

OCEAN EARTH



OCEAN EARTH was established in 1980 as a corporation and is registered in the state of New York as "Ocean Earth Construction and Development Corporation". It emerged from the OFFICES founded in 1980 by Peter Fend, Colen Fitzgibbon, Jenny Holzer, Peter Nadin, Richard Prince and Robin Winters. Artists such as Heather Jansen, Kirsten Mosher, Dennis Oppenheim, Paul Sharits, Wolfgang Staehle, Ingo Günther, Gregory Lehmann, Eve Vaterlaus, Joan Waltemath have associated with OCEAN EARTH. OCEAN EARTH's central figure has been Peter Fend.

This book is a structured presentation of all of OCEAN EARTH's projects and is the first published selection of Peter Fend's writings.

OCEAN EARTH

1980 bis heute

Herausgegeben von Peter Weibel

unter Mitwirkung von Thomas Donga, Heike Tekampe und Peter Fend

für die

Neue Galerie am Landesmuseum Joanneum · Graz

In Zusammenarbeit mit K-raum Daxer · München

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Paul Sharits, Buffalo

Während des Zeitraumes der Arbeit an diesem Buch, speziell von 1988 bis 1994, wurde Ocean Earth weltweit durch American Fine Arts Inc., New York, vertreten. Neue Verträge mit American Fine Arts und anderen Galerien in Deutschland sind in Vorbereitung.

With the exception of "SPACE FORCE / SPACE TRUST", by Taro Suzuki, Glenn Steigelman, Eve Vaterlaus, Joan Waltemath and Win Knowlton, and of a statement by George Chaikin for the Ocean Earth press conference of 3 December 1987 at the United Nations Correspondents Association (speakers being Joan Waltemath, Sante Scardillo and Peter Fend), the texts in this book have been written by the president of Ocean Earth, Peter Fend. As most of the documents have been directed towards the formation or definition of the company, they have not been published. Even now, substantially for reasons of safeguarding corporate intellectual property, most texts are sharply and in some cases near-completely reduced.

All writings, except those assigned to NEWS ROOM, are the property of Ocean Earth Construction and Development Corporation, to be credited to the Corporation.

Ocean Earth was created as an instrument for realizing the ideas generated by germinal sources such as Joseph Beuys, Robert Smithson and Gordon Matta-Clark. It was created in response to the sterile conditions for art manifest by the galleries, even those which had taken the lead in movements like Arte Povera and commissioned outdoor work. Much blockage has been experienced, chiefly from vested interests using government institutions as protection. Some of this blockage can be attributed to the work done by Ocean Earth in mass media with observation satellites, which work revealed the systematically hidden secrets of regions like Iran, the Gulf, Libya, Lebanon, the Falklands, various Soviet military bases and ecological catastrophes like the North Sea algae explosion of 1988. But probably a more serious and chronic blockage has come from the art world itself. We are grateful to get a hearing, at last in a book such as Kontext Kunst (DuMont 1994) and of course this book "Ocean Earth".

Peter Fend

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Artists and Architects who have invested in the New York Subchapter S Corporation named Ocean Earth at its Founding.

Callard, Andrea	Sanfilippo, Steve
Crary, Jonathan	Sharits, Paul
Dolson, Bill	Staeble, Wolfgang
Fend, Peter	Suzuki, Taro
Fitzgibbon, Colen & Otterness, Tom	Vaterlaus, Eve
Knowlton, Win	Waltemath, Joan

The original corporation is registered in New York State, with the name registered also in France by Peter Fend, and in Germany by Wolfgang Staeble.

Artists and Architects who, independent in their own work, have also engaged in the work of Ocean Earth Construction and Development Corporation.

Chaikin, George	image processing / computer graphics
Dolson, Bill	image processing
Ensley, Susan	television
Fend, Peter	architecture, site planning
Fitzgibbon, Colen	TV-production television
Gannon, Kevin	architecture
Günther, Ingo	television / photo / news
Horvitz, Robert	news
Jansen, Heather	installation, sculpture: Exo Wear
Kim, Jee Won	architecture
Knowlton, Win	installation
Lehmann, Gregory	photography
Nolan, Janet	installation: site simulator
Scardillo, Sante	television / photo / news
Sharits, Paul	image processing
Staeble, Wolfgang	television / photo / news
Steigelman, Glenn	photography
Suzuki, Taro	installation / television
Vaterlaus, Eve	installation / sculpture
Von Brandenburg, Peter	site analysis
Waltemath, Joan	installation / television

Contracts or Relations for OCEAN EARTH with Outsiders

Dennis Oppenheim	Sculptor, NY
Kirsten Mosher	Sculptor, NY
Heather Jansen	Sculptor, NY
Paul Sharits	Film Artist, Buffalo
Marc Lombard	Naval Architect, La Rochelle
Kevin Gannon	Architect, NY/Pittsburgh
CEP	Architecture and Planning Firm, Belgrade
ICTB	Biological Research Institute, Venice
Neue Galerie am LM Joanneum	Graz
American Fine Arts Company	NY
Galerie Anne de Villepoix	Paris
Galerie Tanja Grunert & Michael Janssen	Köln
Galerie Esther Schipper	Köln
Le Case D'Arte	Milan
Thomas Nordanstadt	NY/Stockholm
Galerie Metropol	Wien
Die Weltwoche	Zürich
SYGMA Press Agency	Paris
Sipa Press	Paris
Earth Observation Satellite Company	Lanham, MD
European Space Agency, EURIMAGE	Rome
Spot Image Corporation	Reston, VA
Spot Image SA	Toulouse
Sojuzkarta/Contitrade	NY/Moscow
Sophie Vieille (Body Ware)	Paris

Ocean Earth has worked on developing a joint partnership structure for NEWS ROOM with these three other persons, operating through respective profit-making ventures.

Chaikin, George	General Picture
Geismar, Jarg	Around The World (ATW)
Lehmann, Gregory	Media Survey

Editorial

In autumn 1984, I was appointed Professor of Video Arts and Director of the Digital Arts Laboratory of the Department of Media Study at the New York State University in Buffalo. By that time, the Department was indeed legendary. Under the auspices of its founder, Gerald O'Grady, it had in the 1970s, after all, been a fortress of both the avant garde of film making and the semi-commercial film. Among the teachers of that department were the most renowned representants of the structural film, for example Paul Sharits, Tony Conrad and Hollis Frampton, video pioneers like Steina and Woody Vasulka and documentarists like James Blue. A companion of Carl André and Frank Stella, Hollis Frampton had by the end of his life become interested in computers and constructed a Digital Art Lab in which he and his students tried to develop a computer and a new programming language. Two years before I started work in Buffalo, he died of cancer. He had worked in his lab virtually to the very day of his death. From then on, Peer Bode, the son of Harald Bode, who had in the 1950s in Germany been one of the pioneers of synthetic sound and invented a Vocoder called after him, took care of the work in that Laboratory. When I started work in the Lab myself, I found a large body of technical literature with Hollis' name in the *ex libris*, as well as an enormous collection of notes, computer prints and also a frame buffer called Golem, that had been invented by Hollis himself. It hardly worked any more and in fact turned out to be inferior in terms of function to industrially produced buffers.

Gerald O'Grady, who had heard one of my lectures and seen a presentation of my film and videographic work in Washington, contacted me and recommended that I should apply for the now vacant post of full professor with tenure track as the successor to Hollis Frampton. I regarded it a great honour to be considered as a possible successor to Hollis Frampton and it was basically because of that, that I decided to go to the USA. Together with a number of colleagues - or rather, vague friends, whom I had met during my work in the 1960s and seen repeatedly during the 1960s and 1970s at international avantgarde and underground festivals in Europe, I intended to make my contribution to the continuation of artistic and scientific work at the Institute.

Located at the Niagara River, about 20 minutes from the Niagara Falls, Buffalo is notorious as one of the coldest and snowiest cities in America. Having been in economic decline for several decades, this town constituted a perfect symbol of careles capitalism: abandoned, dropped, deserted. The inner city of Buffalo was empty, rich and poor living in segregate quarters. Yet there were 55.000 students nourishing an educational industry of remarkably high quality. The Departments of Literature, Geology, Design, Critical Theory, Mathematics etc. were led by professors of high international repute. It was dreadfully cold when I arrived in winter and took up lodgings in a tattered motel. Therefore, I spent most of my time in my office, where I particularly liked to work during the night, while the whole building was empty and nobody disturbed me except for the cleaning staff who started work early in the morning.

On one of my first days in Buffalo, when I was about to shift my living quarters from the motel room to my office and was busy tidying up the desk there, I found a stack of printed matter, obviously material directed to Paul Sharits from a strange company by the name of OECD. In virtually each drawer I opened and on practically each shelf I inspected, I found further stacks of these papers. After a closer look at

these papers, I was puzzled by a peculiar mixture of economic style and utopian vision. There was too much legal English, official jargon and management methodics to be normal artistic correspondence. For normal business communication, on the other hand, the projects described were definitely too visionary, not commercial enough and too extensive in their social and political implications. I wondered whether a company of that particular type could actually survive as an organization in the capitalist USA. Very soon, I came to the conclusion, that the projects described in these papers must actually be of an artistic nature. And that was how I came across Peter Fend in 1984. I don't know when or whether at all I met him in America. Maybe I met him while visiting Paul Sharits, one of the co-founders of the OECD, who then worked as a painter and occupied Peter's apartment in New York. Peter Fend's work, however, has always accompanied me since the day I found his papers in his former office. When the implications of his work were finally recognized in Europe as well, I was particularly glad to find that the gallery that became interested in him was exactly the one that I was associated with. One of my first moves as founding director of the Städel School-Institute of New Media in Frankfurt, to which I had been called in 1989 by Kasper König, the new head of the Städel School was to set up a NEWS ROOM installation in Frankfurt (1990). In this effort, I was joined by 707 (Andreas Kallfelz), a private association with the aim of promoting art, and the Gallery Varisella. My first idea as "artistic director" of the Neue Galerie (1993) was to organize a larger exhibition for Ocean Earth and in particular to publish a catalogue presenting to the public in extenso the works of Ocean Earth since its creation over ten years ago. This project turned out to be extremely difficult in terms of both organization and budget. We had meetings in Frankfurt, Cologne and Graz, there were several changes in terms of both design and content, a whole number of caption rewrites and new texts. Therefore, it comes as no surprise that nobody has ever tried to publish this book before. Half a year has already been spent on the production of it and who knows how many more weeks lie ahead. Without the financial support of the K-Room Daxer (Karola Grässlin, Johannes Daxer) we would not even have been able to start it. Even today, the complete financing of the book is uncertain. We would like to thank the management team of the Neue Galerie (Dr. Werner Fenz and Dr. Christa Steinle) as well as all the gallery employees, without whose patience the project would have been impossible. Thanks also go to Typographic for their patience and understanding that were absolutely vital for this book. In addition, we would like to seize the opportunity to express our gratitude to all those who have contributed their share to this project: Tanja Grunert, Michael Braunsteiner, Birgit Kulterer, Gudrun Danzer, Christa Steinle, as well as the translators. We are also very grateful to all those who kindly contributed objects to the exhibition: Johannes and Luise Daxer, Rolf and Erika Hoffmann; the galleries that provided us with texts and photographs: Colin De Land, American Fine Art, New York, Tanja Grunert und Michael Janssen Galerie, Cologne, Esther Schipper, Cologne. Finally, we also have to thank all those who supplied us with material and contributed to the production of this book but remained anonymous. Last not least I thank Oktagon Verlag for the distribution.

Peter Weibel, 27.8.1993

CONCERNING THE LOGO



The logo for Ocean Earth, a chart of the concavities of the world as they spiral around what is said to have been the immediately-prior North Pole, at present Trondheim, results from the recognition that polar-projected satellite data shows spiral formations, counter-clockwise in the northern hemisphere, clockwise in the southern.

The Dutch dancer and choreographer Petra Rhijsburger asked for a diagram of the world based on this spiral, at least in the northern hemisphere, which would – if possible – also incorporate the Ocean Earth mapping of the concavities, or basins, of the planet. She wanted to be able to produce a dance surface with body movements mimicking global movements.

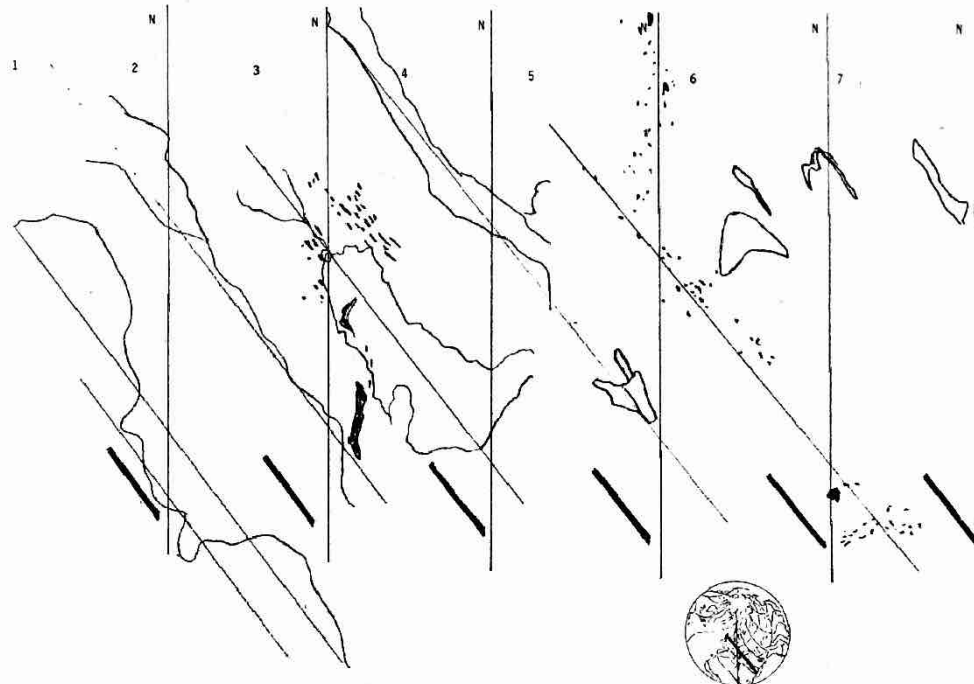
In 1987 in Sweden, it was learned that geologists are supposing that the North Pole used to be centered on Trondheim: drawing therefrom, Ocean Earth discovered that the concavities, or basins, followed a reasonably consistent spiral, similar to that of clouds today. After some eons, presumably, the spiral of basins would conform with the North Pole of today: land masses move slower than cloud masses.

Subsequent inquiries into geology, plus the imagery of the long chain of out-spiralling plates, particularly one spinning

from the Bering Sea (starting point) through the Arabian Peninsula and Africa, the longest train, suggested that some cataclysmic event had shifted the pole from one axis to another, and had forced the outlying, longest train of basins to buckle, with one basin being shoved under the other, producing what are today the largest entrapment of giant marine algae in the world, hence the largest fields of oil and gas in the world.

The spiralling trains of concavities terminate around California, around the eastern edge of the Pacific Ocean. The ridges and basins align from the starting point to that terminus in waves. Each wave, relative to the current North Pole, is at a roughly 30-degree angle. This is precisely the main angle of the veins of trapped oil and gas deposits throughout the world. It is also the angle of the pinched plates, forming a ridge, aligned through the North Sea oil fields, Mount Sinai, Mecca and numerous other significant sites, exhibited in line at the Biennale di Venezia. It is also the main mountain ranges in north-hemispheric Americas – and in the Fish Lake constructed by Iraq in its war with Iran.

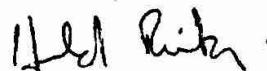
A diagram of the spiral of basins for the then-southern hemisphere would suggest a very different Bild, in mirror reverse, of historical significance.



August 23, 1993

Ocean Earth is one of the few business ventures that fully understands the importance of Conceptual and Earth Art. Through its satellite monitoring, geographic and information awareness programs, it creates models of the world and its markets. Ocean Earth's activities have profound implications for those who want to understand the emerging strategic markets and geopolitical battles of the future. Ocean Earth, since 1980, has challenged us to see the world as changeable, with redrawn boundaries, and to keep in mind more permanent questions, such as ecology. It upsets our sense of what we believe are permanent lines on maps and replaces those imaginary, agreed-upon conventions with more durable and natural facts of our physical world. Despite what people might believe about nations and boundaries there are material facts of earth and water which we all must deal with.

Business would be better prepared for the challenges of the 21st Century if it grasped the implications of developments in the art world during its last major explosion of new thought from 1965 to 1975. The most significant breakthroughs of that period were achieved by those artists who worked within the framework of what became known as Earth and Conceptual Art. Earth artists taught us to look at our world, showing us that we live in a delicately balanced global ecosystem, one where a constant vigilance is required to prevent the abuse of our ocean, earth and their living resources; where through imagination, one can find means of creatively using those resources without destroying them. Conceptual artists led us away from commodity-like, object production, as embodied in traditional painting and sculpture toward a linguistic, information-based visual activity. This art told us that the emerging markets and areas of growth in the future would not be based in objects or commodity-like things, but rather in how we see and understand what is, was and will be.



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April 10, 1990

Mr. Peter Fend
P.O. Box 1138
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New York, NY 10013

Dear Mr. Fend:

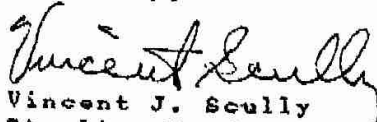
I am absolutely bowled over by your work and am profoundly touched by your much more than generous assessment of my part in its inception. It looks at the world and its problems in a way that makes sense to me and which, as you can well imagine, excites me visually and conceptually. I am working my way through your material with continuing enthusiasm. You are able to visualize structures, as in the breakup of all nation states, which were far beyond my imagining, though consistent with it. Your suggestion about Japan's plans for the dismemberment of the U.S. is weirdly plausible and wholly chilling.

We are what we imagine, are we not, except that we are also where we are placed: is it an irreconcilable dichotomy?

Again, I am deeply taken by your work; it breaks some boundary in a perhaps rather frightening way. Is it to think not politically but topographically that is so cogent and threatening?

