be kept. In gift box.

0790 MAXI 1 pint or 17 oz. capacity with wall holder. \$6.50
0791 MINI 4 oz. capacity without wall holder. \$4.50

7065 VIBRA-PILLOW is our answer for those who can't find the time to get to the steam room or their Swedish masseur! Just plug in this generous foam-rubber pillow (that harbors a tiny vibrating motor)—and relax. Lie on it, lean on it, sit on it (for five or ten minutes) and you'll feel all those knotted muscles untie. It's covered in decorative, washable cotton zip-on cover. (No need to hide it away.) Keep one in the office too! (12" x 16"). \$19.50

8480 DYNAMAGIC FLASHLIGHT is a useful pocket-sized light that never runs out of "juice" just when you need it the most, since it generates its own electricity simply by pumping the handle. Just the thing for hunting for fuses etc. Keep one at home and one with camping gear. \$5.95 (shown)
8481 DELUXE MODEL, broad beam. \$9.95



3990 MESSAGE MINDER lets you throw away your scratch pad because you won't have to write another note. This nifty electronic gadget records and plays back a 30-second message. Just think of its thousands of uses. 6 x 3 1/4 x 2 1/4". \$14.95



1161 RIVIERA SHAVER is spring-powered and makes you independent of outside power. Wind it like a movie camera and you'll be set for the smoothest cleanest shave you've ever had. 3-blade shaving head revolves so fast it gives you 72,000 cutting strokes per minute. Maintains full shaving speed right to the end. Hard to believe but true. This great instrument will give you years of shaving pleasure. A great gift for any man, especially outdoorsmen and those in the service. \$18.50
1162 "MODELE ANATOMIQUE," (pictured) Deluxe Riviera. Transparent housing lets you watch it in action. \$19.95
1163 "TETE TONDEUSE," trimming clipper attachment. \$4.95
1164 SPARE shaving head. \$3.95

3684 PILLBOX CUFFLINKS are the safest and most sophisticated way of carrying your pill supply or secret love potion. Gold finish with locket type closure. Precision-machined in Austria. \$4.95

5363 SLEEPMATE is a real boon for those who are insomniacs and have tried everything else without success. Produces a constant "swoosh" of white sound which allows you to sleep and shut out outside noises. Single-speed drive with adjustable tone and volume \$18.95
5364 2-speed drive for very large rooms, dormitories, etc. with adjustable tone and volume \$24.95



Haverhill's Catalog

free

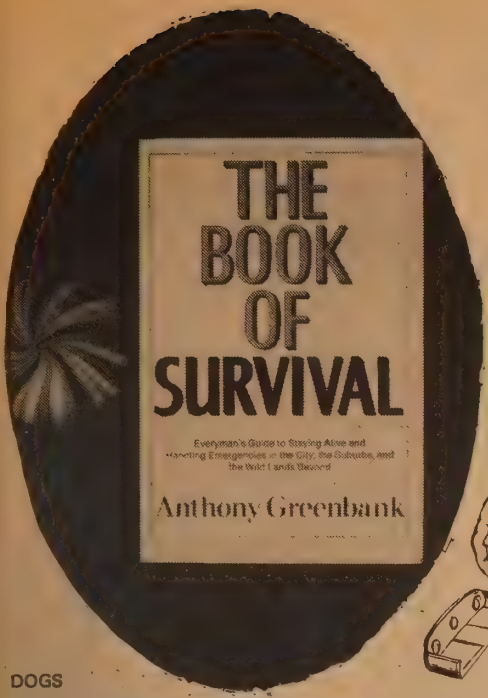
from
Haverhill's
584 Washington Street
San Francisco, CA 94111



9185 ACCUMEN SHAVER is considered the ultimate electric shaver, cordless or otherwise. Powerful Ni-Cd batteries can be recharged from wall socket, and store 2 weeks of smooth, comfortable shaves. Ultra-thin foil (0.00315"). Head 2 1/2 times larger than any other rotary shaver. Spotlight illuminates whiskers. With case. For recharging on 110v only. \$24.95
9186 TRANSWORLD for recharging on 110 and 220v. \$26.95
9187 PRAKTIKUS-5: Fitted case with ACCUMEN SHAVER and 5 attachments \$39.95
9188 PRAKTIKUS-5 (with Trans-World). \$41.95



4154 AUTO-MINI FOLDING BICYCLE fits into the trunk of even the smallest car. Drive to your favorite cycle spot, park your car, and take off on a scenic bike tour. Takes only a minute to snap up. Same model suits men, women or children thanks to adjustable handle bars and saddle. With lights, generator, 2 brakes, gears, luggage carrier and aluminum wheels. Shiny metal heavily chromed. Red lacquer finish. Shipped freight collect. \$99



The Book of Survival and The Survival Book

One barometer of people's social confidence level is the sales of books on survival. I can report that sales on *The Survival Book* are booming; it's one of our fastest moving books. What's weird is that it's almost pure romance to buy *The Survival Book*, which is an excellent handbook for Air Force pilots downed in remote regions. The other book we list, *The Book of Survival*, is far more practical and far better organized. The threats it deals with are closer and realer: burning buildings, freaked humans, speeding cars, dogs, floods, electricity, poison—genuine homely hazards. From what we can see, people are less interested in survival and more interested in the return of the frontier or maybe a sudden desert island. Fat chance.

The Book of Survival

Anthony Greenbank
1967; 223pp

\$5.95 postpaid from:
Harper and Row
49 East 33rd Street
New York, NY 10016

or WHOLE EARTH CATALOG

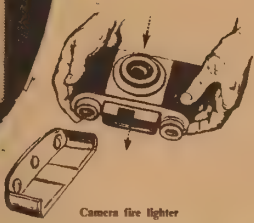
The Survival Book

Paul Nesbitt,
Alonzo Pond,
William Allen
1959; 338 pp

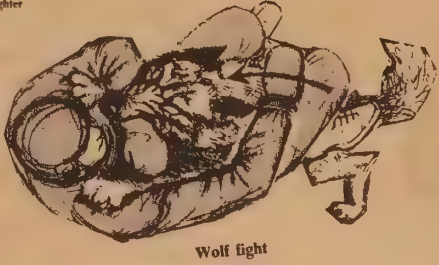
\$1.95 postpaid

from
Funk and Wagnall's
380 Madison Avenue
New York, N. Y. 10017

or WHOLE EARTH CATALOG



Camera fire lighter



Wolf fight

DOGS

Ordinary village dog in other countries is often dangerous. Semi-starved and savage, its bite can be fatal (if dog has rabies). Signs—glazed eyes/foaming mouth/staggering. Stone them to keep at bay if they attack you.

With other big dogs try the following deterrents, in this order:

- (a) Hit on nose HARD and FAST.
- (b) Brace forearm in front of you, offering it to dog. When seized jam it to back of jaws and instantly bring over your other arm (palm flexed and facing floor) so bony edge of forearm forces into back of dog's neck as you force the head backwards and over the arm with a quick jerk. Rolling action.



Kidney and head protection

When lying on the ground and being kicked try to keep rolling, shielding parts being kicked with arms. BUT always protect head as priority. Clasp base of skull with both hands, bring wrists across ears and side of head and press elbows together. Bring knees up, crossing ankles to save genitals.

In all attacks it pays to shout/gasp/yell more than you need: Feign pain. Especially when on receiving end (lying on ground and being kicked). Attacker may be satisfied sooner when you appear in agony.

PRECOLLISION ACTION WHEN NOT STRAPPED IN

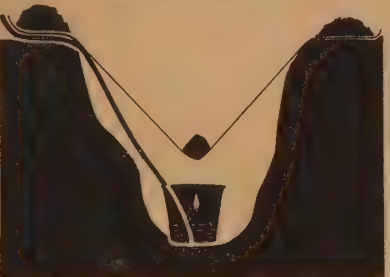
- 1. DO OPPOSITE OF NATURAL INSTINCT TO PUSH AWAY FROM CRASH
- 2. FLING YOURSELF TOWARDS POINT OF IMPACT...
- 3. WRAPPING ARMS ROUND HEAD...
- 4. TWISTING SIDWAYS AND LYING WITH FLANK ACROSS FRONT

EMRGENCY CHILDBIRTH

Happens anytime. Don't panic. Not unique situation. Let nature handle it with you helping it along.

Above all...

- 1. DON'T PULL BABY OR ITS CORD OR AFTERBIRTH ATTACHED TO OTHER END OF CORD.
- 2. TIE CORD AS SOON AS BABY IS DELIVERED.
- 3. CUT CORD ONLY IF NO HELP LIKELY. IF HELP ON WAY, TIE CORD BUT LEAVE AFTERBIRTH ATTACHED.
- 4. KEEP BABY WARM. PLACE BETWEEN MOTHER'S LEGS...



Survival still

FIGHTING DRUNK

Humor.

If involved in brawl, drunks can offer astoundingly strong grip. Hit hard in stomach and this may make him sick.

Basically, only chance for person who does go out in heavy surf (or who gets knocked in off a jetty or sandbank is:

- 1. TRY TO SURF ON SUCH INCOMING WAVES AS POSSIBLE.
 - 2. GRAB SAND WITH FISTS TO AVOID BACKWASH.
 - 3. WHEN CLEAR OF WATER SCRAMBLE ABOVE HIGH-WATER MARK.
- And if swept out by riptide (surf draining back to sea):
- 1. DON'T BATTLE AGAINST IT.
 - 2. SWIM DIAGONALLY ACROSS IT.

After a distance varying from a few feet to hundreds of yards, swimmer is clear of riptide and should be able to regain shore (though perhaps mile or more down the coast).

UNCONSCIOUSNESS

Test by touching eyeball gently—a blink means injured is conscious.

Never shout/shake/pummel. Don't try to force down fluids (and never try to give alcohol). If back does not appear broken (see TOO FAST)...

- 1. TURN BODY AND HEAD TO ONE SIDE.
- 2. CLEAR MOUTH OF DENTURES/VOMIT/DIRT AND CHECK BREATHING.
- 3. LOOK FOR BLEEDING AND STOP.
- 4. LOOSEN CLOTHING AND TREAT FOR INJURIES.
- 5. SEARCH POCKETS FOR IDENTITY—AND NOTICE OF DIABETES, ETC.

Get stretcher/medical help/ambulance.

as someone at ALLOY said, this arrangement is splendid for working on the outside of domes.



Rope climbing using friction knot

One of the authors once gave a 50-cent Swiss jackknife to a Tuareg noble in the Sahara. Later he received courtesies out of all proportion to the demands of hospitality. Finally the noble explained. "When you first came here you gave me a knife that closes. All my life I have wanted a knife that closes. You are my friend. Anything I have is yours."

EXPECTED DAYS OF SURVIVAL AT VARIOUS ENVIRONMENTAL TEMPERATURES AND WITH VARYING AMOUNTS OF AVAILABLE WATER

	Max. daily in shade temperature, °F	Available water per man, U.S. quarts					
		0	1	2	4	10	20
NO WALKING	120	2	2	2	2.5	3	4.5
	110	3	3	3.5	4	5	7
	100	5	5.5	6	7	9.5	13.5
	90	7	8	9	10.5	15	23
	80	9	10	11	13	19	29
	70	10	11	12	14	20.5	32
	60	10	11	12	14	21	32
	50	10	11	12	14.5	21	32
WALKING AT NIGHT AND RESTING THEREAFTER	120	1	2	2	2.5	3	
	110	2	2	2.5	3	3.5	
	100	3	3.5	3.5	4.5	5.5	
	90	5	5.5	5.5	6.5	8	
	80	7	7.5	8	9.5	11.5	
	70	7.5	8	9	10.5	13.5	
	60	8	8.5	9	11	14	
	50	8	8.5	9	11	14	

DO'S AND DON'TS FOR THE TRAVELER IN ARABIAN DESERTS

Here are a few of the most important don't's. In general they apply to the deserts everywhere.

- Don't reprimand an offender in front of other people.
- Don't draw sand pictures or maps with your foot—stoop down and draw with your right hand.
- Don't swear at a native.
- Don't expose the soles of your feet to others. Sit tailor fashion or on your heels.
- Don't ask about a man's wife.
- Don't throw a coin at a man's feet. That is insulting.
- Don't try to gamble. It is forbidden.

And here are a couple of Do's worth remembering.

- Do have patience when dealing with desert people.
- Do act friendly.

Give careful thought to the selection of equipment you will carry on the walkout. A 50-pound pack is a heavy load; 20 to 30 pounds is much more reasonable. The four most important equipment items for jungle travel and living off the land are the machete, the compass, the first-aid kit, and the parachute.

The highways of the jungle are the trails and the streams; use them if you have to do any extended travelling. The beds of small streams are usually used as trails by the natives, because it is easier to wade in shallow water than to push through thick undergrowth.

Deserts are quite healthy places. Dry air is not favorable to bacteria. Wounds usually heal rapidly in the desert, even without treatment. Except in some oases of the Sahara, malaria does not exist in the desert. Venereal diseases, however, are prevalent in both the Gobi and Sahara, and are much more common in Mongolia than in Africa. But unless you lose all sense of proportion as to your immediate situation, you will not become involved in this aspect of desert life.



Fig. 51. Major Deserts of the World.

Hot Springs

It seems incredible that there would be such a book. Here are map locations of all the known hot springs in the world, along with information on temperature, rate of flow, mineral content, and whether commercial or wild. You could travel the rest of your days from spring to spring, stopping at the Tatapani springs, on the west bank of the Sunkasi river ("3 springs forming small pool") 50 miles northwest of Mt. Everest, or the Hamman Ouled Sidi Abdeli ancient Roman baths, still flowing at 500 liters/minute, 81 F, 50 miles southwest of Oran, Algeria.

Published by the U.S. Geological Survey for a song, this directory fails to mention the plastic ice-water afterlife that awaits those who mess up wild hot springs.

Thermal Springs of the United States and Other Countries of the World—A Summary

Gerald Waring
1965; 383 pp.

\$2.75 postpaid

from:
Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402

WHOLE EARTH CATALOG



The Explorers Trademart Log



Most periodicals that have anything to do with exploring are about it, for people who don't do it: useless. This magazine is for explorers, by explorers. The span of subject matter includes backpacking, diving, sailing, flying, spelunking, prospecting, archeology, photography, treasure hunting, mountaineering, and conservation. The magazine is new and growing. Somewhat jolly in tone, it is full of specific gossip on tools, access, and current explorations.

[Suggested by Mack Taylor]

100 The Explorers Trademart Log
\$3.00 per year (monthly)

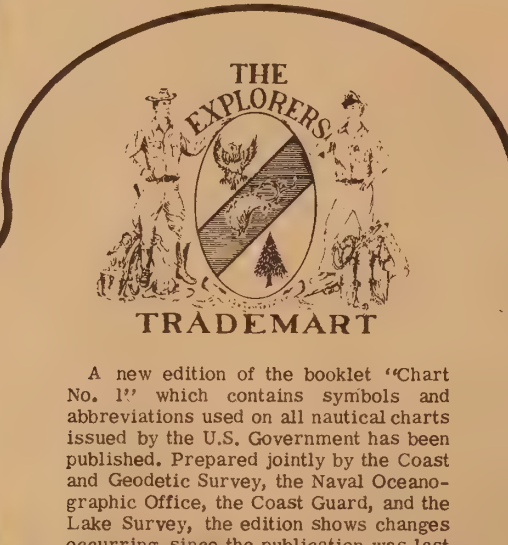
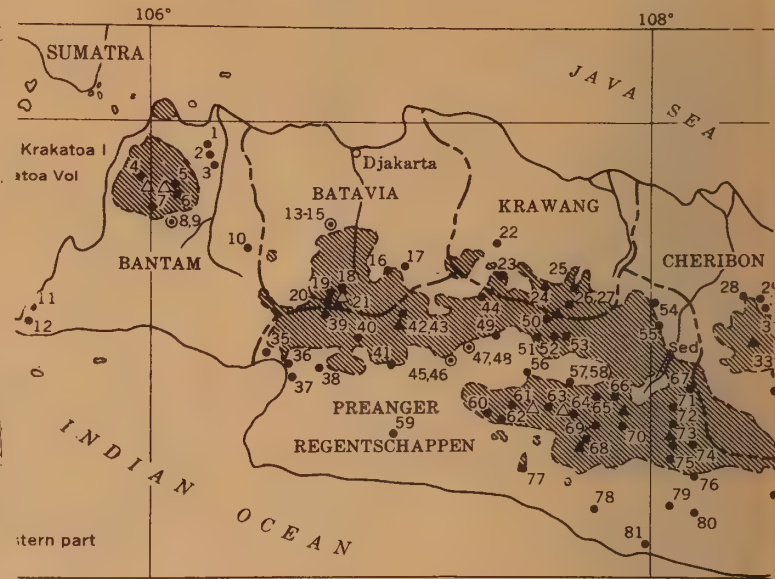
from:
Explorers Trademart, Ltd.
P.O. Box 1667
Annapolis, Md. 21404

Thermal springs and wells in Argentina—Continued

No. on fig. 15	Name or location	Temperature of water (°C)	Flow (liters per minute)	Total dissolved solids (ppm)	Principal chemical constituents	Associated rocks	Remarks and additional references
55	El Saladillo de los Colorados.	34	Moderately Large	4,560	Na, SO ₄ , Cl	Precambrian(?) strata	1 main spring and several small flowing wells.
56	Surgente de Copai de Guayapa, 15 km southwest of Patquia.	22		8,270	Na, SO ₄ , Cl	do	Flowing well. Water used for drinking by cattle.
57	Totoritas, in La Rioja Pismauta, 8 km west of Jachal	26 40; 45		400; 356	NaHCO ₃ Na, SO ₄ ; free H ₂ S	Paleozoic strata	Water used for bathing. 2 main springs. Water contains much Fe ₂ O ₃ and Al ₂ O ₃ . Ref. 912.
58	Quebrada de Huaco (Hedionda).	21-25	100	2,300-2,868	Na, SO ₄ ; much free H ₂ S	Paleozoic limestone	Several springs. Deposits of sulfur. Water used for bathing. Ref. 905.
59	El Volcan	27.1			Na, SO ₄ , Cl; free H ₂ S	Tertiary(?) deposits	Water used locally.



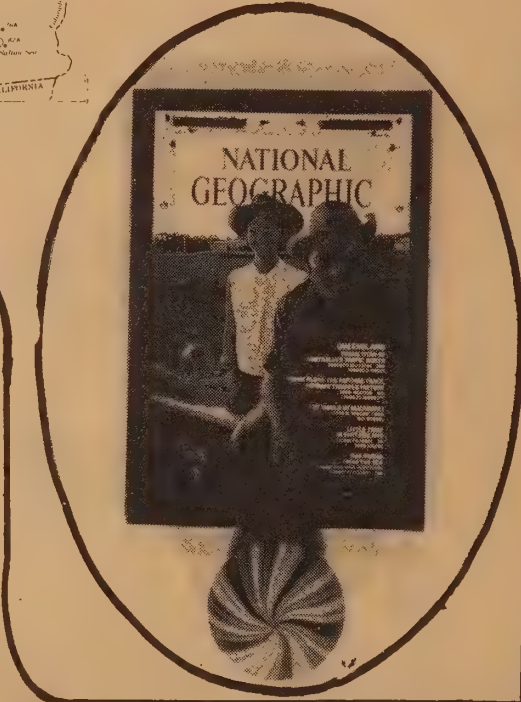
FIGURE 15. California and Nevada showing locations of thermal springs. (Adapted from ref. 148)



A new edition of the booklet "Chart No. 1" which contains symbols and abbreviations used on all nautical charts issued by the U.S. Government has been published. Prepared jointly by the Coast and Geodetic Survey, the Naval Oceanographic Office, the Coast Guard, and the Lake Survey, the edition shows changes occurring since the publication was last printed in 1963. New chart symbols of primary importance include those designated as marine limit areas, such as shipping safety fairways in the Gulf of Mexico, etc. Illustrations depicting aids to navigation have been revised to reflect new technological advances in their construction. Copies may be purchased from the Coast and Geodetic Survey (C44), Rockville, Md. 20852 for 50¢.

His method follows: Cut the potato in halves normal to its longitudinal axis. Hull out the inside to whatever size the meal requires. Stuff with anything that's good to eat. Bacon is not good if it is too fat. Put the halves together again. Wrap in green leaves, wet paper, clay or adobe mud. Wet paper is preferred though. If mud is used, be sure to punch a hole through it to the potato to let out steam. Otherwise it will explode. Bury in the campfire coals. Cover with coals well, so no air will get to the potato.

An old fire will cook quicker than a new one, because the ground is hot. With an old fire, cooking with potatoes will take about an hour and a half to two hours.



National Geographic
Everyone knows about National Geographic. This is just a reminder, or a tribute. Long live.

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12 issues

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The Secretary
National Geographic Society
Washington, D.C. 20036

National Geographic publishes excellent maps at reasonable prices. We use two huge maps in the CATALOG office for geographical portrait of subscribers. Write for Free publication list to above address.

PASSAGE FEATURES

	Short, steep slope (arcuate)
	Short, steep slope (non-arcuate)
	Slip-off slope (toward passage wall)
	Semi-dome (sloping away from passage wall)
	Drop with depth (hachures on lower side)
	Dome

When working around the sea, be extremely careful about salt and sand. In this combination they will ruin most cameras. Keep camera in the plastic bag until actually shooting and the lens cap on. If there is spray, keep it in the bag altogether, wipe the camera carefully at the end of each shooting session. Should a camera be accidentally dropped in salt water, remove the lens, immerse the camera in fresh water until thoroughly soaked. Shake out, immerse in alcohol (rubbing will do) and then either get it to a repairman or start opening it yourself for drying and reoiling. The lens should not be put in alcohol, but only fresh water if necessary. Usually it is well enough sealed to require only a good wiping.



Stylized bird drawing is over 400 feet long. A solstice "road" can be seen running parallel to the bird's wings.

Mountaineering

Any idiot can go climb a mountain, and any idiot can fall off. Not falling off is technical business, of which this is a fine text. Quite British.

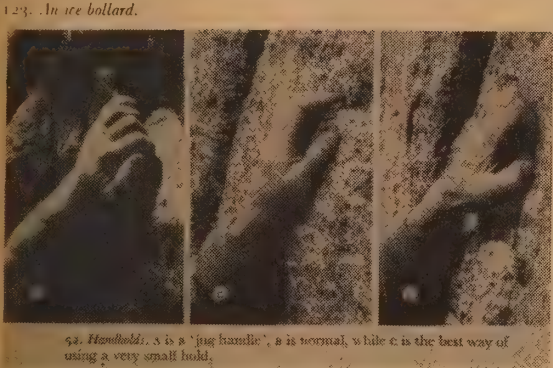
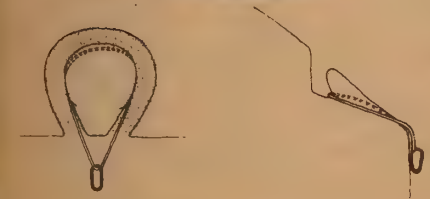
[Suggested by Don Gerard]

Mountaineering

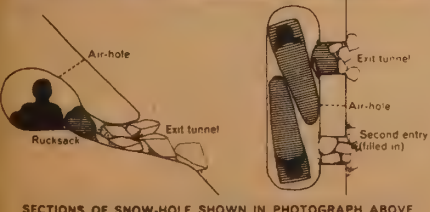
Alan Blackshaw
1965,68: 542 pp.

\$3.75 plus postage

from
Penguin Books, Inc.
7110 Ambassador Road
Baltimore, Md. 21207
or
WHOLE EARTH CATALOG



Anyone who has difficulty in deciding whether a balay is 'psychological' should ask himself whether he would be prepared to rope down from it without a safety rope: if he would not, it is 'psychological'.



SECTIONS OF SNOW-HOLE SHOWN IN PHOTOGRAPH ABOVE

New York State Conservation Publications

This seems a remarkable bargain. Free information leaflets on no end of intriguing subjects. You can order a maximum of 3 at a time.

[Suggested by Jonathan Goodman]

Catalog, leaflets

FREE
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Division of Conservation Education
New York State Conservation Department
Albany, N.Y. 12226

- Boats (Preparation for Winter Storage)
- Farm Pond Weed Control (Aquatic)
- Dams (Build a Log Pyramid Pool Digger)
- Farm Ponds (Where and How to Build Them)
- Leaky Ponds and What to do With Them
- Nature of a Tidal Marsh

- Death of a Stream
- Ecology of a Bog
- Farms (How to Buy an Old Farm)
- Log Cabin Plans
- How to Plant a Tree
- Carrying Capacity - Nature's Balance Wheel
- Field Dressing a Deer - Anatomy of the Deer
- Survival Kit (How to Make Your Own)
- Tanning (Buckskin Briefing)
- Terraria (How to Make Sectional Terraria)
- Poison Ivy
- Wood Duck Nesting Box - Housing for Ducks
- Lake Trout (Why The Trout Fry Died - DDT)



Innovator

This publication offers practical information on two strategies of survival if national affairs get funny: hiding, and running.

Innovator is published quarterly. *Free Trade*, a supplement devoted to ads and correspondence, comes out monthly.

[Suggested by Mu.]

\$1.00 Free Trade for one year
\$4.00 Innovator and Free Trade for one year

from
Box 34718
Los Angeles, CA 90034

Better buys on houseboats may often be found by shopping, in the 'off season,' at locations where wealthy people congregate. From April until the end of summer, for example, is the ideal houseboat hunting period in and around Miami. This is because many wealthy people buy new houseboats, lose interest in them when the novelty wears off or a new model attracts their fancy, and sell at a sacrifice—a kind of status seeking which works to the advantage of the freedom seeker.

Building a houseboat is an easy matter, too—and it is possible to put a medium sized one together for less than a thousand dollars. A professional boat builder will look over your plans for a reasonable fee and make suggestions, and this kind of advice can save you money and headaches later on.



Sierra Club

We aren't listing Sierra Club's exhibit-format books simply because they aren't strictly tools. They do publish useful specific-locale books and if you're a member you get discounts on them. Other services to members include the monthly Sierra Club Bulletin and organized access to local and global wild places plus having a hand in obstructing dumb progress.



\$14.00 first year individual membership; \$9.00 subsequently.
\$18.50 first year for husband and wife; \$13.50 subsequently.
\$8.50 first year for member 12 to 21; \$3.50 subsequently.

from
Sierra Club
Mills Tower
San Francisco, Ca. 94104

Another favorite theme of Fuller's, which supports the viability of King's concept, is: "Dry land nations are inherently divided. The world is united by its water." Quite possibly the free-trading, free-communication floating civilization of the future will bring the peoples of the world's different nations into closer and more direct contact. Fuller says: "There is no question in my mind that there is now beginning a swift break-down of the increasingly intolerable sovereign boundaries interfering with world industrialization. Within two decades the concept of 'Countries' doing business with one another will be as obsolete as having New York City and Hoboken, New Jersey, trade with one another and balance their inter-accounts annually with gold bullion payments." If Mr. Fuller is correct this should provide additional impetus for the creation of aquatic societies. And Richard King might well find himself coordinator of a movement which will not only create free sea-city-nations but will, by virtue of its existence, further weaken the restrictive holds governments have on land—opening the way to a genuine and lasting world peace.

Sailing Illustrated

This is a little book with a lot of pictures and an unusually useful layout. It's a nice job of information packing with easy retrieval designed in.

[Suggested by Don Gerard]

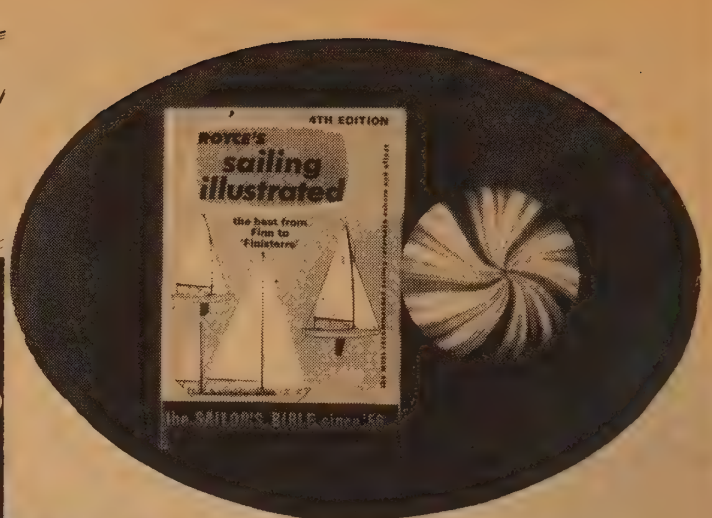
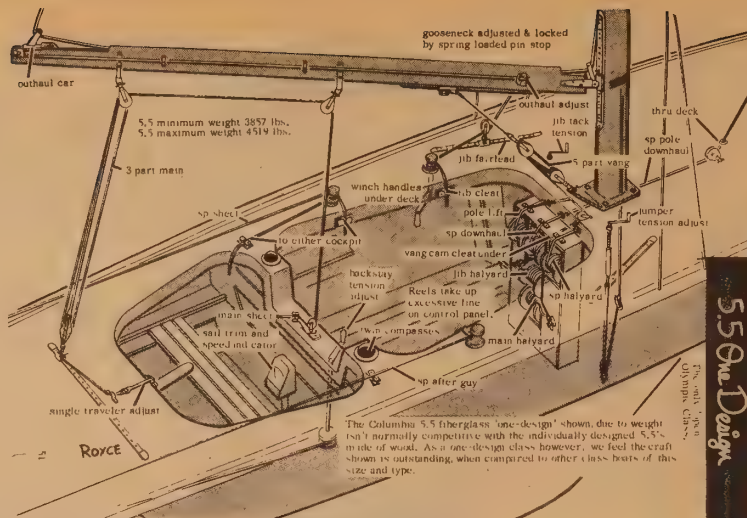
Sailing Illustrated

Patrick M. Royce
1956 .68; 352 pp.

\$4.15 postpaid

from
Royce Publications
Box 1967
Newport Beach, CA 92663

or
WHOLE EARTH CATALOG



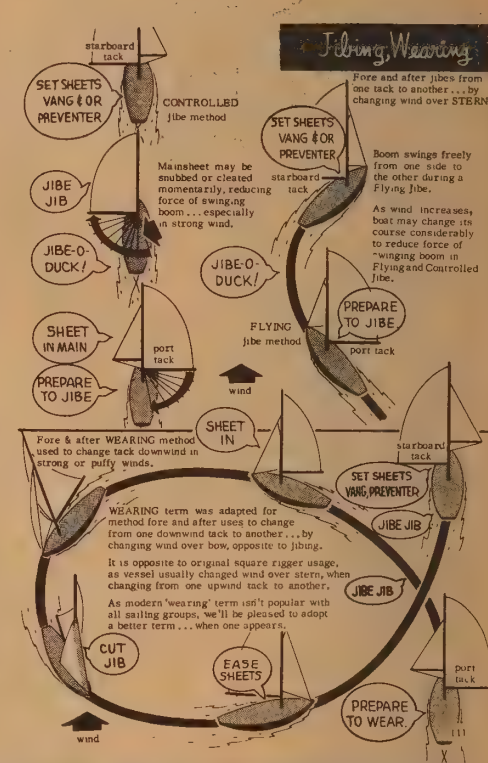
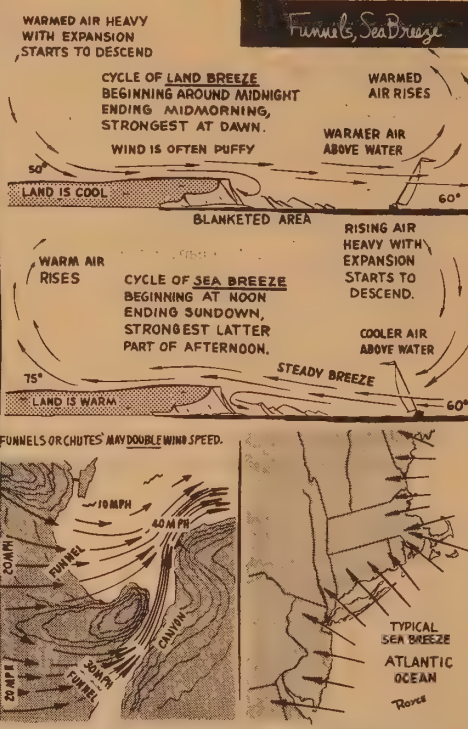
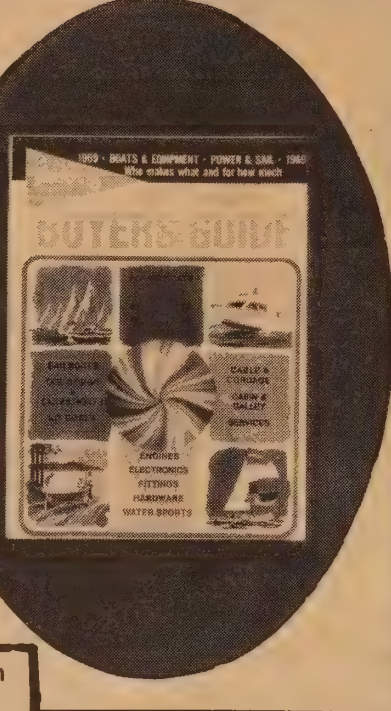
Boat Owners Guide

Published yearly in the winter, this guide gives the full range of what's available in boats, what's new, what prices are, and where to order. We didn't use it to find the WHOLE EARTH CATALOG 'Boojum', but we could have. ('Boojum' is the cheapest sailboat in the Guide, made out of styrofoam, funky as a coffee cup, gentle as a big friendly hand: lateen rigged, 11' length overall, 10'6" length waterline, 3' beam, centerboard, 3'6" maximum draft, 45 sq. ft. sail: \$119.00 from Snark Products, Inc., 1580 Lemoine Ave., Ft. Lee, N. J. 07024.)