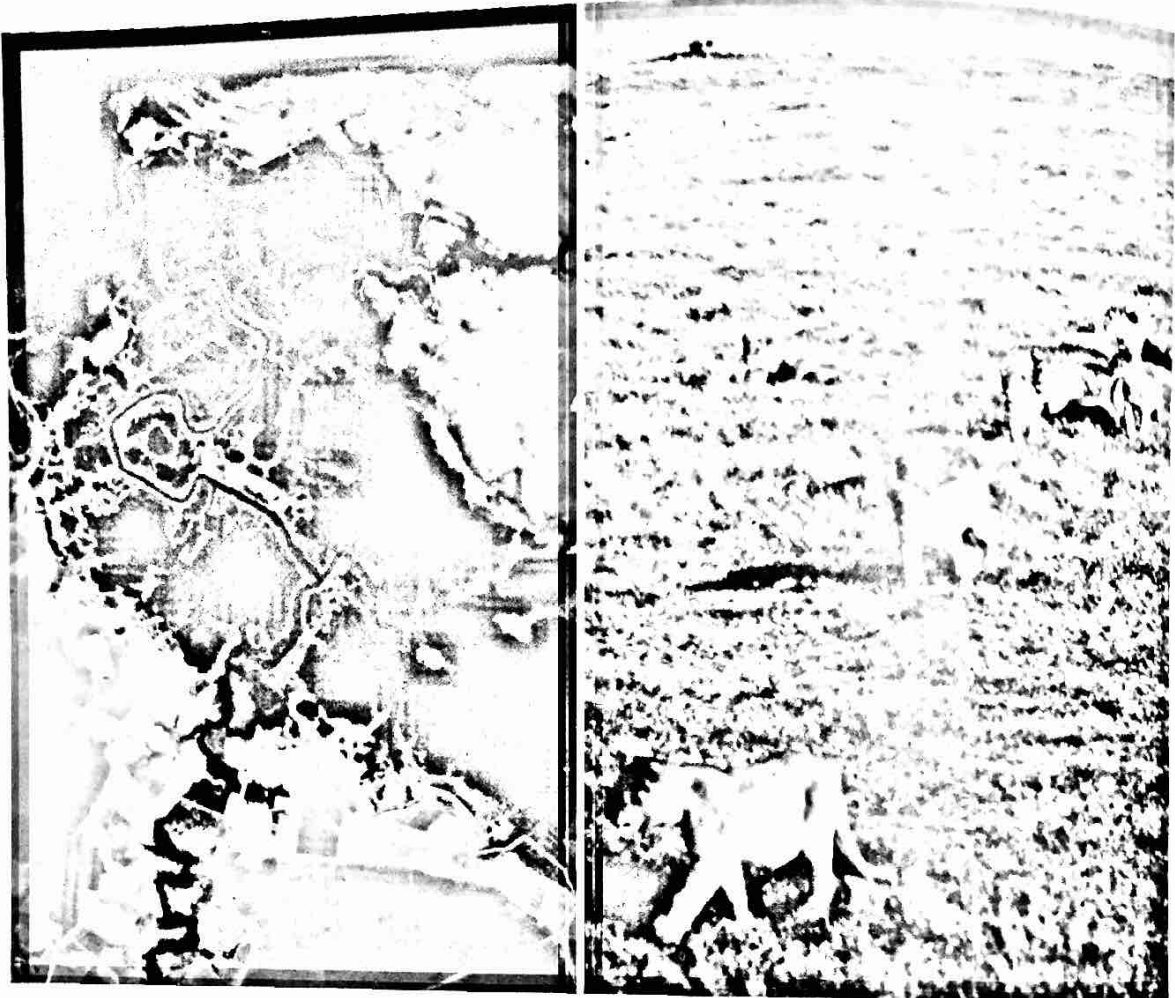
I am grateful to you.

Sincerely,


Vincent J. Scully
Sterling Professor of
the History of Art

VJS:ee

FOREGROUND



1-2 From the beginning of research leading up to the founding of the company, from 1978, there was an *idée fixe*. There was an ideal, a concept of what must be achieved. Nothing less than what we humans had on earth before: a state of nature. Wild nature. Prior to agriculture. Prior to civilization and monotheistic religion. Prior to notions of property in land, with attendant subordination and domestication of the species. Two pictures served as reminders of the goal, and of means to obtaining it: one, of a wild, unaltered marsh, as monitored and managed with satellite or aerial observation; the other, of carnivorous predators on terrain who could roam wild in co-existence with us, also living off the land by predation rather than animal husbandry. A continent such as North America could return to its diversity of species before the White Man, and under a hunting-fishing-gathering regime handled by the territorial force – that is, the military – could actually support more people than live on it now. The deterioration of the continent, notably the Great Plains, is evident. How else might one revert that but with practice towards terrain like those developed in contemporary war?

I. PRIOR THEORY

ECOSYSTEM ARCHITECTURE FIRM

1975

Within a century or two fossil fuels will have been exhausted and humans – or their genetically-engineered successors – will rely for their materials, fuel and food entirely upon renewable resources. Some fuel may be gleaned directly from the sun or the earth's core. But a good percentage will probably also come from biological organisms. Most materials and all food will come from biological organisms. Survival will be possible only if systems are designed and developed for gathering from among "uncivilized" organisms and redistributing among "civilized" organisms all the materials, fuel and food the latter require, and then for distributing the same goods, recomposed, back again among the uncivilized organisms. A "civilized" organism is a human being, its successors in artificial or natural evolution, and any pets or decorative plants that human beings and their successors might keep. An "uncivilized" organism is anything that may be destroyed and in some manner consumed. As the decades pass, the leading civilized organisms will of necessity find ways of efficiently managing the destruction of uncivilized organisms so that the creative powers of nature can at least keep up with the pace and pattern of destruction.

Efficient management requires first a network of communications and transport. The Romans maintained their empire so long partly because they integrated it with roads, river and sea pathways, and aqueducts. They designed and engineered the physical landscape so that the circulation of goods and information could be swift. The civilized organisms of the 21st century and thereafter can maintain their eminence in the ecosystems of the earth so long as they too build and maintain a network of communications and transport which insures the absorption of necessary goods from among the uncivilized organisms, and then an at least equivalent return. Unlike the Romans, the civilized organisms of now will not seek to conquer and colonize lands of the uncivilized. They will instead seek to establish physiological interactions on the body of the land. They will link up with the lands of the uncivilized organisms; they will circulate among those lands and manage them; but they will not settle there. They will make sure that information from throughout the uncivilized organisms' habitat is conveyed to those agents from civilized habitat who are responsible for destroying and transporting into civilized habitat some adequate number of uncivilized organisms. The two habitat could be conceived as organisms also. Each feeds on the other. Each maintains a balance of goods to and from the other. Between each of them is a membrane. This membrane is engineered by the civilized organisms to be permeated with transport lines, overseen by a communications and intelligence network, so that the rates of fertility will be so much higher in the uncivilized habitat that equilibrium – or even an advantage for the uncivilized organisms' proliferation – can be maintained only by the deliberate destruction for consumption of uncivilized organisms.

Architects and engineers design habitats; in concert with biologists and geologists, they are best-prepared for the task of designing efficient conductors of information and material between the uncivilized and civilized habitats. Being proficient at visualizing and designing one organism, they can quite easily advance to two organisms and their interaction in one still-larger organism.

AGRICULTURE ENDS, ART TAKES OVER

1976

Agriculture as practiced now will destroy us. Art as produced now shows means to survival. We shall imitate the art in order to evolve.

Agriculture simplifies the surroundings. Complex and highly-organized animals such as humans flourish over time only if the surroundings remain complex and highly-organized, like themselves. Simplified space cannot support human life. The pressure of human procreation has now combined with the agricultural simplicities to remove complexities throughout the biological space of the world: in the homogenized medium, we disappear.

Agriculture removes from circulation the essentials of higher life. Row tillage emaciates the life underground. Hoarding of materials, combination in eternal forms, manufacture of the inedible – all these delay the return of edible wastes to the lower animals and plants. Single species thrive solely through injections of fertilizers and toxins produced upon depletion of fossil reserves. These too shall perish as the nutrient ions and trace minerals, once circulated by lower creatures, disappear from the ground.

Agriculture's methods of restoration cannot suffice. Rotation cropping with nitrogen-fixing legumes cannot alone restore circulation. Artificial fertilizers bolster specific productivities but fail to maintain the buffering animal-plant complexities. The phosphates and nitrates in those fertilizers run off into streams and choke them with fish-killing algae and bacteria. Nitrates further react in water to poison downstream animals, including humans, and they react with the air's oxygen to deplete the ozone shield against the sun. As the ozone goes, so do most higher creatures.

If even all wastes were returned quickly and if even artificial fertilizers were replaced, agriculture as practiced now would remove from circulation two essentials for animal health: oxygen, and water. The increasing number of acres now planted for single species of fast-growing, short-rising plants vastly reduces the native rates of evapotranspiration and oxygen respiration. More nutrients may be obtained, for awhile, but less water circulates in air, less oxygen diffuses toward human settlements, and both drought and pollution become more common.

A return to pre-industrial farming cannot improve matters; human populations have grown too large and too demanding for old ways. The organicists who propose adoption of Far Eastern habits in multiple-cropping, forestation, composting and canal-construction will, if successful, effect an unprecedented elimination of wilderness variety throughout the world. They might halt the depletion of ozone and loss of soil fertility. But they will not retain the enormous jungles, marshes and savannah which generate the oxygen and water vapor needful to higher animals. They will also not maintain the diversity of higher animals and insects required for protection against plague and famine. Far Eastern organicist traditions have assured the return of nutrients to their source; they have also let humans fall prey to invasions of disease. Cholera, bubonic plague, influenza: repeatedly these epidemics of lower animals start in the simplified domesticity of the Far East. Even with assiduous recycling and multiple cropping, even with a thorough departure from mechanized and biocidal techniques, agriculture will destroy us. For it will destroy

the wilderness. It will leave humans vulnerable to the ongoing forces of evolution. Dullness will spread. We become obsolete, then dead.

Humans must become hunters again. They would forage, they would chase, they would lure. They shall. They thrive amidst a wealth of surging plants and predacious animals. They employ sensoria and intuition to track down what they require. They unleash and move together with the germinative powers. They go beyond agriculture. They proceed to exploration and animal cleverness. They adopt primal means of production, but the primal means, in history, come fresh.

The new means are here. They were developed by ecologists and military scientists. Many of them were developed in the World Wars and Vietnam. Most of them are used daily by the military and by researchers. Some are used to track down and slaughter humans. Some are used to track down genes, microbes, geological formations, botanical activity, electromagnetic fields in outer space. Some are used to survey terrain, track down plant and animal populations, then slaughter animals for human consumption. In East Africa, zoologists and biomathematicians employ military technology, statistics and computer programs to obtain more biomass per acre on wild land than could be obtained on prime agricultural land serviced by irrigation, fertilizers and biocides; the new means not only protect the biological surroundings from simplification, depletion and toxification; they also yield more wealth.

Now we introduce the new means to the economy and its consumers. Artists have begun the task. They experiment with the technology which soon will become standard. They advertise the upcoming habits of thought. They accustom people to seeing in new ways, acting with new concepts, forming in new ventures. They feed society with epitomes of the new means of primary production, the new means of surviving on the land. They prepare for a post-agricultural age.

The new means allow the monitoring and servicing of wilderness – in oceans, on plains, in forests – for the hunting, fishing and gathering of foods, fibers, industrial chemicals and some fuels. They first require new ways of looking at wilderness, of gathering information from the wilderness and ordering that information for its use. Artists show how we shall see.

We see from the air with cameras and down through electron microscopes; we see from the ground with scanning eyes that deliver raining data from phenomenal fields. We do not see through windows on the ground to horizons. We're not trying to plough through fields or graze any meadows, so we do not look toward fixed destinations. We survey the region from the air, then scan the region from the ground; we cover the region with a web of uniformly-accurate data. We know as much about events miles away as we do about events by our feet. There is no blurring at a distance. There is information from all over, cascading to us through television tubes, pored over by us in top-shot photographs.

The Futurists and Suprematists of the early 20th century portended the new means of seeing. They showed features as viewed up in air, perhaps from racing cars, their details dimmed, their horizons set aslant, their positions continually changing in relation to the viewer. Stable cages of Cartesian coordinates, progressing as avenues towards certain ends, fixed, were replaced by meshes of ground-data or snatches of fleeting form as seen while spinning around in air. What they saw depended on the motion of machines, at least on the motion of the body, model for machines; they no longer saw objects in their stability; they saw potential collisions or conjoinings; they saw impending processes; they saw abstrac-

tions from stability; they saw fluctuations and the ongoings of economy, activity, ecology, living actions. Malevich, Suprematist leader, declared that he was painting pure thought: thought is an action, a motion in response to impending events, a coordination of data from surrounding objects while motions continue within the viewer. Boccioni, Futurist sculptor, presents the evolution of a bottle in space; he also sketched the visual field from the ground as his airplane would gyre: motion becomes the subject of art.

Futurism surges forth, free from the lingerings to pretty window scenes set on by the nightmare of World Wars. It receives expression in appropriate media, such as TV, film, electronic art. It flourishes in Milan. It appears in Mad Ave: how often now are words plastered on billboards at a slant, as if seen from turning airplanes? In Suprematist form, it comes from designers of corporate logos: when NBC changes its symbol to a schematized, bipartite "N", does it expect the viewer to read that as one might read letters on a page?

The aerial view upon land burrows down into microcosmic life. Information from a region becomes organized the same as information from the primary units of animated information: genes. Keith Sonner and Carl von Graevenitz project pure information on their video screens and canvases. The pattern matches closely what one would see of genes under electron microscopes. Primal information effects a new retina, then the viewer's thought. Meantime, since Futurism and Suprematism began, aerial photography has elaborated into multi-spectra, multi-tracked portrayals of activity on terrain. Lasers can form holographs showing surface motion. Infra-red tracks can form photographs showing energy as heat. Stereoscope presentation of normal-wavelength photographs can form three-dimensional reliefs without the assistance of point perspective: artificial drawing schemes can be discarded for the presentment of three-dimensional data on a two-dimensional plane. *Remote Sensing in Ecology*, a scientific monograph, observes that, "Aerial photography may be thought of at the ecosystem level as the converse of the electron microscope in molecular biology; each depends upon the spectral reflectance, absorption, emission and transmission characteristics of the respective samples." The first means to useful knowledge in post-agricultural primary production will be aerial photography and surveys, on the macrocosmic level, and electron microscopy of gene pools and available proteins, on the microcosmic level. Wavelength manipulation will grow useful on both levels, as in the deployment of lasers.

Artists show how to monitor the wilderness once it has been surveyed. They experiment with means of telemetry and of scanning ongoing actions. They portary space not as a cavity containing objects but as an ocean of ions, genetic creations, linked-up polymers. Gianni Colombo, Keith Sonner and Stan Vanderbeek investigate ways of altering the shapes of space, making it elastic. One works with polymers, one with the electromagnetic fields influencing cathode rays on a video-tube, one with a combination of film and video environments. They elasticize and vary the space to find means of arranging space for more ready, more realistic comprehension. Space ceases to be a given, seen from an inside. It becomes an inside as visceral as our bodies. The viewer moves through the space, radar-scanning, density-fielding. The viewer works the senses around space and across retina screens to find prey or potential predators. This is how one feels while running long and fast.

Jean Otth, a TV artist in Florence, shifts a horizon-scanning stream of ions up and down a TV screen that shows rippling waters and a shore in the foreground with mountains in

the distance. The viewer does not look from a fixed position to fixed positions, as when assessing a landscape for ploughing or seeding. One scans laterally as the space parts to either side of the entering body. One scans laterally, without perfect symmetry, the sequence of alternately-swung limbs, the drive on through space, the achievement of balance by alternative imbalance. One sees, one feels, as the first hunter. No gun, no repose, only knife or spear to press. Thus plunging, surrounded, see the scientists coordinating displays from scanning TV monitors, roving telemetry devices and ingested data on likely animal movements within a circumscribed terrain. Thus they will see when situated in monitor rooms with simultaneous observations of events in many places, all telemetered into computers with biomathematical programs and memories informed by statistics on base populations so that central-display terminals can project patterns for predation, conceptions of a wilderness whose balance depends on moving in and acting, affecting the undulating equilibrium.

Artists examine the media for conveying information. Ongoing records might best be projected on cathode ray tubes or printed out on computer maps. Hundreds of artists pioneer with the information capacities of the tube. Jasper Johns developed studies on the semiology of maps; landscape architects now use computers to print out chips of information, all coded, for any sizable number of variables, on map-compositions of land plots. Surveys and fine details might best be preserved on film. Paul Sharits and Peter Campus lead efforts to understand the film medium itself, with its grains, its chemical, its responses to light and capacities for enlargement and acceleration.

Artists show how to situate within and view around biological surroundings. They inculcate ecosystem conceptions. Robert Whitman places a spinning projector in the center of a circular chamber, then spins around images of swirling globes, apples, cherries, balls. The viewer, within the chamber, develops a radar-like sensation of surrounding space. He begins to sense the motions around the body. He does not need to see motions to know that they continue. He can see the track once and follow with his thought, tracking. Earth artist Walter De Maria places lightning rods at intervals in an open desert tract. He creates an electromagnetic mesh, a field of forces, in-ducing the people who walk through the tract. A setting becomes invested with information and power receptions. It cannot be seen from a window, outside. It would be sensed as an extension of the nervous system. Michael Heizer builds complexes in the midst of desert to animate the setting and not, as landscape artists of the picturesque might attempt, to place objects in space, each distinct. If one acts in one part of the setting, one affects the balance throughout; in a formal garden, however, one can remove an object without an effect elsewhere in the original setting. In the one, removal of a deer would alter the equilibria of all species there; in the other, removal would be valued for the potential trophy. Carl Andre furthers this new sensation of landscape with his floor slabs. Viewers may walk among the slabs, even on top of and across the slabs. The landscape becomes more than a location; it becomes a sequence, arranged by one's movements, of sensations.

Artists extend operations to entire ecosystems, covering miles of terrain. Christo wraps coastlines and buildings, then stretches curtains across valleys and miles of meadow: space becomes plasmic, built up from ions, spun into membranous wrappings: objects become merely concretions of wrappings, concretions of skin, concretions of plasma energetically bound. Warhols concurs when he says that behind the skin

there is nothing. Then Newton Harrison designs, constructs and maintains an exchange place for plasma, a self-sustaining, prey-predator cycling ecosystem. He builds aquacultural basins by the Salton Sea that cycle nutrients from plankton through to oysters and then crabs, with plants such as algae for oxygen and nutrient packaging. The flow of nutrients determines the space. The nutrients form the plasmic content. Harrison intends to extend the space by integrating the aquacultural system into an estuarial lagoon joining the Salton Sea with the Pacific: where there is flow, there is sculptural space, ready for sculptural forms.

Most essential to primary production is the harvest. Humans must slaughter and take away for consumption what the biological surroundings have generated. How they slaughter remains a matter of art. So artists recently, preoccupied with the fundamental processes, have set forth observations on the art of destruction. They offered not philosophical inquiries into the nature of destruction, but sensibilities' apprehension of the art, of the manner, of the ways. Milan's eminence grise, Lucio Fontana, slits the canvas and declares: "I do not want to make a painting; I want to open up space, create a new dimension for art, tie in with the cosmos as it endlessly expands beyond the confining plane of the picture." Dennis Oppenheim, in his recent show, celebrates the "spinning knife" and the plunging of the knife into the body in an attempt to find "the edge." Artists in recent years deliberately mutilated themselves. Jean Tinguely created machines that would live in order to destroy themselves. Newton Harrison directed the art of killing to more immediately-gainful ends.

Lasers might serve for slaughter better in the open wilderness. Ecologists have speculated on laser use. The military has practiced with laser use. Under the stress of gunfire, animals diminish procreation and flee regions; lasers are silent. Wild rice, wild cattails, and wild hemp, though highly fertile and useful, cannot easily be harvested with agricultural machinery; lasers cut everywhere.

Artists practice with lasers now. Rockne Krebs builds webs of laser light over wide spaces. He defines a space with tangents, as in a spider's predatory mesh, and not with box-frames, as in a Cartesian-ordered cathedral. Other artists, Bruce Nauman for example, have used lasers not for patterns or shootings but to form holograms. Scientists report commercial possibilities with laser holograms in photography of high-speed events, chemical and meteorological analyses (combined with aerial photography and ground-level scanning), three-dimensional movies as aerial stereoscopy, and microscopy. Laser holography advances the technology of post-agricultural primary production. A predatory and sensory advantage results when holography combines with radar. Lasers can be used in holographs much as ultrasonic impulses – i.e., radar – are used by bats. The further a sensation of scanning all about, the further is a sensation intrinsic to life in the wilderness.

The laser, the laser holographs, the laser round-about wrapping of space, all come naturally to artists. Ways for laser slaughter might come naturally from artists, also. Artists work by tradition with light. Light flows about as wave-patterned ions. Lasers coordinate the waves into a synchronic beam. Artists, who already work with light as color and subject for portrayal, might naturally work with light as coordinated in single laser beams. Light waves become a medium in themselves. Artists can best instill a mastery of light waves as a medium because they operate through the sensibilities of the nervous system, and scientists have likened the nervous system to the ordering properties of laser image-forming,

laser holography. Feelings should govern. They should govern because they relate most closely with the instinct for survival, and lasers could serve well the purpose of survival. The military now manipulates the laser for slaughter. Calculation, but no instinct, prevail. Artists might open more uses by accustoming human feelings to this weapon and tool.