Boat Owners Guide
1969; 320 pp.

\$1.95 postpaid (\$1.50 more outside U.S.)

from
Yachting Publishing Corporation
50 West 40 Street
New York, N. Y. 10036



American Practical Navigator - Bowditch

There's an episode in Kenneth Roberts' Lydia Bailey where Albion Townsend, having helped lick Napoleon in Haiti, is sailing across the Atlantic with his common-law bride, Lydia, and they're out on deck a lot at night doing sex with Bowditch's book in hand, teaching each other navigation. This book is big, probably lots more than you care to know about navigation, but it's authoritative, THE word, and it's cheap. Dating origins back to 1799, it has romantic associations to go with its practical lore.

American Practical Navigator - An Epitome of Navigation

Nathaniel Bowditch & U.S. Navy Hydrographic Office
1966; 1524 pp.

\$7.00 postpaid

from
U.S. Govt. Printing Office Bookstore
710 North Capitol Street
Washington, D. C. 20402

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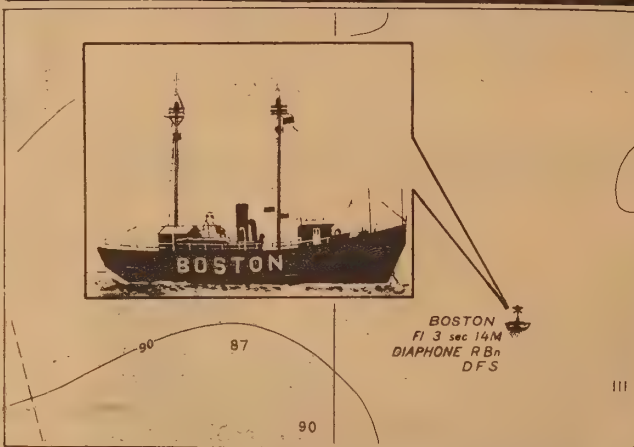
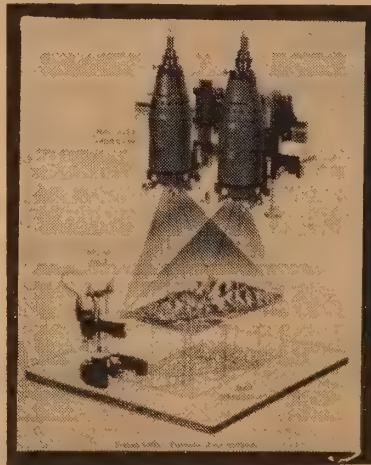


FIGURE 513b.—A lightship with a radiobeacon.

Several items of electronic equipment, some of which are relatively inexpensive, are available for use in small craft, to aid in navigation and increase safety. The principal item of radio equipment, from the standpoint of safety, is a marine radio-telephone, which in addition to providing normal communication to other boats and the shore, permits the boat carrying it to call for help in distress, and assists in the location of the distressed vessel. The radio direction finder is a simple device requiring little power, an important factor on small craft. A multiband direction finder may be used as a second receiver in the broadcast and radiotelephone bands. Portable broadcast receivers permit reception of weather information on even the smallest boats. For larger craft, where ample power is available, radar and loran may be good investments. In addition, every small craft should carry a corner reflector (art. 1209), so as more readily to reflect radar signals. In an emergency a metal bucket might be of some value as a reflector.

If the craft is to proceed out of sight of land for more than short intervals, celestial navigation equipment should be carried. This includes a sextant, an accurate time-piece, an almanac, sight reduction tables, and perhaps a star finder.



NAVIGATIONAL STARS AND THE PLANETS

Name	Pronunciation	Bayer name	Origin of name	Meaning of name	Distance*
Achernar	á'kə-már	ε Eridani	Arabic	another form of Achernar	120
Achernar	á'kə-már	ε Eridani	Arabic	end of the river (Eridanus)	72
Acrux	á'krúks	α Crucis	Modern	coined from Bayer name	220
Adhara	á'dhá-rá	ε Canis Majoris	Arabic	the virgin(s)	350
Aldebaran	ál-dé-bá-rán	α Tauri	Arabic	follower of the Pleiades	64
Alhoth	ál-hó-th	γ Ursa Majoris	Arabic	another form of Capella	90
Alkaid	ál-káid	δ Ursa Majoris	Arabic	leader of the daughters of the bear	190
Al Nair	ál-náir	ε Crucis	Arabic	tail of the bear	80
Anilam	án-ní-lám	γ Orionis	Arabic	string of pearls	410
Alphard	ál-fárd	α Hydrae	Arabic	solitary star of the serpent	200
Alphecca	ál-fé-ká	α Corona Borealis	Arabic	coined name	76
Alpheratz	ál-fé-ráts	α Andromedae	Arabic	the horse's navel	120
Alkaid	ál-káid	δ Ursa Majoris	Arabic	solitary star of the serpent	190
Antares	án-tá-rés	α Scorpii	Arabic	the bear's guard	37
Arcturus	á-rk-tú-rús	α Bootis	Arabic	coined name	130
Atria	á-trí-a	γ Trianguli Australis	Modern	coined name	350
Avior	á-ví-ór	ε Carinae	Modern	coined name	250
Bellatrix	bé-lá-tríks	γ Orionis	Latin	female warrior	200
Betelgeuse	bé-té-lí-jú-z	α Orionis	Arabic	the arm pit (of Orion)	300
Canopus	ká-né-pús	α Carinae	Arabic	city of ancient Egypt	230
Capella	ká-pé-lá	α Aurigae	Latin	little she-goat	46
Deneb	dé-né-b	ε Cygni	Arabic	tail of the heron	690
Denebola	dé-né-bó-lá	α Leonis	Arabic	tail of the lion	42
Diphda	dí-fí-dá	β Cephei	Arabic	the second frog (Pomalhaut was once the first)	57
Dubhe	dú-bé	α Ursa Majoris	Arabic	the bear's back	100
Elmath	é-lá-th	β Tauri	Arabic	one battling with horns	130
Eltanin	é-lá-nín	γ Draconis	Arabic	head of the dragon	150
Enif	é-níf	α Pegasi	Arabic	head of the horse	250
Fomalhaut	fó-mál-háut	α Piscis Austrini	Arabic	mouth of the southern fish	200
Gacrux	gá'krúks	γ Crucis	Modern	coined from Bayer name	72
Gienah	jí-ná	γ Corvi	Arabic	right wing of the raven	130
Hadar	há-dár	β Centauri	Modern	leg of the centaur	200
Hamal	há-mál	α Arietis	Arabic	full-grown lamb	76
Kaus Australis	káus-á-trá-lús	α Sagittarii	Ar.	southern part of the bow	163
Kochab	kó-cháb	β Ursa Minoris	Arabic	shortened form of "north star" (named when it was that, c. 1300 BC-AD 300)	100
Markab	má'káb	α Pegasi	Arabic	saddle (of Pegasus)	100
Menkar	mén-kár	α Ceti	Arabic	nose (of the whale)	130
Menkent	mén-ként	α Centauri	Modern	shoulder of the centaur	15
Miapicius	mí-pí-síus	α Carinae	Ar.	quiet or still waters	86
Mirak	mí-rák	α Persei	Arabic	elbow of the Pleiades	135
Nunki	nún-ké	α Sagittarii	Bab.	constellation of the holy city (Eridu)	130

Stick and Rudder

Subtitle: 'An Explanation of the Art of Flying.' This book was written in 1944 and is still, I understand, the basic flying book. Writing, illustration, comprehensiveness—it's a full-throated classic. I've never flown a plane, but I've flown other stuff, and every page glimmers with useful hints for every kind of flight. Maybe some Sufi pilot would like to do an allegorical review of this profound book.

Stick and Rudder
Wolfgang Langewiesche
1944; 389 pp.

\$8.95 postpaid

from
McGraw-Hill Book Co.
East:
Princeton Road
Hightstown, N.J. 08520
Mid-continent:
Manchester Road
Manchester, Mo. 63062
West:
8171 Redwood Highway
Novato, CA 94947

or
WHOLE EARTH CATALOG

On wings it is safe to be high, dangerous to be low; safe to go fast, dangerous to go slow. Generally speaking, if you want the airplane to go up, you point its nose up; but point its nose up a little too much, and you go down in a stall or a spin. In landing an airplane, to make it sink down on the runway and stay down, you move the controls much as for an extreme upward zoom. In the glide, if you want to descend more steeply, you point your airplane's nose down less steeply; if you want to descend less steeply, you point the airplane's nose down more steeply! And—most spectacular contrariness of all—in emergencies, when the airplane is sinking toward the ground in a 'mush' or falling in a stall or a spin, and you are afraid of crashing into the ground, the only way to keep it from crashing is to point its nose down and dive at the ground, as if you wanted to crash!

Aviation Books

A good comprehensive source of books on piloting and such is Aero Publishers.

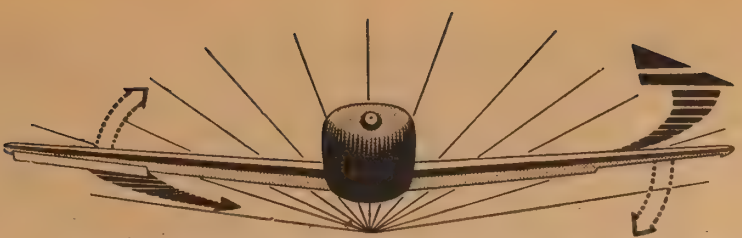
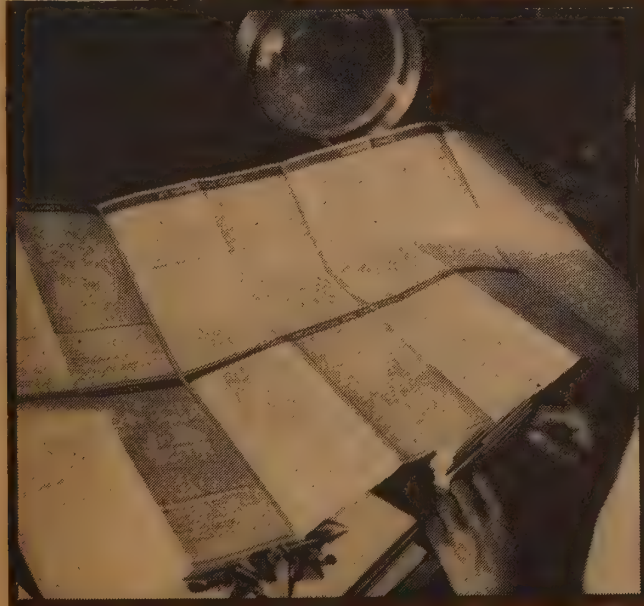
Aviation and Space Books

free from Aero Publishers, Inc. 329 Aviation Rd. Fallbrook, CA 92028

Aeronautical Charts

Mack Taylor is a friend who has a fondness for the blank places on other people's continents. He walks into them in his tennis shoes and makes friends with the chief and walks out and tells stories about how the main hazard in the jungle is dead-eye monkeys who shit on you from the trees. Mack says that often the only maps with information in the blanks are the ONCs—Operational Navigation Charts, available for 50¢ apiece. The Coast and Geodetic Survey Catalog of Aeronautical Charts has a map index for ONCs and sundry other flight maps and publications. The Catalog seems to be

free from Distribution Division C-44 Coast and Geodetic Survey Rockville, Md. 20852

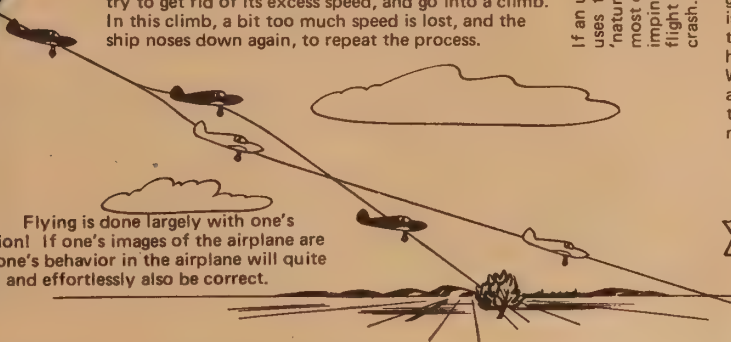


The adverse yaw effect. Ailerons have two effects. White arrows: rolling effect is what pilot wants. Black arrows: yawing effect is an undesired by-product of rolling effect. Here, the pilot banks to (his) left, presumably in order to turn to the left, but the airplane at the same time yaws to (pilot's) right. That's why this yaw effect is called "adverse." Pilot must kill this effect by using rudder.

Hence the Angle of Attack cannot be seen simply by looking out the window; in fact, it cannot be seen at all! For remember, Angle of Attack is the angle at which the wing meets the air—and we can't see air. That is perhaps largely why flying is so much of an art. In baseball the batter keeps his eye on the ball that he is going to hit. Flying is the art of batting the air down with our wings; but in flying, our trouble is that we can't see the air; hence we often fail to hit it right, and hence so many of us break our necks.

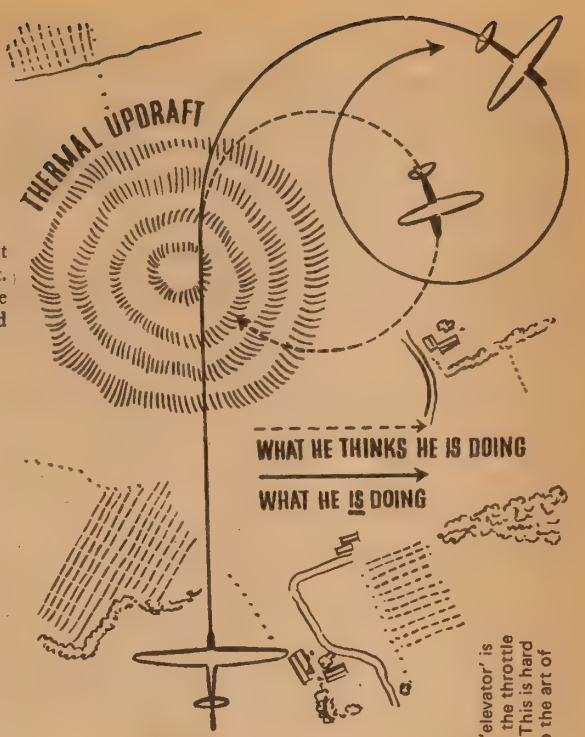
Take your hands off a good airplane's stick, and it will do a good job of flying all by itself. Take your feet off its rudder as well, and many airplanes will even then do a fair job. The airplane has a built-in will of its own, and generally speaking it wants to do whatever is necessary to maintain healthy flight.

In actual practice most airplanes have a tendency to hunt. This means that with the controls released, the ship will not fly at constant speed but will oscillate up and down, now dropping its nose, building up speed, diving for perhaps 10, 20, 30 seconds. Then, with its essential stability and better self asserting itself, it will catch itself, raise its nose, try to get rid of its excess speed, and go into a climb. In this climb, a bit too much speed is lost, and the ship noses down again, to repeat the process.



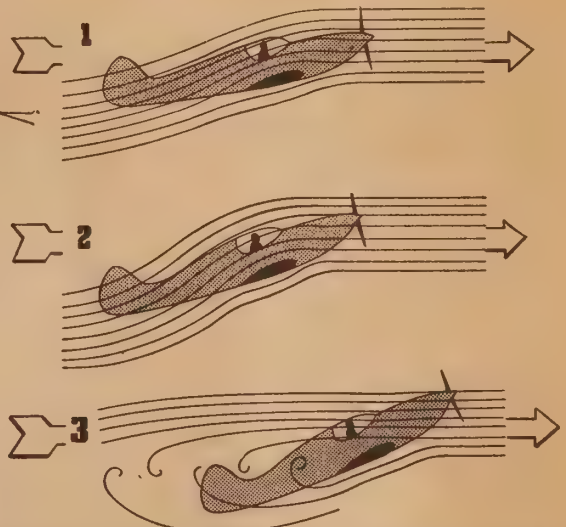
Flying is done largely with one's imagination! If one's images of the airplane are correct, one's behavior in the airplane will quite naturally and effortlessly also be correct.

The pitfall of glide control: when doing the right thing, you get the wrong result first, the right result only later. Nosing the airplane up steepens the descent, but first causes a temporary ballooning. Nosing the airplane down shallows the descent, but first causes an extra sink. Be patient for a few seconds.



As you approach the ground you must keep your vision relaxed and look all around; you must take in the whole scenery, the perspective of the hangars on the side of the field and the other airplanes on the field, the parked automobiles, the trees, the telegraph poles all around, the grass, the horizon; for it is from the perspective and apparent motion of such things that you will get a vivid perception of your height; and a staring eye will not see what matters. When you get tense, you will almost certainly stare; approaching the ground, most students do get tense; that is largely why the landing is so difficult for most beginners.

Stick and Throttle. The so-called 'elevator' is really the airplane's speed control, the throttle is really its up-and-down control. This is hard to believe but is one of the keys to the art of piloting.



An ordinary stall occurs simply because the pilot forces the airplane as a whole to an excessive Angle of Attack. The pilot is trying to lift his airplane by pulling the stick back. He overdoes it, and thus he drops it.

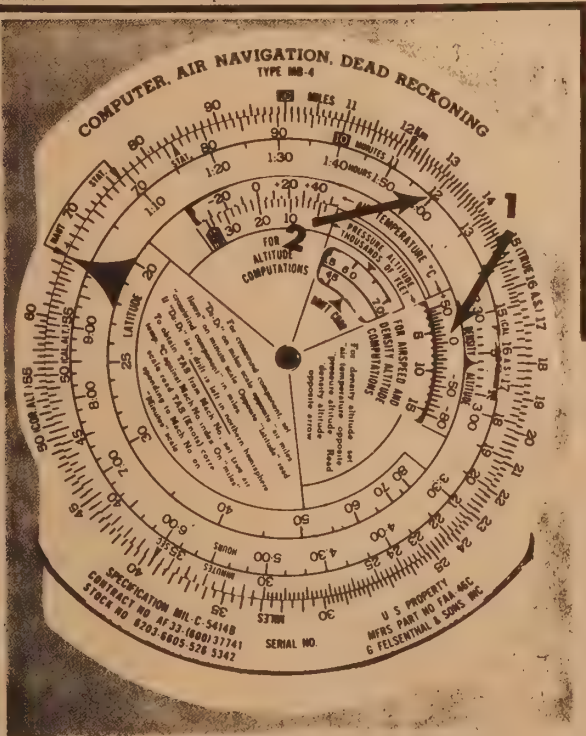


Figure 134. Finding true airspeed when temperature, altitude, and indicated airspeed are known.

Private Pilot's Handbook of Aeronautical Knowledge

FAA 1965; 174 pp. and sample map
\$2.75 from
U.S. Govt. Printing Office Bookstore
710 North Capitol Street
Washington, D. C. 20402
U.S. Govt. Printing Office Bookstore
Rm 1463 14th floor
Federal Office Building
219 S. Dearborn St.
Chicago, Illinois 60604
U.S. Govt. Printing Office Bookstore
Rm 135 Federal Building
601 East 12th St
Kansas City, Missouri 64106
U.S. Govt. Printing Office Bookstore
Federal Building
450 Golden Gate Avenue
Rm 1023 Box 36104
San Francisco, California 94102
or
WHOLE EARTH CATALOG

Private Pilot's Handbook

Here's a thorough, well-illustrated, up-to-date run-down on what stuff you need to know to fly an airplane in the U.S.: Principles of Flight; Weather; Navigation; Aircraft & Engine Operation; Flight Instruments; Aircraft Performance; Publications; Flight Computer; Radio Communications; Flight Planning. It's prepared by the Federal Aviation Agency, but it isn't heavy on you. Nice straight work.



Motor Trend Repair Manual

This manual is intended to be an introduction to automobile mechanics and the more fearsome professional shop manuals. It contains about all the amateur mechanic needs to know in order to diagnose, repair, and maintain domestic cars and VW 1954-1965. It is assumed that the mechanic has no experience at all. All major assemblies are well illustrated and explained both in principle and specifically, with note made of quirks found in certain models. There are chapters or remarks on tools needed and how to use them, working safely, junk yard technique, on-the-road repairs, and general money saving. There is a very good chapter on logical trouble shooting. 'If this is wrong, try this first, this second, etc.' Included is most likely diagnosis and prescription. Common repairs like 'putting in new points' are covered neatly. Major jobs are presented so that the amateur mechanic can get most of the work done before calling in expensive expert help. It is clearly stated when to give up, and what not to attempt without expertise. They even tell you how much you will save, and how long it will take. This is a great book for that person trying to keep the oldie going and/or who wants to understand cars in general. It fits girls too. Well worth the money. [Suggested and reviewed by J. Baldwin]



Motor Trend Basic Auto Repair Manual

1968; 384 pp.

\$3.95 postpaid

from Petersen Publishing Company
8490 Sunset Blvd.
Los Angeles, CA 90069

or WHOLE EARTH CATALOG

One tool maker alone lists 29 different types of pliers in his catalog, with sub-selections under certain categories. No mechanic has or needs all of them, and a few carefully selected pieces will cover many jobs satisfactorily.

A good pair of double-jointed, straight-jaw pliers are always handy and some long-nosed ones for reaching into hard-to-get-at places will find ready use on many jobs. Be sure to include a set of diagonal wire cutters as they are indispensable when doing electrical wiring or setting cotter keys. There are also special pliers for brake springs, hose clamps, retaining rings, and the small nuts on distributors and voltage regulators which can be purchased as needed. Two very handy tools are the Vise-Grip (an adjustable locking plier that stays on when locked and is capable of a very firm grip) and the parallel-jaw adjustable pliers with angled jaws that stay parallel in any degree of opening. This latter is often referred to as Channel-Lok or water pump pliers and is great for grabbing both round and square shapes firmly.

It's a good idea to use tune-up oil on every car to clean out deposits in the cylinders. The oil is poured into the carburetor air intake with the engine at a fast idle. If you can keep the engine running by opening the throttle wide but keep the rpm down to an idle by pouring the oil faster, you know the oil is doing its job properly.

After all the oil is poured in, the car should be driven with wide-open throttle under heavy load, such as climbing a steep hill at about 50 mph. If no hills are available, short acceleration bursts from about 30 mph up to 60 will do the job. This 'blowing out' is especially effective on a car that has been driven around town. Don't blow out the engine after the tune-up, do it before. New spark plugs can be fouled by this procedure so that they must be replaced.

All yard operators strip some fast-moving or valuable parts from a wreck and stock them for resale. Examples would be undamaged components from an air-conditioning system; batteries, tires and even engines and transmissions from late-model wrecks; and intact sheetmetal parts like hoods, trunk lids, bumpers and grilles. The biggest operators are tied together by a regional teletype system so that if one doesn't have the part, it can be determined in seconds whether anybody has it. In fact, if your needs are put on teletype and no one has the part, odds are that in a few days an accident will happen that will enable your order to be filled. A late model wreck, totalled from an insurance standpoint is by no means 'junk.' It will return at least \$500 if properly salvaged. Then, there are still countless rural yards that fill a cow pasture with derelict cars and let you prow around until you find the part you want. These are self-service stores in the true sense because you do your own dismantling, but it's a fascinating way to spend a Saturday afternoon.

The yards that cater to retail customers will generally be quite obvious because there will be a building to house the binned and inventoried small parts and outdoor display racks for the larger items. You must remember, though, that while the part may look serviceable, there is no guarantee that it is, because the yard operator, with the sometime exception of complete engines, doesn't check their function. Thus if, say, you wanted to replace a damaged radiator on your late model car, go search the yards for a low-mileage identical model that's been totalled from the rear. For older cars, the salvage radiator may be no better than the one you want to replace. The bigger yards know what they can get for an item so there is no sense in haggling. In the do-it-yourself lots, though, start the haggling with an offer.

CONDITION	RAPID WEAR AT SHOULDERS	RAPID WEAR AT CENTER	CRACKED TREADS	WEAR ON ONE SIDE	FEATHERED EDGE	BALD SPOTS
CAUSE	UNDER INFLATION	OVER INFLATION	UNDER INFLATION OR EXCESSIVE SPEED	EXCESSIVE CAMBER	INCORRECT TOE	WHEEL UNBALANCED
CORRECTION	ADJUST PRESSURE TO SPECIFICATIONS WHEN TIRES ARE COOL			ADJUST CAMBER TO SPECIFICATIONS	ADJUST FOR TOE-IN 1/8 INCH	DYNAMIC OR STATIC BALANCE WHEELS

TIRE CARE. The most important as well as the easiest single step in tire care is maintaining proper inflation. Pressures specified by Detroit in owner's manuals, ranging usually from 24 to 28 psi for normal driving, tend to favor comfort and quiet over tire life. A trained, conscientious tire salesman will more likely recommend 30 psi at all 4 wheels for maximum tire life.

Address requests for automotive catalogs to:

Sears Roebuck and Co.
Local catalog order center

Montgomery Ward and Co.
Local catalog order center

Spiegel Inc.
Chicago, Illinois 60609

J. C. Whitney & Co.
1917 Archer Ave.
Chicago, Illinois 60616

Honest Charley, Inc.
Honest St. at North Highway 11
Chattanooga, Tenn. 37421

CONTACT AREA CENTERED
CORRECT ALIGNMENT

CONTACT AREA NOT CENTERED
MISALIGNMENT OF CENTERS

CONTACT AREA NOT CENTERED
MISALIGNMENT OF POINT FACES

WINDOW "HEX" TYPE WRENCH

ADJUSTING SCREW

Volkswagen Technical Manual

There's unusual agreement among all the mechanics we've talked to that this is the best book on VW's. It's good prevention against getting burned by the Volkswagen agencies in Reno and Oklahoma City (name your favorite villain; those are mine) when a dismaying noise starts following you down the road and your trip shifts from 400 miles a day to nothing a week.

[Suggested by Don Burns]

Volkswagen Technical Manual

Henry Elfrink from Henry Elfrink Automotive
1964; 256 pp. P. O. Box 20715
Los Angeles, CA 90006

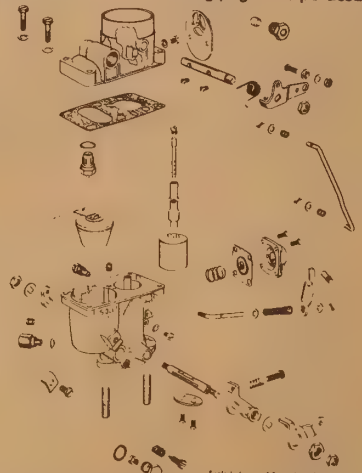
\$3.50 postpaid

VOLKSWAGEN TECHNICAL MANUAL

HENRY ELFRINK
ALL ABOUT THE VOLKSWAGEN

The VW company does not favor speed-tuning, or any other modification for that matter. Although we cannot honestly blame the company for holding this view, it has been our experience that a mild power boost is not harmful, providing the car is sensibly driven. The VW engine—especially the latest type—is very rugged, and it has a greater built-in reserve strength than the majority of small engines built today.

The VW has often been compared to that 'other universal car' of many years ago: the model T Ford of which more than 15 million were built. There is a germ of truth in this comparison; both cars were built for the masses by geniuses in their field, but whereas the old model T was basically a simple car which could be repaired, so to speak by anyone with a screw driver and a pair of pliers, the VW is a high precision piece of machinery. The VW, although simple in its basic conception, actually in many ways is a subtle mechanism, as will be readily apparent after the following pages are perused.



The methods employed to boost the power output of the VW engine follow the usual speed-tuning pattern: dual carburetors, supercharging, high compression cylinderheads, high-compression pistons, long-stroke crankshafts, special camshafts, extra large cylinders and the various possible combinations of these methods.

This book is written to clarify the most important repair and maintenance procedures for the VW automobile and to give the reader a guide as to what is required in the way of knowledge and tools, should he desire to do his own maintenance. Whether or not he should attempt it is a matter he should decide for himself.

The easiest way to remove the engine in the average workshop is to have the rear of the car (or the whole car) jacked up high enough to have the engine removed from underneath (about a yard above the floor). Removal is then possible after the connecting bolts and nuts and the various control cables and leads have been disconnected.

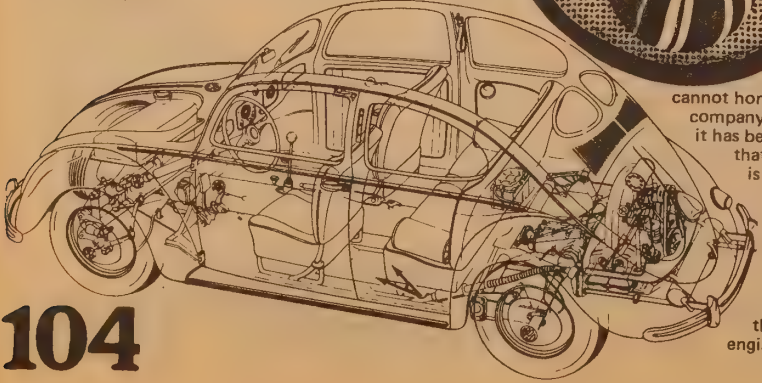
Disconnect the battery, close fuel tap, remove generator leads (51 and 61), coil lead, oil pressure warning light lead, carburetor throttle and choke control cables, heating control cables and flexible pipes. Disconnect fuel line, air cleaner, rear cover plate.

Removal is best accomplished by two men. Important is to have a good engine jack which will support the engine adequately and which can be wheeled back easily.

With the engine supported, loosen bottom holding nuts from the crankcase studs. The top nuts are fitted to bolts, and it is convenient to have an assistant hold them while the nuts are being undone (there are specially magnetic sockets available which will clamp on to the bolt head and wedge against the transmission case, so that the bolt will not rotate while nut is being undone).

Be careful not to let the engine tip as this may bend the transmission shaft or damage the clutch parts.

With the engine disconnected, roll it back until the transmission drive shaft is cleared. Lower engine and then tilt it a little so that it can be removed from under the car.