Feeling constructs models for behavior and thought. Artists, working with feeling in materials, construct models for behaviors and attitudes serving the post-agricultural means of primary production. They discard theistic views, which fostered domestication of animals, humans and plants, and they work up physiologic – i.e., cybernetic – views, which treats organisms as part of metabolic goings-on. Theistic views divide the world into body and soul, passion and will, origins and goals, objects and space, individuals and societies, all delineated within Cartesian-boxed coordinates. Cybernetic views favor complexity. They describe the world as closed-circuit systems, with systems contained within larger systems, information and materials circulating throughout. Intelligence orders the flows so that systems fit together, all in a plasmic mesh, all in connected print-outs, all impressed in membranes and projecting onto screens through to neurons. They replace the view of source and character with a view of setting and landscape. With present art, one does not look for biographies. One looks for biogeographies, biosystems, biological surroundings. Mechanisms are replaced by ions, genes, energetics.

Artists only recently have effected the change in views. David Smith had developed the mechanistic view to its most refined expression: he felt sentiment for cannons that shot from fixed positions to fixed targets. Now we have all-over-at-once missile cascades. Jean Tinguely exhibited the collapse of Smith's world construction, of his means of production, by building dichotomized monster machines that self-destructed of their own force. Yves Klein presaged the cybernetic sensibility by painting canvases with slipping, sliding bodies. He investigated cybernetic means of production by exhibiting the aerial photographs from high altitudes used for geobotanical surveys.

The cybernetic conception, since grounded in physiological science, considers not a mind and a body but treats both within a neurosensory system. Thought is physical. It can be sculpted, being a body. Sol Lewitt displays pure thought in his works. Since thought follows physiological laws, display the nature of neuro-circuitry. Since human activities accord with the patterns of thought, present also the patterns of human activities. All human activities together comprise the human economy. The economy is a subset of the ecology that we call the biological surroundings. As humans develop economic theory, they discover that economic and ecologic success depends as much on responses to diagrams and flowcharts, as much on abstract conceptions, as on responses to more immediate conditions such as the location of prey or vigor of the landscape. Corporate strategies and PERT diagrams become easier to construct and understand for an executive who reads Lewitt's *Location of Lines*. Interwoven complexities with inputs and outputs all connecting, such as government finances or a national economy, become easier to comprehend, all over at once, for an economist who accompanies his readings in the equilibrium theories of welfare economists and econometricians with the drawings in *Arcs, Circles and Grids*. A post-agricultural primary production corporation might train its employees in Lewitt's drawings and sculptures before going into the field so that they might read the landscape not as territory for appropriation but as a

closed system with signs of prey, predators, empty niches, flow requiring direction and buildups.

The neurosensory system performs the organization and filtering of information. Artists serve as neurosensory specialists for society. In the agricultural, theistic age, artists arranged information according to doctrines. They arranged compositions for viewing, within frames. In the post-agricultural, physiologic age, artists arrange information according to scientific investigations. Jasper Johns therefore develops provisional theories of semiology founded in personal observations and the epistemological inquiries of Wittgenstein. Johns and signal-makers such as Winfred Gaul work in the same vein as theorists like Abraham Moles on the effects of variously organizing information and displaying it.

Society altogether directs attention to the processing of information. In recent centuries, social energies were directed to the production of goods. The goal was greater industrial capacity. That goal has been satisfied in advanced societies. As the Pop artists showed, we are glutted by industrial capacity. We have transformed the landscape into a technological artifice. The biological surroundings have become subject to human domination. By virtue of its powers, society must assume the government of the biological surroundings. It must practice cybernetics, i.e., "control and communication in living systems." Control requires information. Communication is the transmission of information. Cybernetics directs social energies not to the production of goods, a solved problem, but to the acquisition and transmission of information. With adequate and timely information, producers and consumers in the economy can moderate and train the production of goods so that society can remain viable within biological surroundings. The economic task remains the same: organization of the means of production for material well-being. But the economic means have changed, from one of productive capacity to one of neurosensory capacity. Mechanical inventors used to lead the way; now media manipulators take over; society begins to handle sensations with speed and power.

With machines, efficiency depends on completeness; with information, it depends on arrangements of shreds. The machinery problem has been solved; now we meet environmental, information problems. Failsafe solutions cannot work. Completeness serves less well than coordination and improvisation. Society learns to improvise as it graduates beyond agriculture to systematic predation of wilderness. It will seek sustenance and viability more than security. As it conceives of biological surroundings as immanent and all-around wilderness, it will adjust to incomplete information and work to coordinate the intruding continuum as it alters. The failsafe solution of Green Revolution agriculture will be discarded, along with traditions of the ancient irrigation empires. Green Revolutions place all hopes in a few genes and great quantities of manufactured fertilizers, biocides and irrigation projects; should alien species enter or should supplies fail, crops do not grow as planned and people die. With a society practiced in patterning information from surroundings, the countryside will be maintained in a wild state which can sustain itself—and humans—despite changes in the ecology or breakdowns in economic machinery. The society adjusted to incomplete information will also not seek the failsafe energy solution of nuclear power, which places all hopes in perfect technology and perfect police security. It will gather energy from whence it gathers ongoing, improvised information: from winds, from sun, from wastes, from earth's ongoing fires and the ocean's ongoing currents. The cybernetic society will not cling to theistic, sure-fire salvations. It will

extend intelligence throughout its biological surroundings and work for the circuited, equilibrated, provisional patterning of incoming and outstreaming data and materials, all within variegated systems. Space will no longer be conceived as a desert passage to distant ends, as Descartes and Renaissance men did, but as encircling ionic oceans for absorption, excretion, coordination, as Oppenheim does.

In his recent show, Dennis Oppenheim displays patterns for post-agricultural behavior and thought. His daughter murders him as father, nuclear family domesticator, and proclaims, "I am going to live in liquid, mental space." Animal skins and American Indian headdresses accompany hard-rock rhythms celebrating a return to the mountains. A room is surrounded with lights and voice tapes, then some wild animal models, and the viewers in the midst are told, "You're looking, but you just don't see. You have to see all around you. It's too dark inside you, and you're blind." To see around in the wilderness, huntsmen know, you first have to see within. You have to know your physiological and neurological goings on. You have to feel throughout your insides in order to extend the neurosensory force-field into the outside for any predatory success. The atmosphere you enter, the room you're within, becomes a part of your interior, an extension of your physiology, if you would be able to see.

Oppenheim is murdered as father because post-agricultural production supersedes domestication, and the father—along with mother—became sovereignties and deities, unquestioned and revered, with the rise of tillage, irrigation and domestic-milk cultures. Before the rise of such domesticated cultures, fathers and mothers played more provisional roles. In one savage society, for example, the father wins obedience from his children by explaining that he has nourished them and they owe compensation. The domesticated cultures, first forming in the irrigation empires of the Middle East, Far East and Mesoamerica, directed primary production away from living off the wilderness—or even from slash-and-burn traversing of wilderness—to failsafe methods. Failsafe, sheltering plans and animals perform from the complexities of biological surroundings, simplified the world, divided the world into Manichean good and evil, and set society outside the helical evolution of life, to eventually collapse.

All systems, being dynamic, contain contradictions. The contradictory claims of species and individuals foment the strife and predation and market exchanges which keep materials and information in circulation. Systems remain vigorous if they sustain many contradictions, many competitions, many predations and patterns of gain or loss. If systems are simplified for servitude to one species or one group, the contradictions coalesce into massive oppositions. The contradictions combine into a single struggle between haves and have-nots, or between a single elite and the masses, or between the domesticators, with their tamed animals and plants, and the turbulent forces of nature. If land were planted under the sovereignty solely of corn, soybeans and a few more select organisms, the forces of biology would line up in opposition against the forces of domesticated tyranny. The simplified order would collapse from the burden of massive oppositions. When his daughter declares that she will live and she murders the domination of nuclear families, Oppenheim offers rites of passage into a society founded on neurosensory development within world-views informed by physiological and ecological science. He offers rites of passage into life in the wilderness, complete with predatory strife.

Joseph Beuys offers rites of passage for society altogether. Joseph Beuys, walking wounded Civilization, arrives at

Kennedy Airport and is rushed in an ambulance to a body repair shop, a Soho loft. He is wrapped in a felt blanket, warm enough, and equipped with a cane as a protection and antenna. At the repair shop, he is placed in a cage with a coyote. The coyote and he, Walking Civilization, are sustained by food and water and by the information in 50 Wall Street Journals delivered daily. The coyote devours the food and the information. Beuys devours the food and some information. The coyote is curious about Beuys. Beuys wards off the coyote. The coyote tries devouring the blanket. He scopes his ears about to listen to the city. Both sense from the loft the palpitations of the city. Beuys learns the economic heartbeat. The coyote learns it also. Walking wilderness and walking civilization, they beat together. They beat together with an economic heartbeat. It's all tracked on TV.

Agriculture, dead-end means, comes to an end as we conceive of the wilderness as a packaging plant. Everything comes in packages, from genes on up to arch-predators such as humans. Some packages unwrap and replicate: e.g., genes and cells. Others prey upon and unwrap other packages, spilling and lapping up the contents to make firmer packages of themselves: e.g., animals. The more highly-organized packages—e.g., humans—use loose shreds to wrap together materials and make them useful. They wrap themselves into clothes, metals into machines, coastlines and valleys into canvas. Humans in particular wrap parts of the wilderness into simplified production plants for selected, tamed animals and plants. The remaining productivity of the wilderness is neglected. When Christo wraps entire coastlines or valleys, he suggests that humans package the entire wilderness in its complexity and keep track of all the packaging-plant operations so that the occasional predation and unwrappings needed for human sustenance can maintain the dynamism and equilibrium of the plant's overall operations. Under moderate predatory stress, plants and animals grow faster and more abundantly: the wilderness packaging plant increases production if humans, the arch-predators, treat it altogether as a super-package and unwrap packaged animals and plants within according as they grow to superfluity and begin to burst the wrappings. Human survival depends not on simplifying the packaging operations and trying to make them secure. It depends on keeping track of the entire panoply, from genes up to fellow predators. It depends, further, on regarding humans as edible packages and arranging for their contents to be spilled and devoured back in the wilderness packaging plant, by lower creatures, after they die. Everything gets repackaged.

Wilderness can become, with art-displayed means, the chief source of production. Unless we want a species demise, it must. If humans want to stay within evolution, they will arrange their economic activities according to conceptions of artists and will build economic ventures that survey resources from the air and down through electron microscopes, that process biomathematical and zoological data for display on computer monitors or TV tubes, that slaughter animals and plants efficiently and moderately for the optimal productivity of the packaging plant wilderness from which they came, and that assure the circulation of all unpackaged or dead materials back to wilderness for repackaging. Their success will depend in part on management sciences developed by cyberneticists and illustrated in conventional media by artists like Lewitt. Their success will depend in part also on technological expertise developed by scientists, especially in the military, and made customary by electronic media artists like Keith Sonnier. Their success will depend altogether on imitating in daily economy what artists show now.

EVOLUTION MEDIATION

Art functions for the proliferation of animals, of spirited animals, the untamed. Art is not for art or philosophy or politics; it's for the animal spirits in us humans and other high forms. So it evolves. So it mediates the evolution of the species all together. So it rises up in this architectural array.

1. DRAWING AND PAINTING

Space for centuries seemed a void, a void in which objects could be removed or added without effect; now it seems a solid or gas in which objects are concretions of energized particles enmeshed with each other. Eyes cannot see through space so much as see conditions of it, states of excitation and flux, collisions and clusters at dispersed points. Eyes cannot look at a particular vanishing point and pretend to have seen a space. They must, engaged in pulsing body, enter the space, sweep a radar beam throughout space, sense in a scan the rippling fields. A video study with a continuously shifting horizon line makes space feel elastic, liquid, substantial. To remain oriented while the horizon rises and falls, while one is apparently in motion, one shifts eyes laterally, then to corners, then about, until the most efficient sensing of space comes not by looking upon it or by knifing into it but by moving amidst it, scanning around as one goes forth. Towards producing such a sensation, drawing and painting would not be trans-fixed. It would be set in motion. It would render the metabolic processes that make space not just be but occur. It would flow - in video, in flow charts, in photo-narrations, in film.

La Pittura futurista: Manifesto tecnico: "linee-forze". Jean Otth: The Limits. Paolo Masi: Grids. Agnes Denes: Ion-trace records. Gianni Colombo: Spazio elastico. Giovanni Anselmo: Entering into the Space. Duchamp: Labyrinth.

Motion pictures from the air.

Cameras in satellites, airplanes or balloons shoot ground scenes at set moments over set tracts. The electromagnetic energy they sense as color marks is not recorded in one image alone but is diffracted into 12 or more portions of the color spectrum and recorded on film. Radar and X-ray scanners pick up other wavelength readings. Many images are collected for one moment. Many more are produced with filterings and superpositions. Each image, as a single frame among others, emphasizes particular features or processes of the terrain. An animated sequence of frames is fabricated for one moment of aerial shooting, or a uniform series of moments, with a rapid streaming of all the specific film frames. A several minute clip, as a continuously-looped flow of alternating spectral slices, presents a composite color tonality and density distribution which more quickly conveys the information sought for a site than would a closely-examined aerial photograph. The eye and brain move through information with greater comprehension than if they stopped to probe.

Visual information has been broken into chips, then re-presented in moving scans. To construct the scans, one first identifies the kinds of information chips needed and their relative importance. One or several spectral slices would supply a particular kind of information. How often a slice is repeated, in what order one slice is placed with others, and how often black frames would be interjected for demarcations or pacing, would all be problems of painting; they would all be problems of building an illusion of colors as a reliable sensation in space. The illusion depends on that phi-phenomenon by which the eye and brain read single frames separated in film time as apparent movement. When the illusion corresponds with a cri-

tical stage in landscape process, as at the start of an algae bloom, then the film stream and the formula for its spectral composition can be recorded and schematized in identical frames to become a standard for comparison. One cannot recognize that or other critical stages without a color-density standard of comparison: colors are not sensed precisely but in comparison. Several standards placed in film bands alongside an incoming film-illusion of the land allow continuous monitoring of which critical stage is being approached. One can read the temperature of land activity. Sequencing of frames on the algae bloom, for example, would proceed as: infra-red, for heat and evapotranspiration; green, for chlorophyll; far infra-red, for radiant heat as separate from organic heat; X-ray, for clustered structures in water; yellow, for high contrast. Single-canvas studies in field-theory painting can model the structures and shapes used in the film.

Paul Sharits. Wolfgang Stähle. Goethe: Die Farbenlehre. Albers: Interaction of Colors. Bragaglia: Futurist photodynamism. Malevich: Aerial Suprematism. Jan Hafström: Color-band landscapes. Boccioni: "sensazione dinamica".

Video models of information display.

Cathode-ray cameras shoot patterns, landscapes, charts. In a control room, input from several cameras, live or taped, is combined. The inputs often are computer-programmed for instant re-structuring of configurations. On the control room monitors, inputs can be sectioned together, superimposed, enlarged, played back upon each other, automatically set in tandem. All is flexible. While one could synthesize superimposed and segmented views of a natural landscape, one could also synthesize graphs and mathematical models of processes in that landscape. One could manipulate graphic data to reveal spatial relations between several species, or proportions of gases in a site, or effects of cropping one animal population on the overall dynamics of the many populations at the site. Ways to organize marks on the screen are developed not only with video but also with the still-frame studies of field-theory painting.

Keith Sonnier: Animation II. Les Levine: Landscapes I and II. Sean Scully; Mario Nigro: Field-theory painting. Dynamic-model theory in quantitative ecology.

Electron microscopy and X-ray diffraction patterns of organic substructures.

Video manipulation of patterns from electron microscopy and X-ray diffraction studies may lead to visual mimicry of primary biological communication. Behavior among cells is apparently controlled less by genes than by mediation of ionic pulses across membranes. One cell projects an image on wall sites, and the adjacent cell chemically or electrically "reads" that projection. The membrane reaches a certain electric-field strength, a certain modulating power over the flow of activated ions, and the diffusion of ions appears as image. Transmission of ion-flow patterns onto screens literally coordinates life activity. Construction of video images with a multitude of microscopic cell-wall and protein photographs, and then their alteration in a control room, might assist in the human visualization of new life information structures - and then new life forms. For example: under X-ray diffraction, the proteins of bacterial flagellae and of feathers appear alike; a series of diffraction-pattern and microscopy photographs might be translated into video images for a hypothetical chronology of assimilations, assisted by hormones, of one resemblant sub-cellular shape with the other.

Bernhard Gilula: Rockefeller University. P. Kent: Editor: Membrane-Mediated Information. Alan Sondheim: Microscopy art. Karl von Graevenitz: Concrete painting. Metabolic diagrams.

Locations of lines, points, arcs and circles at particular positions on the plane describe, together with the marks, a four-dimensional condition. The lines and points themselves present two-dimensional information; the significance of their location relative to the x and y coordinates of the field presents two more dimensions of information. The marks, plus significance of their location, could function to describe events impinging on one another through real time and in real space. Planners with such real time-space systems as the economy, ecologies and foreign-aid projects have devised flow charts and "critical-path networks" to show how several events at one end of the chart must lead through certain other events before conditions can permit subsequent events. The flow charts usually fail to render the systems as dynamisms, as interrelated wholes which continually flex back on themselves. Recent schemes of loop analysis and visual diagrammatic mathematics little help. For the charts still rest within the Renaissance concept of drawings as window pictures, as single outlooks on a scene regardless of how flat the picture space may be. There is no concept of drawings as a multiplicity of contingencies within an equilibrated network. No comprehensive view of events ensues. No coordinated sensation results. Now Sol Lewitt develops a method for drawing on one sheet both the two-dimensional physicality of the marks and the two-dimensional information of their location: he makes the location of the marks determine their physicality. He works out a logic not of drawing a scene but of drawing a particular state of events, a particular equilibrium of forces interacting in ripples throughout a field. This allows for easy rendition in a comprehensive view of such four-dimensional phenomena as physiological systems.

LeWitt: Arcs, Circles and Grids; Location of Lines. Douglas Huebler: Drawings. Norbert Weiner: Cybernetics. Les Levine: information-grid theory. H. T. Odum and other ecologists: Comprehensive visual diagrammatic mathematics.

2. SCULPTURE

Sculpture is a catalyst. It engenders metabolism but is not itself metabolic. Unlike painting and drawing, it is less a record of events or study in perception than an attempt to set forces in motion. While a painting or drawing functions to convey, a sculpture functions to activate. Sculpture does not transmit or display ion pulses; it coalesces and radiates them. It may weather and decay, but it does not – despite one systems artist's contention – achieve value in physically reacting to the environment. It is an unmoved mover.

- Genes and proteins can be sculptures. Organisms are the consequence.
- Earthworks can be sculptures. Collected animal energies are the consequence.
- Masks and standing signs can be sculptures. Adjusting pathways are the consequence.
- Pipes can be sculptures. Fast-flow infrastructures exchanging vital fluids between cities and untamed landscapes can be the consequence.
- Flight and broadcast networks can be sculptures. Outstretched spaces for communication can be the consequence.

Sculptures establish spiritual presence. Savages conceived earthworks and masks to be animal deities, to not only house but to actually manifest a magical agent. Volker Anding has constructed signs outdoors which communicate directly with untamed animals: the signs, like Winfred Gaul's, bestir them into ordered movements. Morton Shamberger considered his most-recognized sculpture, a pipeline, to be "God". Genes program life, so they function as gods. Smithson conceived of sculptures plugging into invisible networks, plugging into forces immanent throughout a cosmos. All types of sculpture exude at a site or group of sites an animating spirit for the site. They have caused an excitation of electric particles there. They have done so without themselves being charged, without themselves being alive, without themselves doing anything. Like catalysts, they trigger activity in the neurosensory continuum of space without being active. Like deities, they motivate life without being motivated. They can be the spirits of specific forests or meadows, of specific places. They act mediately, by shape and suggestion, rather than immediately, as by a direct planting or herding. They affect the higher animals without ever a direct touching or prodding of those animals. Shaped as sculpture, non-life mediates the variegation in a site of animal forms. It forments an Electric Field and Variety Theater. The end of non-life as sculpture is life, and the fullest achievement of sculpture is a life system extending throughout a large space – an ecological system.