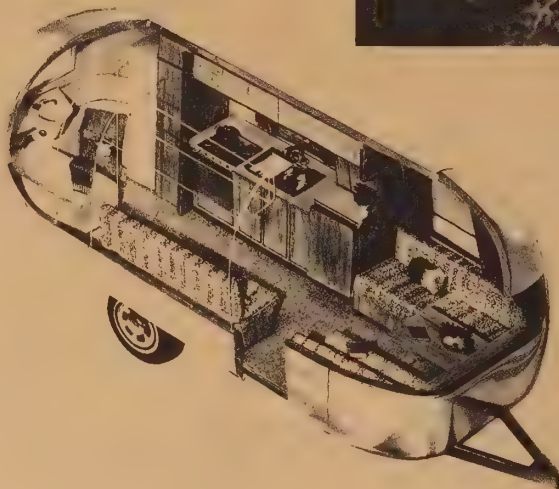


Airstream Travel Trailer

No argument; Airstream is the best travel trailer there is—lightest, most beautiful, best designed. It's built like an airplane—monocoque—the skin is the structure, and so it's free of corners inside and out. A pleasure to inhabit. However it's also more expensive than other trailers. If you buy in August, when the sales on this year's models start, you can save \$1,000 or so. Also used Airstreams are worth considering.

For nearest Airstream dealer consult

Airstream
107 Church Street
Jackson Center, Ohio 45334
15939 Piuma Avenue
Cerritos, CA 90701



Sample prices:

'69	23 ft.	\$6500
'68	24 ft.	\$4900
'63	19 ft.	\$2700
'63	16 ft.	\$2100

Monomatic Toilet

Every time you take a dump or a leak in a standard john, you flush five gallons of water out with your piddle. Five gallons in the Monomatic accomodates one hundred uses before it needs replacing. The cycling system, involving a chemical and filtration, was developed for the airlines and has spun off into general use for recreational vehicles such as campers, trailers, boats, etc. It might also be useful for water-short areas such as deserts, mountain tops, and New York.

Monomatic Toilet

\$195.00 approx.

from trailer supply dealers or write Monogram Industries, Inc. 10131 National Blvd. Los Angeles, CA 90034

The chemical costs \$4.75/box. The Monomatic runs on 12 volt current. I see where they have a box that disguises your toilet as a suitcase.



Hitch-hiking in Europe

This primer will prepare you for some of the vagaries of the road in Europe or elsewhere. There is nothing much in it that you wouldn't learn soon enough for yourself—its main point being that there is no substitute for the experience of hitch-hiking. But the book is useful for its good sense, humor, and perspective—written in classic hitching style—a taste of the road which may help you through a down and out scene or two. In addition there are numerous tips on getting to Europe and back, where to go, meeting people, sleeping arrangements, other means of transportation, etc.—all as related to the hitch-hiker.

[Reviewed by Joe Bonner.]

Hitch-hiking in Europe: an informal guidebook

Ed Buryn
1969; 72 pp.
\$1.75 postpaid

from Hannah Associates
P. O. Box 31123
San Francisco, CA 94131
or
WHOLE EARTH CATALOG

If you prefer fire to water, try Destroilet, which cooks the living shit out of you. No water. Requires gas and electricity. \$350. from Combustion Toilets, Walworth, Wisconsin 53184

Rooms can be had cheaply anywhere in Europe any time of the year. Get them simple, without bath, but with breakfast. One hears so much crap about the need for reservations. I suppose it's true for American-type tourists, but working-men's rooms, student's quarters, plain but clean hotels, and private homes are always available to you as a non-god-plated human being. The main railroad station of a large city usually has clean cheap rooms.

Another essential is a good map. See the appendix for some recommended ones. In Europe, you'll have to know what's along the route you're taking to your destination. To merely know your destination is not enough. You'll have to make quick decisions at times about alternate routes suddenly presented by a stopped—and waiting—motorist. Maybe some Welshman will offer you a ride to Pwllheli, but doesn't know himself if it's on the way to Amlwch, your destination.

APPENDIX

Recommended Guidebooks:

Let's Go, The Student Guide To Europe
Europe on \$5 a Day

Michelin Guides in general (especially good because they're written for motorists)

Recommended Maps:

Kummerly and Frey (Swiss mapmaker—available everywhere)

Other Material:

Youth Hostel Directory (obtain from IYH)

List of U. S. embassies

List of American Express offices

Phrase books, such as the Dover Publications

Pocket dictionaries



Who To Go With. If you're going to go with anyone at all, the answer is unquestionably—go with a girl. If you're a guy, she'll be your passport to lots of rides. Take good care of her. If you're a girl, you've got the whole gamut of choice: a guy or another girl. From the standpoint of rides alone, you'll be better off with the girl.

Whenever hitching is especially bad, try making it at gas stations, or anywhere else that personal contacts are possible—restaurants, truckstops, rest stations, picnic areas, campsites, etc.

Your special advantage is the experience of uncertainty, which you buy at a bargain rate. Uncertainty keeps you on the *qui vivre*, the best stance for seeing and learning. You don't know who you'll meet, what experiences you'll have, which places you'll see off the rut, what things you'll learn that aren't in the guidebooks (this one included). And despite the difficulties, getting started and keeping going is not that hard. Your troubles will usually offer you no alternative but to cope with them. And you do!

Nothing?

Learning

Dr. Spock

Baby and Child Care by Dr. Benjamin Spock is an excellent book to have handy, especially with a first child. The advice and explanations Dr. Spock gives regarding fever, rashes, coughs, inoculations and clothing for the infant is presented in simple language, somewhat wordy and repetitious, but in such a manner that you cannot misunderstand or confuse his instructions. Bathing an infant and sterilization of bottles, etc. seemed far too complicated. The chapters on illness, first aid, and special problems are excellent and probably the most read and re-read chapters in the book. Not only do you get lots of psychological guidance in the areas of toilet training, weaning, thumbsucking, and bed wetting but, as may be expected, there are sermons on aggressive children, no-war toys and growing up in a bomb-oriented world. You couldn't possibly agree with everything Dr. Spock says but after reading this book you are left with the feeling that you should relax, enjoy your baby, do what seems right and natural and that Spock is speaking from experience and common sense.

[Reviewed by Connie Duckworth]



Baby and Child Care

Dr. Benjamin Spock
1946, 1968; 620 pp.

\$1.05 postpaid

from
Pocket Books
1 West 39th Street
New York, N. Y. 10018
or
WHOLE EARTH CATALOG

More babies are overdressed than underdressed. This isn't good for them. If a person is always too warmly dressed, his body loses its ability to adjust to changes. He is more likely to become chilled. So in general, put on too little rather than too much and then watch the baby. Best guide is the color of his face. If he is getting cold, he loses the color from his cheeks.

To some degree, the first pregnancy spells the end of carefree youth—very important to Americans. The maidenly figure goes gradually into eclipse, and with it goes sprightly grace. Both eclipses are temporary but very real. The woman realizes that after the baby comes there will be distinct limitations of social life and other outside pleasures. No more hopping into the car on the spur of the moment, going anywhere the heart desires and coming home at any old hour. The same budget has to be spread thinner, and her husband's attention, all of which has gone to her at home, will soon be going to two.



Better to remove and distract him than just to say, "No, no!"

155. Gradual weaning from breast to cup in the middle of the first year. If a mother is producing plenty of milk, how long should she plan to nurse? Best of all, most natural of all, is to nurse until the baby is ready for weaning to the cup. Most breast-fed babies are becoming bored between 5 and 6 months.

It's a good idea to begin offering a sip of milk from the cup from the age of 5 months, so that the baby gets used to it before he is too opinionated.

Creative Playthings

While living in Sydney for a few years, the C.P. catalog was our reliable source of valuable toys, meaning toys with lasting interest or play value and which are sturdy enough to last two—maybe three childhoods. Our orders were filled with no delay and packed well, so they always arrived on time and in good shape. Some of the toys our mob likes best are a real stethoscope; an Eames-designed set of building cards; an African thumb piano; some rubber hand puppets, not the usual cast, but a whale, a crow, an alligator, and a frog; a rhythm band set—enough for the whole neighborhood, to name only a few of the indoor type. There are fair-weather toys for every child who likes to crawl, climb, hang, jump, slide, ride, rock or swing.

Baffled grandparents appreciate the C.P. catalog. So do kids who don't like to get clothes for Christmas.

[Reviewed by Gretchen Guard.]

(Husband's note: If you've got tools, you can make a lot of these toys, based on the pictures in the catalog—big simple stuff.)

C.P. catalogs are free at Creative Playthings stores or write
Creative Playthings
Princeton, N.J. 08540



Happy Baby Carrier

We first saw this baby carrier on a customer in our showroom; she was so enthusiastic about it that we tested it and found all her praise to be merited. It can be used for even the tiniest infant because it has a padded cushion to support his head. The soft, but sturdy, washable fabric holds the baby in the psychologically ideal position, snug and close to his mother, without physical strain to her. She can carry him in front to keep a watchful eye on him, or on her back while she does housework or shopping. 2 mos.-2 yrs.

NE083 (1 lb. 2 oz.) \$13.95

Perception TM Cylinders

When an infant is able to grasp with both hands, he can hold these fascinating new "look-watch" tubular toys. As he handles them, things happen within: in one, marbles roll around, drop down, make pleasing sounds; within another, steel mirrors shift position and, hence, reflections; in the third, tiny beads sift through a hole, disperse, and drop

through again when the toy is up-ended. Each is a clear plastic cylinder 2 3/4" x 3 1/2", with firmly glued maple end closures. 9 mos.-3 yrs.
MARBLE ROLL NB641 (6 oz.) \$2.50
MIRROR NB642 (4 oz.) \$2.50
HOUR GLASS NB643 (6 oz.) \$2.50
SET OF 3 NB644 (1 lb. 6 oz.) \$6.75



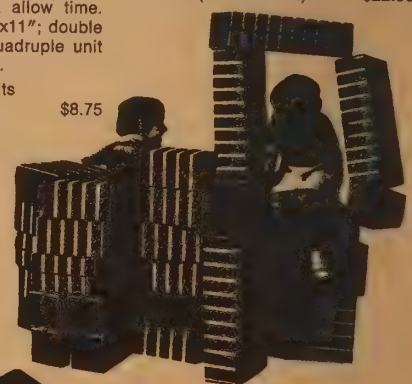
Play-Core TM Hollow Blocks

For those who find school hollow blocks too expensive for home use, we have reproduced them in heavy-duty corrugated board. These blocks have a strong inner core to support even an adult's weight. Shipped flat, easily assembled, but allow time. (Unit block, 5 1/2" x 5 1/2" x 11"; double unit, 5 1/2" x 11" x 11"; quadruple unit 5 1/2" x 11" x 22".) 2-8 yrs.

BEGINNER SET 20 units
NP494M (14 lbs.)

\$8.75

INTERMEDIATE SET 16 units, 12 double units.
NP500M (22 lbs. 6 oz.) \$14.50
HALF-SCHOOL SET 16 units, 16 double units, 8 quadruples. Express.
NP501E (38 lbs. 6 oz.) \$22.50



Sling Swing

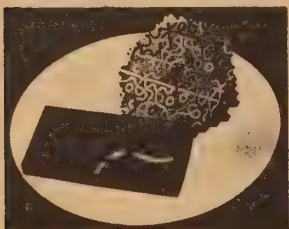
It's great fun to bounce up and down as well as swing back and forth on this new exerciser. Rubber belting, 5" wide, forms the safety seat. 28" double rubber suspension straps provide the action. Hung from a swing frame, tree, any beamed ceiling, or in doorway. 4-12 yrs.
NP510 (3 lbs. 10 oz.) \$11.50



Psyche-Paths TM

Developed by thinking men for puzzle people, and game people, and oriented to the psychedelic world of today, it's bewitching in its eye appeal, beguiling in its mind appeal. 85 six-sided pieces, with ribbons of color running through each, must be fitted side by side to form meandering paths. The goal is to form a large hexagon or truncated triangle. For 1-5 players. 10 yrs.-adult.

NR616 (12 oz.) \$4.00



Wood Recorder

A true musical instrument that all ages can master and enjoy. From West Germany, made of pear wood. Soprano, baroque fingering, 2 1/2 octaves, tone-perfect. 6 yrs.-adult.
NQ338 (12 oz.) \$4.95

Plastic Recorder

Soprano, key of C, two octaves, chromatic, baroque, 12 3/4"
NR310 (8 oz.) \$2.50



Visi-Tune TM Hurdy-Gurdy

Children can hear the music, as well as watch the playing mechanism, as they turn the crank forward or backward at any speed. Don't worry; the crank can't overwind! Beautiful wood, with plastic see-in top. 18-note Swiss unit plays "on the Bridge at Avignon," 3 1/2" x 5/8". 2-6 yrs.
NM924 (8 oz.) \$5.00

The Psychology of Children's Art

An elegant masterpiece on an inelegant subject, children's art. And they mean young children ages two through ten. Rhoda Kellogg, having analyzed some one million pieces of children's art, has categorized their early scribbling patterns into seventeen consistently recognizable stages and basic shapes. She has found, and you'll see this with her through a startlingly clear picture essay presentation, that children from every part of the world go through the same artistic maturational stages in terms of the identical shapes, designs and symbols that they use. "If children everywhere are so alike, then it may be possible to build upon man's common heritage rather than to founder upon his differences." *The Psychology of Children's Art* is a visual treat and an educational rarity—it would be a welcome gift to new parents, old parents and non-parents.

[Suggested and reviewed by
Carol Guyton Goodell.]



The Psychology of Children's Art

Rhoda Kellogg with Scott O'Dell
1967; 110 pp.

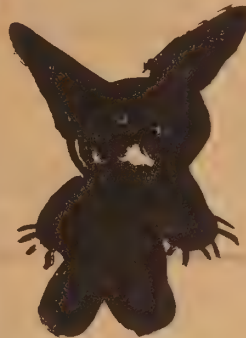
\$10.00 postpaid

from
Random House, Inc.
Westminster, Md. 21157
or
WHOLE EARTH CATALOG

The mandala, a simple crossed circle, has always been one of man's favorite compositions. This is the finger painting of a three-year-old.



In his early pictorial work, the child is just beginning to paint and draw animals. He also tries buildings, trees, flowers, boats, cars and airplanes. In child art, humans become animals when there are ears on top of the head instead of hats or hair.



The critical period in child art is between the ages of five and seven. The child who feels free to use the colors and basic shapes which please him will continue to flourish artistically when he moves into pictorial work.



Creative Drawing

Ernst Röttger has a fruitful technique for graphic exploration (or any other kind). He gives the students a medium—usually very simple—and some harsh constraints—usually very simple—and lets them find their own way out to fresh air. I suspect that this kind of medium exploration is better the more 'useless' it is. Good book.

[Suggested by Dr. Morton Grosser.]

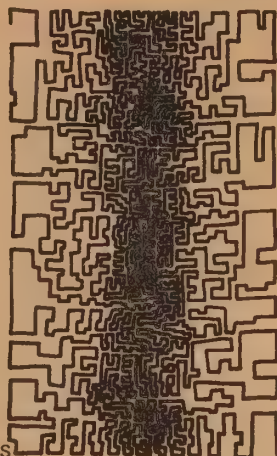
Creative Drawing

Ernst Röttger and Dieter Klante
1963; 143 pp.

\$5.95 postpaid

from
Van Nostrand Reinhold Co.
450 West 33 Street
New York, N. Y. 10001
or
WHOLE EARTH CATALOG

Van Nostrand-Reinhold also has Röttger books on Paper Design, Wood Design, Clay Design.



BLOWN LINES

A thick line drawn on the paper with India ink. By blowing sideways at the line the ink runs over the paper at random, producing bizarre patterns. What at first seems to be an aimless blue becomes quite controllable after a little practice. If a drinking straw is used for blowing, the stream of air is concentrated and easily aimed. Patterns can be influenced in many different ways—the distance of the straw from the paper, the angle at which it is held, blowing straight, crooked, evenly or in bursts or by moving the tube. The best way of exploring the possibilities is to begin by free experimentation, then the results achieved by chance should be brought under control and used consciously. The few illustrated examples show the enormous potential variety. Formal patterns of this kind have a unique character which is quite unattainable by drawing. If colour is also employed the number of possible combinations is greatly increased.



Creative Play Series



CREATIVE DRAWING



Point and Line

Röttger / Klante

Reinhold



Books on Education

John Holt has written books on education, so naturally he gets asked *What books on education do you recommend, Mr. Holt? And he says:*

EDUCATION

John Holt:
How Children Fail. Pitman, paperback, Dell.
How Children Learn. Pitman.
introduction to *Our Children Are Dying*.
Nat Hentoff, Viking.
introduction to pamphlet *Teaching the Unteachable*.
Herbert Kohl, *New York Review of Books*.
review of *Toward a Theory of Instruction*.
Jerome Bruner, *New York Review of Books*,
4/14/66.
review of *Village School Downtown* by Peter Schrag
and *Death at an Early Age* by Jonathon Kozol,
New York Review of Books, December 1967.
article, *Education and Peace*. Manas.
article, *The Dignity of Children*. Manas.
article, *How to Help Babies Learn-Without Teaching*
Them. *Redbook*.
article, *How Teachers Make Children Hate Reading*.
Redbook, Nov. 1967.
article, *The Fourth R - The Rat Race*. *New York*
Times Sunday Magazine, 5/16/67.
review, *Learning to Teach in Urban Schools*. Book
Week, *New York Herald Tribune*, 10/31/65.
chapter in *Social Policies for America in the Seventies:*
Nine Divergent Views, ed. Robert Theobald,
Doubleday.
letter, *Yale Alumni Magazine*, April 1968.
letter, *This Magazine Is About Schools*, Vol. 2, Issue
2, Spring 1968.

James Herndon, *The Way It Spoiled To Be*. Simon
and Schuster.
Herbert Kohl, *Teaching the Unteachable*, pamphlet
from *New York Review of Books*.
Virginia Axline, *Dibs: In Search of Self*, paperback,
Ballantine.
A.S. Neill:
Summerhill, Henry Hart, both hardcover and paper.
Talking of Summerhill. Victor Gollanez, London
(order from Blackwell's, Oxford, England)
Herbert Kohl, *Thirty-six Children*. New American
Library.
Nat Hentoff, *Our Children Are Dying*. Viking, both
hardcover and paper.
Jonathon Kozol, *Death at an Early Age*. Penguin
Paul Goodman:
Compulsory Miseducation. Vintage.
Growing Up Absurd (especially the first half). Vintage.
"Freedom and Learning: The Need for Choice." *Saturday*
Review, 5/18/68.
Edgar Friedenberg, *The Vanishing Adolescent*. Dell.
Growing Up in America. Dell.
Sybil Marshall, *An Experiment in Education*. Cambridge
University Press.
David Holbrook, *English for the Rejected*. Cambridge
University Press.
Sylvia Ashton Warner, *Spinster*. Simon and Schuster.
Teacher. Bantam.
James Agee, *Let Us Now Praise Famous Men*. Ballantine.
Julia Weber, *My Country School Diary*. Dell.
Thoughts on our Schools, The Children's Community.
Ann Arbor, Michigan Spring 1968.
Elwyn S. Richardson, *In The Early World*. New Zealand
Council for Educational Research.
Joseph Featherstone, "Revolution in the Primary Schools,"
New Republic, Aug. 10, Sept. 2, Sept. 9, 1967.
"A New Kind of Schooling," *New Republic*,
March 2, 1968.

Edward Yeomans, *Education for Initiative and
Responsibility*. National Assoc. of Ind. Schools.
George Leonard, *Education and Ecstasy*. Delacorte
J. H. van den Berg, *The Changing Nature of Man*.
Delta.
George Dennison:
The First St. School, issue No. 3 *New American*
Review, New American Library.
The First St. School, Radical Education Project,
Box 625, Ann Arbor, Michigan 48107.
The Lives of Children. Random House. 1969
Julia Gordon, *My Country School Diary*. Dell. 1961

HUMAN PSYCHOLOGY AND DEVELOPMENT

Abraham Maslow:
Motivation and Psychology. Harper & Row
Toward A Psychology of Being. Van Nostrand.
Erich Fromm:
Man For Himself. Avon.
The Art of Loving. Pocket Books.
Escape From Freedom. Avon.
Rollo May, *Man's Search For Himself*. New American
Library.
Carl Rogers, *On Becoming A Person*. Houghton-Mifflin.
Robert Rosenthal, *Pygmalion in the Classroom*. Holt,
Rinehart and Winston.
R. D. Laing, *The Politics of Experience*. Ballantine.
Barbara O'Laing, *Operators and Things*. Ace Books.
Haim Ginnott, *From Parent to Child*. MacMillan.
George von Hilsheimer, *Is There A Science of Behavior?*
Humanitas Curriculum, Orange City, Fla.
Hannah Green, *I Never Promised You A Rose Garden*.
Signet.

Push Back the Desks

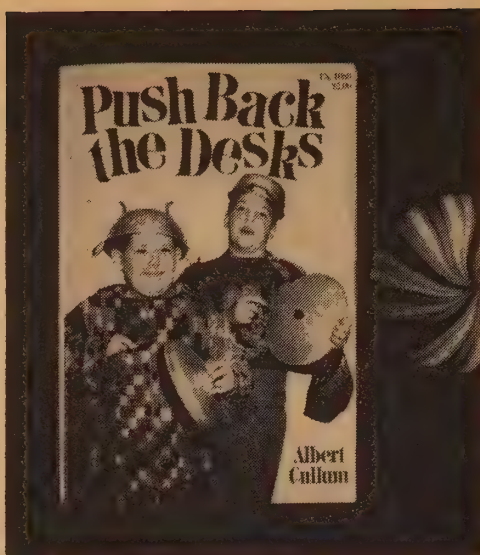
Every effective teacher has had projects and ideas which really turned kids on, but most of them don't take the time to write about just what it is that makes their classes remembered by former students as 'one of the best years ever.' Albert Cullum did, and his enthusiasm and involvement with his class of elementary kids over a twenty-year span spill over to the reader in a veritable flood of ideas, theories, and teacher war stories. He is explicit enough about his projects to make them instantly available to any admirer, but the major strength of the book is its ability to awaken a hundred or so related ideas in the teachers who read it. It is teachers like Mr. Cullum who epitomize the best aspects and possibilities of the self-contained classroom for elementary school children. [Suggested and reviewed by Carol Guyton Goodell.]

Push Back the Desks

from
Citadel Press
222 Park Avenue South
New York, N. Y. 10003
or
WHOLE EARTH CATALOG

Albert Cullum
1967; 223 pp.

\$2.00 postpaid



A sensitive teacher is always aware of the drama inherent in his class. Every class contains a cast ready to play their roles in every subject matter area, and the teacher, sensing the rhythm of his group, soon finds his role too. It is not necessary for the teacher always to play the lead; frequently he can do twice as well in a supporting role.

I have found that children are interested in two things—doing and doing now. Children are looking for the unexpected, not the safe; children are looking for noise and laughter, not quiet; children are looking for the heroic, not the common.

Shakespeare may be for scholars to debate and discuss and philosophize over, but he is also for Corky, a fifth-grader who died beautifully as Julius Caesar. There are 'murderers' galore in the elementary schools ready to help Macbeth kill Banquo; many a fifth- and sixth-grade girl can really whip up a moment of insanity as Ophelia.

How did we establish a feeling of New York City? We spread a large piece of brown wrapping paper on the floor, and almost everyone helped create the fabulous city of millions by drawing window after window.

Teacher

Teacher is as unphoney, warm, and appealing as the grubby, tear streaked face of a child; it is also an important technical notebook for educators. Miss Ashton-Warner's organic approach to reading and writing is a detailed enough account to be explored further by teachers anywhere. It is of especial value to teachers working with primary children. Students with a cultural or language barrier, and adult illiterates.

[Suggested and reviewed by
Carol Guyton Goodell.]

Organic reading is not new. The Egyptian hieroglyphics were one-word sentences. Helen Keller's first word, 'water,' was a one-word book. Tolstoy found his way to it in his peasant school, while, out in the field of UNESCO today, it is used automatically as the only reasonable way of introducing reading to primitive people: in a famine area the teachers wouldn't think of beginning with any words other than 'crop,' 'soil,' 'hunger,' 'manure,' and the like.

Backward readers have a private Key Vocabulary which once found launches them into reading.

The power content of a word can be determined better from a backward reader than from an average reader.

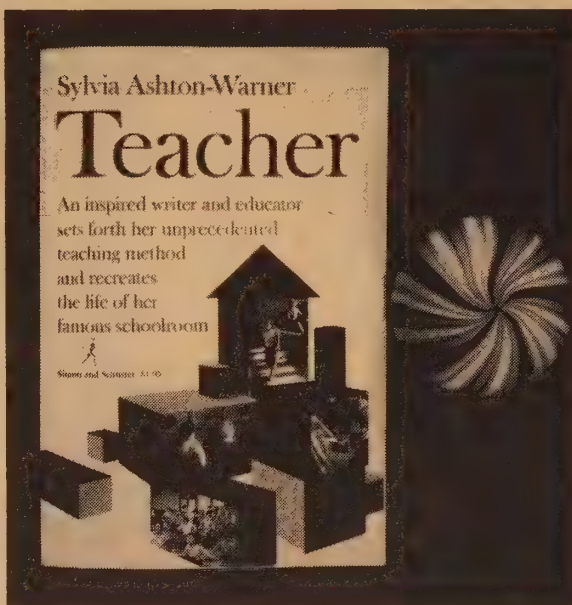
In the presentation of key words to five-year-olds, illustrations are to be shunned rather than coveted.

The length of a word has no relation to its power content.

Why is sorrow in such disgrace in infant-room reading fare? Where are the wonderful words 'kiss' and 'cry'? The exciting words 'ghost' and 'darling'? Everyday words in European homes as well as Maori ones.

In grown-up novels we enjoy the true conversational medium, yet five-year-olds for some inscrutable reason are met with the twisted idea behind 'Let us play.' As a matter of fact, Maoris seldom if ever use 'let' in that particular setting. They say 'We play, eh?'

But there are two kinds of order, and which is the one we wish for? Is it the conscious order that ends up as respectability? Or is it the unconscious order that looks like chaos on the top? There is a separate world on each side of this question mark.



Teacher

Sylvia Ashton-Warner
1963; 224 pp.

\$2.45 from
Simon & Schuster, Inc.
630 Fifth Avenue
New York, N. Y. 10020
or
WHOLE EARTH CATALOG

I went to the river and
I kissed Lily and I ran
away. Then I kissed
Phyllis. Then I ran away
and went for a swim.

Our baby is dead.
She was dead on
Monday night. When
mummie got it

Noise, noise, noise, yes. But if you don't like noise, don't be a teacher.

By organic I mean that way of growth where the strongest thing pushes up ahead of the less strong. I think of trees growing in a clump. The strongest get to the light. In speaking of a child's mind I mean the strongest impulses push up, irrespective of whether or not they should, at a given time. Making the behaviour of the children anything but an ordered one in the conscious meaning of the term order. I call it the abstract order because the pattern it makes is so mixed up, so unpredictable. That's how I come to relate the terms abstract and organic. They are associative. Natural includes them both.



We were going to put some Piaget stuff about here in the CATALOG, but it's hard to see where to begin with Piaget.

Any suggestions?

How Children Learn

This rambling series of innocent everyday happenings to a bevy of pre schoolers is described, digested, and given educational depth by an extremely observant and articulate educator, Mr. Holt. The great strength of his book is its readability. His use of preschooler learning situations is ingenious, since it is a common reference point to all teachers and parents. Anyone who doesn't see toddlers in a different light after reading this book probably ought to write a book himself.

[Reviewed by Carol Guyton Goodell.]

My aim in writing it is not primarily to persuade educators and psychologists to swap new doctrines for old, but to persuade them to look at children, patiently, repeatedly, respectfully, and to hold off making theories and judgments about them until they have in their minds what most of them do not now have—a reasonably accurate model of what children are like.

One of my earliest recollections—actually by now I remember the telling of it rather than the event itself—was of playing in the park with a friend my own age—about three, perhaps four—who out of a clear blue sky hit me in the head with his toy shovel. We had been playing peacefully; I never understood, then or later, why he hit me. Perhaps it was this same overpowering urge to see what would happen.

Bill Hull once said to me, 'If we taught children to speak, they'd never learn.' I thought at first he was joking.

When I was little, children's books contained mostly words and very few pictures. We knew that if we wanted to find out the story, we had to learn to read the words. Remembering this, I one day took into a classroom of three-year-olds a book with no pictures in it at all, sat down in a corner, and in a quiet voice began to read it aloud. After a while, some of the children began to notice, and listen. One by one, they came over to see what I was reading. When they looked in the book, and saw no pictures, they were at first surprised. Then, after more watching and listening, quite a number of them would point to a word on the page and ask, 'What does that say?' I would tell them. None of them stayed for long—it wasn't a very interesting book. But they all grasped the vital idea, new to many of them, that in some way those black marks on the page said something.

Teaching As a Subversive Activity

You may have noticed that schools are society's goat just now, and the blame machine revs on and on. The authors of this handy de-crisis book take a nice clean no-blame revolutionary approach to things: what works this minute and doesn't work this minute. In their experience (high-school), instruction in authoritative subject matter doesn't work very well. What does work is an experience-based inquiry approach to learning to learn and learning to selectively un-learn: i.e. basic survival strategy in an environment of change. What's nice is they aren't just threatening: they have gathered and published a strong collection of technique.

Teaching As a Subversive Activity

Neil Postman and Charles Weingartner
1969; 219 pp.

\$5.95 postpaid

from
Delacorte Press
750 Third Avenue
New York, N. Y. 10017
or
WHOLE EARTH CATALOG

What we confront, at this juncture, is a most difficult problem in education: helping students to unlearn much of what they 'know.' Josh Billings said it almost a century ago: 'The trouble ain't that people are ignorant; it's that they 'know' so much that ain't so.' What are some of the things these students know that 'ain't so?' Well, for example, they 'know' that 1) the more 'content' a person 'knows,' the better teacher he is; 2) that 'content' is best 'imparted' via a 'course of study'; 3) that 'content' is best kept 'pure' by departmentalizing instruction; 4) that 'content' or 'subject matter' has a 'logical structure' or 'logical sequence' that dictates how the 'content' should be 'imparted'; 5) that bigger schools are better than smaller schools; 6) that smaller classes are better than bigger classes; 7) that 'homogeneous grouping' (with students 'grouped' on the basis of some real or fancied similarity) makes the learning of subjects more efficient; 8) that classes must be held for 'periods' of about an hour in length, five days a week, for about 15 weeks in order for a 'course' in a 'subject' to happen.

It comes as a shock to the students that there is no evidence to support any of these contentions. On the contrary, there is massive evidence to confute them. It takes some doing, however, to help students to recognize the fact that most of their deeply internalized assumptions about 'education' are based on misinformation rather than information.

Thus, a literal translation of the statement of Bruner's we quoted a moment ago would be something like this: 'The task of teaching a subject to a child is to make the child perceive objects and relationships the way authorities perceive them.' This sounds more like the old education than a new one, especially because it directs the child to see only what some previous perceivers have seen. We have already referred to the 'discovering your pendulum' application of Bruner's work. The children are taught to 'see' exactly what the teacher wants them to see because that is the nature of the 'subject.' Another name for this is the Seductive Method of Learning. The purpose of this method is identical with that of the old education: to get the learner to 'ventriloquize.'

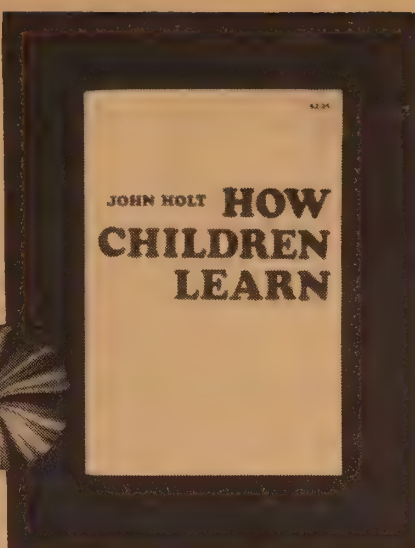
The instructor brought to class a black attaché case. He told the students that inside the case there was a small computer which was capable of producing the answer to any question anyone asked. 'What questions,' he asked, 'do you want it to answer?'

How Children Learn

John Holt
1967; 192 pp.

\$2.25 postpaid

from
Pitman Publishing Corp.
20 East 46 Street
New York, N. Y. 10017
or
WHOLE EARTH
CATALOG



Year after year we would see the same thing happen. Here would be a boy in the third or fourth grade who seemed so hopelessly clumsy, unathletic, and ignorant of all the rules and skills of baseball that it looked as if he could never learn to play. Two years later that same boy would be a competent and often an expert player—and many of them did almost all their playing at school. They learned, as I say, by watching the older boys who did it best, and trying to do what they did.

As a matter of fact, they learned, on the whole, much better than the boys at another school, at which I taught, where there was far more play space, more time given to sports, and where teachers tried to teach softball. The boys in this school spent a good deal of their sports time standing around watching while someone 'explained' something to them.

Here is a copy of a letter, written by the mother of a boy who is at one of the schools in which children are not required to attend classes, but learn when, and what they like, with whatever help from the older people around them they may choose to ask for. The boy, who had been having great difficulty in his conventional school and had not learned to read, went to this school when he was seven. Two years later his mother wrote:

... (he) has not, until the last month or so, attended a single class... yet in taking the Standard Achievement and I.Q. tests we find he is reading into the tenth grade, doing math into the ninth grade, working with electronics and in several other areas that are not offered in public schools, even to the high school student...

The electronics suggests how this seeming miracle was accomplished. There are no electronics manuals, texts, and instruction books written for young children. To use them, you must be able to read words like 'resistor,' 'capacitor,' 'potentiometer,' and the like. No doubt this boy had to have help at first; but in learning to read the basic terms of electronics he undoubtedly got enough information about letters and sounds to enable him to read any words he met. To work in electronics, you must also know arithmetic, up through the decimals, so he had to learn that, too, along with a good deal about electricity and electric circuits.

When, through such play and fantasy, the children had taken these materials into their minds, mentally swallowed and digested them, so to speak, they were then ready and willing to play very complicated games, that in the more organized and businesslike situation had left other children completely baffled. This proved to be so consistently true that the experimenters made it a rule always to let children have a period of completely free play with the materials, before asking them to do directed work with them.

1. What do you hear if you are in a car and it is raining outside?
2. What do you feel if you are standing outside?
2. Describe the odor of gasoline.
3. What sounds do you hear if you are walking with heavy boots in a deep snow? (Don't use the word 'crunch'.)
4. What does hair feel like? Anybody's hair.
5. Describe the texture of skin. Feel it.
6. How would you describe fear? If you've never been afraid, don't answer. If you have, you don't have to answer either, unless you want to.
7. Describe the odor of freshly cut grass.
8. Describe the sensation of placing an ice cube against your lips.
9. Is there a particular odor in the air before a rainfall? Describe it.
10. Is there a particular odor in the air after a rainfall? Describe it.
11. If your hand slides across a piece of silk, what sensation do you feel?
12. If you were to walk barefoot along a beach of pebbles, what would you feel?
13. What does your hand feel like?
14. What does someone else's hand feel like?
15. Describe the taste of salt.
16. Describe the flight of a seagull.

When the answers had been written, the instructor asked for volunteers to share them, and selected one girl. She went to the board and wrote her responses. She was asked to write them without identifying numbers, so that it would look as if they were all of a piece, not 16 different reactions. What she wrote is reproduced, unedited, below.

Soft rhythms on tin
Torrents of miniwetness
Odor spray
Spreading, pushing, never toe touching ground
Twisting strands—sometimes silky flowing, oil
Smooth body, surface
Filled with dread anticipation
Moist flower fragrance
A burning cold
Wet heat, when first to breathe is dying
In fresh clearance objects sparkle and air is pure
A finely never broken woven texture
Sharp, bumpy pains against the pad of feet
Dry dampness underneath
Bare-top dry
Blue crystals on tongue
All perfection, soaring through air with wings
Outstretched, silhouetted against the cloud.

As the student wrote her reactions on the board, the instructor asked several students in their seats to read aloud their responses, as if they were part of a whole, and not fragments. After several were read aloud, the instructor turned the attention of the class to the responses on the board. He read the responses aloud.

INSTRUCTOR: What does that sound like?
FIRST STUDENT: Some kind of poetry.
SECOND STUDENT: Free verse.
INSTRUCTOR: How can that be?

[No response.]

Why should a group of reactions sound like poetry?
THIRD STUDENT: Because the same person wrote them.
INSTRUCTOR: But what makes it hang together?

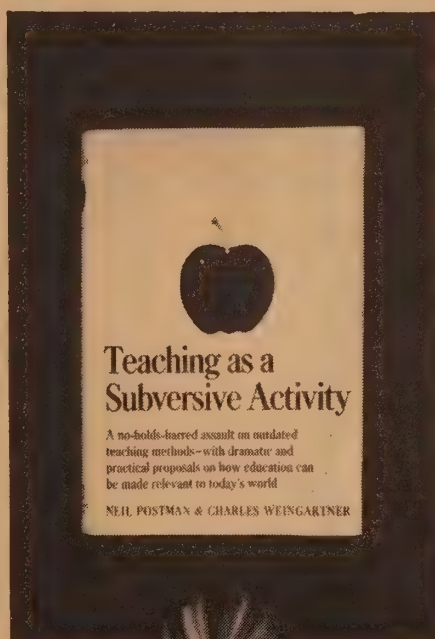
[No response.]

It does hang together, doesn't it?

The students were soon saying that people write out of a well-integrated web of experiences and, no matter what they write, regardless of the descriptions, their phrases would seem to go together because 'a person is together.' They went on to formulate tentative hypotheses about personality integration, prose, poetry, how one writes, how one reads, and the difficulty a person who is 'not together' would have with reading and writing. When asked if they had liked what they had written, the students answered with a unanimous 'Yes.' When asked if they would like to write a poem, they answered with a unanimous 'No.'

INSTRUCTOR: But you enjoyed the writing in class.
FIRST STUDENT: You didn't say it was a poem.
SECOND STUDENT: You tricked us.
INSTRUCTOR: May I trick you some more?

[Laughter.]



The new education, in sum, is new because it consists of having students use the concepts most appropriate to the world in which we all must live. All of these concepts constitute the dynamics of the questing-questioning, meaning-making process that can be called 'learning how to learn.' This comprises a posture of stability from which to deal fruitfully with change. The purpose is to help all students develop built-in, shockproof crap detectors as basic equipment in their survival kits.

The teacher rarely tells students what he thinks they ought to know.

His basic mode of discourse with students is questioning.

Generally, he does not accept a single statement as an answer to a question.

He encourages student-student interaction as opposed to student-teacher interaction. And generally he avoids acting as a mediator or judge of the quality of ideas expressed.

He rarely summarizes the positions taken by students on the learnings that occur.

His lessons develop from the responses of students and not from a previously determined 'logical' structure.

Generally, each of his lessons poses a problem for students.

He measures his success in terms of behavioral changes in students.

Perhaps you have noticed that most examinations and, indeed, syllabi and curricula deal almost exclusively with the past. The future hardly exists in school. Can you remember ever asking or being asked in school a question like 'If such and such occurs, what do you think will happen??' A question of this type is usually not regarded as 'serious' and would rarely play a central role in any 'serious' examination. When a future-oriented question is introduced in school, its purpose is usually to 'motivate' or to find out how 'creative' the students can be. But the point is that the world we live in is changing so rapidly that a future-orientation is essential for everybody. Its development in schools is our best insurance against a generation of 'future shock' sufferers.

Programmed Reading

If you have a pre-school or kindergarten age child who you feel is ready to learn to read but you don't know how to start, this series of programs may be your answer. The series of twenty-two books begins with a set of eight sound-symbol cards. Each 8 x 10" card has a picture and the sound (letter) it stands for.

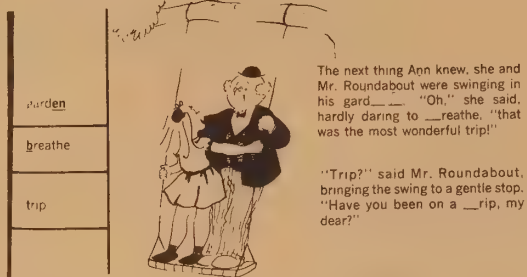
When the child has learned all eight sounds without the help of the pictures, he is ready to begin the primer, which uses only the eight familiar sounds plus 'I', 'yes', and 'no'. Learning the sounds and getting into the primer may take a long time and plenty of help from you, depending on the age of the child and how much he can absorb in one sitting. Our children started short sessions before age four and it was several months before they reached the self-teaching level, about half-way through the primer. After that they were on their own, going through each book at their own rate and becoming fairly good readers by the time they started kindergarten.

The material in every book is presented in a highly entertaining way; drawings by Carol Andrews are funny and colorful so that learning to read never becomes a drag.

The main characters throughout the series are Sam, Ann, their little brother Walter, Nip the dog and Tab the cat. The beginning books are about their daily adventures and how they get into and out of trouble. In the more advanced books, when the mob is looking for adventure they visit the Roundabouts who live in a land where anything can happen. The last three books, also in the form of self-teaching programs, are stories from Greek mythology meaningfully written for seven and eight year olds.

Cynthia Buchanan has also written a three-part series, *Programmed Geography* (Macmillan) including *The Earth in Space, Continents & Oceans, Latitudes and Climates*. Our children were able to do this series successfully at eight years or so. Another excellent program by the Sullivan Associates is *Programmed Astronomy* (2 books).

[Suggested and reviewed by Gretchen Guard.]



Programmed Reading

Cynthia D. Buchanan
Sullivan Associates.

Programmed reading: The pre-reading series. 3 bks. bk. 1, Programmed pre-reader. 1966. \$1.80; 2nd ed. 1968. \$0.92; bk. 2, Programmed pre-reading. 1963. \$2.40; bk. 3, Programmed primer, \$1.32; readiness test, \$2.80; teacher's alphabet cards, \$3.60; student's alphabet cards, \$1.84; sound-symbol cards, \$1.92; teacher's guide to Pre-reader, stage 2, 1968, \$2.72; teacher's guide to Reading readiness, stage 1, 1968. \$2.00.

Programmed reading. 2 series. 1963. series 1. 2 vols. vol. 1, Programmed pre-reading, \$1.48; vol. 2, Programmed primer, \$1.24; reading readiness test, \$2.40 per pkg. of 10; series 2, Programmed reading, bk. 1, \$1.32; teacher's guide, \$0.72.

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Programmed reading classroom starter set. 1967. \$360.00.

from McGraw-Hill Book Co. Princeton Road Hightstown, N. J. 08520
Manchester Road Manchester, MO 63062
8171 Redwood Highway Novato, CA 94947

Thinking Straighter

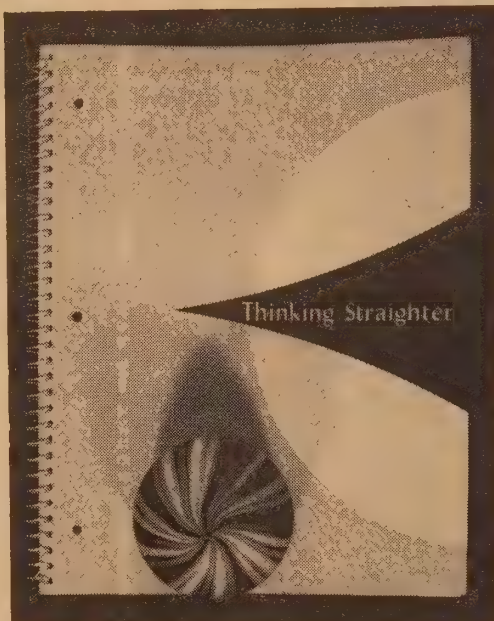
In an era when information is going to have to replace laws, it's increasingly important to be familiar with the anatomy of bullshit (manipulation by language). Everybody does it, and that's cool; it's just when you don't know it's happening that it gets hazardous. This book does vivid, organized analysis of ads, political statements, and other bubbles of our day. How to build your own shock-proof crap detector.

Thinking Straighter

George Henry Moulds
1965; 234 pp.

\$4.75 postpaid

from Wm. C. Brown Book Co. 135 South Locust St. Dubuque, Iowa 52003 or WHOLE EARTH CATALOG



Media & Methods

A slick education magazine with some of the flavor of *Psychology Today* and some of the tone of *THIS Magazine is about Schools*. Trying to run a soft magazine in the hard-sell education-media market looks difficult.

school SCHOOL school SCHOOL school SCHOOL school SCHOOL
FAKE fake FAKE fake FAKE fake HI 'hi HI hi HI hi HI hi
CRACKED cracked CRACKED cracked SMILE smile SMILE smile
cold COLD cold COLD cold BARE bare BARE bare BARE bare
HALLWAYS corridors HALLWAYS corridors HALLWAYS corridors
assignments ASSIGNMENTS assignments ASSIGNMENTS assignments
SILENCE silence SILENCE silence SILENCE silence SILENCE
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dumb dumb stupid stupid stupid dumb stupid stupid
EMBARRASS EMBARRASSEMBARRASSEMBARRASS EMBARRASS
—Valerie Thibaudreau (St. Mary's Academy, Milwaukee, Wisconsin)

QUOTATION OUT OF CONTEXT

Meaning: Quotation out of context is a fallacy when the effect of quoting a given statement without its context is to distort the original meaning in context.

Example: Someone quotes the Bible as saying that "money is the root of all evil" but leaves out the preceding words, "the love of."

REPETITION

Meaning: We buy or believe because we have heard or seen the idea or the product name so often.

Example: Radio commercial: "Get up with GET-UP. GET-UP's got get up. Got it? Get it! Get GET-UP!!"

ATTACKING A STRAW MAN

Meaning: Your opponent either (1) restates your position falsely or (2) exaggerates the consequences that may follow from your position.

Example: (1) Smith: "I am opposed to capital punishment."
Jones: "I'm not."
Smith: "You ought to be; capital punishment is unchristian."
Jones: "I'm getting tired of people like you who oppose punishing criminals."
(2) Smith: "I am opposed to capital punishment."
Jones: "You fellows that are against capital punishment must want your daughters molested every time they leave the house."

DRAWING THE LINE

Meaning: Sharp distinctions are drawn where no sharp distinction exists.

Example: "Either you tell the truth or you lie."

The motive is the reason behind the argument; the intent is the reason ahead of the argument.

My English teacher gave me a F on my paper for Media and Methods. Without all the extra junk, I just said mainly two things. Mans selfishness shines in his decisions. The world is not worth saving. I proved it to myself on the original paper and feel that the teachers judgement should not be final.

Dave Antonelli

The feeling of contempt so many college professors feel toward high school teachers and high school teachers in turn feel toward elementary teachers is shot through with irony. What has been consistently borne out in my experience is that the best teaching takes place at the elementary level (especially nursery school through 3rd grade). The best environments for learning are reflected in these 'elementary' situations, the most natural employment of media are demonstrated, and the most humane relationship between adult and child exist.

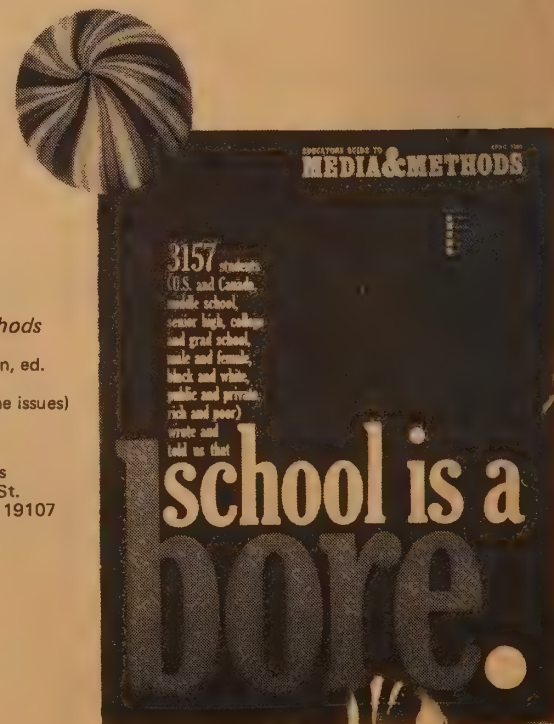
Media and Methods

Frank McLaughlin, ed.

\$5.00/ yr. (nine issues)
\$6.00 in Canada

from Media & Methods 134 North 13th St. Philadelphia, PA 19107

An ornate ring of diamonds. The large central stone emits great quantities of green, violet, or rose-colored fire which inundates the whole scene with a strange glow, complex in color, the product of the fusion of multiple fires. One of the diamonds opens revealing within it a little angel. The angel leaps from the ring, picks it up and carries it away.



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- 602. Marshall D. Sahlins **THE ORIGIN OF SOCIETY**
- 612. Walsh McDermott **AIR POLLUTION AND PUBLIC HEALTH**
- 618. A. J. Haagen-Smit **THE CONTROL OF AIR POLLUTION**
- 619. William L. Langer **THE BLACK DEATH**
- 621. Bernard Berelson & Ronald Freedman **A STUDY IN FERTILITY CONTROL**
- 623. Herbert H. Hyman & Paul B. Sheatsley **ATTITUDES TOWARD DESEGREGATION**
- 625. Richard S. MacNeish **THE ORIGINS OF NEW WORLD CIVILIZATION**
- 1106. Anthony C. Allison **SICKLE CELLS AND EVOLUTION**
- 1070. John Napier **THE ANTIQUITY OF HUMAN WALKING**
- 1071. Harald Esch **THE EVOLUTION OF BEE LANGUAGE**
- 1075. Ruth Hubbard & Allen Kropf **MOLECULAR ISOMERS IN VISION**
- 46. George Wald **EYE AND CAMERA**
- 81. William H. Stein & Stanford Moore **CHROMATOGRAPHY**
- 82. George W. Gray **THE ULTRACENTRIFUGE**
- 83. George W. Gray **ELECTROPHORESIS**
- 84. Curtis A. Williams, Jr. **IMMUNOELECTROPHORESIS**
- 125. Mary A. B. Brazier **THE ANALYSIS OF BRAIN WAVES**
- 601. Sherwood L. Washburn **TOOLS AND HUMAN EVOLUTION**
It is now clear that tools antedate man, and that their use by prehuman primates gave rise to *Homo sapiens*.
September 1960
- 515. Laurence Jay Stettner & Kenneth A. Matyniak **THE BRAIN OF BIRDS**
Since birds have a smaller cerebral cortex than mammals, are they less intelligent than mammals? Recent work suggests that they may simply use other parts of the brain to effect intelligent behavior.
June 1968

THE HUMAN SPECIES

- 601. Sherwood L. Washburn **TOOLS AND HUMAN EVOLUTION**
- 602. Marshall D. Sahlins **THE ORIGIN OF SOCIETY**
- 603. Charles F. Hockett **THE ORIGIN OF SPEECH**
- 604. William W. Howells **THE DISTRIBUTION OF MAN**
- 605. Robert J. Braidwood **THE AGRICULTURAL REVOLUTION**
- 606. Robert M. Adams **THE ORIGIN OF CITIES**
- 607. Herbert Butterfield **THE SCIENTIFIC REVOLUTION**
- 608. Edward S. Deevey, Jr. **THE HUMAN POPULATION**
- 609. Theodosius Dobzhansky **THE PRESENT EVOLUTION OF MAN**
- 1125. Kjell Johansen **AIR-BREATHING FISHES**
Lack of oxygen in water forced certain Devonian fishes to develop air-breathing organs. Some left the water and colonized the land; descendants of others are today's remarkable air-breathing species.
October 1968

- 1120. George A. Bartholomew & Jack W. Hudson **DESERT GROUND SQUIRRELS**
Two little animals of the Mohave Desert have evolved remarkable adaptations to heat and aridity. Each has adapted in its own way, which apparently enables them to live together without competing.
November 1961
- 1121. Donald R. Griffin **MORE ABOUT BAT "RADAR"**
A sequel to an earlier article which described the capacity of bats to locate objects by supersonic echoes. This natural sonar is now known to incorporate extraordinary refinements.
July 1958
- 1122. Sir Solly Zuckerman **HORMONES**
These potent biological substances are called the chemical messengers of the body. They may also be viewed as members of a larger system which integrates the phenomena of life.
March 1957
- 1123. Johannes A. Kylstra **EXPERIMENTS IN WATER-BREATHING**
If the lung of an air-breathing animal (including man) is filled with the appropriate solution, the animal can obtain the oxygen necessary to sustain life. The procedure holds promise for medicine and diving.
August 1968
- 1124. Arthur Kornberg **THE SYNTHESIS OF DNA**
Test-tube synthesis of the double helix that controls heredity climaxes a half-century of effort by biochemists to re-create biologically active giant molecules outside the living cell.
October 1968

Krazy Leg

Watching the magnetic pendulum swing this way and that over the target of other magnets I kept thinking of Hero's steam engine - just a toy. This toy, like Hero's, lets you play with an invisible dynamic and get used to invisibility and dynamics and how just a little shift here makes a big change there.

[Suggested by Jeff Wilson.]

Krazy Leg

\$10.00 postpaid

from
Rathon, Inc.
2931 Irving Blvd., Suite 103
Dallas, Texas 75247
or
WHOLE EARTH CATALOG



Soothe your nerves and while away the time watching this seemingly intelligent swinger trying to find a stable field.

Index to 16 mm Educational Films

For those who want to know what the whole situation is this index compiled by the National Information Center for Educational Media (NICEM) contains ca. 26,000 titles. These are recent films from the lists of the Library of Congress and film distributors.

[Suggested and Reviewed by Chip Chappell]

Index to 16 mm Educational Films

2nd edition, May 1969

ca. \$50.00 postpaid

from
McGraw Hill, or at Libraries, film distributors

On February 2, 1967, the University of Southern California and the McGraw-Hill Book Company announced the establishment of a National Information Center for Educational Materials (NICEM). The purpose of the center is to catalog and store in computerized form current and comprehensive data on all types of non-book educational media - motion pictures, filmstrips, recordings, transparencies, and similar materials. The non-book media bank will be useful for a wide variety of educational services and organizations, including schools, libraries, training programs, and the like. The first of a number of volumes to be published by McGraw-Hill on materials now in this master file is this Index to 16mm Educational Films.

Encyclopedias

A page from *General Encyclopedias in Print 1968*; S. Padraig Walsh; 112 pp.; \$3.00 postpaid from R.R. Bowker Company, 1180 Avenue of the Americas, New York, N.Y. 10036.

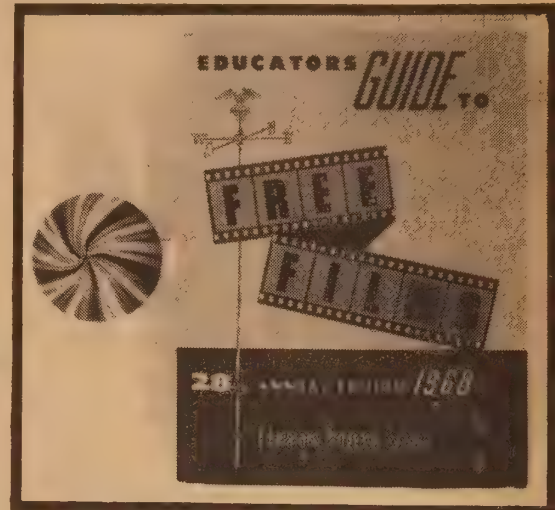
Listed below are 22 general encyclopedias in print (and one as yet unpublished and unrated title), which comply, in varying degrees, with the criteria for reference books established by professional librarians and educators. With some exceptions, these sets are currently approved by the Subscription Books Committee of the American Library Association, are listed as desirable purchases in the H. W. Wilson catalogs, and appear on the approved lists issued by several state and local education authorities. Each encyclopedia has been allocated a number rating according to (a) its frequency of inclusion in standard reference book selection guides and bibliographies, (b) where too new to be included in such guides, its compliance with accepted evaluative criteria, and (c) its cost in comparison with other similar and equally rated works. Where two or more sets have been equally rated, they are listed by order of cost within their ratings.

NUMBER RATING	TITLE	LOWEST PRICE	SUGGESTED AGE SUITABILITY	VOLUMES	PAGES	WORDS (MILLIONS)	ILLUSTRATIONS	COST PER MILLION WORDS	COST PER 1,000 ILLUSTRATIONS	COMB. TOTAL COSTS
MULTI-VOLUME GENERAL ENCYCLOPEDIAS										
15	WORLD BOOK ENCYCLOPEDIA (p. 19)	\$179.80	9-Pop. Adult	20	12,100	8.5	25,000	\$21.14	\$ 7.19	\$28.33
15	ENCYCLOPEDIA INTERNATIONAL (p. 22)	199.50	10-Gen. Adult	20	11,908	9.5	19,000	21.00	10.84	31.84
15	NEW BOOK OF KNOWLEDGE (p. 24)	199.50	7-14	20	9,442	6.3	22,400	31.66	8.90	40.56
15	MERIT STUDENT'S ENCYCLOPEDIA (p. 27)	289.50	9-17	20	12,144	9	15,000	32.16	19.30	51.46
15	COLLIER'S ENCYCLOPEDIA (p. 29)	329.50	12-Adv. Adult	24	18,920	21	17,000	15.67	19.38	35.05
15	ENCYCLOPEDIA AMERICANA (p. 32)	375.00	12-Adv. Adult	30	27,750	31	18,100	12.10	20.83	32.93
15	ENCYCLOPEDIA BRITANNICA (p. 35)	459.00	15-Adv. Adult	24	28,264	36.5	22,702	13.56	20.21	33.77
12	GROLIER UNIVERSAL ENCYCLOPEDIA (p. 38)	99.50	10-Gen. Adult	20	6,342	5	12,000	19.90	8.27	28.17
12	COMPTON'S ENCYCLOPEDIA (p. 40)	136.85	9-17	24	10,116	8	22,544	17.10	6.07	23.17
12	NEW CATHOLIC ENCYCLOPEDIA (p. 43)	550.00	15-Adv. Adult	15	16,522	15	7,500	36.66	73.33	109.99
10	BRITANNICA JUNIOR ENCYCLOPAEDIA (p. 45)	149.90	8-14	15	7,878	5.3	11,227	29.00	13.35	42.35
10	CHAMBERS'S ENCYCLOPAEDIA (p. 48)	259.00	15-Adv. Adult	15	14,500	14.5	4,000	17.86	64.75	82.61
10	AMERICAN PEOPLES ENCYCLOPEDIA (p. 51)	259.50	10-Gen. Adult	20	11,068	10	15,654	25.95	16.57	42.52
8	NEW STANDARD ENCYCLOPEDIA (p. 53)	119.50	10-Gen. Adult	14	9,038	6	12,000	19.91	9.95	29.86
8	OUR WONDERFUL WORLD (p. 55)	189.50	9-17	18	8,500	5.5	15,745	34.45	12.04	46.49
6	AMERICAN EDUCATOR ENCYCLOPEDIA (p. 61)	129.50	9-17	14	7,400	5	11,774	25.90	10.99	36.89
6	CATHOLIC ENCYCLOPEDIA FOR SCHOOL AND HOME (p. 64)	184.50	10-Gen. Adult	12	8,473	5	6,500	36.90	28.38	65.28
4	NEW CAXTON ENCYCLOPEDIA (p. 66)	259.00	12-Gen. Adult	20	6,720	6	20,000	43.16	12.95	56.11
2	FUNK & WAGNALLS STANDARD REFERENCE ENCYCLOPEDIA (p. 69)	37.25	15-Gen. Adult	25	9,660	7	5,000	5.32	7.45	12.77
2	ILLUSTRATED WORLD ENCYCLOPEDIA (p. 71)	39.95	8-14	21	7,000	4.5	15,000	8.87	2.66	11.53

Educator's Guide to Free Films

This is an invaluable reference if you are interested in film education. The book has indices of contents, film listings, cross-index; titles, subject, and source and availability. The source and availability index saves hours of time, although it does not indicate whether or not you need a special order form. It also indicates whether you pay mailing cost one-way or two-way. Every school or proto-school should have a copy.

[Suggested and Reviewed by Chip Chappell]



Educator's Guide to Free Films

1968; 784 pp; 4943 films
\$10.75 postpaid
from
Educators Progress Service
Randolph, Wisconsin 53956

- CIRCLE OF THE SUN** 16mm Sound 29 min.
This film, in full color, records one of the last gatherings of the Blood Indians of the Blackfoot Confederacy. It shows the sun dance, but it also reflects the predicament of the younger generation--those who have relinquished their ties with their own people but have not yet found a firm place in the changing world. (Available from the Boston, Chicago, Detroit, Los Angeles, New Orleans, and Washington offices. See Source Index for addresses and areas served by each.) (Not cleared for TV)
Consulate General of Canada
- CONQUEST OF LIGHT** (1964) 16mm Sound 10 min.
This film tells the story of the laser (sometimes called an optical maser), a device with almost unlimited potential in many areas. Although the film explains basically how a laser works and what it is, it does so in language clearly understandable to a non-technical audience. (Not cleared for TV)
Bell System Telephone Offices
- *ARCHITECTURE OF JAPAN** 16mm Sound 20 min.
This film, in full color, shows the traditional architecture of Japan. It is based on wood and features exposed structures, sturdy interlocking columns and beams, open interiors, pure lines and rich surface textures. The film includes the Horyuji Temple, the oldest wooden structure in the world, the Todaiji Temple in Nara, and the Katsura Villa in Kyoto.
Consulate General of Japan
- RIGHT--THE FIRST TIME** (1965) 16mm Sound 10 min.
This film, in full color, presents the history of Zero Defects program at Lockheed-Georgia Company, from early studies, kickoff, implementation and significant results. (Cleared for TV)
Lockheed-Georgia Company
- GODDESS COMES HOME, THE** 16mm Sound 30 min.
This film presents the festivities as a village in Bengal prepares for the feast of the goddess Durga, a symbol of bravery and liberation. The age-old rituals show the family ties and religious beliefs. (The film is shipped by express collect.)
Information Service of India
- STRESS** 16mm Sound 11 min.
This film presents Dr. Hans Selye of the University of Montreal who explains his theory of "Stress" which is making an outstanding contribution to medical progress. (Available from the Boston, Chicago, Detroit, New Orleans, Seattle, and Washington offices. See Source Index for addresses and areas served by each.) (Not cleared for TV)
Consulate General of Canada

The Black Box

Officially, the name of this learning device is 'The Inquiry Box.' It was developed for Science Research Associates by Richard Suchman. It is a black wooden box (13 x 13 x 2"). On one side there are 3 small rectangular holes, the opposite side has one hole, and the remaining sides have 2 holes each. You don't know what's going on inside but something is. For example, there may be a string coming out of one hole and a rod sticking out of another hole. If you pull the string, the rod jumps. By pulling and pushing the things that stick out and by poking around inside with a stick you're supposed to figure out what arrangement of pulleys, pegs, springs and strings is inside.