Beuys: The Pack; Hauptstrom. Oppenheim: Search for Clues. Burnham: Beyond Modern Sculpture. Volker Anding: Wild chicken project. Germano Celant: Arte Povera. Goethe: Der Erdgeist. Wolfgang Wickler: Stammesgeschichte und Ritualisierung; Mimicry.

Sculptural program for animal variety at a desert, salt site

1. Evenly-spaced steel poles in a large grid, effecting a neurophysiological uniformity throughout the site by conducting electricity evenly between air and earth. Consequent rise in capacity of higher organisms to maintain the electric polarities intrinsic to immunity. De Maria forms Boccioni's "spazio sviluppante invisibile".
2. Burrows and tunnels, identified as sculpture by Nauman and Matta-Clark, dug near groundwater upwelling in salt sink. Underground animals gather, build more tunnels. Dry soil absorbs slime; animals conserve and distribute water; groundwater slips into increasingly spongy soil. Groundwater upwelling shifts above salt sink.
3. Upright caves, Oppenheim's Dry Wells, attracting migratory birds, with fats and salts from lowlands, sheltering soil animals, inducing and collecting rain.
4. Large open pits, as by Heizer, Oppenheim and Nauman, dispersing ground salts in fresh rainwater, collecting muds and tars, increasing animal convergence.
5. Ramps and spirals of dry land out onto depressions, as by Smithson and Richard Long, producing sites for salt accumulations and mammal populations. Salts and waters mix: both inanimate, they both catalyze organization of life forms, first in microbial algae, then in higher forms of air and water life.
6. Deeper pits, with precipices and fall-traps, suggested by Heizer. Giant curtains divert herds towards the deadly meeting grounds. Laser nets by Rockne Krebs and Horst Baumann and spiked beds by De Maria heighten the exchange among species. Rather than avoid the site, animals cluster there, feed there, procreate fast in the stress.
7. Marsh by salt flat. Mud flat, seminal marshes, exuding

evapotranspirative clouds in the desert like Oppenheim's Whirlpool. As seen from aerial cameras through infra-red filters, the lower lands become grasslands, or Oppenheim's Red Stars.

8. Dispersal of project throughout entire salt drainage basin, first with the transport networks of insects, birds and mammals, noted by Smithson, and then with replications of the project with the survey methods, from land and air, of Jan Dibbets.

First-wave earth art. Boccioni: Manifesto tecnico della Scultura futurista: "scultura d'ambiente". Beuys: Marsh performance. Duchamp: Marchand de Sel.

3. ARCHITECTURE

Masks for city. Construction from city out into intrinsic space.

Mediation of humans with the other animals in their territory takes shape in the mask. The mask is a face, an outgrowth, a front. Without such a front, without such an encrustation of expression, without such a covering of animal skins, humans die of exposure. They fail to mimic the animal surroundings for an ongoing pulling together, an ongoing copulation and racing ahead. They become alien to the other species; they lose their cover; they seek protection in huddles of human commiseration.

With tribes now replaced by cities, still more by jet networks of cities, the mask would meet the needs of cities and not of tribes. The mask would be an expression of the city. It would present an attitude. It would speak for the We that is the city co-extensive with the animals and plants in its territory.

The mask of the city has not developed. It is little more now than a clock. By the clock, the society of burghers – the bourgeois society – puts up a front in its relations with the facticities of nature. The clocktower is the city's present totem pole. Time is money, and money – or Mammon – is god.

Through forms of earth sculpture and through Futurist fascinations with electric lights as they blast, a sense of the city mask begins to rise. The mask would throb like Balla's Street Lamp, as an Electric-city, as a radiance of light in a reverberative space. The mask would be seen photodynamically. It would be seen from the air. It would generate and continuously cycle back its own energy. It would express, as running force, Boccioni's Unique Forms of Continuity in Space. Body art and earth art conjoin: the mask appears as a continuous shaping of landscape processes under force of human body-energies; it appears as an active mediation of human bodies with a body-landscape, as a consummate exchange of human forms with land forms, of life with rock. It is seen as Nauman's Consummate Mask of Rock.

The city functions as a group of mammals. A group of mammals holds territory in a sink. It holds space in a drainage basin, in Duchamp's urinal, in Smithson's land-tilt complete with water-hole. A freshwater sink is the Serengeti grassland, from which enormous migrating herds rarely pass. The more encompassing saltwater basin for the Serengeti is the Mediterranean Basin, which human mammals in history have sought to consolidate in one group holding. Fertility concentrates within each basin. It does not generally flow from basin to basin; it flows down rivers in basins and generally rises up in basins with ocean floods and mountain upheavals. Over time, despite the circulation of fertile materials by birds, by insects, by grazing mammals, by salmon, the uplands gradually lose

fertility and the lowlands and coastal waters gradually accumulate it. With sedimentation, with gravity's pull, the fertility collects into tars, into salts, into muds. Only geological catastrophes have reversed the degradation. And cities, with their attendant agriculture simplifying the land's animal variety, have only accelerated that degradation. From Ur onwards, cities have accelerated a geological tendency towards desert. Not until cities develop masks and disperse their mask images throughout the basins they occupy can the geological process be mimicked, be shifted in direction, be reversed.

The city places masks on its space. The masks give expression to the entire sink.

1. Mask of Tar. Burn city residues, reduce them to primary geological ingredients, to hydrocarbons, ammonia, ash. Collect hydrocarbons into Beuys' Fat Corner. Allow Fat Corner to become gas, then combine with ammonia and specified ash in a fermentation vat. Certain microorganisms consume the solution. City converts to rock in rapid mimesis of geological petroleum formation, and then life grows on rock.

2. Mask of Feathers. Break down epidermal tissues from animals, tissues which lie dead on the outside of live creatures, tissues used often in masks. Break down feathers, skins, scales, claws, tusks. Create mixture of keratin proteins. Add the microorganisms grown on Fat Corner, of which the coatings of flagellae have proteins that resemble under X-ray diffraction the keratin proteins of the epidermal tissues. Pipeline these transformed city residues into chambers with rows of feather follicles. The microorganisms' keratin-like proteins become assimilated with the keratin proteins of the epidermal tissues by a membrane mediation, then by a bonding: all proteins become enmeshed with feathers regenerating from the follicles. City mimics bird and grows feathers. Life processes transform dead tissues from animals' cover into yet more dead tissues, incorporating meanwhile the microorganisms from Fat Corner. By appropriating the biocrystalline exudations of animals, by appropriating the keratin life-rocks, and by then enacting the process of feather formation, the city grows a biocrystalline, life-rock epidermis – a rock-like mask – from its own extrusions. (Oppenheim: Feather Ridge; Identity Transfer. Rebecca Horn: Feather Masks.)

3. Mask of Birds. Drop feathers along bird migration paths. Drop at the marshes where birds drop feathers, where they intersect with lower forms and feed, where they scatter nutrients from elsewhere. Life-rocks from city are dispersed along flight routes. Rock basin is covered then with swarms of insects and birds feeding on life-rocks. Motion pictures from the air record a metabolic transformation, an increased temperature and vegetation, on the face of the mask. (Oppenheim: Migratory Time Zones. Hans Haacke: Live Random Airborne Systems. Sharits: "Structuralist" films.)

4. Mask of Fish. Produce fish in abundance. Lift salt seas onto rock tilt, onto sink face. Remove accumulations from waters not as sediments, as rocks, but as sediments upwelled and absorbed by fish and seaweeds. Offshore rigs and pipelines coursing from seas onto land effect continuous geological transfers. They mimic rivers in reverse: they mimic ocean floods. Fish and concomitant seaweed populations become abundant partly because of pipeline structures that upwell waters and conduce harvests quickly to land, and largely because of the masks of feathers and birds; since marshes are activated with clean feathers from city residues and since the uplands are managed with birds-eye scanners as untamed animal-plant systems fecund with meats and fruits, the rivers

draining the rock-tilt pass no urban sewage, no agricultural wastes, no excess runoff. Highly-evolved giant kelp becomes plentiful enough for harvests that yield, upon decomposition in piped chambers, the methane needed to fuel all engines in the city's basin. Engines then mimic beasts, exhaling only carbon dioxide and water: air pollution ends. From the sky, the basin appears as a tracery of silver rivers and serpentine pipelines, both full of water organisms and their residues, and both forming an infrastructural substrate for human settlements. The clear skies and rich animal-plant diversity produce a rock-basin facade as scintillating as the multihued scales of fish. (Marinetti: Electrical War. Oppenheim: Annual Rings; Removal Projects. Smithsonian: Tilting Ring. Matta-Clark: Substrait. Rinke: Wasserplastik.)

4. CONSEQUENCE

Execution of the painting, drawing and sculpture now described throughout a rock-tilt such as the Colorado River Basin including Southern California or the Mediterranean Basin produces an architecture of cities as super-animals thriving amidst a panoply of wild animals and plants.

Note: First published in *Spanner* in 1979, an artist-run magazine based in NY and London, edited by Richard Miller and Terri Slotkin. With this, engagement began in Collaborative Projects, the artist-run venture serving as a non-profit model for the for-profit venture, Ocean Earth.

A POST-FACTO STATEMENT

BRIEF HISTORY OF OCEAN EARTH FOUNDED 1980

1985

The Ocean Earth Construction and Development Corporation arose from efforts of artists to develop projects larger than possible for any one artist and of public rather than art-world service.

The company arose from the ferment of the 60s and 70s, during which artists moved into video and film as display media, and into earthworks and ecosystems as sculptural and architectural material. Numerous concepts emerged then: that television had become like the cathedrals of prior centuries, and that artists should produce television news as they had produced sculpture and friezes for the cathedrals before; that earth art implied an entirely new way of dealing with terrain and regional planning; that artists should function chiefly to investigate and report visually-apprehensible facts of public import, and not to produce decorative objects for adornment; that mass media and not art galleries or museums are the primary field of action.

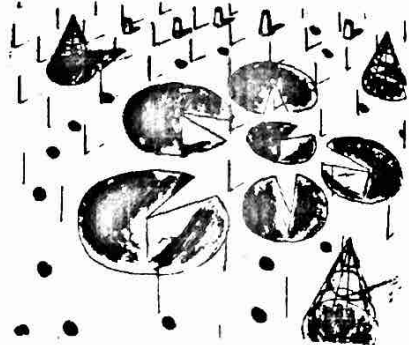
The company was founded through the efforts of an attorney, Richard Cole, now a partner at LeBoeuf, Lamb, Leiby & MacRae. Much of the intellectual foundation for the company, and its dedication to large-scale earth monitoring and engineering, comes from lectures by Vincent Scully, architecture historian at Yale. Scully argues that recent earth art and conceptual art contain the germs of a radically new approach to gardens (or land), fortresses (or military defense systems) and, extendibly, regional planning. Herefrom, the company proceeds into the public arena.

V. "Electric Field with Snares"

Plan

Pitfalls with water attract land animals; cages over waterholes attract air animals; in the competition for space, predators take advantage. Evenly-spaced electroconductive poles effect an immunological structure.

Concepts: De Maria, Denes, LeWitt, Oppenheim, Smithson



VI. "Assembled Spirals"

Low-angle aerial photograph

River is channeled into hillside, ponding there among spiraled holes and snares. Unsopped water flows gradually downward in reverse-S up the valley and onto the opposing slope, where a second spiral receives it.

Concepts: Beuys, Oppenheim, Smithson



VII. "Production Lines"

Ultra-high aerial photograph

Aerial migration routes bind sites in Eurasia with sites in Africa, transferring to the uplands nutrients from salt waters. At stops, species intersect, marshes form and grasses spread, making possible the sustained harvest of mammals on land and of kelp, degradable to methane, in the sea.

Concepts: Haacke, Oppenheim



details from *Earth Net: An Economic System*, 1977-78

Page from the catalog at Caltech's Baxter Art Museum showing "Earth Net: An Economic System", 1978

II. FOUNDING DOCUMENTS

The company is registered in the State of New York to (1) provide "media services" and (2) produce "architectural components". This gave a mandate, for example, to produce mise-en-scene or film documents of sites monitored or built into with our architectural components. These documents were filed with attorneys as part of the registration process. The final name of the firm was a second choice, being unlike anything else in the registry, and by unintended coincidence had the acronym "OECD". It was decided then, despite what could be foreseeable confusion with the Paris-based OECD, to proceed with the full name.

OCEAN EARTH CONSTRUCTION AND DEVELOPMENT CORPORATION, OECD

1980

OCEAN EARTH

Planet monitoring and management for stable nutrient circulation, high numbers of wild animals and plants, continuous exchange of gases CH_4 - CO_2 - O_2 , particularly within saltwater catchments, or ocean basins including lands supplying freshwaters, soil, and possible pollutants.

Sea rigs For production of seaweeds and fish at artificially-high rates. Rigs are hydrodynamically-stabilized, semi-submersible and rotating. They may have artificial upwellings, furnishing them not only bottom nutrients but also possible thermal-gradient energy. Harvesting of seaweeds from below allows weekly yields, a ten-fold increase over present harvesting methods could meet all present hydrocarbon needs with a non-polluting, replenishable fuel. **Effects:** end to most air pollution; return of outwashed soil nutrients to economic circulation; increased ocean yields.

Waste conversion Via pyrolysis and bioprotein-production, yielding predominately a lower-animal feed suitable for wild feeding and spawning grounds – notably marshes. Yielding from the small ash/metal-fraction certain extractible minerals. **Effects:** End to most water pollution; fertilization of ecological systems through existing animal networks, therefore with complete micronutrient dispersal; easier access to recyclable ash minerals.

Marsh construction Whether in deserts, as wadis, or along rivers, for animal increase and flood control, or among estuaries: functioning earthworks that build up groundwater supplies and increase mix of fresh and salt waters for high bioproductivity. Set along migratory pathways of animals, chiefly airborne ones, so that upgrading and fertilization there leads quickly to replenishment of surrounding ecosystem. Nearby, traps and lures for wild animal harvests are constructed. **Effects:** end to agricultural poisons or artificial fertilizers, which damage environment; end to monoculture; end to destruction of varied habitat; commercial or paramilitary harvesting of wild animals and plants in superior overall yields and of superior nutrient quality.

Video monitoring In the mode of Futurist photodynamism, mobilize the many possible spectral readings of an environment—usually from aircraft or satellites—into algebraically-formulated video color streams. Consciousness may not recognize all the information, but the eye-brain complex—given a carefully balanced software program—will accurately respond anyway. Apply program not only to specific sites, like marshes, but also to entire hydrological systems. **Effects:** televisable image of entire ecological (hydrological) systems, for all to see; proper timing of harvest and fertilizations.

CITY BILD

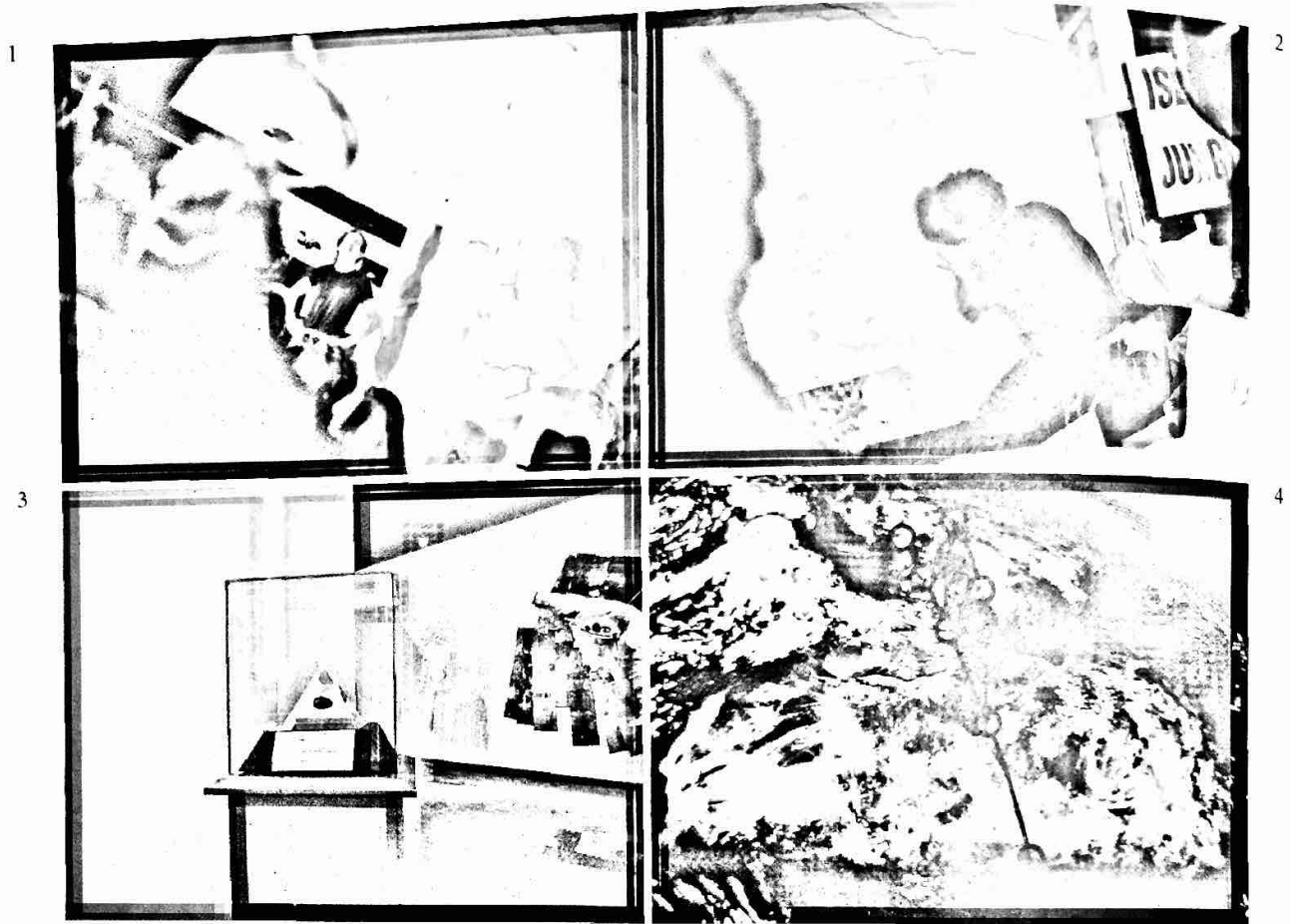
Construction of human settlements with optimum exposure to sun, air and scenery, with an overall shelter from extreme winds, temperature or sunlight, and with minimum interference with the movements of wild animals. Locations tend to be scattered, often on sloping terrain, along conduits.

Skeletons Sloped frameworks; counterbalanced and cantilevered bridges; bascule bridges; counterbalanced discs: all these usually in combination and usually set in linear patterns along hillsides or across valleys. Principles of bridge constructions have become predominant in skyscrapers: now the skyscraper is set on its side, and the city becomes a series of linear, sloping structures. Skeletons rest on floating caisson foundations; they are ready to hold containers, pipelines, transport aqueducts, hydroponic farms—all upon the extending beams. Plug-in elements are structurally fitted to be ferried about by overhead gantry cranes and to add to the overall structural strength as they are inserted. **Effects:** relative safety from earthquakes; easy access to infrastructure for repairs; security of infrastructure from water damage; extreme ease of renovation and reconstruction, with no need for new foundations; each time skylines gain fresh configuration.