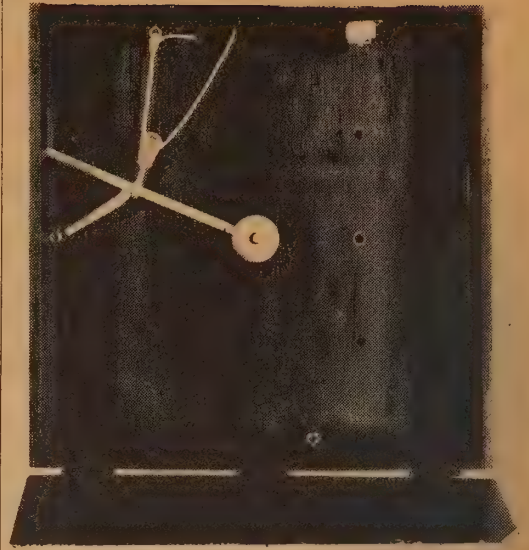
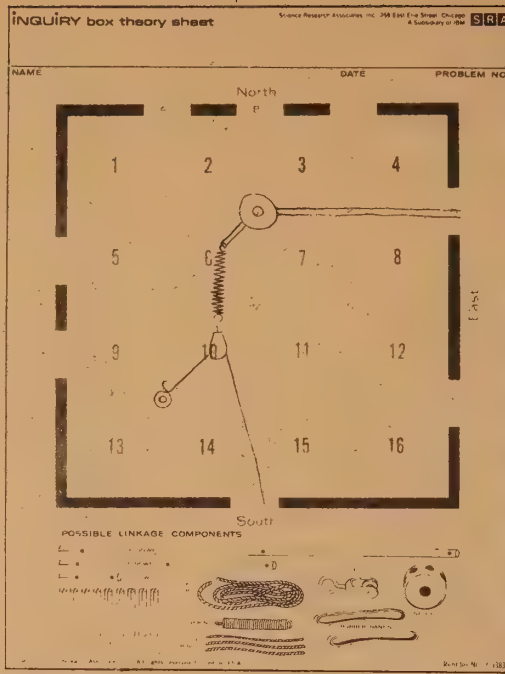
There are an inexhaustible number of ways to arrange the insides with the components provided (see illustration). One kid can set up the 'mystery arrangement' for another. You can set it up for them, they can set it up for you. And this certainly isn't limited to children. It's not at all a dull game for adults.

The Inquiry Box was designed for the teaching of theory building and theory testing to children. The teacher's handbook gives you a very specific procedure to use the box by, but if you want to order (or make) just the box, you can learn a lot from it using it any way you please.

Inquiry Box set

[Suggested by Dick Suchman,
Reviewed by Jane Burton.]

\$19.96 Shipping Weight 4½ lb.
from
Science Research Associates, Inc.
259 East Erie Street
Chicago, Illinois 60611



We Built Our Own Computers

Time was, kids built their own radios. Now it's rockets and computers, and so much the better. Once you've built one computer you have a far more sophisticated relationship with all computers. This British text, prepared by five school boys who indeed built their own computers, is an excellent introduction to hands-in technique

[Suggested by Jane Burton]

We Built Our Own Computers
ed. A. B. Bolt

\$1.95 postpaid

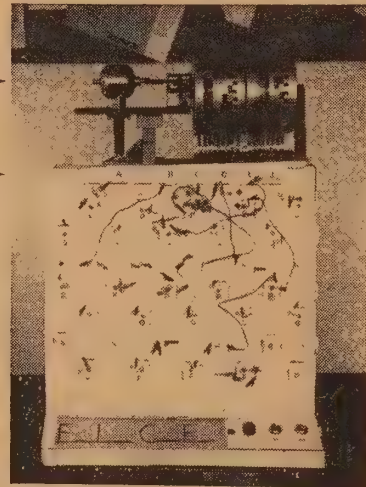
from:
Cambridge University Press
32 East 57th St.
New York, N. W. 10022
or WHOLE EARTH CATALOG



Electric Logical Computer Exeter

Motor to drive uniselector

Variables



Uniselector drum

Brushes to variables

Problem board

Control panel



Paper Airplane Book

'If we knew what it was we would learn, it wouldn't be research, would it?' was the title of an ad for *Scientific American's* project of an international paper airplane competition. The 20 winners are photographed in full page aeronautical glory followed by a tear-out pattern for imitations. No materials are needed other than the basic one referred to in the dedication —

The authors wish to dedicate this manuscript to Capt. Fear God Bascomb, out of New Bedford, Massachusetts, who brought the first known pad of lined 8 x 11" paper from China on May 1, 1743. It may well be said of Capt. Bascomb that without him, the paper airplane as we know it would not have been possible.

and scissors and infinite doodling type patience. As a school librarian with only two copies of this wildly popular book, I was finally reduced to tearing it up page by page for an eye level wall long display for group reading and a handy supply of tracing paper for pattern copiers. Our airborne climax was the North Hillsborough, California School Paper Airplane Olympics with appropriate contests and flyers, after which we

were able to cross the school campus without shuffling ankle deep in aborted and/or terminated flight materials. The school custodian was one of the few associates not turned on by this librarian's flight of fancy (or reason, depending on your bias).

[Reviewed by Carol Guyton Goodell.]

The Great International Paper Airplane Book

Jerry Mander, George Dippel, and Howard Gossage
1967; 128 pp.

\$2.95 postpaid

from
Simon & Schuster, Inc.
1 West 39th Street
New York, N. Y. 10018
or
WHOLE EARTH CATALOG



Fig. 20 Pocket Rocket. Instructions: Wrap aluminum foil around upper half of paper match. Push straight pin up under foil to head of match and remove again, leaving an exhaust channel. Place match on opened paper clip and hold lighted match to tip. Step back.

S. J. TWEEDIE AND F. D. WOODRUFF,
FALLS CHURCH, VIRGINIA

WFF 'N PROOF

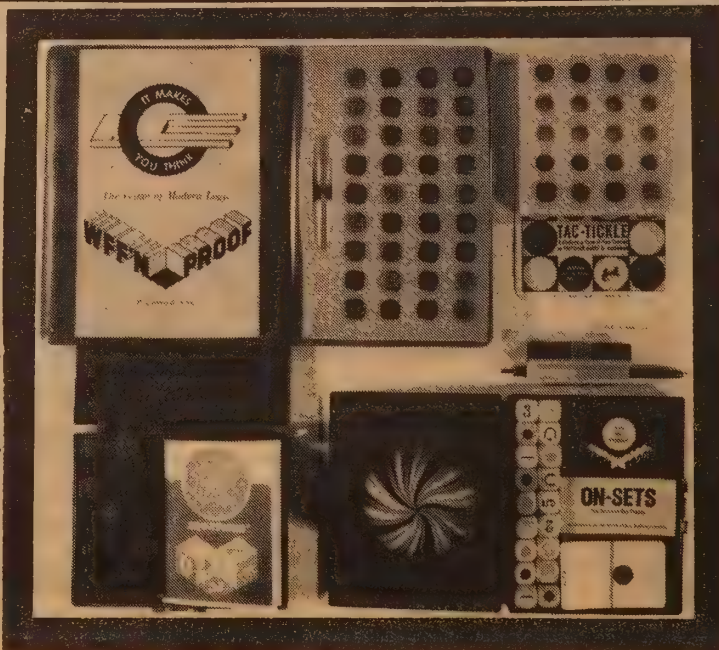
The WFF 'N PROOF games came out of the ALL project (Accelerated Learning of Logic) at Yale Law School. This project was established in 1960 to develop materials to teach mathematical logic to elementary school students. The authors' first principle in designing the games was that they be fun to play.

The primary aim of WFF 'N PROOF is to encourage a favorable attitude toward symbol manipulation activities in general and, incidentally, to teach something about mathematical logic and provide practice in abstract thinking.

[From the introduction to the WIFF 'N PROOF manual.]

WFF 'N PROOF is a series of 21 games. The first ones can be played by children (starting around age eight), the last ones are difficult enough to interest logicians. The first game can be bought separately under the name of just 'WFF.' It is the best game and children always like to play it. In it you learn what a WFF (well formed formula) is, and there is no nicer way of doing that. The rest of the games teach you about constructing logical proofs. They are more tedious and a good teacher can find ways of doing this which are more fun. There's no harm in getting the whole set, however, and using it as long as it works.

[Reviewed by Jane Burton.]



WFF **\$1.50** postpaid
WFF 'N PROOF **\$8.00** postpaid
Tac Tickle **\$1.00** postpaid
The REAL Numbers Game **\$2.00** postpaid
On-Sets: The Game of Set Theory **\$5.00** postpaid
The Propaganda Game **\$6.00** postpaid

from
WFF 'N PROOF
P. O. Box 71
New Haven, Conn. 06501

or
WHOLE EARTH CATALOG

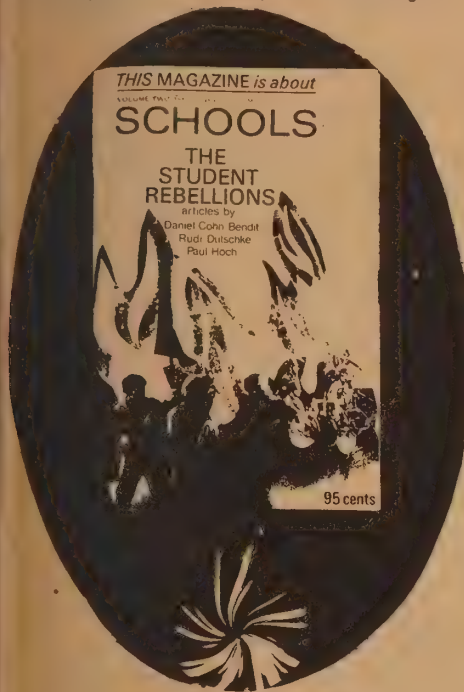
THIS Magazine is about Schools

This is a double-good magazine about schools. Made in Toronto, it's global in context and it's superbly written and edited. Everything else we've seen on education looks stale and sad next to it.

[Suggested by Jane Burton]

Until the cops attacked, the construction of the barricades was a bit like a celebration. There was an extraordinary atmosphere. If the police had retreated, there would have been a marvelous explosion of joy, everybody would have celebrated the liberation of the Quarter. We'd even thought about bringing along some orchestras. But the darker it got, the more the barricades got reinforced and multiplied, the more we realized that the attack of the cops, if it took place would provoke a massacre. That's why I agreed to go to the Rector's (Roche of the Sorbonne), not to discuss anything but to explain to him what was going to happen if the cops didn't withdraw.

Then to the accompaniment of loud boos and hisses, with only a scattering of applause, the vice-president of the Ontario Union of Students tore up his Bachelor of Arts diploma and marched out of the building.



THIS MAGAZINE is about

SCHOOLS

THE STUDENT REBELLIONS
articles by Daniel Cohn Bendit, Rudi Dutschke, Paul Hoch

95 cents

\$3.50 for one year (quarterly)

from: THIS Magazine is about Schools
P.O. Box 876, Terminal A
Toronto 1, Ontario, CANADA

Mr. Spelina's voice rises to a crescendo; he has not finished, but he has outdone himself, and he is outdoing the class. Delight has turned to confusion, and and panic is spreading in the ranks. The French are holding fast, but the Spanish, with the exception of Mr. Ameller, are going under; Miss Fanaras has gone under. Mr. Cayo Junior is thinking about his girl-friend, and Mr. Rodriguez has decided to abandon English.

The lesson to us is: do not learn crafts from famous artists, but rather from competent technicians. Avoid like the plague teachers who talk a lot about self-fulfillment, self-realization, togetherness in creativity, or centering of your soul (that's for potters).

THE HARD LIFE
prepares children for the illogicalities and hardships of our present-day regimented existence. **WAR BUSINESS TABOOS.**
points out the drawbacks of organized efficiency. **FORCED TO READ SET BOOKS.**
shows how boredom can arise from enforced activity and lead to inactivity. **DOZING IN CLASS**
satisfies a child's need for simplified, structured surroundings. **YOU KNOW WHERE YOU ARE.**

permits nervous teachers to avoid personal relations with children. **RETREAT TO THE STAFF ROOM.**

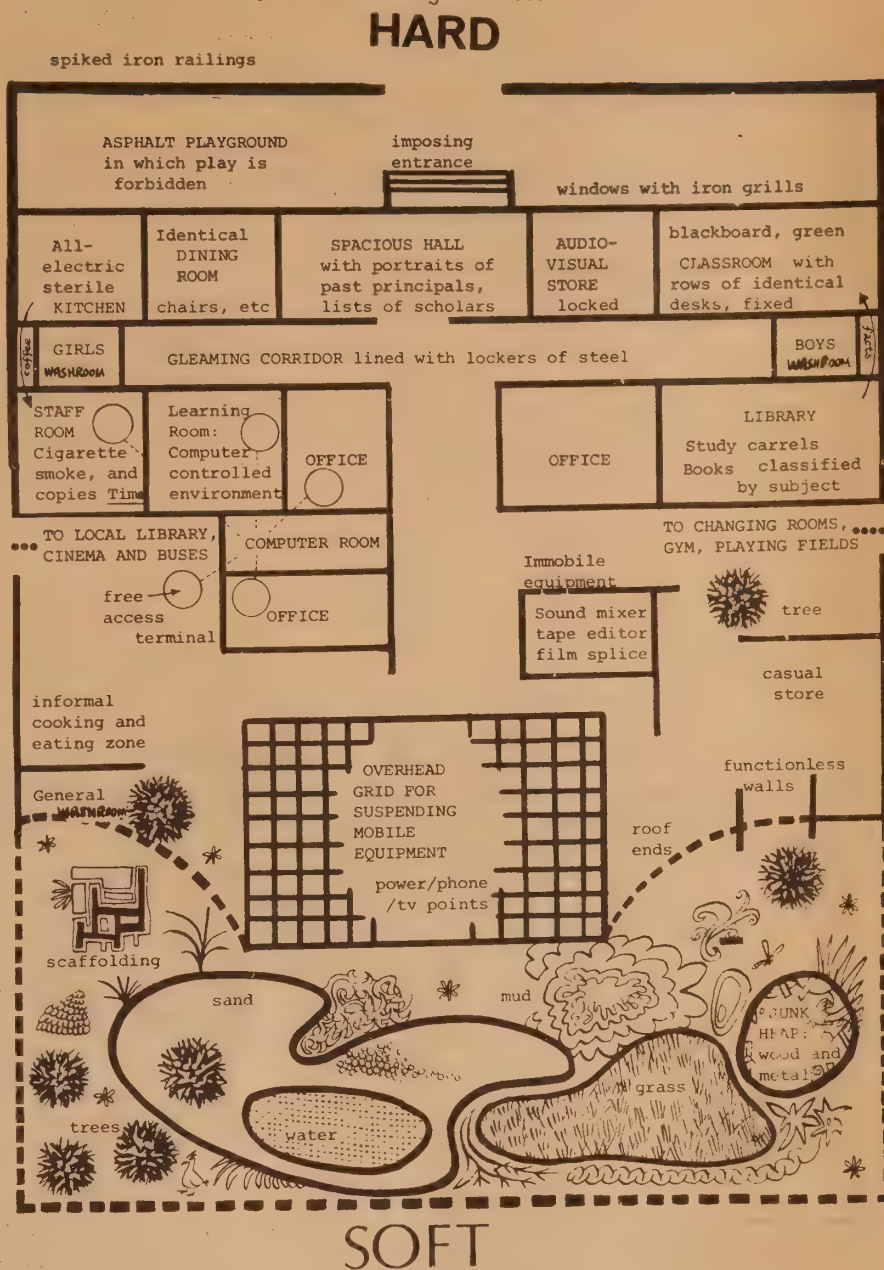
THE SOFT LIFE
prepares children for life as active individuals. **TRY IT MY WAY.**
points out the drawbacks of organized inefficiency. **CAN'T FIND MY BOOK.**
shows how boredom may arise from freedom, also, and lead to activity. **MUSTN'T WASTE OPPORTUNITIES.**
satisfies a child's need for diversity in exploratory play. **THIS IS JUST A MODEL.**
permits teachers to get to know children well, on equal terms. **NO TALKING DOWN.**

THE HARD-SOFT LIFE
enjoys the advantages of the hard and soft. **CONTRAST.**
shows how environment affects people and their work. **GRAPH PAPER AEROPLANES.**
allows children to learn how to get the best of both hard and soft worlds. **COMPUTERGRAPHIC PAINTING.**
demonstrates the need to work in an intermediate zone. **DRAMA IN A FRAME.**
permits teachers to teach the way they like best. **CHALKDUST FOR ME.**

One of the students looked at President Harris Wofford and asked: "If we join your Socratic seminar, will you come and drop acid with us?"

A geography teacher from Whitby spoke of how he started off teaching knowing so little about geography that he used to call it geometry.

The hard-soft school might look something like this:



SOFT

Cuisenaire Rods

The first rod is a small wooden cube with a 1 centimeter side. The second is twice as long with the same cross section. The third is three times as long as the first. Each length has its own color. With these rods, a child can learn arithmetical operations and mathematical relationships even though he recognizes no mathematical symbols. (Children are capable of grasping mathematical concepts before they have the mechanical ability to write. Therein lies one of the great advantages of Cuisenaire rods.) For example, if a child puts the first (white) and the second (red) rods end to end he can see that together they are equal in length to the third (green) rod. Once he realizes that a white and a red always equal a green, he has learned something quite general about addition and equality. If, later, the numeral '1' is associated with the first rod, '2' with the second rod and '3' with the third, he will be in a position to grasp at once that $1 + 2 = 3$. But the rods have no absolute numerical value so that if the value '1' were assigned to the third rod rather than the first, the truth $1/3 + 2/3 = 1$ would also be forthcoming as 'proved' by the general rule that the child discovered with the rods.

What is happening here is that algebra (the general case) is being learned before arithmetic (specific cases), as logically, it should be.

discovering mathematical relationships with

RODS

Fig. 3: Addition of rods

Fig. 4: Multiplication of rods

Fig. 5: Division of rods

This is undoubtedly one of the best pieces of teaching equipment ever invented. But it is important that you don't show children the truths that the rods demonstrate. They must be allowed to discover these themselves or it won't work. *Mathematics with Numbers in Color*, books A, B, C, D are a worthwhile purchase if you don't feel sure of how to use the rods. Also, *For the Teaching of Elementary Mathematics* will give an idea of what's going on when a child learns (as opposed to memorizing) math.

chase if you don't feel sure of how to use the rods. Also, *For the Teaching of Elementary Mathematics* will give an idea of what's going on when a child learns (as opposed to memorizing) math.

[Suggested by Virginia Baker
Reviewed by Jane Burton]

Catalog free
Basic classroom kit for 25 kids (includes above books) **\$57.50** postpaid
Cuisenaire Home Mathematics Kit **\$12.50** postpaid
from Cuisenaire Co. of America, Inc.
9 Elm Avenue
Mt. Vernon, N. Y.
Home Math Kit available from
WHOLE EARTH CATALOG

ITA shærz with CUISENAIRE RODS a hie repuetæshon for hænjing the formerly grim to the nou-delictfull, Uezually kids, lërnig to reed and riet or disceridzd noe end bie the illodzick ov normal iglish spelling. With the ita alfabet, it's mor lodzickl and consistint. Riten lærgwidz becoms a toel insted ov a drag; the kids commens reeding and rietig on thær oen tiem, læter on thær mæk the shift to normal ideotick spelling without pertickvelar stræen. Wun ov thees jeneræshons mæ not bother to shift.

ita has other applicæshons ie bekev. for wun, yw can heet riten lærgwidz better with it. An ita transiæshon ov FINNEGAN'S WAKE woud be a reeal servis. (A BETTER INFORMED REVIEW OF THIS SUBJECT IS NEEDED.)

The inishial teeching alfabet

devised in igland bie sir jæms pitman and introeduesd in 1963 in the uenieted stæts, the inishial teeching alfabet (i t a) is used as a transishional teeching toel to help peepl lern to reed. it has 44 symbols, eech representig wun sound, which tæk cær ov the fœnetic irreguelæritis ov the tradishional alfabet. after havig lerned to reed with i t a, the beginner transfers with ees to the tradishional alfabet.

the second yeer ov eksperimentashon with i t a in this cuntry has shoen remarkabl effectivness, not oenly in meny first græds, but aulsœ in remeediæl reeding, kindergarten reediæg rediness, and adult illiterasy classes.

The ITA Handbook for Writing and Spelling

Mazurkiewics and Tanyzer
1964; 50 pp.

\$2.00 from:
postpaid Initial Teaching Alphabet Publications, Inc.
20 East 46th Street
New York, NY 10017 or WHOLE EARTH CATALOG

From back cover of *Winni-the-Poo*

\$2.95 postpaid

published by E. P. Dutton
201 Park Ave South
New York, N.Y. 10003

thær wos noe wind to blœ him neerer to the tree soe thær hee stæd. hee coud see the huny, hee coud smell the huny, but hee coudn't kwiet reech the huny.

after a littl whiel hee cauld down to yow. "Cristofer robin!" hee sed in a loud whisper.

"halloe!"

"ie thiæg the bees suspect sumthing!"

"whot sort ov thiæg?"

"ie døen't noe. but sumthing tells mee that thær'r suspishius!"

"perhaps thæ thiæg that yow'r after thær huny?"

"it mæ bee that.

yow never can tell with bees."

thær wos anuther littl sielens, and then he cauld down to yow agæn.

"Cristofer robin!"

"yes?"



There's workbooks, manuals, library materials, etc. available. Promotional literature is free. The best how-to-do introductory text I've seen is:

LIFE Science Library



LIFE Science Library
from:
Time-Life Books, Inc.
Retail Sales Dept.
540 N. Michigan Ave.
Chicago, Illinois 60611



WHAT'S WRONG WITH THIS PHRASE?
At first glance, seemingly nothing. But with closer reading the repetition of the word THE becomes obvious. Because we generally read rapidly in word patterns rather than slowly a word at a time, it is easy for the eye to skip over the extra THE and register the familiar phrase "correctly."
Light and Vision

Learn by leaving books around. These books anyway. They get picked up randomly, glanced into, and hours later you're still there on the john or wherever helplessly engrossed in diagrams explaining the design of musical instruments.

Rumor was, a few years ago during one of the Time-Life shuffles, that a lot of the best people there had gone into Time-Life books. I believe it. This series is well edited, illustrated, and authored. *Man and Space*, for example, is by Arthur C. Clarke; *Water*, by Luna Leopold and Kenneth Davis.

Most popular science books are badly behind the times. This series puts special emphasis on recent developments.

The books are only available by mail from Time-Life Inc.

A book comes every month or so, with a bill for \$4.73, and you either send the book back or pay up. Some are better than others, but we haven't sent one back yet.

While the outermost reaches of Jupiter's atmosphere are extremely cold, the internal temperature is probably quite high, due to a "greenhouse effect," in which the atmosphere acts as an insulator to hold in heat from the sun. Water might exist there, permitting the formation of the "organic soup" which sparked the first earthly seeds of life. It is now believed, in fact, that Jupiter's hydrogen-ammonia-methane type of atmosphere is what existed on the primitive earth in the days when life made its first appearance.

Although Jupiter's cloud cover is constant, most of the cloud markings we see there are quite transient, and disappear after a few days or weeks. However, there is one puzzling formation which has remained visible, on and off, for at least 130 years. This is the famous Great Red Spot, an oval shaped mass lying parallel to the planet's equator and not far from it, in the Southern Hemisphere. The Great Red Spot is considerably larger than our entire earth, yet it drifts around Jupiter like a gigantic raft; it has made several revolutions of the planet during the century that it has been under intense observation. The most popular theory holds that the Great Red Spot is a huge meteorological disturbance.

Kaiser Aluminum News



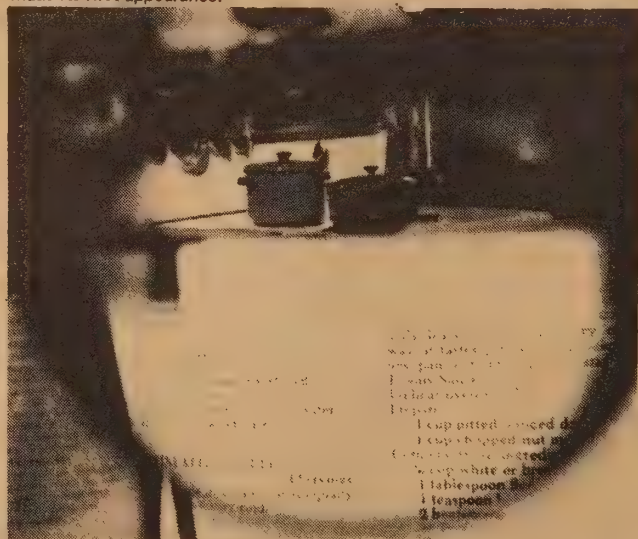
Don Fabun is doing very well at his job of making Kaiser appear comprehensive and futuristic. The Kaiser Aluminum News that he edits comes out several times a year, each issue devoted to one large topic, such as communication, transportation, food crisis, etc. They are excellent compendiums of current thought, vividly illustrated and laid out. Best of all, they're free if you write Kaiser for single copies.

Inquire for their list at:
Public Affairs Department
Kaiser Aluminum and Chemical Corporation
Kaiser Center 866
Oakland, California 94604



PIECES OF A PICTURE
The object of this perception test is to fill in the missing pieces so that a familiar picture appears. If the test remains puzzling at normal reading distance, try it again from three or four feet before looking at the answer below.

116



TWO LENSES IN ONE
Light and Vision
Bifocals—introduced to America in the 18th Century by Benjamin Franklin—help older people with rigid lens structure to focus at both near and far distances. The upper half of the spectacle lens gives slight correction for distant viewing. The lower half is for close-up work; it provides the increased refraction needed to compensate for the increasing rigidity—and the inability to focus—of the aging lens.

The Road to Kwashiorkor
It is the custom in many of the most deficient areas that children are not weaned until the second or third year of life. They thus may receive enough calories, but insufficient protein. The result is a disease called "kwashiorkor," which may disable the child for life and frequently is fatal. The child's own body is "starved" and "alter" severely, and the result is a dramatic improvement that takes place when sufficient protein is fed to a child suffering from kwashiorkor.

American Boys Handy Book

Dan Beard's American Boys Handy Book was first published in 1882. Out of print for a long time, Tuttle has finally reprinted it. This is barefoot-boy-with-cheek-of-tan stuff, detailed lore on how a boy may make his own world. Extraordinary book, highly recommended for funky schools or communities, especially if woods are handy.

[Suggested by Arthur Brand]



The Paper Pitfall.

Over the top of an earthenware jar fasten a piece of writing

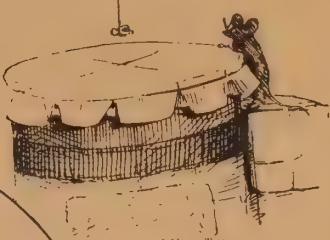


Fig. 140.—A Mouse Trap.

The American Boys Handy Book

D. C. Beard
1882; 391 pp.

\$3.95 postpaid

from:
Charles E. Tuttle Co., Inc.
Rutland, Vermont 05701
or
WHOLE EARTH CATALOG

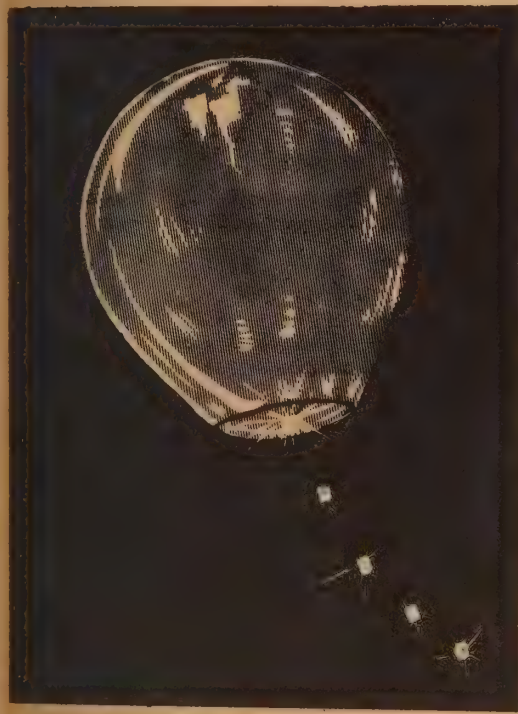
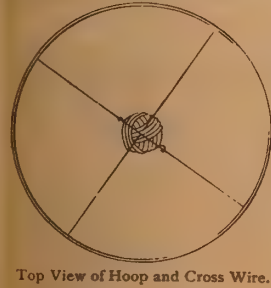


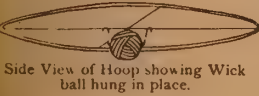
FIG. 100.



Top View of Hoop and Cross Wire.



Wick-ball.



Side View of Hoop showing Wick ball hung in place.

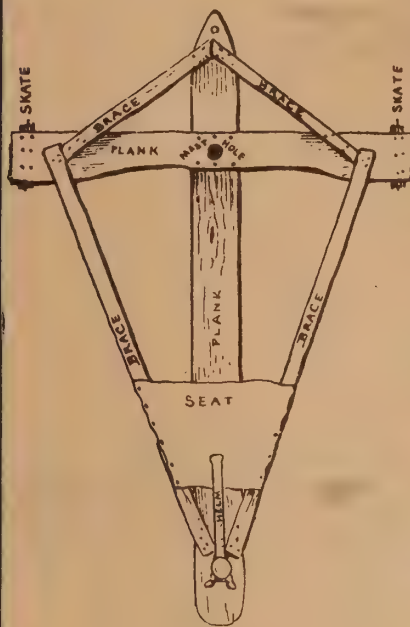


FIG. 188.—Top View of Ice-Boat.

The Voice Disguiser

is made of a piece of corn-stalk about three inches long. After removing the pith cut a notch near each end, as shown in the illustration, upon opposite sides of the corn-stalk; upon the ends stretch a piece of fish-bladder, or any thin membrane; a piece of thin tracing-paper will answer. With a large pin make a hole in each piece of membrane, as shown at A in the illustration. Now cover the notch, cut into the corn-stalk, with your mouth and laugh; the noise you produce will set you laughing in earnest. By placing your mouth over either of the notches and talking or singing, the voice is so changed as to be perfectly disguised, and if you sing a song through this instrument it sounds like some one playing on a comb covered with paper. The voice disguiser is very handy in Punch and Judy or puppet shows.

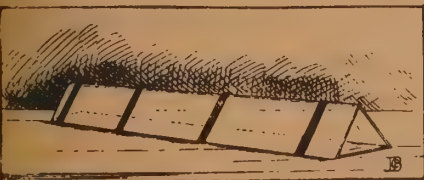


FIG. 213.—Kaleidoscope.

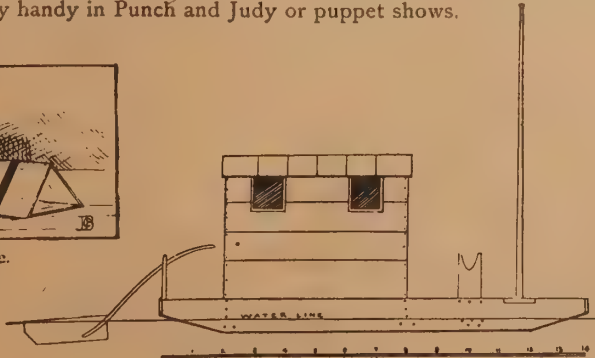


FIG. 81.—Side View of Flat-Boat.

Set a seat in front of the rowlock with a hole in it for the "jack-staff" to pass through. The jack-staff should be made so that it can be taken out and put in at pleasure. This can be done by...

Pioneer Posters

Cheap, good, educational, weird. They're a whole other kind of history than book history and better posters than most posters. Immense variety.

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- C160—BILL OF SALE—18 by Gov. Price. 17 x 1 25c
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- C162—LINCOLN FUNERAL casket advertised wi Rare oddity 35c
- C163—AMER. REVOLUTIO Phila. Coffee House. 1 15c
- C164—STAR SPANGLED B —Rare 15c
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- C168—CUSTERS LAST ST white, pat. medicine 18 1/2
- C169—PAT. MEDICINE P medicine on horse 1 Circa 1840 18 1/2
- C170—BROADSIDE—dated France, in English. 2 65c
- C171—BROADSIDE—dated rare 65c
- C172—JULY 4th POSTER—parody of celebratio Civil War period 25c
- C173—AUCTION POSTER— 20c

AT THE PRINCESS

"HELL'S Angels"
THE BIG MOVIE
ABOUT THE BIG WAR!



A GRAND EXHIBITION

OF THE EFFECTS PRODUCED BY INHALING NITROUS OXIDE, EXHILERATING, OR LAUGHING GAS!

WILL BE GIVEN AT The Masonic Hall

Thursday EVENING, 15th 1845.

30 GALLONS OF GAS will be prepared and administered to all in the audience who desire to inhale it.

MEN will be invited from the audience, to protect those under the influence of the Gas from injuring themselves or others. This course is adopted that no apprehension of danger may be entertained. Probably no one will attempt to fight.

THE EFFECT OF THE GAS is to make those who inhale it, either LAUGH, SING, DANCE, SPEAK OR FIGHT, &c. &c. according to the leading trait of their character. They seem to retain consciousness enough not to say or do that which they would have occasion to regret.

N. B. The Gas will be administered only to gentlemen of the first respectability. The object is to make the entertainment in every respect, a genteel affair.

- These who inhale the Gas once, are always anxious to inhale it the second time. There is not an exception to this rule.
- No language can describe the delightful sensation produced. Robert Southey, (poet) once said that "the atmosphere of the highest of all possible heavens must be composed of this Gas."
- For a full account of the effect produced upon some of the most distinguished men of Europe, see Hooper's Medical Dictionary, under the head of Nitrogen.
- C193—BROADSIDE, 1750, Mass.—Murderer speaks on execution day; Bailed; oddity 40c
- C194—MASS. BAY COLONY, 1711—Orders soldiers not to desert—Impt. 35c
- C195—NEW ENGLAND PROCLAMATION—Oct. 17, 1706 THANKSGIVING day, gives reasons 50c
- C196—MASS. BAY COLONY, 1711—warning about desertion 35c
- C197—1703 POSTER—Queen orders colonies not to trade France, Spain. Rare 50c

NEW COMPANY RULES

- Office employees will daily sweep the floors, dust the furniture, shelves and showcases.
- Each draftsman will bring in a bucket of water and a scuttle of coal for the day's business.
- Draftsmen will each day fill lamps, clean chimneys, trim wicks. Wash the windows once a week.
- Make your pens carefully. You may whittle nibs to your individual taste.
- This office will open at 7 A.M. and close at 8 P.M. daily, except on the Sabbath, on which day it will remain closed.
- Man employees will be given an evening off each week for courting purposes, or two evenings a week if they go regularly to church.
- Every employee should lay aside from each pay a goodly sum of his earnings for his benefits during his declining years, so that he will not become a burden upon the charity of his betters.
- Any employee who smokes Spanish cigars, uses liquor in any form, gets shaved at a barber shop, or frequents pool or public halls, will give me good reason to suspect his worth, intentions, integrity and honesty.
- The employee who has performed his labors faithfully and without fault for a period of five years in my service, who has been thrifty and attentive to his religious duties, and is looked upon by his fellow men as a substantial and law abiding citizen, will be given an increase of five cents per day in his pay, providing a just return of profits from the business permits it.

didate—woman—official
s yet interesting list of
ston for London, picture
l of illustrations; chart
then but humorous now
ception 15c
r 20c, old, scarce 20c
t, men, women filling
ens—illustrated—15 1/2 x
00—very scarce 20c
rated, 22 1/2 x 5 1/2 50c
e, 14 1/4 x 11 1/4 30c
184—\$15. week for lead
Two" 25c
strated, advertises salve.
shows Bakery on Wheels,
San Fran., Calif., interest-
yes 1862, 4 pages with
taty of Ghent—historical
on's last letter—stirring
N POSTER—shows Clevel-
r 14 1/4 50c
description 25c
104—Aaron Burr for Gov-
about 1901, re: Seidon
strict 20c
RULES—1850—Unusual control of private life,
ce 30c
—1905—Fur coat styles illustrated 25c
BILL SHOW HANDBILL—scene/Spanish-American
5c
—about 1870—illustrated—girl with biggest feet
ants to marry, oddity & true 35c
—1778—Play postponed account indisposition
25c
POWDER HANDBILL—Shows kitchen 1900—interest-
5c
G HANDBILL—English, 5th Grenadier, to fight
30c
HINGTON & HIS FAMILY—rare, silhouette portraits
ustrates OLD BELLS, church, school, fire 16 x 11
0c
R HANDBILL—1861—strong appeal to women to
25c
LE—1858—Court orders 8 slaves sold 35c
N FIXTURES—1880—illustrated 20c
HCINE—wear hat, 30 days hair grows back, 1890,
20c
HCINE—1880—Lose weight, wear obesity belt plus
20c

Old Reward Posters

ernia gold rush is the most colorful chapter in History. Men, lusty and restless, stamped 450 to stake their lives for a pile of gold dust. Wells, Fargo & Co. began a vital pioneer in- . and banking service. Through the highway-ridersness rode the Wells-Fargo coach with chest filled with gold dust and bullion. The ver was used to protect this prize from out- one Colt model earned the title of "The Wells Samuel Colt had a stagecoach hold-up scene on the cylinder of his "Hartford Hardware!" courtesy of Wells, Fargo, we are privileged a limited edition of exact facsimiles of the original rare "REWARD POSTERS." Unique items, they make picturesque decorations to your den and recapture the exciting adventure violence of the Old West.

On fine finish white paper, suitable for framing. 12 posters, all different at 50 cents each, or the entire set of 12 posters for only \$3—while supply lasts.

Guinness Book of World Records

An astonishing amount of conversation in the Western World is spent agreeing or disagreeing on the extremes of experience. Maybe it's some primordial urge to know where we are in the universe. Whatever, it's deep. This book is automatic conversation; whoever's reading it has to start reading aloud. And whoever's around has to listen and respond. Wierd. Painless education though.



CURTAIN CALL RECORD: Ballet stars, Dame Margot Fon eyn (left) and Rudolf Nureyev (right) taking one of their record 89 curtain calls to the Vienna State Opera House.

Handshaking. The world record for handshaking was set by Theodore Roosevelt (1858-1919), as President of the U.S.A., when he shook hands with 8,513 people at a New Year's Day White House Presentation on January 1, 1907. Outside public life, the record is 37,500 hands in 7 hours 15 minutes 18 seconds by George Borkowski, in London on February 22, 1967.

The English Duden

'One picture is worth a thousand words.' The Germans believe that too, and proof is available in *The English Duden*. This is a short, fat, 928 page book that includes a picture of almost anything you can think of, and many things that you can't. Most of the illustrations are in black and white, but a number (including good ones of the human body) are in color. All are meticulously drawn and have every single constituent carefully and accurately labeled. The comprehensiveness of the book is staggering. It offers, with Teutonic omniscience, pictures showing every part of, say, a motorcycle engine, a paper-making factory, a handsome young lady, and the interior of a barber shop. Dress styles, beehives, photographic laboratories, musical instruments, Roman gods, jet aircraft; they are all here, clearly dissected and indexed in German and English (or French or Italian if you prefer), with differences between British and American usage noted. It is one of the publishing bargains of the 20th Century.

[Suggested and reviewed by Dr. Morton Grosser]

The English Duden
1960; 928 pp.

\$5.55 postpaid

from
Adler's Foreign Books, Inc.
162 Fifth Avenue
New York, N. Y. 10010

Using Libraries Effectively

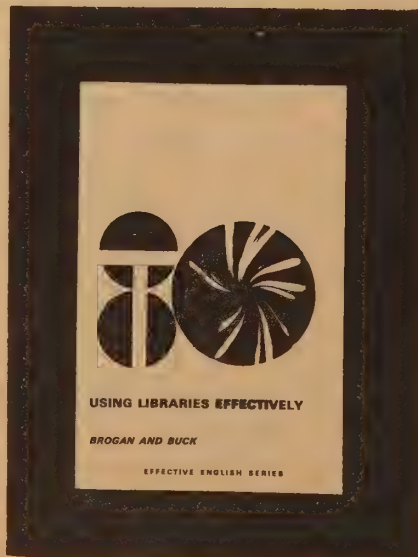
Every idiot should know how to use a library. (This idiot had to graduate from college before really learning.) Here's a simple book that covers the ground nicely, from how to look up anything to all the reference books you can expect to find. A library is such a handy handy handy handy thing. Viva.

Using Libraries Effectively

Brogan and Buck
1969; 116 pp.

\$1.95 postpaid

from
Dickenson Publishing Company
Belmont, CA 94002
or
WHOLE EARTH CATALOG



Foundation Directory, New York, Russell Sage, 1967.

Philanthropic foundations have existed for years, and almost everyone has heard of the Ford, Carnegie and Rockefeller foundations, but this book lists several thousand others. They are indexed by their field of interest as well as by their location. The founder, address, and activities of each foundation are listed.

Monro, Isabel. *Costume Index*, New York, Wilson, 1937; Supplement, 1957.

Hundreds of books with illustrations of what people wore (or did not wear) are indexed in these books. Whether you are looking for queens' or acrobats' costumes, you can locate them here by country, by historical period, or by vocation.

Brady, George S. *Materials Handbook*, 9th ed., New York, McGraw-Hill, 1963.

This is an alphabetic dictionary of materials used in manufacturing and other industries. It gives brief descriptions of numerous everyday products and some unusual products.

Kendrew, Wilfred G. *Climates of the Continents*, New York, Oxford University Press, 1961.

Thinking of moving? Here you will find such information as the altitude, variation in temperatures, and average precipitation of places all over the world.



HIGHEST HABITATION: This "silver hut," a prefabricated laboratory erected at an altitude of 18,765 feet in the Mt. Bo Valley of the Himalayan mountains of India, was inhabited for four months in 1960-61.

Earliest Duodenal Ulcer

The earliest description in medical literature of a duodenal ulcer was made in 1746 by Georg Erhard Hamberger (1697-1755).

Earliest Slipped Disc

The earliest description of a prolapsed intervertebral cartilage was by George S. Middleton and John H. Teacher of Glasgow, Scotland, in 1911.

Pill Taking

It is recorded that among hypochondriacs Samuel Jessup (born 1752), a wealthy grazer of Heckington, Lincolnshire, England, has never had a modern rival. His consumption of pills from 1794 to 1816 was 226,934, with a peak annual total of 51,590 in 1814. He is also recorded as having drunk 40,000 bottles of medicine before death overtook him at the surprisingly advanced age of 65.

Hiccoughing

The longest recorded attack of hiccoughs was that afflicting Jack O'Leary of Los Angeles. It was estimated that he "hicked" more than 160,000,000 times in an attack which lasted from June 13, 1948, to June 1, 1956, apart from a week's respite in 1951. His weight fell from 138 lbs. to 74 lbs. People sent 60,000 suggestions for cures, of which only one apparently worked—a prayer to St. Jude, the patron saint of lost causes.

Sneezing

The most chronic sneezing fit ever recorded was that of June Clark, aged 17, of Miami, Florida. She started sneezing on January 4, 1966, while recovering from a kidney ailment in the James M. Jackson Memorial Hospital, Miami. The sneezing was stopped by electric "aversion" treatment on June 8, 1966, after 155 days. The highest speed at which expelled particles have been measured to travel is 103.6 m.p.h.

Yawning

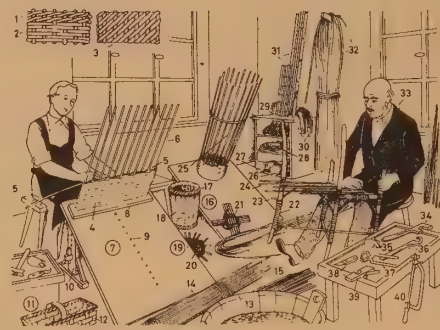
In Lee's case, reported in 1888, a 15-year-old female patient yawned continuously for a period of five weeks.

Swallowing

The worst known case of compulsive swallowing was reported by the *Journal of the American Medical Association* in December, 1960. The patient, who complained only of swollen ankles, was found to have 258 items in his stomach, including a 3-lb. piece of metal, 26 keys, 3 sets of rosary beads, 16 religious medals, a bracelet, a necklace, 3 pairs of tweezers, 4 nail clippers, 39 nail files, 3 metal chains and 88 assorted coins.



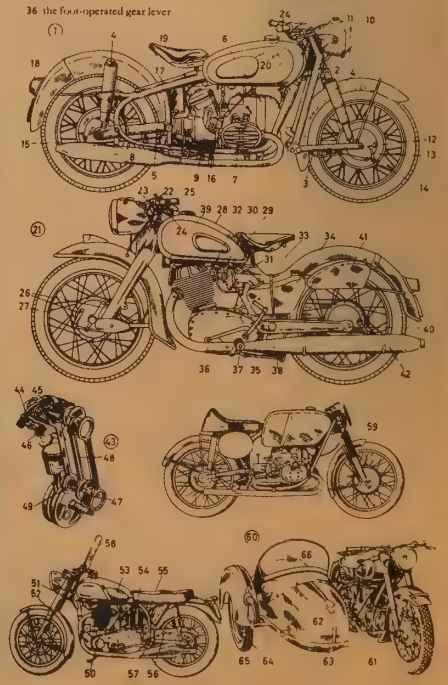
The Basket-maker 130



- 1-40 basket-making (basketry, basket-work).
- 1-4 weaving patterns:
- 1 the pairing
- 2 the slewing
- 3 the oblique randing
- 4 randing, a piece of wickerwork (of screen work)
- 5 the horizontal rod (weft)
- 6 the stake (tell, upright rod, warp)
- 7 the working board
- 8 the transverse ledge
- 9 the hole to fix the ledge in
- 10 the stand
- 11 the chip basket
- 12 the chip
- 13 the soaking tub
- 14 the one-year willow sticks (willow twigs; osier sticks, osier twigs)
- 15 the three-year willow rods (osier rods)
- 16 the basket, a piece of wickerwork (basket-work)
- 17 the rim (border)
- 18 the woven side
- 19 the slath
- 20 the woven bottom
- 21 the bottom cross
- 22-24 covering a frame:
- 22 the frame
- 23 the end
- 24 the strap
- 25 the framework
- 26 the grass; *zort*: esparto grass, alfalfa grass
- 27 the rush (China rush string)
- 28 the reed (reed mace, club rush)
- 29 the raffia (raffa, bast)
- 30 the straw
- 31 the bamboo cane
- 32 the rattan (rattan)
- 33 the basket-maker
- 34 the bending tool
- 35 the cutting point
- 36 the rapping iron
- 37 the pincers
- 38 the scraper
- 39 the basket-maker's plane
- 40 the bow saw

182 The Motorcycle (Motor Bicycle)

- 1-59 sales (solo machines),
- 1 side-valve (S.V.) two-cylinder four-stroke (Am. four-cylinder) motor with horizontal cylinders:
- 2 the tubular frame with front and rear suspension
- 3 the front-wheel leading link
- 4 the telescopic springing
- 5 the back (rear) wheel swinging arm with shaft drive and universal joint
- 6 the opposed-cylinder engine
- 7 the cylinder head
- 8 the silencer (exhaust box, muffler)
- 9 the induction pipe
- 10 the motorcycle headlight
- 11 the ignition key
- 12 the hub brake
- 13 the brake lever
- 14 the brake cable
- 15 the back (rear) wheel brake linkage
- 16 the rear brake pedal (Am. service brake)
- 17 the tyre inflator
- 18 the rear (tail) light
- 19 the pivoted saddle with saddle cover
- 20 the maker's badge
- 21 the overhead-valve (O.H.V.) single-cylinder motor with dry-sump lubrication:
- 22 the carburettor air lever
- 23 the dipswitch
- 24 the horn (hooter) button
- 25 the steering damper
- 26 the parallel brake levers
- 27 the full width hub brake
- 28 the petrol (Am. gasoline) tank
- 29 the throttle control cable
- 30 the air control cable
- 31 the carburettor (Am. carburetor tickler)
- 32 the combined filter and petrol tap (Am. gasoline shut-off valve) with reserve
- 33 the tubular section pressed steel frame
- 34 the oil tank
- 35 the kickstarter
- 36 the front-operated gear lever
- 37 the foot-rest
- 38 the motorcycle stand
- 39 the horn (hooter)
- 40 the rear wheel spindle (Am. axle)
- 41 the motorcycle tool box (Am. tool kit)
- 42 the silencer (Am. muffler)
- 43 the overhead valve operating crank
- 44 the valve rocker
- 45 the cam
- 46 the overhead camshaft
- 47 the eccentric
- 48 the overhead valve operating crank
- 49 the needle roller bearing
- 50 the vertical shaft overhead valve (O.H.V.) engine
- 51 the plate showing type or model number
- 52 the telescopic fork
- 53 the knee grip
- 54 the motorcycle battery
- 55 the motorcycle dual seat
- 56 the chain guard inspection plug
- 57 the pillion-rider's foot-rest
- 58 the handlebar windscreen (Am. windshield)
- 59 the sports model
- 60 the motorcycle combination (motorcycle and sidecar):
- 61 the side-valve (S.V.) single-cylinder four-stroke motor (Am. four-cycle motor)
- 62 the sidecar body
- 63 the sidecar bumper
- 64 the sidecar wheel
- 65 the side light
- 66 the sidecar windscreen (Am. windshield)



This book grew out of a smaller volume called *Suggestions for Science Teachers in Devastated Areas* whose production was sponsored by UNESCO right after World War II. It was meant for use in schools whose buildings and labs had been destroyed and soon found its way into the hands of people who had never had these things to begin with. Thus it solves the problem of schools, communities—people—who want to do live science without money or equipment. There isn't any experiment in it which would be too costly for any of us to do. The book tells you how to put together the equipment you need: real clever ways of making glass cutters, balances, burners, telescopes, microscopes, etc. A lot of what you need to do the experiments is just stuff you'd have around the house. The rest can be gotten [very low-cost stuff] at the drugstore, hardware, junk yard, etc.

Also the book is unusually well written. There's no bullshit in it and it doesn't talk down to the reader. Just very straightforward instructions with illustrations that are highly readable. In most cases you aren't told the outcome of the experiment, an aspect which makes you much more interested in doing it. (Jane Burton)

700 Science Experiments for Everyone
1958; 250 pp

\$4.00 postpaid

from:
Doubleday & Company, Inc.
501 Franklin Avenue
Garden City, L.I., N.Y. 11531
or
WHOLE EARTH CATALOG
or
Edmund Scientific



A simple rotation machine

Secure a breast-drill or hand-drill such as the one shown in the diagram. Clamp a small screw eye or cup hook in the chuck of the drill. Attach a 30 cm length of light string near the point end of a spike. Make a loop in the other end of the string and attach it to the screw eye in the chuck of the drill.

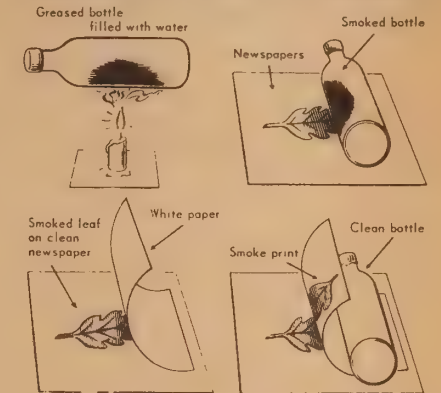
Now rotate the drill steadily by crank. Observe how the centrifugal force affects the suspended spike.

An egg osmometer

Place some dilute hydrochloric acid or strong vinegar in a shallow dish, such as a saucer, to a depth of about one centimetre. Hold the large end of an egg in the acid until the shell has been eaten away or the end leaving the thin membrane exposed. Rinse the acid from the egg. With a sharp instrument work a small hole through the shell at the other end. Insert a soda straw or a length of glass tubing through the hole into the interior of the egg. Seal the opening around the tube with household cement or sealing wax. This must be absolutely tight. Place the osmometer in a glass of water and let it stand for a few hours.

Making smoke prints of leaves

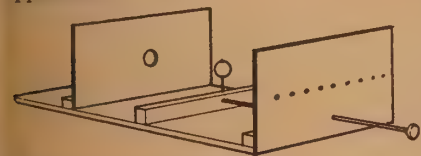
Smoke prints of leaves may be easily made by following the four steps shown in the diagrams.



Cover the side of a smooth, round bottle with a thin layer of grease or vaseline. Fill the bottle with cold water and cork it tightly. Hold the bottle over a candle flame until it is covered evenly with soot. Place a leaf, vein side up, on a layer of newspaper and roll the sooty bottle over the leaf. Remove the leaf and lay it vein side up on clean newspaper. Cover the leaf with a sheet of white paper. Next, roll over the white paper and leaf with a clean round bottle or other roller.

A model illustrating how an eclipse appears

The sun is represented by an opal electric bulb shining through a circular hole 5 cm in diameter in a piece of blackened cardboard. The corona is drawn in red crayon around this hole. The moon is a wooden ball 2.5 cm diameter mounted on a knitting needle. The observer views the eclipse through any of several large pin holes in a screen on the front of the apparatus. The corona only becomes visible at the position of total eclipse. The moon's position is adjusted by a stout wire bicycle spoke attached to the front of the apparatus.



Another way to show that water pressure increases with depth

Find a tall tin can. Punch holes up the side of the can about 3 cm apart. Put a strip of adhesive or plastic tape over the row of holes and fill the can with water above the top hole. Hold the can over a sink and strip the tape from the holes beginning at the bottom. Observe the streams and note the distances travelled outwards from the can.

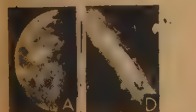
Water pressure is the same in all directions

Punch holes around the base of a tall tin can with a nail. Cover the holes as above with a strip of tape. Fill the can with water and strip off the tape while holding it over a sink. Observe and compare the distance the streams shoot out from the holes all around the can.

Edmund Scientific

Edmund is the best source we know of for low-cost scientific gadgetry (including math and optics gear). Many of the items we found independently, such as Dr. Nim, 700 Science Experiments, Geo-D-Stix, Spilhaus Space Clock, etc., turned up in the Edmund Catalog, so we were obliged to recognize that in this area we've been preceded. They list 4,000 items, they ship, and their catalog is free.

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STROBE LIGHTS... "FREEZE" MOTION... EXCITING... WILD... PSYCHEDELIC... FUN

3 strobe lights... Mini, Medi, and Mega. Each gives spectacular, psychedelic lighting effects for professional light shows or home use at parties, special occasions, etc. Amaze your guests with old-time movie effects. It's wild! Perfect "in" accessories for musical combos.

These are not mechanical strobes, but genuine Xenon strobes with a variable flash rate adjustable from 1-10 cycles per second... just adjust knob on rear of each unit. Each strobe light has a gold-handled, solid-walnut case; 6" diam., satin-finished, aluminum reflector; U.L. approved cord (use 110-120V AC); instructions, and a 90-day warranty.

(A) STROBE... MINI
A bargain-priced unit that's ideal for beginners. 40 watt-second Xenon lamp gives up to a million flashes. Consumes a max. of 40 watts. Weighs just 3 1/2 lbs. Measures 9 1/4" x 9 1/4" x 4". **No. 70,969 \$79.95 Ppd.**
Extra Flashtube For Above **No. 41,156 \$8.00 Ppd.**

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Extra Flashtube For Above **No. 41,157 \$13.50 Ppd.**
Stand And Remote Control **No. 71,052 \$15.00 Ppd.**

(C) STROBE... MEGA
Covers an area of approx. 60 ft. x 80 ft. Includes remote control and stand. 200 watt-second Xenon lamp gives up to a million flashes. Consumes a max. of 75 watts. Weighs 16 lbs. Measures approx. 9 1/4" x 10" x 7". **No. 71,041 \$149.95 Ppd.**
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Just place this ultraviolet filter over strobe's reflector and flashtube. Gives wild black light strobe effects. Glass; longwave; measures 8 1/4" x 9 1/4" x 1 1/4". **No. 71,083 \$9.95 Ppd.**

NEED LAMPS FOR YOUR COLOR ORGAN? SEE PAGE 20.

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Outward Bound

'I can't do that, I'll die.

But, if, for whatever horrid reason you do do it, and live, ah. Then right from your center out speculation is open about all the other things you knew you couldn't do.

This was one of the qualities of the Acid Tests administered by the Merry Pranksters. It was the only deeply useful thing I found in Ranger and Paratroop training in the Army. It looks to be the basic function of the Outward Bound school of the possible.

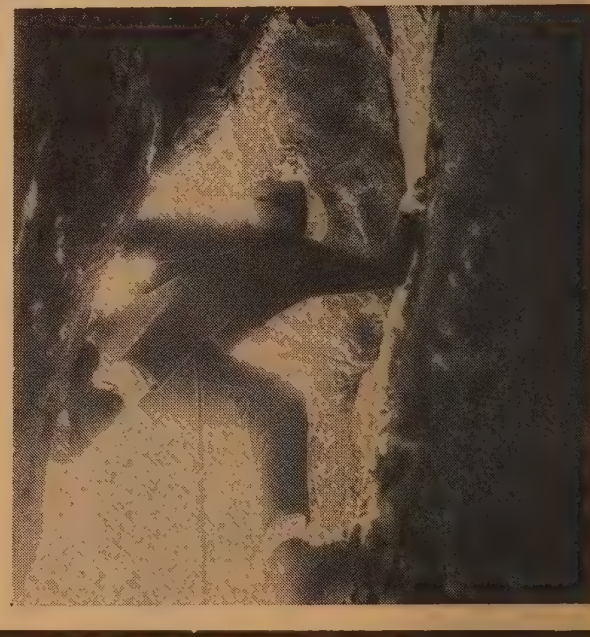
Tuition for 26 days of Outward Bound (schools in various harsh locations) is \$350-450 for people mid-teens to early twenties. There are courses for girls and older folks. According to a report in Reader's Digest, 'No one who wants the Outward Bound course is denied for financial reasons.' U.S. schools are at Concord, Mass., Morgantown, N.C., Denver, Colo., Minneapolis, Minn., and Eugene, Ore.

For information and applications forms, write:

Outward Bound, Inc.
Andover, Mass. 01810

26-DAY PROGRAM FOR ONE 12-STUDENT WATCH

DAY	0845-1030	1030-1215	1300-1545	1545-1730	1945-2100
1	Enroute to Rockland, Maine		12-mile boat trip to Hurricane Island	Issue Gear Quiet Walk	Director's Welcome Pledges
2	First Aid Lecture	Initiative Tests Ropes, Wall	Seamanship and Navigation Rowing Whaleboats		Navigation Lecture
3	Seamanship Small Sail Boats	Ecology First Field Trip	Drownproofing Introduction	Climbing Knots, Belays	Free Time/Duty Watch (duty watch begins at 2100)
4	DUTY WATCH: 24-hour manning of the Rescue Station and Radios Radio Procedures, Fire Fighting Techniques, Proper Use of Equipment, Weather, Logs, Mess Detail				
5	Sunday Meeting Free Time	Seamanship Peapods	Initiative Tests Ropes, Walls	Drownproofing Float Test	Artistic Inspiration Lecture, Demonstration
6	Climbing Belaying, Rappelling	Drownproofing Practice tied up tests	Seamanship and Navigation Rowing Drills, Intro. to Sailing		Navigation Plotting charts
7	Three Day - Planning a Cruise, Stowing and Checking a Boat Inventories, Camp Ashore at Night.				
8	Training Cruise: Basic Campers Skills, Boat Watches Intensive Seamanship, Night Exercises				
9	In Whale Boats Anchoring, Man Overboard Procedures, Furling, Sailing Navigation, Return by 1730				
10	Climbing Rappelling, Practice Falls	Drownproofing Legs Tied Test	Seamanship Drills without Instructor		First Aid Lecture
11	Seamanship Lifesize Drill	Ecology Field Trip, (low tide)	Community Service	Drownproofing Arms Tied Test	Free Time Duty Watch
12	DUTY WATCH: 24-hour manning of the Rescue Station and Radios. Solo Briefing after 2100 Rescue Unit, Fire Fighting, Search Patterns, Mess Detail, Casualty Handling, Logistical Support				
13	Solo Drop Out on an Island				
14					
15					
16	Solo Pick Up			Solo Debriefing	
17	Initiative Tests Ropes, Wall	Drownproofing Travel Stroke	Seamanship Drills	Skin Diving Ocean Swim	Recreational Sailing Or Free Time
18	Climbing Short and Long Rappells, Casualty Handling		Drownproofing Long Distance Swim	Seamanship Practice for Expert	Navigation Time, Rate, Distance
19	Sunday Meeting Free Time	Seamanship Small Sail Boats	Drownproofing Life Saving	Community Service	Free Time
20	Climbing Cliff Evacuation		Seamanship and Navigation Preparation for Final Expedition		Briefing Final Expedition
21					
22	FINAL FOUR-DAY EXPEDITION IN WHALEBOATS: Students in the 30-Foot Open Ketch Rigged Whale Boats. Operate In Any Weather, Camp Ashore First Night and Part of Second, Operate Through the Third Night Expedition to Cover Over 100 Miles.				
23					
24					Return to Island Clean Gear
25	DUTY WATCH: 24-hour manning of Rescue Station and Radios. Turn in Gear, Write Course Impressions, Watch Competitions, Awards Dinner, Pack				
26	Enroute to Rockland, Maine and Home!				



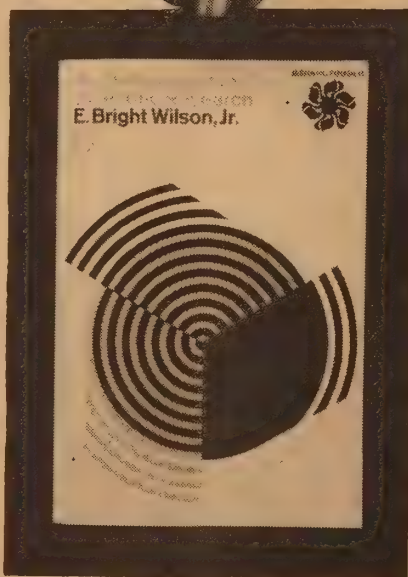
An Introduction to Scientific Research

A practical guide for the scientific experimenter, covering experimental planning, design of apparatus, and analysis and reporting of results. Basic general information applicable to many fields. Extensive lists of references for further information. The book is clearly written and surprisingly enjoyable reading.

[Reviewed by Larry McCombs.]

This book is an attempt to collect in one place and to explain as simply as possible a number of general principles, techniques, and guides for procedure which successful investigators in various fields of science have found helpful. The emphasis is entirely on the practical rather than the philosophical or psychological aspects.

There is a story of an industrialist who was unable to duplicate in a branch factory the manufacture of a chemical in a desirable crystal form. On further investigation of the process in the main plant, he found it in charge of an elderly employee who had always operated it, apparently with a perfectly simple routine. Closer examination, however, revealed that at one stage he always injected tobacco juice into the vat. This was the missing step, presumably because of surface active ingredients which influenced the growth habits of the crystals.



An Introduction to Scientific Research

E. Bright Wilson, Jr.
1952; 373 pp.

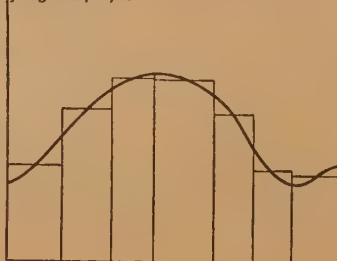
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WHOLE EARTH CATALOG

Fig. 12.3 A graphical method of determining the area under a curve. The horizontal lines are drawn so that the areas omitted and those wrongly included in each rectangle balance, as judged by eye.