Containers Intermodal freight containers serving as standard architectural space, as standard bay, which can be continued indefinitely along a skeletal framework of a mega-structure city. Usually of the 10' x 8' x 20' size, sometimes half or a quarter of that for specific functions (such as bath). Basic unit has steel roof, floor and corner posts; each post has flanges and grooves to accommodate optional, variously-cutout wall pieces. Interior spaces could be horizontal multiples of such containers. Ducts and services could be channeled through 2' gaps between slot levels on the skeleton. **Effects:** translocatable fixtures for new or different lofts; metabolically-specific spaces to accelerate certain body processes (e.g., sleep).

Windbreaks Tensile canopies sustained by hot-air collectors (using chiefly exhaust heat of the city) and stabilized by air-foil assemblies that baffle and neutralize wind loads. Plants suspended amidst the rigging increase oxygen supplies and baffle sunlight. Running alongside or over city frameworks, sometimes strong enough to suspend walkways, giant signs, aerial retreats. **Effects:** reduce wind load, the main load and stress on buildings, allowing lighter weight and more temporary structures; less insulation for each building, and less air-conditioning; a moderate city climate.

Aqueducts Pumped arteries to support continuous freight and pedestrian pathways. The supported weights do not add to load on structures bearing up the arteries, and noise is far less than that of highways or subways: lightweight, aerial tracery can result: all travelers can see their city. **Effects:** mass transit with no waiting; personal choice of speed.



- 1 Performance at a Collaborative Projects event, "Island Jungle". In the early 1980s, the question was whether the scenarios, here comic, could become serious, or even real. Collaborative Projects was founded in 1977.
- 2 The person rather aggressively marking up the Caribbean is the founder and first president of Ocean Earth, Peter Fend.
- 3 Space Window Show, organized by co-founding shareholders and Space Force initiators Eve Vaterlaus and Joan Waltemath. This was an international art show at the Rhode Island School of Design. It was also probably the first art show, in 1977, dealing with outer space.
- 4 Earth Net 7-2, migratory path prior to stabilizing the ecosystem. This is from the first public presentation of ESA Meteosat imagery, in 1978.

INVENTION

1980

Futurist "painting". Field-theory multispectral video/film "fotodinamism". With fixed frame, computer-based NASA imagery, can generate motile, multispectral video renditions of coherent landscapes, which are hydrological basins. Renditions can also be made with horizontal views.

Counterbalance architecture. Structures which bear loads by weighing off one cantilevered arm against another, often to great heights. Extensive utilization of concepts in bascule and cantilever bridges.

Airfreight container modular architecture. Frameworks which are prefitted to accomodate airfreight containers, which are automatically strengthened while the container load is added, but which do not allow contact of container with container, thus allowing flexibility in vertical placement of containers. Design of corner posts in existing widebody-jet airfreight containers so that walls are optional and changeable-leading to modular architecture based entirely on airfreight container dimensions.

Animal-site earthworks. Immunological fields of lightning rods. Underground animal and water-table induction structures, based on earthworks vocabulary of Oppenheim. Convex marsh arrays with ever-larger interspersions of pits and dryland.

Hard-soft sculptures. Liquefied materials shaped and held up by fabric or skin sheaths made firm with vertical or circular beams. Combination of studies by Oldenburg and Piene.

Equilibrating windfoils structures. Assembly of rigid and soft sails within cablework to equilibrate and cancel any wind flow from any direction. Continuation of work by naval architects and engineers at University of Edinburgh.

Marsh fertilization through animal food chains. Introduction of microorganisms, as from bioprotein plants, or of up-graded materials like keratins, to marshes - possibly along lines of aerial and water animal migration.

Pumped aqueducts as transporters of platform-borne loads. Test models based on Rinke logic.

Equilibrated hydrodynamic structures, often overgrown with or accomodating seaweeds. Rigid blades and circular frames, with upwellings, stabilize a rig placed in open seas. On large scale, could be well offshore.

Seaweed holdfasts with multiple bonds, which can be regularly adjusted to allow for harvesting of seaweeds - notably kelp - from below.

EFFICIENT STRUCTURE

1980

- 1 means of production
- 2 means of habitation
- 3 means of observation
- 4 means of communication

increase the number of wild animals
 accomodate the humans along with wilderness
 monitor habitat with landscape color studies
 reduce the barriers and spaces between humans

FUNCTION

STRUCTURE

- 1
River control:
freshwater marsh
- Tidal circulation:
estuarine marsh
- Savanna formation:
desert marsh
- Animal harvest
- Plant harvest
- Mariculture
- Fertilization
- Wastes conversion:
biochemical and hydrocarbon
- Structural members:
shift to biolithic materials

Contre-roule of river bed, in lowgrade traverses of alternate hillsides, convex marshes set in discs at beads. Performs much of function of large dams: controls flow, prevents flash floods, affords a long-term dispersal of water and nutrients throughout the terrain, stores water yet without stagnation, collects silt, but in expandable, shiftable spirals.

Spits, bars, sluices, spills, in hydrodynamic swirl forms. Slopes, with sops, for maximum saltwater-freshwater mixing during in- or out-flow. For buildup of ocean fisheries.

Upright cones, freshwater-collecting pits near salt flats; gradual buildup of pits into spirulated animaltrap fields for mammals and birds. For buildup of oases, particularly along flylines.

Deceptive signs, blind alleys, traps for the less discerning and fatigued, set among marshes and near steep slopes. Wedge structures afford difference in drop, for different degrees of danger.

Large-scale hydroponics, usually within elevated urban infrastructure; campaign-like foraging sweeps.

Open sea, subject to competition among species, with semi-submersible seaweed rigs. Harvesting from bottom for nonstop growth; fertilizing, direct- and indirect by buildup of detritus-feeders from the top. Adjustable submersion. Lure-and-trap schemes for fishes.

Artificial upwelling of seafloor nutrients, largely used in mariculture. Conversion of human wastes to hydrocarbons and then to micro-organisms, which possibly then are built up to keratin-like tissue (e.g., feathers) suited for animal food chains, to be dispersed in feeding sites and spawning grounds at crucial moments along migratory paths.

To animal-food-chain agent (above) using entire waste stream except engineering parts of the ash residue after pyrolysis (5%), which can be material for metals industry. The substrate for growth is a methane or other hydrocarbon gas.

Metals industry, either of recyclable steels (continous process, hydrogen or methane as reducing agent) or aluminium. Plastics-like, regenerable keratins, as for roadbeds, wheels, beams. The formation of keratin structures is based on research by scientists in Australia, showing that monocellular organisms (such as yeasts) can aggregate and then amass large keratin sheathings if the follicle rods and certain homones or ribosomes have been introduced. Keratin formation occurs chiefly by hormonal communication, and the follicles or ribosomes are used as the substrate to be regenerated upon. A hair root or nail base can be used: the regeneration procedures resemble the mechanisms of neoplasm growth. Ideally, the effects of "wear and tear" would be modest, as any surface could be keratin-lacquered much as fingernails are today.

2

Surface transport – land:
minimum friction

Level roadbed, as aqueduct, affording minimum stress on substructure and therefore the lightest and least-costly construction. Fluid need not be water; could be a heavier-than-air gas. Pumps, suspended beneath duct to counteract gravity's drag and maintain strictly forward thrust, propel the viscous material. Metal or plastic sheet (including biochemical materials like keratins) functions as continuous floating belt, pliable vertically but firmly tracked laterally. Parallel ducts have increasing velocity and decreasing width from right to left; leftmost is the fast lane. The carriage is banked for turns; centripetal force keeps loads, including sheet-platforms in place. Substructure, desirably not set in an embankment, would be a clear-elevated bridge, possibly in counterbalanced, bascule-type sections: terrain is wild.

Surface transport -water:
minimum aerodynamic and hydrodynamic drag

Hydrofoil with engine and drive-shaft suspended amidships. Fuselage never rests in water but rises above platform, held aloft by counterbalancing forces of the twin V-beams of the foils: there is no hull. Aerodynamic drag reduced by fluting of foredeck airfoils, by fish-like shape of superstructure, and – to a countervailing extent – by rigid or ballooning sails, including sails for exhaust gases of the ship itself.

Immunological strength

Lightning Field, conceived by De Maria. Increases rate and uniformity of electric flow near ground, literally charging the spirits, literally increasing the polarity in body cells of immunogens vis-a-vis antigens, literally increasing the degree of physiological organization – as occurs among mountains and by the sea, two traditional favorites for human settlement. Field of lightning rods could benefit cities or animal sites, either directly or indirectly aiding defenses of the most-highly organized species, such as humans.

Public synapses

Video & film viewing spaces, with private booths, accompanied by microfiche and computer-processing systems. In new forms of the library and the museum. [NEWS ROOM]

Cities not interfering
with animal movements

Radical-cantilever, counter-balanced bridges, carrying upon them all infrastructure and superstructural modules, coursing across flatlands with the structural efficiency of the counterbalancing, symmetrical human body. Foundations, functioning like the human foot in their pontoon-like or pad-like readiness to rock or roll with shifting load and substrate, reduce danger from earthquake. Within steep slopes, excavations accommodate single-cantilever sloped framework again for infrastructure and buildings. Each cantilevered level functions as a raw space, as in loft buildings, suited for plug-in modules or for custom construction of buildings and gardens. Floating cities, immediately at the site of thermal gradient, saline gradient, wind, wave and biomass forms of ocean-solar energy. Giant floating hulls cast in concrete, steel or – better – biolithic materials like coral and keratins, at sea: components are triangular with extended sides for attachments. Bridges above.

Compact, transportable
and metabolically supportive
chambers

Fixtures for lofts integrated within modules built like and transported like present airfreight containers. E.g.: kitchen; video-stereo-computer-word processing-microfiche-copier container (high-tech study); sound and film studio; pneumatically and barometrically adjustable sleep chamber; washroom & sauna. These fixtures can be purchased or custom-built as discrete works of hardware, as furniture which surrounds the user. the art-precursor is "the installation". Suitable for plug-in to lofts; helps incite decentralized office work. Buyers can shift locations throughout the world without having to "move".

Windscreen/leafy canopy

Surrogate for city walls and for attempt at giant enclosures like Fuller's N.Y. dome. Relatively-light gases, chiefly the heated air and exhausts (non-polluting) of the city itself, are chief suspending force of light-weight tensile structures bearing airfoils and foilage to break windload and reduce temperature stress, so accommodating lightweight construction on city understructure.

3

Aerial observation

Software-hardware package for video or film display, video preferably, of the many different spectral readings available with current air and satellite photography and current computer-aided adaptation of such photography. Software package interjects spectral readings into extremely brief time span (several seconds), given that, on video at least, there are 60 time slots per second. Frequency and sequence of color-specific interjections is determined by repetitious eye-brain studies to see how much information can indeed be received and acted on without being explicitly cognized, and by an algebraic formulizing of the relative weights of color-indicated information in the decision on what is occurring at a particular ground site and what to do about it.

Final product for viewer with decisions to make about the site may appear on twin video monitors, one showing a tape loop of a particular algebraically-formulated color-scan sequence, abstracted into a smooth color stream, and the other showing live data from an air monitor over the actual site, the live data being sliced up into particular spectral readings and being reassembled according to the algebraic formula of the control tape loop. If, according to the viewer's judgment, the color streams of the control correspond with those of the live data, then the ground truth is understood relative to a particular decision or action. To view the site in regard to other questions for decision, the viewer must play a different control tape loop and must play the live data according to that tape loop's spectral-reading formula. All citizens can read this of their hydrological or other closed systems. It can be shown on TV. It can become an immediate indicator of the success – ecologically and physiologically – of the territory's management group. From the direct evidence, as in a mirror, the polity can take direct action. The eye in the sky becomes a tool – towards Direkte Demokratie.

4

Send-recv television images and sound

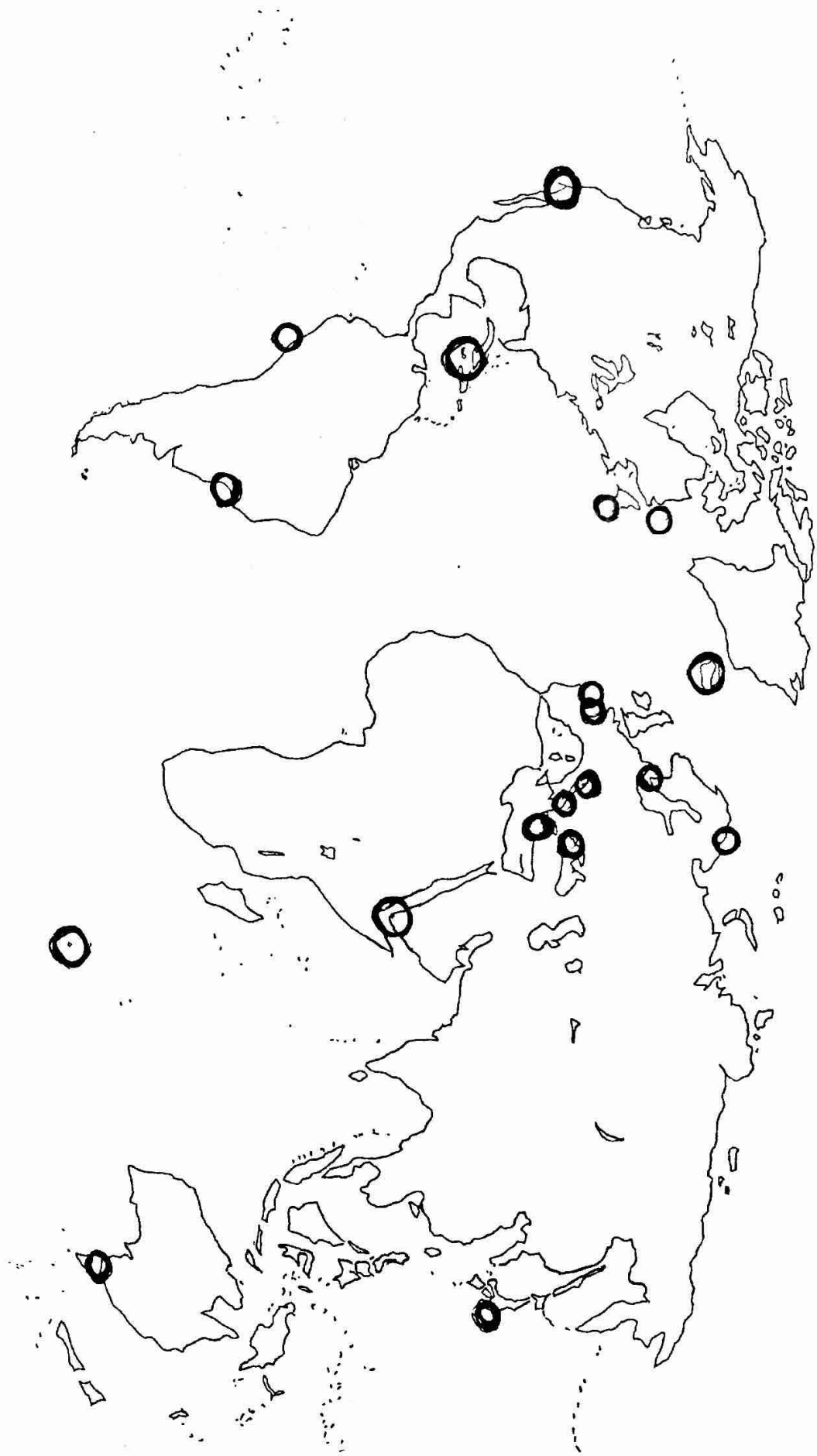
Earth stations, each purchasable by normal citizens, which plug into satellites set in geostationary or highly-regular orbit. Cultural programming then becomes a matter of individual direction, of individual choice. Many sources can send out signals, with relatively low-cost equipment. Still more people can receive signals, with still-more inexpensive equipment. There is no more economic advantage in commercial or state-dictated broadcasting. The airwaves are free. The capital city as repository of official language and culture loses power. Certain cosmopolitan cities may retain appeal only for the immediate neighborhood lifestyle and fermentation they offer. Cities, then, become consumer goods – not means to intimidation. [The Thing, a venture started in 1991 by Wolfgang Staehle, now extending throughout the "art world".]

Impregnable, accurate gas metering, for resource control

Placed at regular, carefully-defined intervals within the infrastructure and its frameworks bearing city buildings, the meters become one of the absolute indicators of consumption of goods produced by the ocean monopoly. The equivalent of taxes, or public revenues, would be obtained from any consumer of monopoly-produced gas at a rate of: (actual gas consumption) times (number of meters). This tax-public finance structure discourages the excessive appropriation of space, especially in highly-desired locations with many meters, and the excessive consumption of ocean-born gas. Since gas distribution is less wasteful than electricity distribution, the system would tend to foster local generation of electricity rather than long-range transmission. Anyone developing self-reliant energy systems gains autonomy from the ocean monopoly.

Computer-tracked and containerized shipment of ocean goods

Airfreight containers with slide-in trays every foot, each tray accommodating fresh layers of ice or other coolant, as required for fish, seaweed, coral and other fresh ocean products. Uniform size, with centralized distribution agency in each basin, suitable also for trade into other sinks; foundation for further public finance control by satellite, as conducted – for tax-assessment – by pin-point ecological readings.



Targeted Sites for Ocean Industry Development 1993

OCEAN EARTH

Hinterland Industrial Architecture

III. OCEAN INDUSTRY OFFSHORE PRIMARY PRODUCTION

MANAGEMENT OF COASTAL WATERS 1976

Diverse and prolific populations of organisms must be maintained in the ocean. They should better be exploited. They will best be maintained and exploited if property rights prevail where ocean organisms are most concentrated: in coastal waters.

Oceans collect materials from the land, and ocean organisms thrive where those materials are most available: near the land. Quality of ocean organisms, indicated commonly in the diversity of species, depends on the composition of materials from the land. Some materials are consumed by decomposer organisms, which in turn are consumed by ocean animals. Some are taken up by plant organisms, such as kelp and phytoplankton, which are cropped by ocean and land animals, including humans. Two food chains, through decomposers and through plants, re-package and re-concentrate most of the materials that flow from the land to the oceans.

Diverse and prolific populations of ocean organisms must be maintained to assure supplies of oxygen and rain. The organisms circulate 80% of the earth's atmospheric oxygen. They accelerate the evaporation of water from the oceans to make available more rain on the land; the resulting vapor is the chief source of rain on earth. The rain supplies water, sulfur, phosphorus, nitrogen and other essentials for the land.

Ocean organisms should be exploited economically for ready supplies of nutrients, industrial minerals and compounds, and fuel. They collect the greater part of the energy flow on earth. They collect the energy from the sun, through plants, and from wastes of the land, through detritus-feeding decomposers. Compared to land organisms, ocean organisms consume very little energy in maintaining equilibria of heat and water, or in maintaining structure against the forces of gravity. Most energy proceeds directly to construction of organic materials useful as nutrients, industrial minerals and fuel.

The oceans should be exploited economically because humans have accelerated the flow of materials from the land to the oceans. The land naturally degrades, and the oceans naturally return to land through geological upheavals. Humans hastens the degradation; they might better not try hastening the upheavals.

Sometimes the most efficient method of extracting minerals is not mining but the harvesting of fish or plants. Certain ocean organisms concentrate certain minerals. A brown algae concentrates copper from thousands of proximate acres. Littoral seaweeds concentrate iodine. Certain marine microorganisms, operating in the decomposer food chains, concentrate mercury. Harvesting such organisms proves valuable not only in extracting the dissolved minerals which scientists have yet failed to extract economically, but also in removing minerals which in concentrations prove fatal to most ocean organisms. Potentially the most dangerous elements from industry on land are copper, tin, lead, chromium and mercury. There may be ecological niches in the ocean for plants that remove these all.