A completely free rigid body has six degrees of freedom: displacement in three perpendicular directions and rotation about three perpendicular

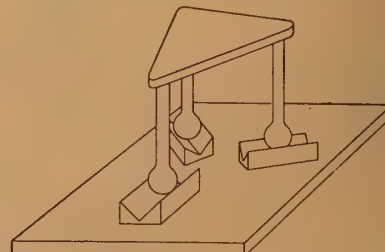


Fig. 5.13. Kinematic mounting for removable part which must be precisely located. Three ball feet make two contacts each with V grooves.

axes. The stool on the flat floor had only three degrees of freedom because its motion was restricted by three properly placed constraints, the three contacts of its ball feet with the floor. The stool (or platform) of Fig. 5.13 has no degrees of freedom because its supports make six suitable contacts, two for each ball foot. In general, a contact (or constraint) is needed for each degree of freedom which is to be eliminated. More may be used, as with the four-legged table, but then sag (internal strain) or rocking will occur unless the workmanship is very precise.

Altered States of Consciousness

If you're doing anything with meditation, dope, hypnosis, dreams, subjective exploration of any kind, this is a useful book. John Lilly borrowed our review copy and returned it with particular recommendation for these articles:

A Special Inquiry with Aldous Huxley into the Nature and Character of Various States of Consciousness

Milton H. Erickson

Toward the Experimental Control of Dreaming

Charles Tart

A Study of Dreams

Frederik van Eeden

The 'High' Dream

Charles Tart

Mutual Hypnosis

Charles Tart

The Effects of Marijuana on Consciousness

Anonymous

Subjective Effects of Nitrous Oxide

William James

Attitude and Behavior Change Through Psychedelic Drug Use

Joseph Downing

Psychedelic Agents in Creative Problem Solving

Harman, McKim,
Mogar, Fadiman,
Stoleroff.

Guide to the Literature on Psychedelic Drugs

Charles Tart

An Electroencephalographic Study on The Zen Meditation

Kasamatsu, Hirai

Operant Control of the EEG Alpha Rhythm and Some of Its Reported Effects on Consciousness

Joe Kamiya

Elsewhere in the CATALOG is a book called "Direct Use of the Sun's Energy." Tart's book is moving toward Direct Use of the Mind's Energy.

Wonderingly, but with outward calm, I undertook to arouse Huxley from the trance state by accepting the partial clues given and by saying in essence, "Wherever you are, whatever you are doing, listen closely to what is being said, and slowly, gradually, comfortably begin to act upon it. Feel rested and comfortable, feel a need to establish an increasing contact with my voice, with me, with the situation I represent, a need of returning to matters in hand with me not so long ago, in the not so long ago belonging to me, and leave behind but AVAILABLE UPON REQUEST practically everything of importance, KNOWING BUT NOT KNOWING that it is AVAILABLE UPON REQUEST. And now, let us see, that's right, you are sitting there, wide awake, rested, comfortable, and ready for discussion of what little there is."

As he watched, he became annoyed with me since I was apparently trying to talk to him, and he experienced a wave of impatience and requested that I be silent. He turned back and noted that the infant was growing before his eyes, was creeping, sitting, standing, toddling, walking, playing, talking. In utter fascination he watched this growing child, sensed its subjective experiences of learning, of wanting, of feeling. He followed it in distorted time through a multitude of experiences as it passed from infancy to childhood to school days to early youth to teenage. He watched the child's physical development, sensed its physical and subjective mental experiences, sympathized with it, empathized with it, rejoiced with it, thought and wondered and learned with it. He felt as one with it, as if it were he himself and he continued to watch it until finally he realized that he had watched that infant grow to the maturity of 23 years. He stepped closer to see what the young man was looking at, and suddenly realized that the young man was Aldous Huxley himself, and that this Aldous Huxley was looking at another Aldous Huxley, obviously in his early fifties, just across the vestibule in which they both were standing; and that he aged 52, was looking at himself, Aldous, aged 23. Then Aldous, aged 23 and Aldous aged 52, apparently realized simultaneously that they were looking at each other and the curious questions at once arose in the mind of each of them. For one the question was, "Is that my idea of what I'll be like when I am 52?" and, "Is that really the way I appeared when I was 23?" Each was aware of the question in the other's mind. Each found the question of "Extraordinarily fascinating interest" and each tried to determine which was the "actual reality" and which was the "mere subjective experience outwardly projected in hallucinatory form."

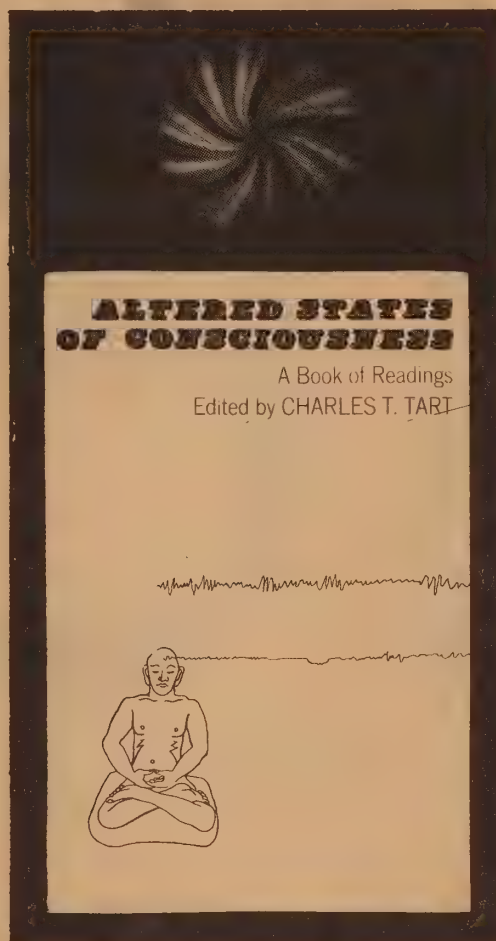
When I have been flying in my dreams for two or three nights, then I know that a lucid dream is at hand. And the lucid dream itself is often initiated and accompanied all the time by the sensation of flying. Sometimes I feel myself floating swiftly through wide spaces; once I flew backwards, and once, dreaming that I was inside a cathedral, I flew upwards, with the immense building and all in it, at great speed.

When the expanded depth condition was imposed on the hypnotized subject, he became very happy....

He became involved with the shapes of objects and the relation of objects to space. As he did this, he found himself becoming less self-concerned and more concerned with people and their relationships to one another. He became more alert, active and involved. He found that by concentrating on perspective and the relation of lines and sizes to one another, he was able to actually change the usual way he perceived depth.

Induction of the no depth condition with the hypnotized subject produced a sense that everything was flattened out which he attributed to excessive fatigue from the final exams which he had just completed. Colors, shapes, and sounds all seemed less intense. He reported a loss of sensitivity to touch. He became bored, withdrawn, and hostile.

The fact that expanded depth is associated with mystic experience recalls the observation of William James (1902) that most mystic experience tends to occur outdoors. The traditional predilection of religious devotees for mountain tops and desert places may not be merely a desire to get away from the distractions of the social world, but a movement to a place where experiences of enhanced depth are possible.



Altered States of Consciousness

Charles Tart, ed.
1969; 575 pp.

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WHOLE EARTH CATALOG

The most coherent and articulate sentence which came was this:

There are no differences but differences of degree between different degrees of difference and no difference.

1. The first three to five hours are usually individual, to try to relax and let go.
2. Spouses' problems; usually we like spouses separate for first group treatments. If both are present, it is better if you start in different areas, but if you both want to be together, okay.
3. Don't be surprised at anything you may see the therapist doing—he knows what he is doing.
4. A person who is having trouble breaking through needs something to resist against—the therapist may hand wrestle, or be on top and have three to six others on top as well. The person then can exert all his strength to break loose.
5. Anytime you are in trouble, don't hesitate to ask for help.
6. As people make break-through you'll hear laughing, crying, screaming. Don't worry about it, or get concerned.
7. Nothing is expected of you, don't expect anything of yourself—most people have a glorious trip.
8. Try to avoid impressing anybody—you'll have a better trip.
9. Around three to four hours after beginning, a stimulant will be brought around to keep your energy level up.
10. Anytime you want to stop the trip, take some niacin, 500 to 1000 mgm at a time. Niacin is good for bad re-entry, will make it easier.
11. During the experience, if you want to come together, touch the other person or ask him. He may shake his head 'no,' or else turn and touch you. Don't have hurt feelings, or guilt if they don't want to be with you, be free to be yourselves.

The change that then came over Bill was dramatic. He began mumbling typical induction suggestions about relaxing, but over the course of a few minutes his voice became dramatic and forceful. He suggested that Anne see a diamond in her hand and concentrate on it and then almost immediately suggested that it would disappear and her mind would go blank. Then he very forcefully suggested physical relaxation as he counted her into hypnosis: when he reached 20 his whole manner changed and became relaxed and soothing. Anne reported a depth of 22.

Bill then began talking about a 'hallucinatory' journey that he and Anne were on together. His voice was confident, smooth, relaxed, and completely convincing that he was describing actual events that were happening rather than anything 'unreal.' They were standing on a mountain slope, in front of the entrance to a tunnel. They walked hand-in-hand down this tunnel, with the explicit suggestion by Bill that they would be going deeper into hypnosis as they walked deeper into the dark tunnel. It was quiet in the tunnel, all outside noises had vanished, and an ineffable feeling of pleasantness and significance pervaded the tunnel. Anne reported a depth of 35 after a few minutes of this, and Bill continued describing their walk down the tunnel.

The tunnel was absolutely real to Anne and Bill (and to Carol), as real as any experience in life. Although it was dark they could 'see' its walls in a strange way: Anne said it felt as if she had a 'light' coming out from under her eyebrows, and "...it wasn't illuminating anything. I was seeing, yet it helped me to know that things were there without seeing them." Both Ss reported feeling the texture of the rock walls, which ranged from soft and slippery at places where it seemed moss-covered to quite hard where the bare rock was exposed.

Anne and Carol were intensely curious as to what lay at the end of the tunnel, the end that Bill would not let them reach. This resulted in an interesting aftermath. About a month after this session, Anne was a subject in a group hypnosis test. As she knew what the induction procedure was, she decided to 'go' back to the tunnel and explore it as soon as she was hypnotized but before the suggestibility test items were administered. She found herself running along the tunnel, hurrying to reach the end before the test items. At the end of the tunnel she found a cave, blazing with brilliant white light, and occupied by an old man of angelic appearance. The room was filled with music from an unseen source. Anne repeatedly asked him what this experience meant: he ignored her at first, and finally told her, very sternly, that he could not answer her question because Bill was not with her. Anne then found herself back at the group hypnosis testing.

I asked the Ss about their perceived bodies during the experience and found that they were curiously disembodied much of the time. They mentioned having heads or faces but no bodies at times, and Anne reported that they walked through each other sometimes. When Bill commanded Anne to give him her hand so he could lead her back, Anne reported that she had to "crawl back into my body, sort of. It was almost as if we were moving around with just heads. When Bill said give him my hand, I had to kind of conjure up a hand."

It also came out in conversations some weeks later that this passing through each other was also accompanied by a sense of merging identities, of a partial blending of themselves quite beyond the degree of contact human beings expect to share with others.

Anne and Bill read the transcripts over and were both shocked. They had been talking about their experiences to each other for some time, and found they had been discussing details of the experiences they had shared for which there were no verbal stimuli on the tapes, i.e. they felt they must have been communicating telepathically or that they had actually been 'in' the nonworldly locales they had experienced. This was frightening to both Ss, for what had seemed a lovely shared fantasy now threatened to be something real.

Sense Relaxation

Becoming comfortable with touch requires patience and awareness. Experience what your attitudes are, how you touch, what your feelings are. Slowly, if you desire, you can change these reactions and allow yourself to enjoy touching not only others, but the floor, yourself, paper, food, trees, animals, flowers, life.



This is a book which is an experience while it teaches you how to have additional experiences. It is a combination of simple straight forward how-to-do-it prose broken by puns (to slow down your reading) plus sensual photographs of every exercise. Your first time through this book you will only glance at the words; the pictures are so compelling. The second and third times through you will read individual sections to find out what the pictures suggest. Finally you will begin to use this book to add touch, relaxation and pleasure to your life. This book gives very specific and easily followed exercises for individuals, couples, and groups to tune in to their own bodies and to all their senses. Gunther gives suggestions and techniques to energize, to tranquilize, and above all to increase awareness. It is a beautifully designed and executed book.

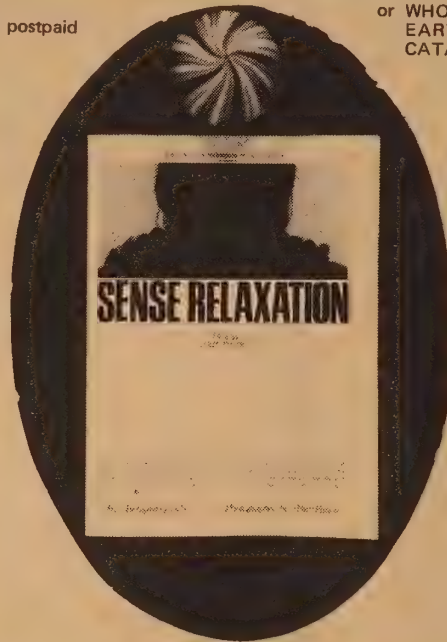
[Reviewed by James Fadiman]

Sense Relaxation — Below Your Mind
Bernard Gunther, photographed by Paul Fusco
1968: 191 pp.

from:
Collier Books
866 Third Avenue
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or **WHOLE EARTH CATALOG**

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Here's an unusual freebie: a mail library of magical books. The catalog lists 1600 titles from 'ABC of Jung's Psychology' to 'Zoroastrianism: The Religion of The Good Life.' You can borrow two books at a time for a month. Lucis is a nice service that subsists on contributions; it probably is fragile to exploitive use.

[Suggested by Gerald Thatcher]

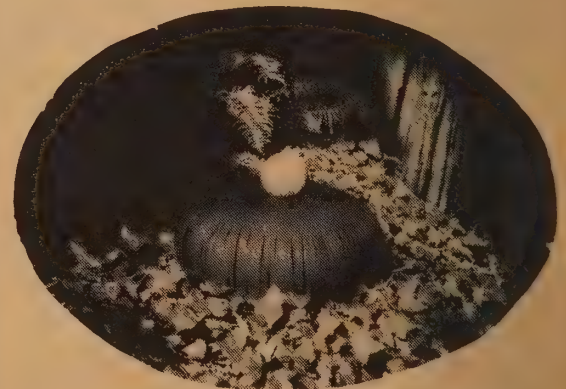
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Self-Hypnosis

A guy from Stanford named Bob Lochridge came into the Truck Store, saw Lecron's *Self Hypnotism* and said that it was sure enough a good book about self hypnotism, but for technique we'd be better off with Sparks' *Self-Hypnosis*. So we are.

[Suggested by Bob Lochridge.]

Pre-Trance Instructions

While in a comfortable place and with eyes fixed straight ahead:

1. Think of the time you wish to 'wake up.'
2. Formulate your suggestion.

Trance-Induction Procedure

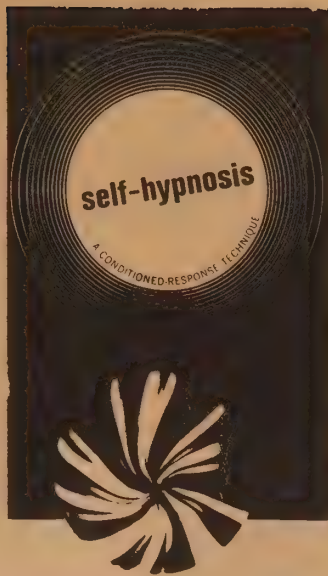
3. Imagine '1000-1', the symbol for evoking tiredness of the eyelids.
4. Imagine '1000-2', the symbol for evoking eye-closure.
5. Imagine '1000-3', the symbol for relaxation.
6. Imagine '1000-4', the symbol for emotional tranquillity.
7. Imagine '1000-5', the symbol denoting 'hyper-suggestibility'.
8. Imagine a circle enclosing an 'X', then carefully, erase the 'X'.

Deepening Procedure

9. Imagine, one by one, the letters of the alphabet, as if writing 'A' in the circle, then erasing it, etc.

Hypnosis is a marvelous means of effecting and maintaining a painfree and symptom-free state of being, but the fact that it must never be used for this purpose until the exact causes of the symptoms are determined cannot be overemphasized.

Once the causes are clearly understood there are a number of different procedures that may be used. These may be classified in a general way as suggestions for: well-being, anesthesia, analgesia, dissociation, and symptom-substitution.



Self-Hypnosis

Lawrence Sparks
1962; 254 pp.

\$2.00 postpaid

from
Wilshire Book Company
8721 Sunset Blvd.
Hollywood, CA 90069
or
WHOLE EARTH CATALOG

Whatever may be your purpose in developing self-hypnosis, you must put that purpose to one side temporarily and keep it separate from the development process itself! Think of self-hypnosis as a tool that you can use in various ways after you have developed it, but in order to use it you must first create it. You will find it far easier to develop this tool with suggestions that are 'neutral' than with those that are more emotionally meaningful, because the very significance of your major purpose would be inhibitive to your progress. This cannot be over-emphasized.

"We are now going to assume that you are at the stage of 1000-5 and that we have made the suggestion that your right hand is going to move up toward your face, and when your fingers touch your face you will go deeper than ever before. While you are very deep I will go over the pattern again, and from then on you will be able to put yourself into a deep trance whenever it is safe for you to do so. You will be able to go deep any time you wish. Quickly and easily as long as it is safe. Deeper each time.

"I want you to think about your right hand now. Notice how it feels. Everyone has sensations going on in his hands continuously, but usually we don't notice these sensations. We have no need to notice them. Now, I want you to notice your right hand. Think about how it feels. Think about whether it feels warm or cool. Think about whether it feels light or heavy. Notice whether or not you can feel the pulse beating in your hand or fingers. In a little while, perhaps already, there will be a sensation of lightness in your hand and arm. Your hand will keep getting lighter and lighter and it will be drawn up to your face. When your fingers gently touch your face you will go very deep. Deeper each time. Deeper than before.

"Keep thinking about your hand. Your fingers may have a tendency to twitch or move a little. This just means you are going deeper. This is what we want. Now I want you to think of your hand being a little bit higher than it is. Picture your hand a little bit higher and, as you do, it becomes that way. Now picture yourself writing the word 'lighter' on a blackboard. Each time you write the word 'lighter' your hand moves up higher, a little higher each time. It keeps moving higher and higher with each breath. Picture the image of your hand a little higher alternately with writing the word 'lighter' on the blackboard. Each time you do, subconscious impulses make your hand and arm lighter, and they keep moving up. Moving up. Higher and higher."

After she achieved a self-induced trance, I explained to her that she would see a movie that she had seen years ago, that it would be very clear and vivid and that she would see it upon a signal of snapping my fingers. I made a mistake, which had to do with the realization that I had neglected to give her certain instructions, and inadvertently snapped my fingers before explaining to her about the second signal. I imagine my surprise when she immediately woke up! I felt rather provoked with myself until I noticed her amazed expression, and she said, "Why, that's the most interesting thing that ever happened to me!"

"What happened?" I asked, not knowing quite what to expect.

"I just saw *Gone With the Wind*," she replied, laughing.

"How much of it did you see?"

"I saw the whole thing from beginning to end. It was even better than I remembered."

While I was still trying to figure out what had happened, she was telling me at great length about the picture. I found it hard to believe that she had really seen the whole picture, or even a small part of it, in such a short instant of time. But she convinced me by describing every detail of the opening scenes and dialogue, and continuing with vivid word-for-word reproduction as if she had just come from the theatre. Better, in fact, than if she had. It was clear that she had experienced imagery of the most vivid kind imaginable of a two-and-one-half hour picture in the time it took to snap my fingers—not between two signals; just during one snap!

Psycho-cybernetics

This strange and gaudy volume will probably turn you off if you associate wisdom with subdued writing or humble exposition. However, if you can overcome your initial resistance to the high-pressure, breezy style and the sometimes excessive claims, it will be worth the effort. Dr. Maltz has outlined perhaps the easiest program of personality development and modification in print. It is easy because it contains nothing but the suggested exercises and the understanding that the motivation to change is still the most powerful tool.

This is not a book to read. It is a kit of tools to use in gaining control of your nature for whatever ends you desire. The author has made it clear that there is no virtue in being obscure or even in being poetic if it detracts from getting the reader off his ass and doing something about himself.

There is an assumption of a higher self or a core to one's being which tends toward realization or whatever term you prefer but understanding of this inner nature is not vital to using the book.

Psycho-cybernetics

Maxwell Maltz, M.D.
1960; 256 pp.

\$1.00 postpaid

from:
Essandess Special Editions
Simon & Schuster
630 Fifth Avenue
New York, N.Y. 10020
or
WHOLE EARTH CATALOG

What we need to understand is that these habits, unlike addictions, can be modified, changed, or reversed, simply by taking the trouble to make a conscious decision—and then by practicing or "acting out" the new response or behavior.

Simple? Yes. But each of the above habitual ways of acting, feeling, thinking does have beneficial and constructive influence on your self-image. Act them out for 21 days. 'Experience' them and see if worry, guilt, hostility have not been diminished and if confidence has not been increased

So, why not give yourself a face lift? Your do-it-yourself kit consists of relaxation of negative tensions to prevent scars, therapeutic forgiveness to remove old scars, providing yourself with a tough (not a hard) epidermis instead of a shell, creative living, a willingness to be a little vulnerable, and a nostalgia for the future instead of the past.

If the above puts you off then this is not the book for your use. If this totally western way of dealing with yourself interests you, this book is far better than most of the other pop-enlightenment books around.

[Suggested and reviewed by James Fadiman]

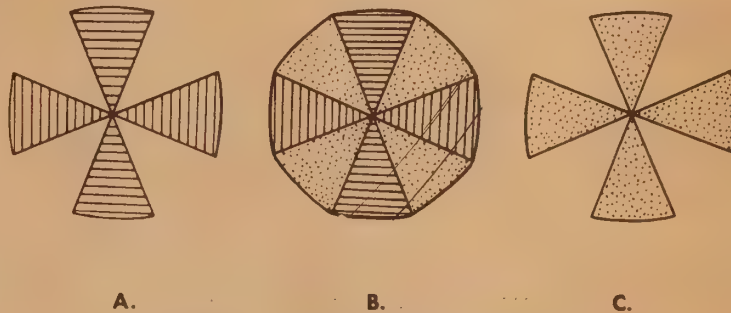


Figure 2. Ambiguous stimulus patterns.

An example of a structured pattern designed to purposely effect perceptual changes is shown above in figure 2.

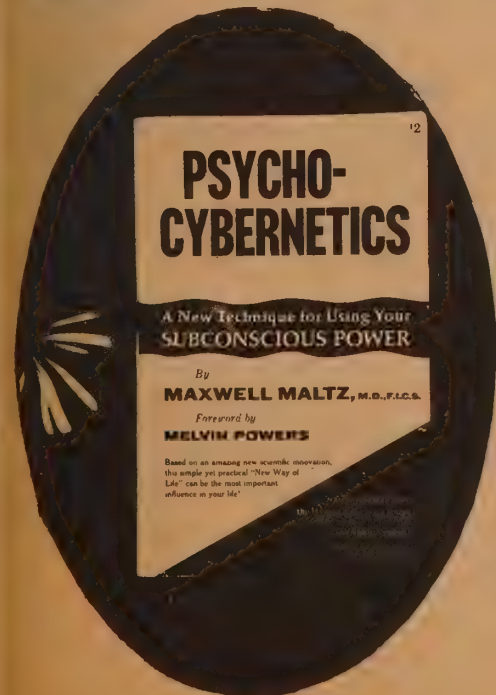
Your perceptual reaction to the patterns shown in figure 2 can be predicted. If you will first stare for thirty seconds or so at pattern 'A' and then look at pattern 'B', you will see pattern 'A' as if it were against a background of crossed lines. But as you continue to look, pattern 'A' will become the background and the crossed-line pattern will become itself no matter how hard you try to keep it from doing so. If you will then stare at pattern 'C' for thirty seconds or so you will find, upon looking at 'B', that pattern 'C' is first perceived as the figure, but again, the changes will take place automatically.

Your automatic mechanism, or what the Freudians call the 'unconscious,' is absolutely impersonal. It operates as a machine and has no 'will' of its own. It always tries to react appropriately to your current beliefs and interpretations concerning environment. It always seeks to give you appropriate feelings, and to accomplish the goals which you consciously determine upon. It works only upon the data which you feed it in the form of ideas, beliefs, interpretations, opinions.

Inner disturbance, or the opposite of tranquility, is nearly always caused by over-response, a too sensitive 'alarm reaction.' You create a built-in tranquilizer, or psychic screen between yourself and the disturbing stimulus, when you practice "not responding"—letting the telephone ring.

You cure old habits of over-response, you extinguish old conditioned reflexes, when you practice delaying the habitual, automatic, and unthinking response.

You may have never been formally hypnotized. But if you have accepted an idea—from yourself, your teachers, your parents, friends, advertisements—or from any other source, and further, if you are firmly convinced that idea is true, it has the same power over you as the hypnotist's words have over the hypnotized subject.



A Yaqui Way of Knowledge

This book records the experiences of an anthropology student who becomes the apprentice of don Juan, a Yaqui indian "man of knowledge" who is also a "diablero", a black sorcerer. It is a profoundly disturbing book since it opens up areas and ideas we usually dismiss or deny. Don Juan, over a period of five years, teaches the author a little of his knowledge. He teaches through giving his apprentice various psycho-active plants: peyote, datura, and a mixture of psilocybin mushrooms, genista canariensis, and other plants. Each of these plants has its own way of teaching, its own demands and its own kind of power. For those of us who thought we understood psychedelic effects this book reveals the rudimentary state of our knowledge. For those of us who have dismissed magic as a combination of hypnotism and stage effects we are confronted with powerful and effective magic which seems irrefutable.

Don Juan himself appears as a powerful, indecipherable, wise man whose knowledge is both extensive and alien to our own. He offers to each of us the possibility of dealing with other realities, but he makes it clear that all these ways are dangerous, difficult and once entered, cannot be put aside as simply another experience.

The goal of his teaching is partially expressed as follows:

The particular thing to learn is how to get to the crack between the worlds and how to enter the other world. There is a crack between the two worlds, the world of the diablos and the world of living men. There is a place where these two worlds overlap. The crack is there. It opens and closes like a door in the wind. To get there a man must exercise his will. He must, I should say, develop an indomitable desire for it, a single-minded dedication. But he must do it without the help of any power or any man..."

Not a book to be read for pleasure, a book which will effect you more than you may wish to be effected.

[Reviewed by James Fadiman]

(Why not read it for pleasure? It's frontier Boswell and Johnson. —SB)

"Don't get me wrong, Don Juan," I protested. "I want to have an ally, but I also want to know everything I can. You yourself have said that knowledge is power."
"No!" he said emphatically. "Power rests on the kind of knowledge one holds. What is the sense of knowing things that are useless?"

He looked at me for a long time and laughed. He said that learning through conversation was not only a waste, but stupidity, because learning was the most difficult task a man could undertake. He asked me to remember the time I had tried to find my spot, and how I wanted to find it without doing any work because I had expected him to hand out all the information. If he had done so, he said, I would never have learned. But, knowing how difficult it was to find my spot and, above all, knowing that it existed, would give me a unique sense of confidence. He said that while I remained rooted to my "good spot" nothing could cause me bodily harm, because I had the assurance that at that particular spot I was at my very best. I had the power to shove off anything that might be harmful to me. If, however, he had told me where it was, I would never have had the confidence needed to claim it as true knowledge. Thus, knowledge was indeed power.



Once a man has vanquished fear, he is free from it for the rest of his life because instead of fear, he has acquired clarity of mind which erases fear. By then a man knows his desires; he knows how to satisfy those desires. He can anticipate the new steps of learning, and a sharp clarity surrounds everything. The man feels that nothing is concealed.

And thus he has encountered his second enemy: Clarity! That clarity of mind, which is so hard to obtain, dispels fear, but also blinds.

"I say it is useless to waste your life on one path, especially if that path has no heart."

"But how do you know when a path has no heart, Don Juan?"

"Before you embark on it you ask the question Does this path have a heart? If the answer is no, you will know it, and then you must choose another path."

"But how will I know for sure whether a Path has a heart or not?"
"Anybody would know that. The trouble is nobody asks the question; and when a man finally realizes that he has taken a path without a heart the path is ready to kill him. At that point very few men can stop to deliberate, and leave the path."

"How should I proceed to ask the question properly, don Juan?"

"Just ask it."

"I mean, is there a proper method, so I would not lie to myself and believe the answer is yes when it really is no?"

"Why would you lie?"

"Perhaps because at the moment the path is pleasant and enjoyable."

"That is nonsense. A path without a heart is never enjoyable. You have to work hard even to take it. On the other hand, a path with heart is easy; it does not make you work at liking it."

You have the vanity to believe you live in two worlds, but that is only your vanity. There is but one single world for us. We are men, and must follow the world of men contentedly.

"But is this business of the dog and me pissing on each other true?"

"It was not a dog! How many times do I have to tell you that? This is the only way to understand it. It's the only way! It was 'he' who played with you."

"Let's put it another way, Don Juan. What I meant to say is that if I had tied myself to a rock with a heavy chain I would have flown just the same, because my body had nothing to do with my flying." Don looked at me incredulously. "If you tie yourself to a rock," he said, "I'm afraid you will have to fly holding the rock with its heavy chain."

The Teachings of Don Juan: A Yaqui Way of Knowledge

Carlos Castaneda
1968; 276 pp.

\$0.95 postpaid (a buy)

or WHOLE EARTH CATALOG

from
Ballantine Books
Simon and Schuster, Inc.
630 Fifth Avenue
New York, NY 10020

Fundamentals of Yoga

Mishra has practised as general physician, surgeon and endocrinologist in India and the West and has a thorough knowledge of Western medicine as well as yoga. This makes his book invaluable to the student desiring a detailed scientific understanding of yogic theory and methods. The book contains several interesting diagrams of physical systems and psycho-physical planes of consciousness.

Being a practising teacher of yoga, Mishra writes in a forthright direct style and gives, in each chapter, exercises arranged in numbered steps, to practice the methods described. The physical, or hatha yoga methods are described in some detail, though still only as preparatory to the other meditative types of exercises. Methods not usually described in other works on yoga—such as *tratakam* (concentrated gazing) and *nadam* (tuning in to inner sound-vibration) are also taught and given extensive treatment. There are chapters on "Techniques to Magnetize the Body", "Group Relaxation and Group Magnetism", "Postoperative and Post-meditative Suggestion", "Anesthesia Produced by Yoga", "Heal Yourself by Your Own Hormones and Tranquillizers", et al.

One might find fault with the book's somewhat excessive load of Hindu terminology, much of which is redundant, and of more interest to students of Indian culture than to practitioners.

This is probably the best book for those professionals and laymen who want to apply yogic techniques in physical and psycho-therapy both for themselves and others.

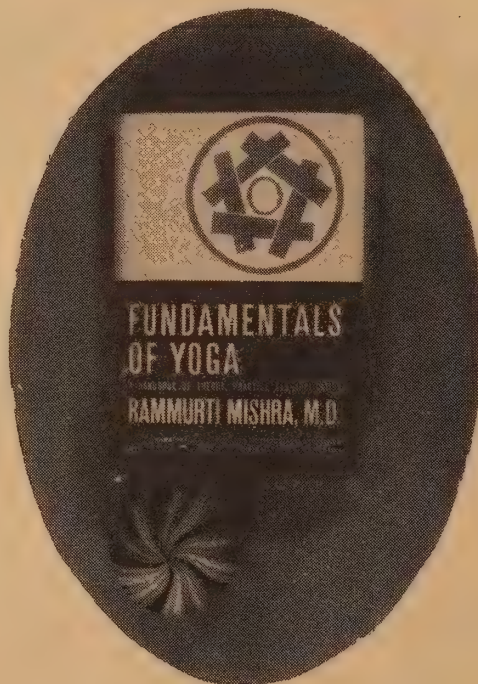
[Suggested and Reviewed by Ralph Metzner]

Fundamentals of Yoga

Rammurti Mishra
1959; 255 pp.