Ocean organisms should be exploited for the full range of nutrients. Where they are exploited they are plentiful, and they transpire vapors rich in nutrients which may rain on the land

regardless of its owner. Where they are exploited they also are removed by humans, with the nutrients becoming property for distribution to particular organisms on particular tracts.

Any land organism can consume the nutrients contained in ocean organisms. As it does, it consumes the closest approximation to its own composition of nutrients: land organisms merely embody and encase a portion of the ocean. The consuming land organisms may be decomposers in a freshwater marsh, which then generate food chains throughout the area and downstream. The consuming organisms may be soil bacteria and worms, and than plants. Or they may be hooved animals. Or they may be humans. The same nutrients from ocean organisms used to inoculate ecological systems and fertilize farmlands can be used directly to feed humans. Only single-cell proteins manufactured from hydrocarbon or waste substrates can approach this universality of utility for land organisms.

The oceans, especially in coastal waters, can be exploited to yield enormous quantities of complete and extremely potent fertilizers. Artificial fertilizers fail to supply all the trace elements required by organisms. They fail to provide the bulk needed by soil to house microorganisms and worms – or simply to hold water. Their manufacture consumes more energy and labor than the extraction of ocean plants and fishes might consume. That manufacture costs several times more the energy that is gained from land crops. Natural fertilizer from the land scarcely serves better: its manufacture is arduous and its composition is often incomplete. More, the fertilizers manufactured or composted on the land cannot be consumed by higher animals: they cannot supply other markets.

Coastal waters can be exploited to yield the greater part of the energy required by advanced societies. They furnish many sources. All of the sources of energy either burn completely or do not burn at all; none of them release the carcinogens and other particulates attributed to combustion of petroleum, coal and wood. All of the sources derive from ongoing phenomena; none of them releases energies stored up long ago in fossil or nuclear fuels, and none of them therefore increases the earth's temperature upon combustion. Supplies are abundant, continuous and diverse. They include the celebrated retinue of non-polluting energy sources: wind, sun, currents, thermal gradients, tides, electric fields. Yet the main source of energy may well be certain combinations of marine microorganisms and algae.

The reaction of brown kelp with certain decomposer organisms produces hydrocarbons, e.g., methane. In past geological epochs this reaction left deposits of petroleum and natural gas. The deposits will soon be exhausted. The process of their formation can soon be repeated on a large scale. Scientists at the California Institute of Technology and the U.S. Naval Undersea Center have developed offshore farms of brown kelp, and they process the harvest with microorganisms for a methane gas that approaches natural gas in purity and thermal power. Natural gas consists mainly of methane. Large algae other than brown kelp may be used, with perhaps less methane product, but brown kelp seems better suited for hydrocarbon production than any other plants or animals on

land or in the water. The kelp proliferates in deeper coastal waters, where there are few competing uses for space. It thrives on the flood of nutrients from upwellings or estuarine outlets. It can easily be managed for harvest, stretching out 200 feet in single units. It grows faster than virtually all other plants on earth. For several decades, scientists have developed ways to convert algal cultures to hydrocarbon fuels and materials, to phosphate-rich fertilizers, to antibiotics, to salt and even cement; conversion of kelp to methane appears to be the most lucrative possibility.

Methane from the oceans may be generated in algae and fish properties encompassing 150 square miles and costing \$ 2 billion. On these same properties, perhaps interspersed with the colonies of kelp, a producer of methane might also operate wind turbines, tethered kinetic energy machines, solar energy collectors and electrostatic generators. Devices for raising nutrients from the ocean bottom simultaneously create thermal gradients; in one effort, both kelp for methane and power for electric generators can be produced. Coastal waters of the northeastern United States furnish a prime location for wind turbines. The technology for kinetic energy machines and electrostatic generators has not been well developed. Solar radiation might more economically be collected where few photosynthetic organisms can live, as in the desert. Methane will probably be the chief source of energy for these reasons: the oil companies that would exploit it, as generated in offshore rigs, already have coastal facilities for hydrocarbon refining and gas transmission; motor vehicles could be easily adapted to consume it; the methane and associated hydrocarbons can be produced with microbiological and chemical engineering from many agricultural and urban wastes.

As a fuel, methane from the oceans may become the dominant successor to the leading fuels of recent centuries. Methane from the land may become important also, but often the original organic material has a better alternative use. The fuels of recent centuries include: wood, coal, petroleum, natural gas, radioactive elements, whale and fish oils, urban wastes and agricultural wastes. Hydrocarbon gases and liquids, including methane, can be obtained from nearly all of these fuels. None of the fuels, including their gases, appears to be superior for large markets to methane from the oceans.

The management of coastal waters here proposed amounts to a systemic management of animals together with plants. It directly concerns marshlands, estuaries, sand dunes, rivers flowing into the ocean, as well as the coastal shelf. Its principles are applied to land plants and animals inhabiting or moving through coastal waters and marshes. Its principles affect also the upland plants and animals. If upland plants and animals are not managed systemically, and if they instead are managed monoculturally with the consequent runoffs of biocides and fertilizer chemicals, successful management of the coastal plants and animals – both of land and water – will become difficult to achieve. And if coastal plants and animals are managed systemically with success, they can generate the decomposer organisms which concentrate the fertility of the oceans and which can be introduced to upland forest beds or streams for greater circulation of nutrients.

If cultivation of algal crops can be greatly expanded, and if diversity or rotation of crops can be maintained enough to prevent mass invasions of diseases or predators, the algae can supply not only food and materials but also a very large portion of society's energy crop. Only tropical sugarcane and napiergrass can yield as much organic matter for methane conversion per acre per year, and their continued cultivation requires relatively costly land fertilization. Large-scale feasi-

bility in coastal waters has not been determined. But the geological history of petroleum and natural gas suggests that fuels can be produced efficiently from large tracts of those algae which grow faster – and with more species variety – than all other plants on earth. Schemes for hydrogen extraction from water or for safe and climatically-acceptable fusion with the ocean's deuterium may supersede schemes for production of fuel from algae, but only after considerable technical progress.

Production of food, materials and fuels from aquatic plants comprises part of the more sizable task of managing the ecological processes of the earth. Those processes may be considered as two: decomposition by lower organisms and feeding by higher organisms; both degradation and concentration. Each process balances with the other. In general, the oceans degrade materials from the land, and the land concentrates materials in the ocean. Activity concentrates in coastal waters. If one manages coastal waters, one manages the decomposition and reconcentration between land and oceans. One acts on these fundamental observations: the oceans are the sources from which we have evolved, and we embody them; the land naturally becomes exhausted of life; the land is but the ocean floor uplifted.

Production of methane or hydrogen from algae would combine with other means of production from the land and wastes for an integrated management of ecological cycles. Algae synthesizes nutrients in water with energy from the sun. They generate heat and cause evaporation: rain falls, and water and minerals spread over the land. Photosynthetic plants evolve on land. Fish evolve in the oceans to eat algae. Land animals evolve to eat land plants. Water flows back to the oceans, carrying with them nutrients and organic materials. Humans accelerates the flow of nutrients to the oceans relative to that of organic materials, or decomposable organisms. They also clear away the marshes that support the plants on which decomposer organisms thrive. Humans therefore upset the balance against the fastest-growing large animals on earth: fish. To restore that balance, humans exploits the fastest growing plants on earth: giant algae.

Complete Cycles with Wastes, Using Sea

1976

Beuys inspired this sequence for human economy within nature. All residues from human activity are sent through pyrolytic chambers that yield hydrocarbons, i.e., fat. The clean fat becomes a substrate for growth of uncontaminated, uniform, selected microorganisms. The microorganisms, developed by oil companies as single-cell proteins, are slipped into the step-up transformers of biological energy and organic decomposition: marshes and rivers and ocean upwellings. They may be slipped also into forest beds for accelerated decomposition of seedlings and wastes. Animal food chains in the ocean ensue. Nutrient circulation in the forests, with alternations of animal and plant paramouncy, ensues. With animal food chains in the ocean, algal populations can be increased without eutrophication. Algae can be cultivated in giant tracts to supply nutrients, industrial materials and – after biological conversion by microorganisms – methane.

British Petroleum combines its single-cell protein plant with a waste treatment plant that yields hydrocarbon gases, which gases contain none of the toxic substances that contaminate sludge used for compost. ENI-BP sells the single-cell protein for use in forests, on agricultural lands, in hydrological basins, especially in the enormously fecund and vital marshes and stamps. In the water, nutrients from cities are

translated into materials that can be taken up by fish directly instead of by algae. A balance between fish and algae populations can be achieved. Greater biological productivity and stability exists generally in coastal waters. Since coastal waters now contain a great surplus of nutrients and soil fertility, the long-term survival of terrestrial species depends on extraction of many of those nutrients from the waters for replenishment of the land. Biological activity in the waters already accomplishes this, somewhat. Greater organic activity spurs greater evapotranspiration, with greater rain, greater warmth and greater return by rain of nutrients. The droughts of present times may be ascribed to declines in biological productivity in the oceans. By funneling wastes through hydrocarbon cycles, and then growing microorganisms that feed fish, humans simultaneously prevent contamination of water, eutrophication by algae and grave land pollution from accumulation of wastes. By exploiting the greater biological productivity of the offshore waters, mostly as concentrated near coasts, humans then complete the management of ecological, climatic and nutrient cycles. ENI-BP uses its fish-farming technology to catch fish and algae in quantity. It also builds a fertilizer industry with ocean products and with the single-cell proteins direct from waste treatment. That may be most lucrative since artificial nitrogen fertilizers have been largely responsible for depletion of the ozone layer.

CORPORATE STATEMENT

1981

Ocean Earth Construction and Development Corporation develops regional plans and other architectural programs that promote those means of energy production which in no way contribute to ecological breakdown of the planet.

Ocean Earth therefore promotes those means of energy production which in no way include the extraction as fuels of depletable mineral resources.

Ocean Earth excludes from its regional plans and recommendations – from all of its architectural projects in fact – any schemes for long-term reliance on these mineral fuels: oil, coal, natural gas, shale oil and related feedstocks for synfuels, uranium and other nuclear fuels.

Ocean Earth encourages the development of solar energy in proven forms such as these:

- direct solar, as collected by photovoltaic cells or water vessels
- wind
- waves and ocean currents
- thermal gradients in the sea, depending on differences in water temperatures from top to bottom
- land-based biomass, such as wood (which, however, could very likely lead to depletion of the soil)
- organic wastes and landfill, yielding methane
- sea-based biomass, degradable chiefly to methane.

Some of these forms of energy waves and thermal gradient energy systems, for example, depend on geological formations on the earth's crust.

Ocean Earth also encourages the development of energy based on the relations of earth with its satellite the moon, notably: tidal energy.

From the vantage of outer space, Ocean Earth discerns what may well become a prime source of energy in the future: hydrogen fuel. The galaxies and suns themselves are conceptions and combustions involving hydrogen gas. A number

of scientific projects point toward possible breakthroughs in the production of hydrogen gas from even so readily-available a raw material as sea-water.

As an architectural corporation, Ocean Earth develops plans for viable habitats. Ocean Earth believes that private citizens, companies and even governments can easily arrange for solar energy programs that do not involve hydrocarbons. Ocean Earth encourages the development of wind and wave power plants, of thermal gradient offshore stations, of judicious timber-harvesting. But all such energy programs will be pursued for naught if the hydrocarbon energy program in a city or region continues to rely on fossilized, mineral deposits rather than renewable sources. And all such energy programs will still be set within a context of continued planetary degradation. For Ocean Earth, the first and prime task is the guarantee of a stable, ongoing supply of hydrocarbon fuels from renewable, biomass sources. While some such fuels might derive from urban and industrial wastes, by far the bulk of them will derive from the industrial decomposition of plants that grow faster than all other plants in sites which constantly accumulate – by force of gravity and drainage – the bulk of the planet's nutrients: that is, from the industrial decomposition of sea-based biomass – of seaweeds, of seagrasses, of marsh grasses.

A city or region with its hydrocarbon supplies based on sea-based biomass, chiefly in the form of methane, enjoys the freedom from air and water pollution, and from our wars and inflation, that result from present reliance on exhaustible mineral resources for our hydrocarbons. Such a city or region can easily afford to develop other energy sources, possibly to a point of making hydrocarbons a very small part of the overall energy supply. But any city or region remains caught in a vise of planetary degradation if it does not develop a biologically-sustainable source of hydrocarbons. For that reason, Ocean Earth concentrates on developing such a source.

OPEN-SEA MARICULTURE RIG

1981

Marine biologists and ocean engineers at Caltech, General Electric, the American Gas Association, the US Navy and utilities like Southern California Edison and Brooklyn Union Gas have developed projects for open-sea mariculture.

Scientists as prominent as Wernher von Braun and Wheeler North at Caltech have foreseen structures such as this causing an eventual replacement of the present fossil-fuel industry, both polluting and depletable, with a biologically safe and replenishable indirect-solar industry.

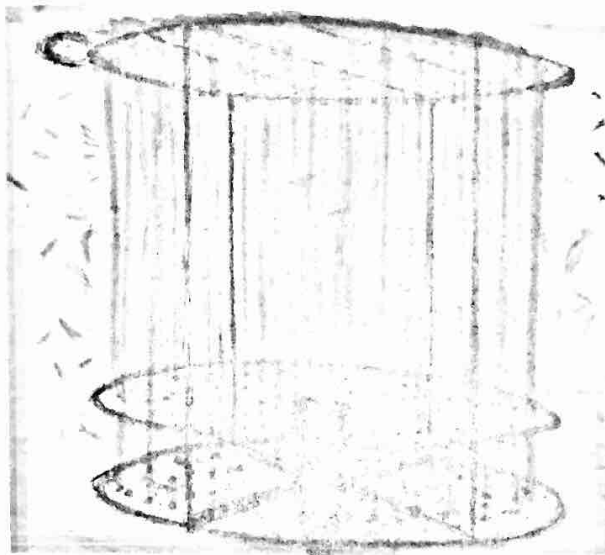
Concepts derived from recent artworks – such as by Walter de Maria, Dennis Oppenheim, Vito Acconci, and Robert Smithson – suggest ways to resolve functional problems with the test structures built so far.

Ocean Earth derived its paradigms from the century's radical breakaway art – from Futurism, Constructivism, and Conceptual art – and from current biology. The architectural consequence is clean-air cities.

Unlike aquaculture, open-sea mariculture does not involve enclosures that protect fish species, nor near-shore structures and other aspects of domestic animal management. A mariculture rig is placed within an essentially "wild" context, and domestication extends only to plants.

Mariculture allows for crop production and general fish harvesting where nutrients and productivity are greatest: at offshore upwellings, both natural and artificial; in fishing banks; throughout fisheries regions like the North Sea; along strong coastal currents such as the Humboldt Current and California Current.

1

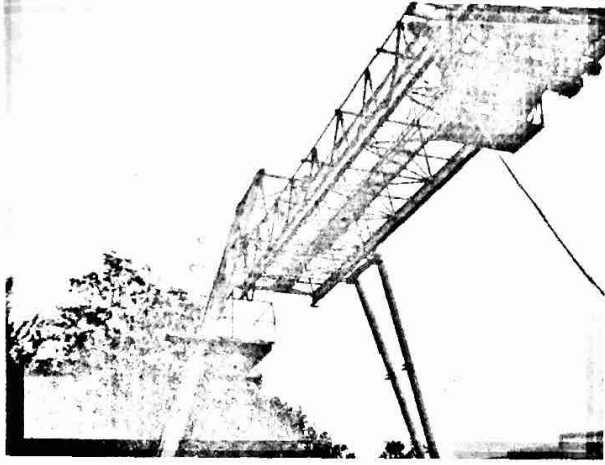


2



1 First concept-drawing of oceanic macro-algae rig, 1979. The middle ring is movable for repeated down-pulling.
2 Kelp bed air monitored by the California Department of Fish & Game, 1970s

3



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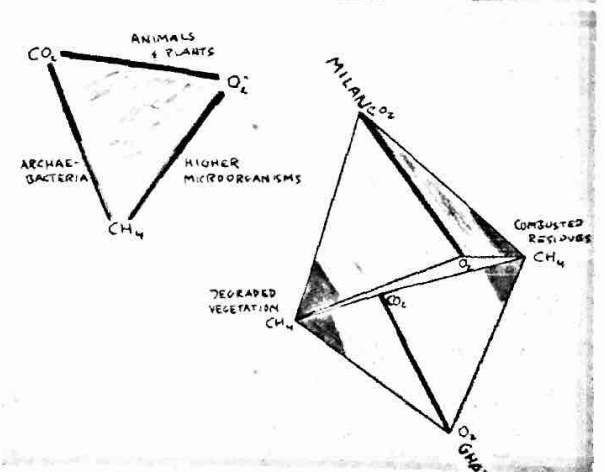


5

BASED ON BEUYS

THE CONCEPT OF FAT CORNER
CYCLE OF $CO_2 - O_2 - CH_4$
MARINE ALGAE \leftrightarrow GAS

6



- 3 An upland version of the same technology: a structure, in this case for canals and sloughs in The Netherlands, for collecting eutrophicating vegetation in the water – even before it reaches the sea. The structure is little more than a gantry crane (see Chapter VI.3, “PROJECT SITE: NORTH SEA/BALTIC SEA”).
- 4 A suitable site for beginning would be the large tracts assigned to the Italian national hydrocarbon company, ENI, for exploration and production in the Labrador current and just downstream from the mouth of the Orinoco, along the Equatorial Current. Coordination would be made with the IFREMER oceanographic and IFP hydrocarbon institutes in France.
- 5 All the work is based on Beuys’ concept of Fat Corner. (“Based on Beuys”), acetate overlay of photo, from Site Simulator, American Fine Arts Co., 1991–92, Collection of Barbara and Howard Morse.
- 6 At the same time, roughly, archaeobiologists were developing an understanding of a primary triangle in biology, whereby the plants and animals undergoing $CO_2 - O_2$ exchange could be degraded either anaerobically or aerobically. The Fat Corner became twice part of a rotating triangle, altogether a diamond. This concept was prepared in 1978 also as the sketch for Earth Net: An Economic System, prepared for exhibit at the California Institute of Technology, Baxter Art Museum.

III. OCEAN INDUSTRY: OFFSHORE PRIMARY PRODUCTION

7 Designs such as this, according to scientists at the California Institute of Technology, have failed to assure that plants survive storms. Funding for further tests was disappearing by the time we met with scientists there and at related companies, like Global Marine, in 1980. Instead, with the Reagan Administration, the oil industry got major tax breaks, and research such as this ceased. We developed then certain innovations, specifically for (1) under-pulling to harvest from kelp, and research with submarines, and (2) structuring in a cylinder, with equipoise maintained in counter-rotation blades.

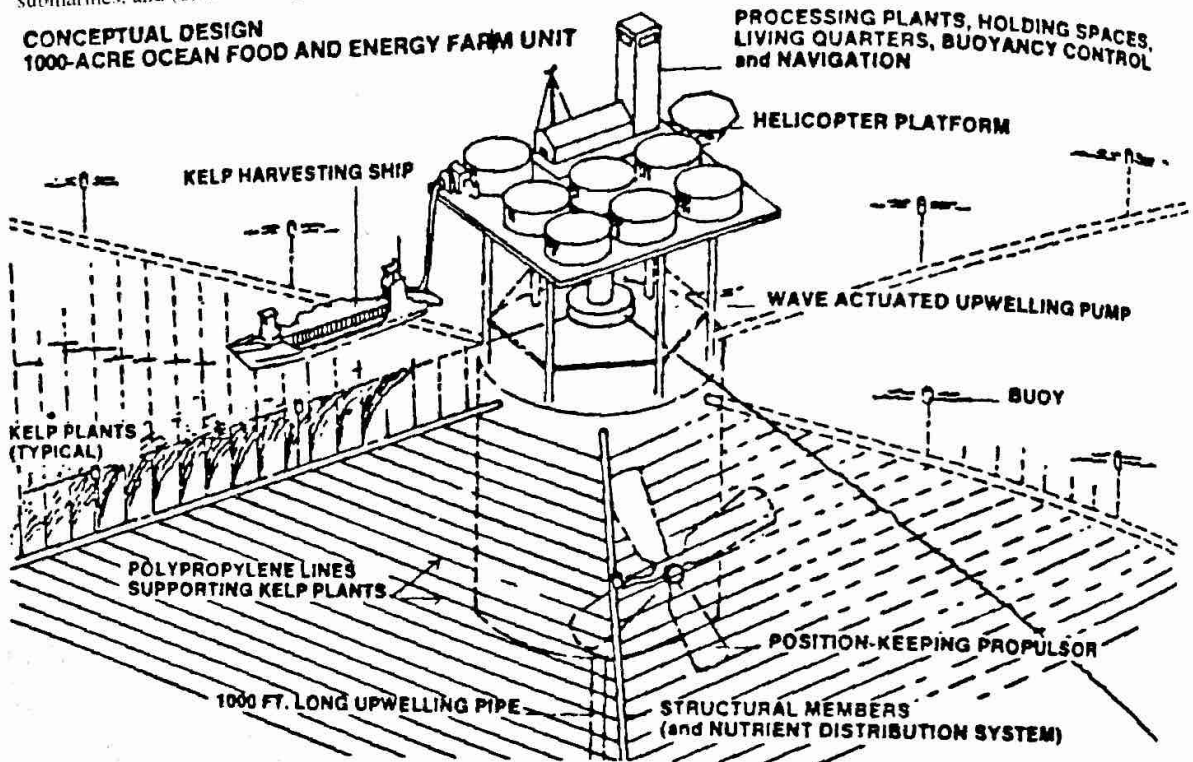
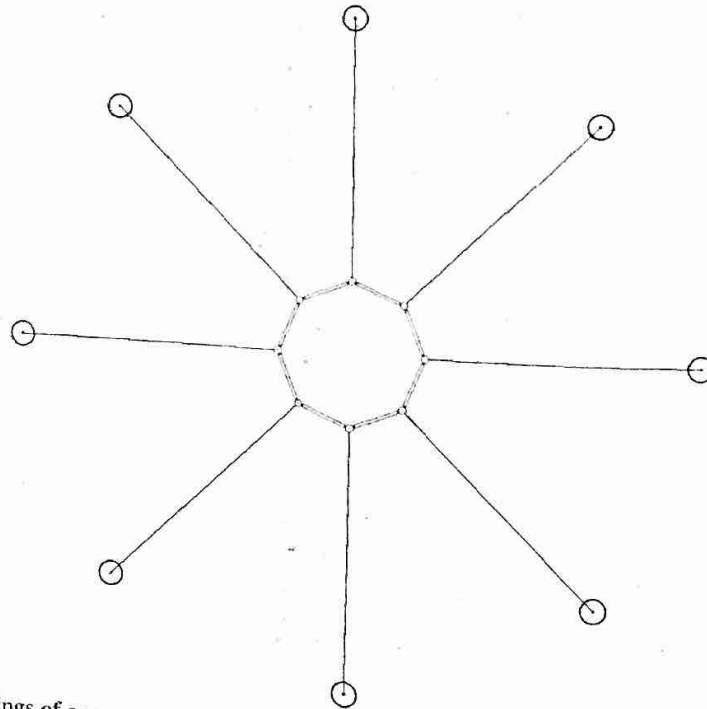
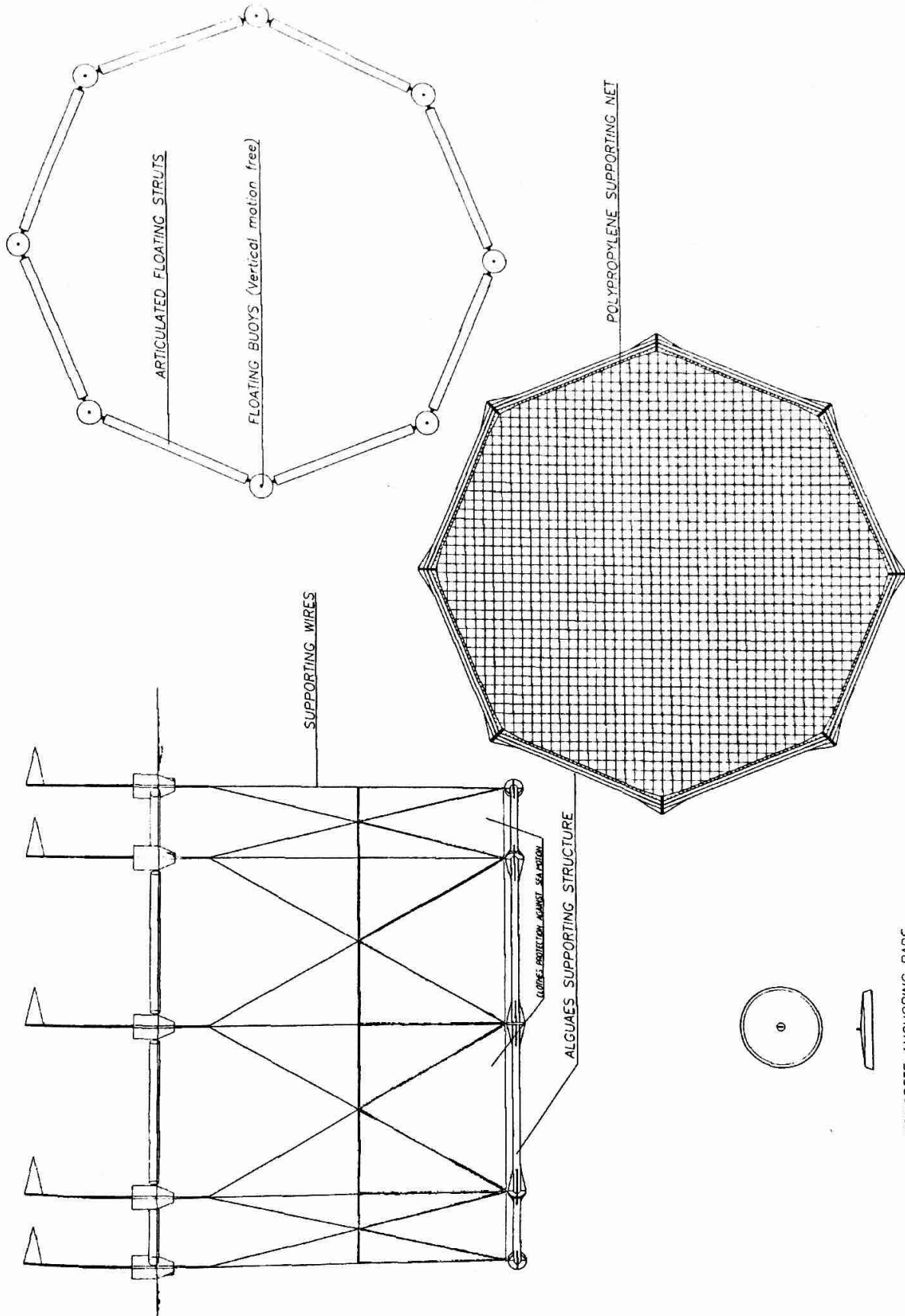


Illustration from "The Ocean Food and Energy Farm Project" by Howard A. Wilcox, distributed recently to the 150,000 members of the Cousteau Society. Dr. Wilcox presents a persuasive argument for open ocean kelp farming for food and energy use. "The marine farm concept is 'conservatively' projected to yield enough food to feed 3,000 to 5,000 persons per square mile of ocean area cultivated, and at the same time it will yield enough energy and other products to support more than 300 persons at today's U.S. per capita consumption levels, or more than 1,000 to 2,000 persons at today's world average per capita consumption levels."

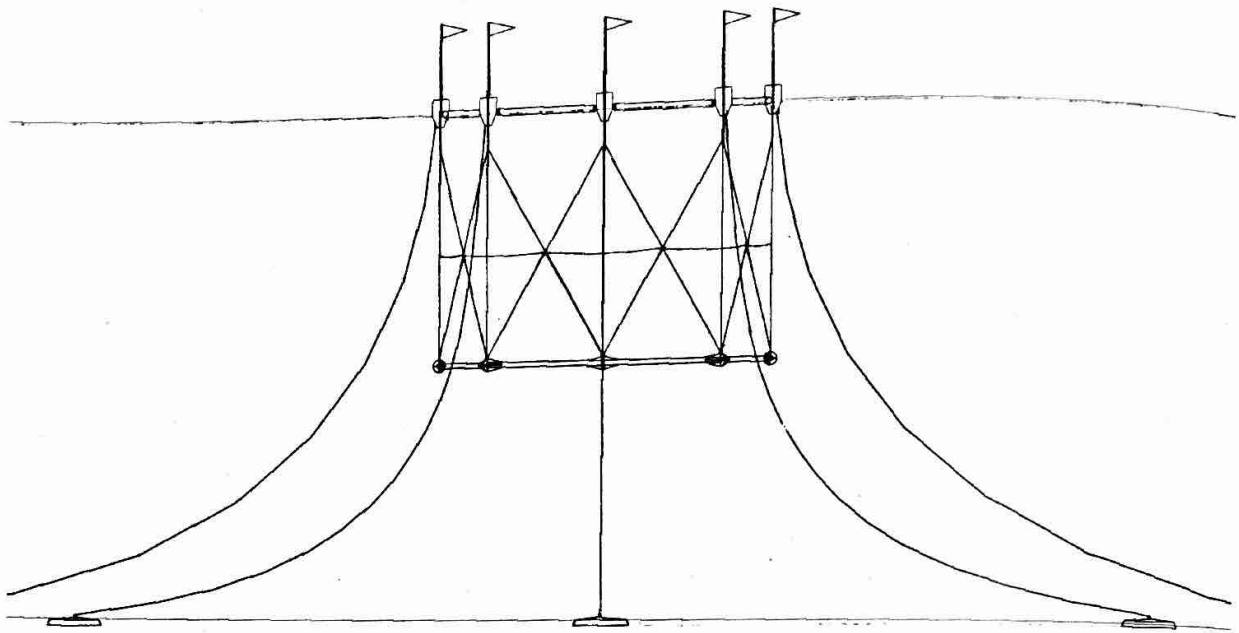
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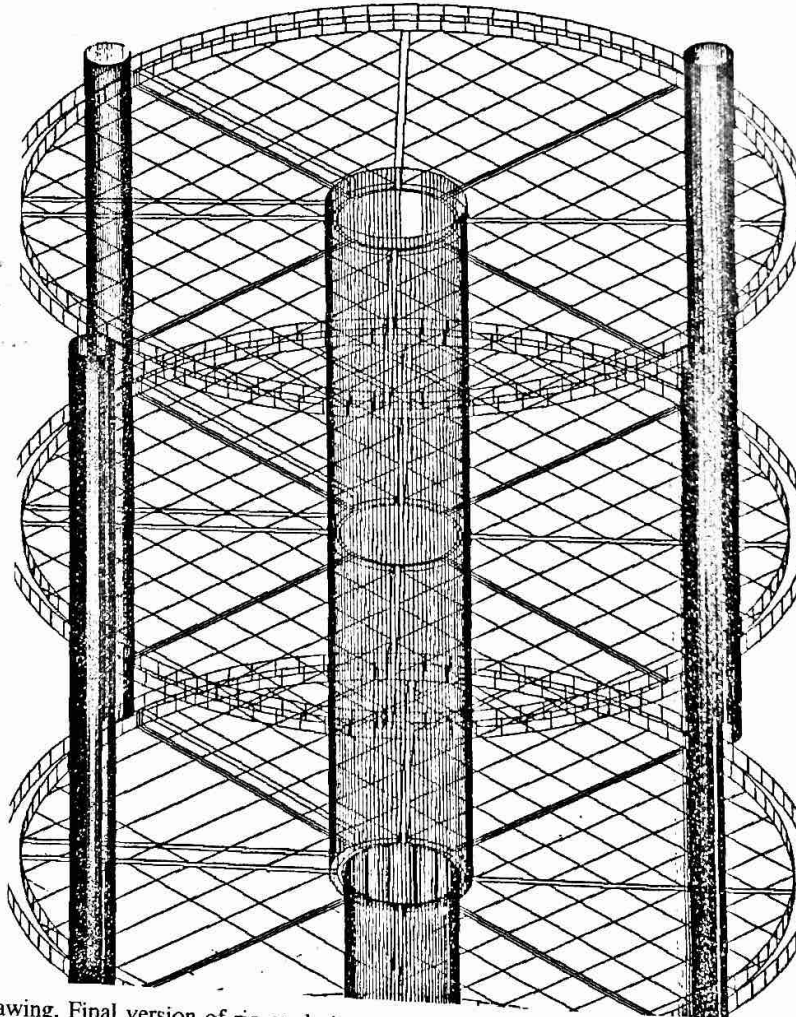
8-10 Architectural drawings of open-sea mariculture rig for Ocean Earth by naval architect Marc Lombard, 1993, following consultations with leading algae scientists in France under a project financed by the FRAC Poitou-Charentes.



10

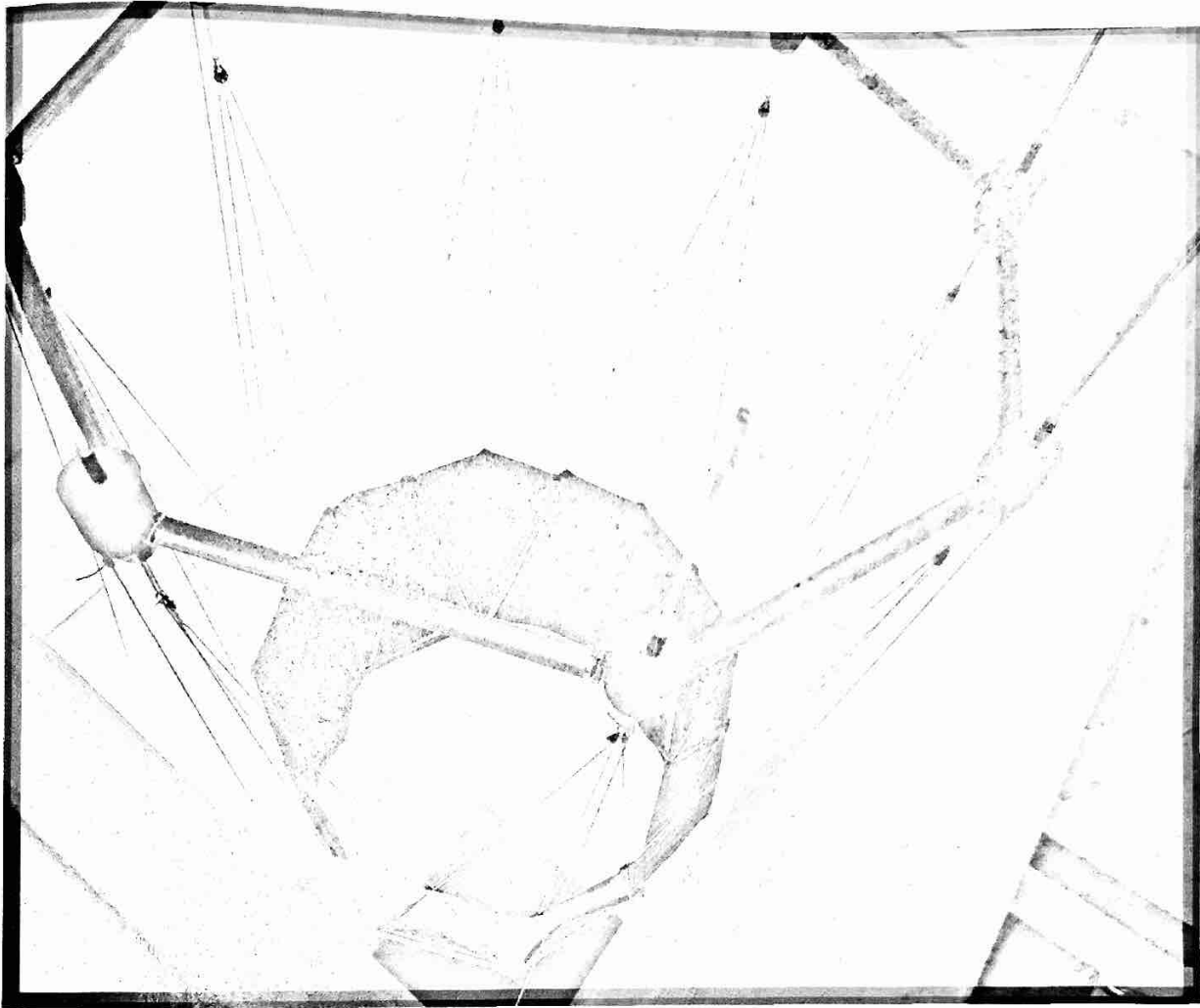


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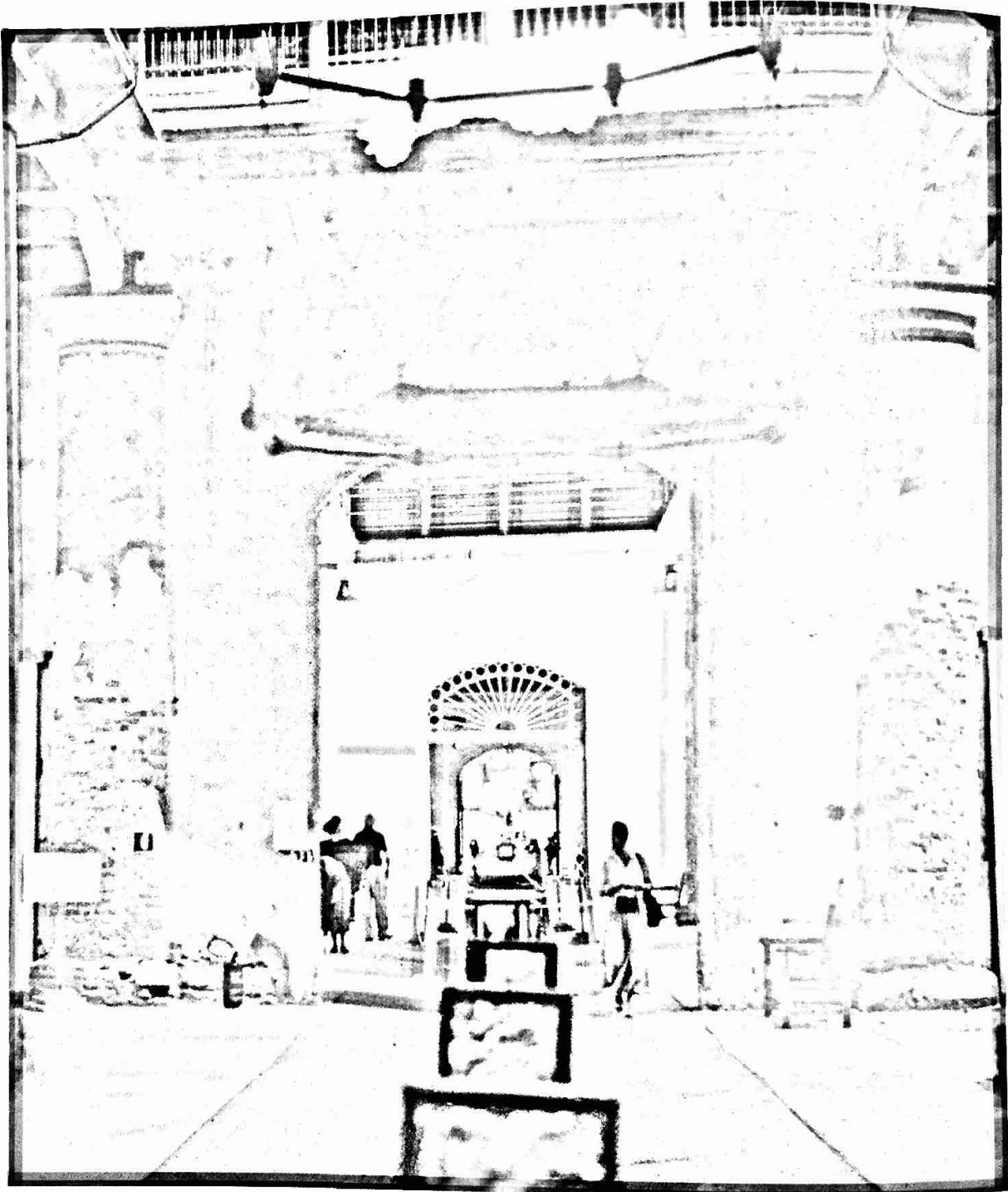
10 Elevation drawing. Final version of rig as designed by Naval Architect Marc Lombard of La Rochelle in a shared intellectual and industrial rights agreement with Ocean Earth. Each buoy (flagged) has a spring rod extending to the structure so that while they bob up and down the holdfast level, hence the plants, remains undisturbed. This presumes waves no higher than the range of spring elasticity: 5 meters. Lombard recommends sea-tests first in a sheltered bay.