\$1.25 from
Lancer Books
1560 Broadway
New York, N.Y. 10036

or WHOLE EARTH CATALOG



"Now you are in your native land. Now you do not know where your body is. The entire universe is in you and you are in the entire universe. Innumerable suns, stars, and planets are moving in you. Feel it, enjoy your real life." Complete silence.

1. Adopt an easy posture.
2. Relax your entire body.
3. Feel your heart pumping in the chest.
4. Hold your breath.
5. In a moment you will feel that heart rate and vigor of beat are increased.
6. With every heartbeat, the heart is sending energy to every part of the body. Feel it.
7. With increased heart rate and beat, energy is changed into electromagnetic pulsation and the entire body is filled with it. Feel it.
8. The entire is now magnetized, and the spiritual heart and spiritual consciousness are fully manifested in you. Feel them.
9. The whole body becomes the heart of the universe, and you feel that the entire body is pulsating as a single heart.
10. Gradually you forget the feelings of the physical body and you identify yourself completely with supreme consciousness.
11. Now you know that your consciousness is never a product of the body, but is manifested in the body.
12. Feel that your body is one point of manifestation of consciousness, but really you are everywhere.

There are innumerable varieties of *nadam*, but they will be impractical for beginners. The following ten are the most useful and frequent:

1. Cin *nadam*: Like the hum of the honey-intoxicated bees; idling engine vibration; rainfall; whistling sounds; high frequency sound.
2. Cin-in *nadam*: Waterfall, roaring of an ocean.
3. Ghanta *nadam*: Sound of a bell ringing.
4. Sankha *nadam*: Sound of a conch shell.
5. Tantri *vina*: Nasal sound, humming sound like that of a wire string instrument.
6. Tala *nadam*: Sound of a small tight drum.
7. Venu *nadam*: Sound of a flute.
8. Mridanga: Sound of a big bass drum.
9. Bheri *nadam*: Echoing sound.
10. Megha *nadam*: Roll of distant thunder.



The Act of Creation

Koestler takes his notion of bisociation to be the root of humor, discovery, and art. I take it to be one of the roots of learning, subject to applications of method (on yourself or whomever).

Koestler is a scientist of some reputation by now. He's made contributions beyond the work of others that he's generalized from. This is the book that gave him the reputation.

There are two ways of escaping our more or less automatized routines of thinking and behaving. The first, of course, is the plunge into dreaming or dream-like states, when the codes of rational thinking are suspended. The other way is also an escape—from boredom, stagnation, intellectual predicaments, and emotional frustration—but an escape in the opposite direction; it is signaled by the spontaneous flash of insight which shows a familiar situation or event in a new light, and elicits a new response to it. The bisociative act connects previously unconnected matrices of experience; it makes us 'understand what it is to be awake, to be living on several planes at once' (to quote T.S. Eliot, somewhat out of context).

The first way of escape is a regression to earlier, more primitive levels of ideation, exemplified in the language of the dream; the second an ascent to a new, more complex level of mental evolution. Though seemingly opposed, the two processes will turn out to be intimately related.

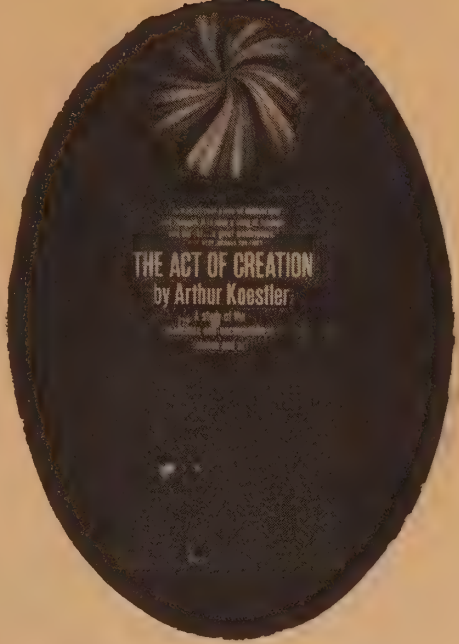
When two independent matrices of perception or reasoning interact with each other the result (as I hope to show) is either a collision ending in laughter, or their fusion in a new intellectual synthesis, or their confrontation in an aesthetic experience. The bisociative patterns found in any domain of creative activity are tri-valent: that is to say, the same pair of matrices can produce comic, tragic, or intellectually challenging effects.

The re-structuring of mental organization effected by the new discovery implies that the creative act has a revolutionary or destructive side. The path of history is strewn with its victims: the discarded isms of art, the epicycles and phlogistons of science.

Associative skills, on the other hand, even of the sophisticated kind which require a high degree of concentration, do not display the above features. Their biological equivalents are the activities of the organism while in a state of dynamic equilibrium with the environment—as distinct from the more spectacular manifestations of its regenerative potentials. The skills of reasoning rely on habit, governed by well-established rules of the game; the 'reasonable person'—used as a standard norm in English common law—is level-headed instead of multi-level-headed; adaptive and not destructive; an enlightened conservative, not a revolutionary; willing to learn under proper guidance, but unable to be guided by his dreams.

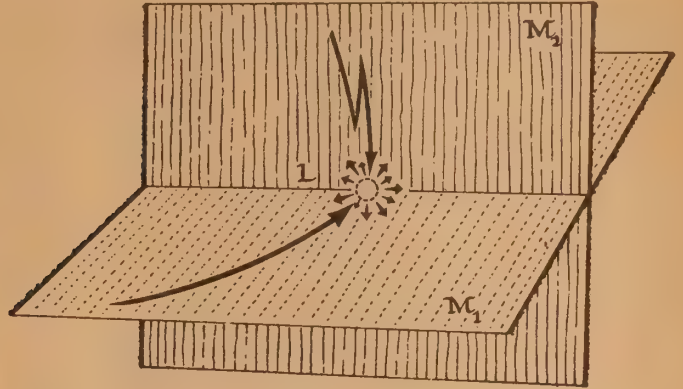
The main distinguishing features of associative and bisociative thought may now be summed up, somewhat brutally, as follows:

Habit	Originality
Association within the confines of a given matrix	Bisociation of independent matrices
Guidance by pre-conscious or extra-conscious processes	Guidance by sub-conscious processes normally under restraint
Dynamic equilibrium	Activation of regenerative potentials
Rigid to flexible variations on a theme	Super-flexibility (reculer pour mieux sauter)
Repetitiveness	Novelty
Conservative	Destructive-Constructive



The Act of Creation
 Arthur Koestler
 1964; 750 pp.
\$1.25 postpaid
 from:
 Dell Publishing Company, Inc.
 750 Third Avenue
 New York, N.Y. 10017
 or
 WHOLE EARTH CATALOG

I have coined the term 'bisociation' in order to make a distinction between the routine skills of thinking on a single 'plane', as it were, and the creative act, which, as I shall try to show, always operates on



more than one plane. The former may be called single-minded, the latter a double-minded, transitory state of unstable equilibrium where the balance of both emotion and thought is disturbed.

Everybody can ride a bicycle, but nobody knows how it is done. Not even engineers and bicycle manufacturers know the formula for the correct method of counteracting the tendency to fall by turning the handlebars so that 'for a given angle of unbalance the curvature of each winding is inversely proportional to the square of the speed at which the cyclist is proceeding'. The cyclist obeys a code of rules which is specifiable, but which he cannot specify; he could write on his number-plate Pascal's motto: 'Le cœur a ses raisons que la raison ne connaît point.' Or, to put it in a more abstract way:

The controls of a skilled activity generally function below the level of consciousness on which that activity takes place. The code is a hidden persuader.

This applies not only to our visceral activities and muscular skills, but also to the skill of perceiving the world around us in a coherent and meaningful manner. Hold your left hand six inches, the other twelve inches, away from your eyes; they will look about the same size, although the retinal image of the left is twice the size of the right. Trace the contours of your face with a soapy finger on the bathroom mirror (it is easily done by closing one eye). There is a shock waiting: the image which looked life-size has shrunk to half-size, like a squashed oval shape. Seeing is believing, as the saying goes, but the reverse is also true: knowing is seeing. 'Even the most elementary perceptions,' wrote Bartlett, 'have the character of inferential constructions.' But the inferential process, which controls perception, again works unconsciously. Seeing is a skill, part innate, part acquired in early infancy. The selective codes in this case operate on the input, not on the output. The stimuli impinging on the senses provide only the raw material of our conscious experience—the 'booming, buzzing confusion' of William James; before reaching awareness the input is filtered, processed, distorted, interpreted, and reorganized in a series of relay-stations at various levels of the nervous system; but the processing itself is not experienced by the person, and the rules of the game according to which the controls work are unknown to him.

The I Ching

The I Ching, the Book of Changes, is a brilliant problem-solving device. A problem (or ignorance) generally consists of being caught in local cyclic thinking. To consult the oracle, the wisdom of chance (or synchronicity, no matter), is to step out of the cycle of no-change and address a specific story on the nature of change. You now have an alternative set of solutions that owe nothing but proximity to your problem. You make the associations, you find the way out. It's prayer.

I can't think of a more important and useful book than this one. It's famously ancient, poetic, deep, esoteric, simple, involving. It has been the most influential book on American art and artists in the last 15 years.

Most people know about it. We've included it here to point at the new smaller (unabridged) cheaper Princeton University Press version of the classic Wilhelm-Baynes Bollingen edition. The oracle method is still on page 721.

33. Tun / Retreat above CH'EN The Creative, Heaven
 below KEN Keeping Still, Mountain

The power of the dark is ascending. The light retreats to security, so that the dark cannot encroach upon it. This retreat is a matter not of man's will but of natural law. Therefore in this case withdrawal is proper; it is the correct way to behave in order not to exhaust one's forces.

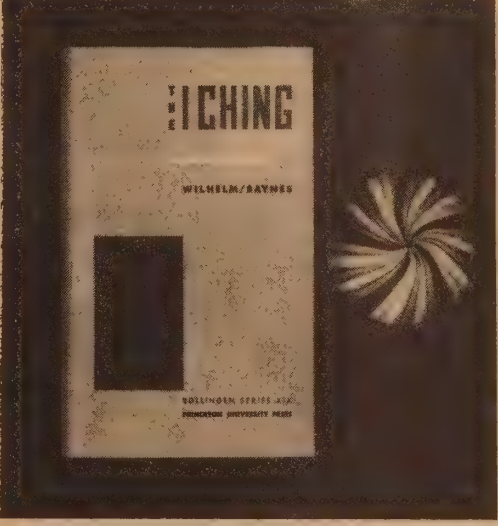
In the calendar this hexagram is linked with the sixth month (July-August), in which the forces of winter are already showing their influence.

THE JUDGMENT
 RETREAT. Success.
 In what is small, perseverance furthers.

Conditions are such that the hostile forces favored by the time are advancing. In this case retreat is the right course, and it is through retreat that success is achieved. But success consists in being able to carry out the retreat correctly. Retreat is not to be confused with flight. Flight means saving oneself under any circumstances, whereas retreat is a sign of strength. We must be careful not to miss the right moment while we are in full possession of power and position. Then we shall be able to interpret the signs of the time before it is too late and to prepare for provisional retreat instead of being drawn into a desperate life-and-death struggle. Thus we do not simply abandon the field to the opponent; we make it difficult for him to advance by showing perseverance in single acts of resistance. In this way we prepare, while retreating, for the counter-movement. Understanding the laws of a constructive retreat of this sort is not easy. The meaning that lies hidden in such a time is important.

THE IMAGE
 Mountain under heaven: the image of RETREAT.
 Thus the superior man keeps the inferior man at a distance,
 Not angrily but with reserve.

The mountain rises up under heaven, but owing to its nature it finally comes to a stop. Heaven on the other hand retreats upward before it into the distance and remains out of reach. This symbolizes the behavior of the superior man toward a climbing inferior; he retreats into his own thoughts as the inferior man comes forward. He does not hate him, for hatred is a form of subjective involvement by which we are bound to the hated object. The superior man shows strength (heaven) in that he brings the inferior man to a standstill (mountain) by his dignified reserve.



The I Ching
 Translated by Richard Wilhelm, Cary F. Baynes
 7 B.C.; 740 pp.

\$6.00 postpaid
 from:
 Princeton University Press
 Princeton, New Jersey 08540
 or
 WHOLE EARTH CATALOG

or
\$5.25 postpaid
 from
 Shambala Booksellers
 2482 Telegraph
 Berkeley, CA 94704



Advertisements

The CATALOG takes ads not primarily for revenue, but to give suppliers a place to have their own say about their product. How they do promotion is of interest to the prospective buyer, and the buyer doesn't have to pay for the extra information.

The CATALOG accepts ads only from suppliers, manufacturers, creators of items listed in the CATALOG. (Listings change; the supplier of an item in the previous CATALOG that's dropped in the current CATALOG may still advertise in the current issue, but not in the next issue.)

Rates for ads:

full page \$200	\$75	
	\$25	\$10
		\$5

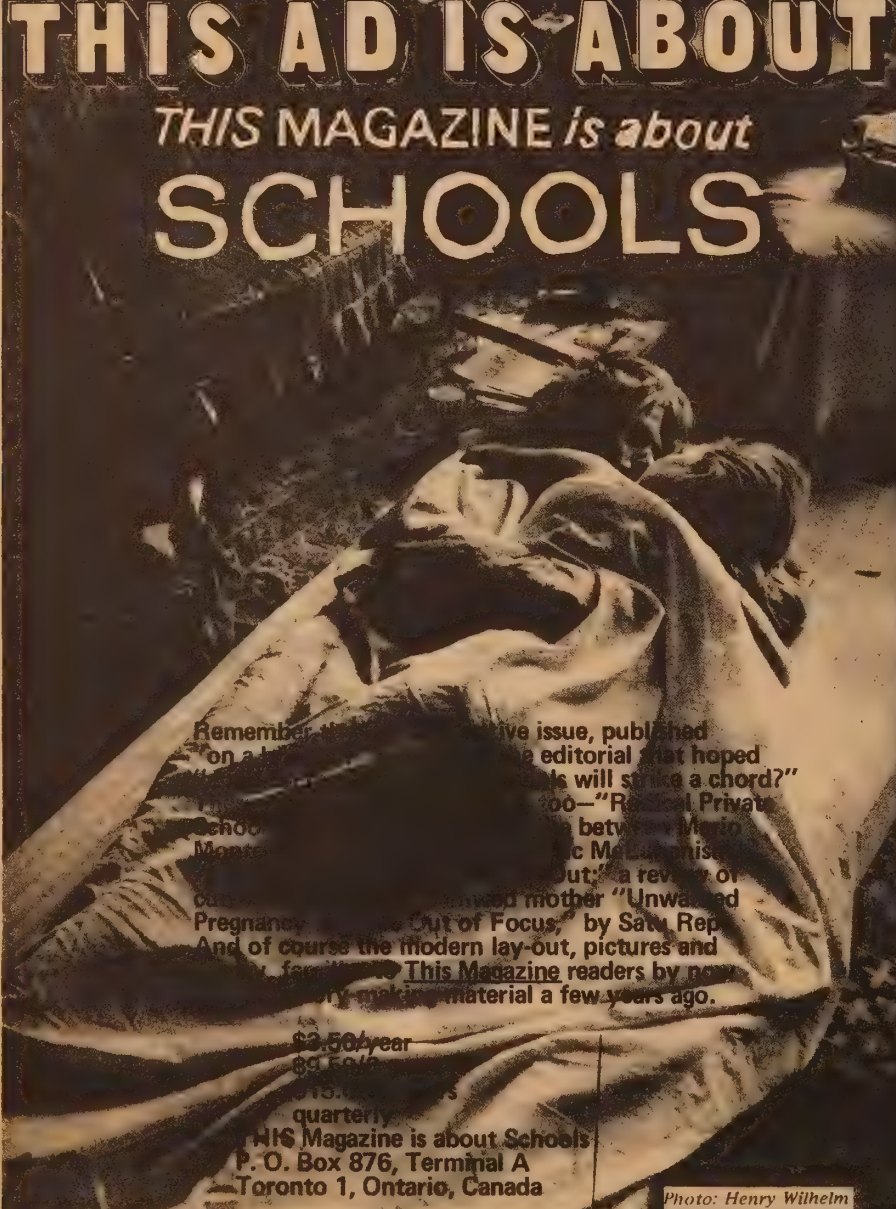
or in exchange for a CATALOG ad in a listed periodical, such as *THIS Magazine is About Schools*, below.

Copies of this Spring 69 issue of the CATALOG are being sent to all the listed item sources. We'll see what they do about it.

THIS AD IS ABOUT

THIS MAGAZINE *is about*

SCHOOLS



Remember the...ive issue, published on a... the editorial that hoped "... will strike a chord?" ... "Radical Private School" between... Mont...ic Magazine... out: a review of... mother "Unwanted Pregnancy" by Sam Rep. And of course the modern lay-out, pictures and... This Magazine readers by... making material a few years ago.

\$3.50/year
\$9.50/3
\$15.00/6
quarterly

THIS Magazine is about Schools
P. O. Box 876, Terminal A
Toronto 1, Ontario, Canada

Photo: Henry Wilhelm



**ZOMEWORKS
HUMANUFACTORY**
Box 445 CORRALES NM 87096

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5300 166 Ave

DOMES-ZOME'S SOLAR HEATING

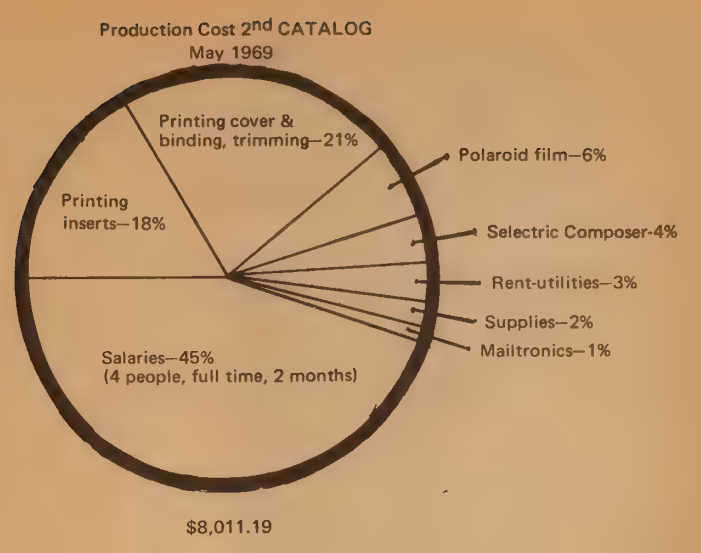
**DESIGN
FABRICATION
CONSULTING
LECTURES**

CATALOG costs

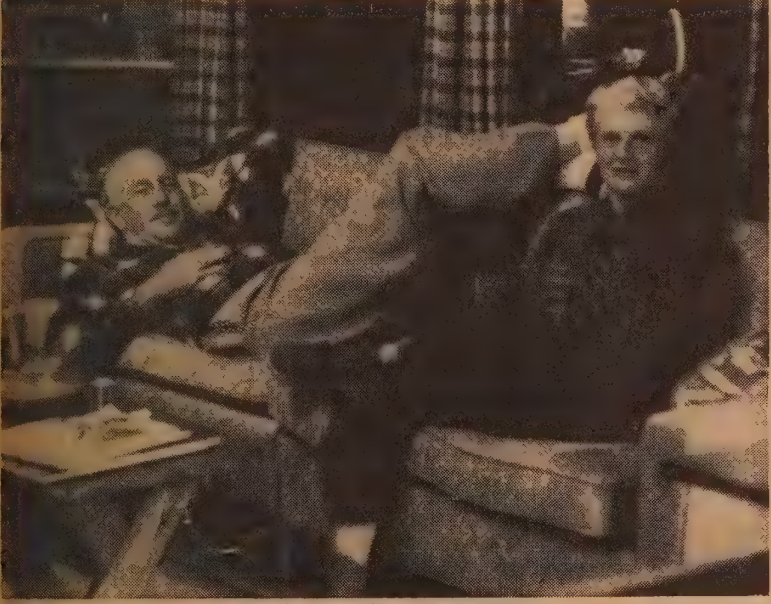
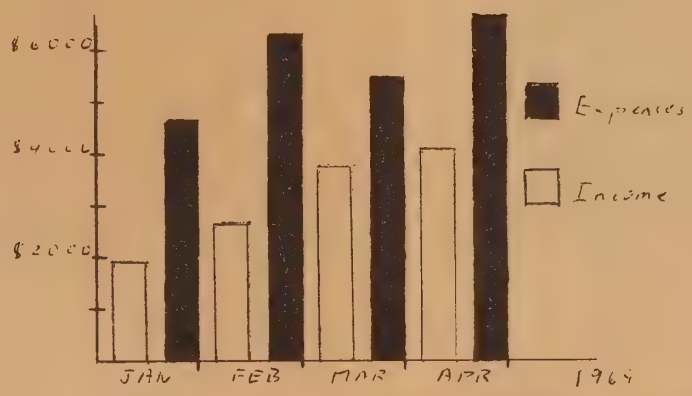
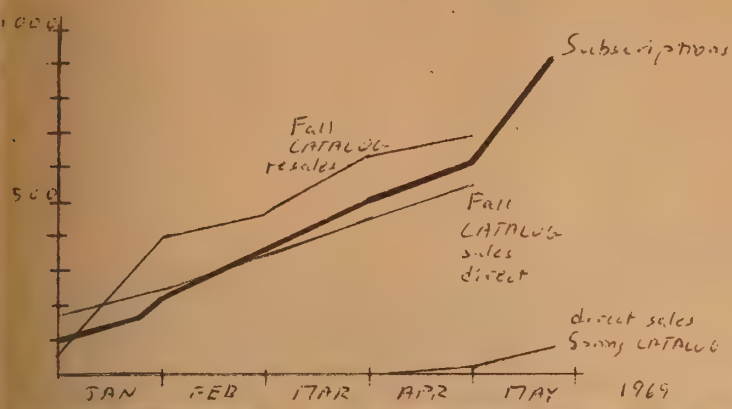
At Steve Baer's suggestion we gave some of the costs of producing the CATALOG in the March Supplement. Response to that piece was warm, especially from other people starting publications, so we're making it a custom to print what we know about our costs.

We estimate the direct cost of producing the Spring 69 CATALOG to be \$8,000, divided like so:

We printed 10,000 CATALOGs, which makes the unit cost 80 cents. We get \$2.00 a CATALOG from subscribers and distributors. If we sell them all, we'll have \$12,000 to work on the Fall CATALOG with, supposedly. Actually that money gets divided among the CATALOG, the Whole Earth Truck Store (which is excellent for research but not particularly money-making), and the past—the \$18,500 deficit we have. Since June 68 we've spent \$40,269 on CATALOG operation, and we've had income of \$21,769; the difference is \$18,500, which I've put in as loans.



The only reason for our cheerful outlook is the trends. 1969 so far:



Arthur and Julia Brand

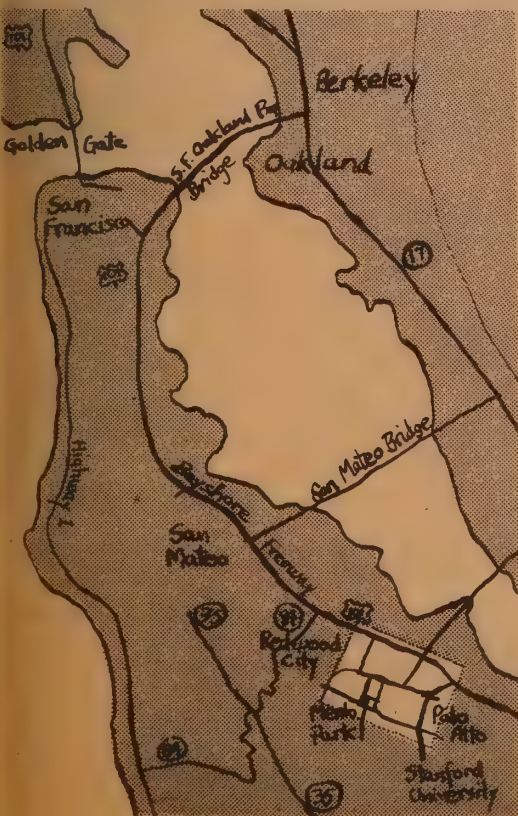
Obviously the CATALOG couldn't have happened without money and organization in front. The funds were there by grace of my parents and grandparents. The organization was there in the person of Richard Raymond, head of Portola Institute, who had immediate encouragement and basic facilities on hand when the idea first hit.

It's as Dick Alpert used to say: it's love money that underwrites this sort of venture every time. Which suggests that if foundations and governments want to do the job they say they do, they should retain the services of better lovers.



Richard Raymond and daughter Megan

Whole Earth Truck Store



A major research source of ours is the Menlo Park Whole Earth Truck Store, which stocks most of the items in the CATALOG. We see who's buying what. We hear complaints and suggestions. We try out items that might be in the next CATALOG. We have a place where friends can come and see what's happening.

Hours: Monday—Thursday, 11 am - 6 pm
Friday, 11 am - 9 pm
Saturday, 10 am - 3 pm
558 Santa Cruz, Menlo Park, CA, 94025
Phone: 415 323-0313



send to: **WHOLE EARTH CATALOG**
Portola Institute
558 Santa Cruz, Menlo Park, California 94025

_____ amount enclosed

\$4 One issue of CATALOG ___ Fall ___ Spring

\$8 One year subscription: two CATALOGs and four Supplements

US and Canada starting ___ Fall CATALOG ___ Jan Supplement ___ March Supplement

\$9 surface elsewhere;

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\$25 One year Retaining Subscription

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Visit by Truck Store

The initial fantasy behind the CATALOG was for a truck store out in the boondocks carrying tools and information among the intentional communities, schools, and so forth. The actual CATALOG took dominance gradually because it could reach more people more economically, But we couldn't shake the truck store. It was a superb excuse to flee the city and visit friends where there was dust and stars and calluses and some odd new shapes looming up.

If you're in a scene that could use a visit by the Truck Store this summer, let us know.

When this summer is best for us to come by? When shouldn't we visit?



Truck Store at ALLOY

This summer a truck driven by Mu and his family and stocked with the contents of the WHOLE EARTH CATALOG will be on the road. The intent is for the activity to be self-supporting, for sales to cover Mu's expenses. Additionally he'll be carrying gossip, rumor, lore, and other free information. He will be gathering whatever might add to the Truck Store and CATALOG's usefulness.

Where are you? Details please, map preferably. (This information will be confidential unless you specify otherwise)

Phone? _____

Mail address: _____

Who should we ask for? _____

How many are you? _____

Other scenes nearby _____

Things you especially want us to bring _____

Thank you _____

send to:
Whole Earth Truck Store
558 Santa Cruz
Menlo Park, CA 94025

Information in the **WHOLE EARTH CATALOG** aids the potential user of an item in finding the most direct access to the item at lowest possible cost. Suppliers' addresses and prices are given with listings.

The **CATALOG** accepts no commissions for the sales it inspires. Suppliers may wish purchase advertising in the **CATALOG** in which they may advertise either an item listed or their own catalog. (Inquire for rates.)

Listings in the **CATALOG** reflect the judged usefulness and relevance of an item as well as the quality of service behind it. They may reflect a price advantage offered by the supplier. However, the service of listing is not directly purchasable, and the **CATALOG** makes no charge to manufacturers or suppliers. The **CATALOG** is interested to learn from suppliers the quantity of orders received on these forms.

diz

Suppliers



Portola Institute, Inc.
558 Santa Cruz
Menlo Park, CA 94025
(415) 323-0313

Portola Institute is a non-profit tax-exempt organization fostering innovations in education. The **WHOLE EARTH CATALOG** is one program of the Institute. The **CATALOG's** function is

access to tools
for

Understanding
Whole Systems

Shelter and Land Use

Industry and Craft

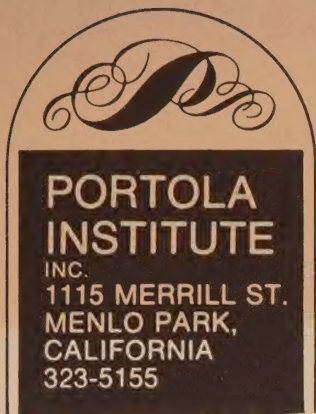
Communications

Community

Nomadics

Learning

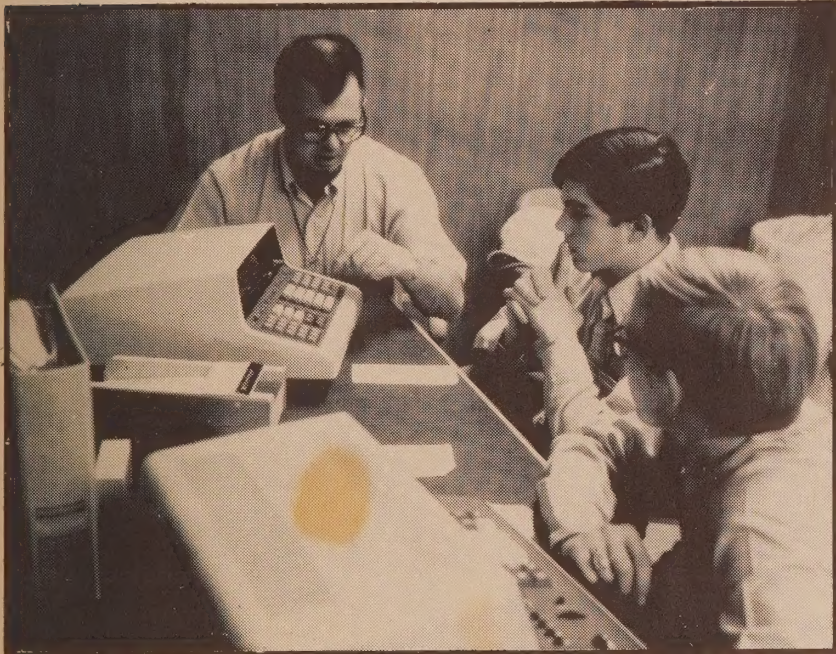
The **WHOLE EARTH CATALOG** is published in the Spring and Fall.



The cover photograph is from NASA's Apollo 8 mission. The statement is from *Energy Flow in Biology* (by Harold Morowitz, \$9.50 from Academic Press, 111 Fifth Avenue, New York, N. Y. 10003). The hand is Steve Durkee's.

The Whole Earth Catalog is one division of **PORTOLA INSTITUTE, INC.**
Other present activities of the Institute include

Computer education for all grade levels



Robert Albrecht, two members of the Computer Club, and two Commodore calculators.

Simulation games for classroom use



Dennis Dobbs, the Pacific ocean, and a class on the beach of simulation Atlantis.

Ortega Park Teachers Laboratory



Ortega Park Teachers Laboratory, one teacher, one student, and 70 acres of redwoods.

PORTOLA INSTITUTE was established in 1966 as a nonprofit corporation to encourage, organize, and conduct innovative educational projects. The Institute relies for support on private foundations and public agencies, to whom specific project proposals are submitted.

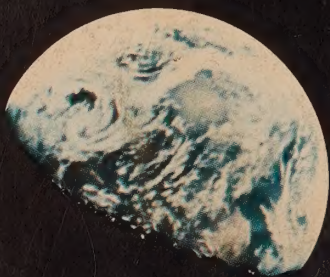
Because Portola Institute is a private organization with no need to produce profits or guarantee "success", it can experiment with new and unusual educational projects that would be difficult to administer within more structured organizations. For this reason the staff and facilities of the Institute are deliberately kept small and flexible.

Within its framework a wide variety of projects dealing with innovative education can be created as people with ideas are able to interest people with funds. New projects are always being considered, both within the existing divisions and programs, and within as yet unexplored realms of the learning experience.

Portola Institute, Inc.
1115 Merrill Street
Menlo Park, CA
94025

More information on Portola Institute, please. Especially _____

DEPT. PRICE
ITEM



*"The flow of energy
through a system
acts to organize
that system."*