11 Perspective drawing. An early version of rig, upgraded by the studio of Marc Lombard, manifesting Ocean Earth theories about a movable holdfast grid, which can be periodically drawn below, to allow for cutting away from both senescing ends of the Macrocytis, at their biological rates of senescence of up to 2 meters (one meter at each end) a week.



- 12 Through-view from above of 1:15 scale model of offshore rig as designed with Marc Lombard, Naval Architect, La Rochelle, and constructed for "France: Strategie Globale" exhibition, regarding ocean industry on global basis, in the FRAC Poitou-Charentes, Angouleme. The model and accompanying documents, occupying three floors of the building, resulted from several months of research at oceanographic and mariculture centers along the Atlantic coast of France.

13



13 Installation of offshore rig, as constructed by a shipbuilding firm in Trieste at 1:7 scale, with consultation further among scientists at the University of Trieste, at the Aperto, Biennale di Venezia, 1993. The structure was suspended above the corridor. Along the floor, on both sides, lay a strip of aeronautical charts indicating where Ocean Earth would first introduce the technology, in an "Oil-Free Corridor" extending from Somalia to Iceland. The central axis, split apart along two sides of the corridor, bisected these possibly significant sites: Mecca, Mount Sinai, Tivat Bay, Mostar, Gorizia, Waterloo and others. Geological history conforms with the apparently interesting human history. For promotional reasons, we proposed to work in this corridor, starting perhaps at either end: Iceland and Djibouti. Also, of course, the Yugoslav coast. Scientists in Trieste have proposed working on the other side of the bay there, outside the European Community, which blocks such a project, in Slovenian waters. The video monitors along the center display satellite monitoring of sites along this potentially oil-free, post-fossil-fuel region. Above, rear, is featured a possible first ocean basin for integrated development: the Adriatic. This seemed to make sense in the context of the Venice Biennale and our contracts with scientists and architects based in Venice. Architect Kevin Gannon in 1991 proposed basing any such project in Venice.

Mariculture rigs have been constructed and tested in hopes of developing large-scale production systems for giant algae like kelp, which upon harvest and decomposition can yield enormous quantities of methane gas. It has been argued that all the hydrocarbon needs of modern industrial economies could be met with offshore kelp rigs. Certainly this system of biogas production, in exploiting the natural accumulation of nutrients offshore rather than depleting limited soil-nutrients upland, compares favorably with other bio-gas production systems, as with sugar cane, animal wastes, urban wastes or even water hyacinths.

We have designed a rig which allows for continual harvesting at both the bottom and the top, and for hydrodynamic utilization of water currents to maintain high nutrient exposure while preventing breakdown of the rig. The frequent harvesting at both ends allows the kelp to grow without interruption, so yields could be more than 20 times greater than now. These design features are unique. They have been discussed at length at Caltech following an exposition. They have yet to be tested. Prior rig designs have proven faulty during storms. Whether this rotary, spinning structure would withstand turbulence is not yet known.

Features of the Rig:

1. Rotatable but hydrodynamically stabilized by rigid fins, so that the structure spins – increasing exposure of plants to nutrients – but goes nowhere.

2. Adjustable holdfasts, which grip the plant stems to allow nutrient absorption, one each, placed on several tiers. The adjustability permits frequent harvesting by pulling the plants under, so they must reach skywards, up to two meters a week. As the plant grows skyward (up to two meters a week), the holdfasts are loosened and transferred to a tier below, and the stem extending free at the bottom is cropped. This allows weekly rather than semiannual harvests and increases overall yield per year many times over.

3. Upwelling spouts at the bottom, coupled with micro-nutrient sprayer at the top, allowing for maximum mixing of nutrient-rich water throughout the plant structure. This promotes plant growth and in turn allows for concomitant growth in fish populations.

The chief art concept is one of underpull. The science is now sanctioned, for example, by Japan's Ministry of International Trade and Industry. At issue: with what design; toward what urban market; under whose overall regional plan?

SEAGAS ACTION

1989

On-site actions for production of large algae, continuous harvesting and conversion, substantially, to methane gas with residues, begin where political and physical conditions are best. In all cases, consumption is local, for people who cannot afford to import fossil fuels, and who could use the work in the sea. We prepare for work at these sites.

1. Jamaica

Windward Passage and Cayman Sea upwelling converge. UNDP and UNEP offices nearby, including Regional Seas Program. Stable but dynamic government, ready to test new means of internal economic development.

Extensible to Haiti and the Rio Coco, the twin points of influx into the Cayman Sea.

Along the critical ocean-weather passageway from the Amazon to North America and Europe: a central location with coldwater upwellings from the Antarctic.

2. Red Sea

Starting near Yanbu, with its vast infrastructure and energy-industry development, establish offshore biogas industry. Emphasize labor intensive work for burgeoning population, as in Egypt, along with possibility for immediate near-shore use – without pollution.

Extensible throughout Red Sea and into the Dead Sea Basin, for a post-fossil energy development program linked with the Arabs of these basins. A target city-state: Djibouti.

A symbolic parallel with the Persian Gulf: here, a dearth of fossil fuels is converted into a surfeit of biological fuels, with superior qualities – and none of the geopolitical burden.

3. Calabria

Bacino Torbido, draining into a vast bay with well-known upwellings, yielding giant kelp in nature. Now the basin is systematically monitored for optimal siting of floating rigs to hold kelp at heaviest upwelling points.

Further to programs started by the Italian state oil company, the know-how and tradition can be applied throughout Italy – within the political context of regionalism and self-reliance through methane, once advocated by ENI's Mattei.

Initiative for Europe, sponsored in part by the EC, but sited through cultural and art/architecture programs.

4. Diomedes

Pending the reception of the Competition Diomedes, be ready to install floating rigs for giant kelp along the shallow between the two Diomedes Islands, on the Soviet-US frontier; all consumption of yield is for the Eskimo population.

Quite possibly, we advance on the first three sites in tandem, at roughly the same time. Know-how or credentials learned from one effort feed the others. We move quickly, with signal events to celebrate production and firing of gas.

FOR INDUSTRY BASED ON MACROCYSTIS: 1993 RESPONSE TO 1981 PAPER BY G.T. BOALCH

Macrocystis algae is unique. It grows very much faster and bigger than other algae. It is perennial. It is buoyant and easy to harvest. It is highly desirable as fish habitat. It grows in thick forests and can easily re-attach deep down. Yet despite all these advantages it is not invasive. It does not overwhelm a marine environment, does not normally enter intertidal zones accommodating smaller species of algae, does not aggressively colonize.

The great commercial advantage is that, as the most rapid packager of nutrients in the sea, it quickly yields the quantities of biomass necessary for what is now regarded to be the main industrial market for ocean algae: hydrocarbons. This may well do with an evident fact, revealed with geographical distribution today, that the macrocystis may have been a dinosaur-era plant which, in being wiped out during their extinction, ended up being trapped in the large quantities sufficient for today's oil & gas deposits. Today's usually-smaller species, if trapped in a geological shift, would not yield large hydrocarbon reserves.

The scientific verdict at a UN environmental conference in London in 1990 is that the use of fossil fuels – mineral sources of hydrocarbons from trapped vegetation, chiefly marine algae – must be cut back by 60% "now, or else." Well?

This is possible on an income basis with the giant algae, of the genera *Macrocystis*. Rather than grow about 2 meters a year, like conventional brown algae, they can grow 2 meters a week. The enormously greater yield makes the economic choice clear. The growth process involves senescence at the

same rate, so harvesting must be done on a weekly basis, at the same 2 meter a week rate. Such a genera, descending from the dinosaur era, no longer exists in what was then the northern hemisphere [as indicated in the Ocean Earth logo]. It exists, but is not especially exploited in the-then southern hemisphere. It could be re-introduced, with astounding results in bioproductivity and in a transformation of the fuel industry, worldwide.

But for now, in the European Community at least, the *Macrocystis* genera is forbidden. The reasons are based on a paper published in 1981 by Dr. Gerald T. Boalch of the Mari-

ne Biological Association of the U.K. Dr. Boalch explains that from the start of news of French attempts to test an introduction of *Macrocystis* into waters off Brittany, near the U.K., there was alarm in the U.K. – particularly at the Admiralty. The immediate concern was that an alien genera might spread from French into British waters, with possibly disastrous consequences to local ecology and industry. The paper is full of innuendos and errors. In response, we list... [paper continues for five pages, now being reviewed in France at oceanographic institute and environmental-ministry level].

INDUSTRIE OCEANIQUE – OCEANIC INDUSTRY

1992

“The homeland, for each, is where the whales swim.”

Basic cycle. Methane and other low-molecular weight hydrocarbons – which all burn clean – as the primary industrial feed-stock, is achieved either by biological degradation, i.e., fermentation of vegetal material and wastes, or by anaerobic pyrolysis. Other materials recur occasionally in the flow-stream.

1. Open-sea floating structures for giant algae in continuous growth and cropping.
2. Replacement of open-sea species of harmful algae with commercial algae.
3. Daily surveillance of overall temperature, sediment and vegetation-health conditions.
4. Organization of all surveillance data into a given basin.
5. Conversion of surveillance data.
6. Optimal use of salt marshes.
7. Algae species selection for coast.
8. Fermentation and delivery.
9. Naval construction.
10. Electricity generation.
11. Ocean testing within bay.
12. Naval construction within bay.
13. Test site regional scientific cooperation.
14. Coast suitability.
15. Harvesting of giant algae.
16. Exploitation of giant algae.
17. Naval architecture test site.
18. Marsh test site.
19. Marsh engineering.
20. Counterpart basin exploitation.
21. Protein production.
22. Continuous growth thermodynamics.
23. Freshwater upwelling test site.
24. Macro-, microalgae relations.
25. Gas vehicle.



14 Current Ocean Earth Sites 1993

Golfe de Gascogne: La Rochelle/Royan/Rochefort; Nantes; Angoulême; Lannion, satellite data

Kattegat/Øresund: Gothenburg; Danish Meteorological Institute; Danish Hydraulic Institute

Eastern Adriatic: Risan Bay, in Boka Kotorska; Tivat Bay, also in Boka Kotorska; Adriatic Entrance: Albania/Montenegro/ Dubrovnik, along stream to Vis; Trieste/Pula

Baltic: Kiel; Rostock; Stockholm; Øresund; Hiiumaa

Schelde/North Sea: Antwerp; Ghent

Gas Car: Graz; Paris/Nantes; Moscow

Flyway via Tivat: Bacino Torbido, Calabria; Bari; Malta; Belgrade towards Hungary; Tripoli

Flyway via Graz: Chad; Sirte; Malta; Torbido; Graz; Rostock

Macroalgae Structure, Naval Construction: Athens/Salonika; Copenhagen; La Rochelle; Trieste

Satellite Monitoring: Graz, Black Sea: Strasbourg, ocean industry testing; Copenhagen, North Sea/Baltic Sea;

Bern, Adriatic; Lannion, Gulf of Gascogne

Desert Flood: Head of the Arabian/Persian Gulf: Wadi-el-Batin, Saudia Arabia; Head of wadis converging on Sirte; Gulf of Gabes

Migratory Marsh Feed: Mur; Oder; Donau Delta; Tuloma Fjord; Gascogne coast of Spain and France

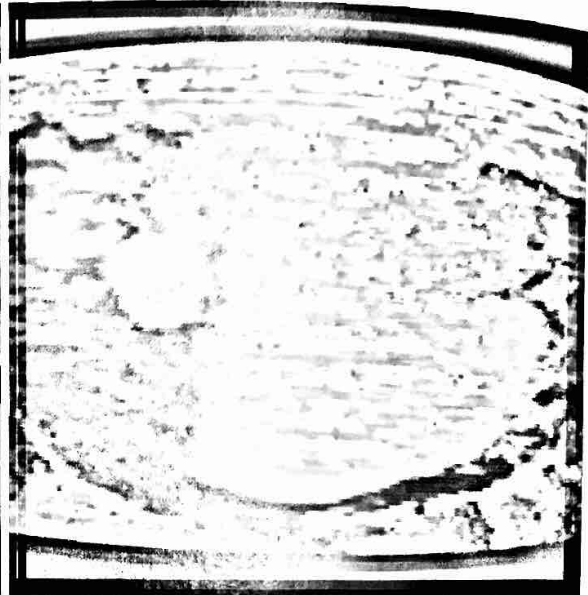
Wateroogster Project; Weerselo, Netherlands; Bocholt, Belgium; Hungarian Plain towards Belgrade

Comprehensive Development Model: Iceland

15



16



15-16 An immediate objective of the firm was fulfilled soon after the first satellite exhibition, Art of the State, under contract for NBC and BBC of the Falklands. Here, at Pebble Beach, we found, in the bluish strips, signs of giant algae. 1982

The Southern Hemisphere has much greater bioproductivity, both in flora and fauna, than the Northern Hemisphere. Further, the *Macrocystis* giant algae genera which are now forbidden in Europe are native in the Southern Hemisphere, such as here in the Falklands. A global ocean industry development policy might better be initiated in this hemisphere, as around islands like Kerguelen and Tasmania, than in the relatively polluted and crowded waters of the north – even for the northern markets.

SPACE FORCE

**A FIRST POINT OF ENTRY
FOR THE FIRM, AS DECIDED
WITH PAUL SHARITS, 1981**

IV. SPACE FORCE

SPACE FORCE / SPACE TRUST 1980
SPACE TRUST / SPACE FORCE

Ventures into space have opened to mankind frontiers and possibilities previously unimaginable. The technology of space exploration has provided us with a plethora of new information, images and perspectives. Humans have gone from seeing the planet as a vast, open expanse to seeing it as a single sphere, with fragile heat balance, moving among many in space.

Ultimately man changes his own nature through the use of his imagination. Man can control his own evolution. Space exploration and the development of space technology have tremendous potential for changing human perspectives – and therefore human nature.

Science and art have in tandem been responsible for cultural change. Now, as scientific knowledge advances, both in amount and quality, and as the applied technology becomes increasingly potent, it is imperative that the artist keeps apace and fulfills the responsibilities inherent in art. Scientific discoveries and technological advances often remain confined to the circles that develop them; consequently, outer space is still an extraneous abstraction to most of the planet.

We are interested in the expansion of cultural response to outer space. We seek the creative use of the hardware and software now employed solely by scientists and technicians. We seek a collaboration of art and science.

As a group, Space Force seeks a more integrated function and purpose for the artist in society. It seeks a realization of the ancient, primary role of the artist – as presenter, disseminator and demystifier of ideas and possibilities. We see outer space as a limitless frontier for humanitarian, cultural and utilitarian functions. Our purpose is to present ideas, energy and desires toward visions – all for civilizations grounded in outer space.

In the spirit of Vanguard and Pioneer, Space Force and arelated Space Trust Institute will propose a series of artist-designed programs. These programs will utilize the great log of scientific and technological material now amassed with the ultimate goal of preparing mankind to manage its future in a responsible and creative manner.

Win Knowlton	Glenn Steigelman
Eve Vaterlaus	Joan Waltemath
Taro Suzuki	

This text was telecast on cable TV as part of a "SPACE FORCE" series, produced by Ocean Earth's Wolfgang Staehle and Colleen Fitzgibbon.

ORIGINS OF "SPACE FORCE" 1988

In his relations with what has come to be known as the work of Ocean Earth, Taro Suzuki – an independent and established visual artist – has made these contributions:

inventing the concept and much of the terminology and spirit of "Space Force", a group of artists working on space projects, one of which would include the satellite observation of earth developed by Ocean Earth

playing a leading role in Space Force, helping it cohere with friends such as Bill Dolson, Joan Waltemath, Eve Vater-

laus, Wolfgang Staehle, Win Knowlton, Peter Fend, Peter von Brandenburg and Lauren Amsden – as evidenced in a series of cable TV shows called "Space Force"

conducting, together with Wolfgang Staehle and Peter Fend, the first, pioneering trip to Washington towards development of satellite observation of earth, oriented towards the media, as a practice of "Space Force in Action"; conducting this trip to meet with a friendly scientist at NASA, who introduced him, Staehle and Fend to the-then novel technologies of multispectral data processing

coining the promotional terms "Weightless News" and "Space Force: Aim Higher"

inventing the concept of "Television Government", and providing the chief ideas for the first essay expounding on this, published as "Television Government" for the 1984 Show at Ronald Feldman Gallery in 1983

inventing the concept of "Space State", a political reality achievable through Television Government, i.e., systematic observation of earth from space, with video manifestation on earth, for all the public

playing a principal role in the installation of "Art of the State", the first exhibition of video and photosequential earth monitoring, at The Kitchen in 1982

co-writing, along with Joan Waltemath, Win Knowlton, Eve Vaterlaus, and Glenn Steigelman, all in Space Force, the "Space Force" manifesto, released at The Kitchen in 1982

meeting with potential investors for the satellite observation work

helping define a policy for Space Force of observation of totalitarian or secretive regimes, such as the Soviet Union has been, largely in response to contract interests voiced by French TV Antenne 2

promoting the concept of "Command, Control and Communication" or C3, in Space Force terms, not conventional military ones.

[Statement for the first exhibition of SPACE FORCE at The Kitchen Center for Music and Video, NY, Feb. 1982.]

ART OF THE STATE 1982

SPACE FORCE, an operation of the Ocean Earth Construction and Development Corporation, OECD, presents an installation of the state of the art in earth monitoring.

It therefore begins a sequence of inquiries into space technology generally and its appropriation by human consciousness.

Earth monitoring from space is a high-technology form of landscape rendition. As visual researchers, artists can assist in advancing such landscape rendition to a pliable and expressive means of visual communication. Earth monitoring, like most space-vehicle imaging of planetary bodies, involves an elaborate array of sensors, digital data systems, and eventually a mathematically-programmed display of meaningful colors, and it could therefore be seen as part of the general evolution of art.

Now, major questions have arisen as to how to display the earth-monitoring data, what colors to use, what contrasts and field-intensities to employ, what images overall to effect for impact and understanding: altogether, how to organize infor-

mation through time in a two-dimensional multispectral surface subject, in video at least, to changes through time. The objective is communication; the task is to build a language. This could be considered as a color language, a field density-distribution language, a display language, a visual language.

As *The New York Times* reports, there is now a "data glut" from earth-monitoring satellites. The chief question is how to make the data usable to intelligent observers. As *Scientific American* remarked, "The eye-brain system will need help." Although the apparatus of image production is vast and astounding, the ultimate task remains one of communicating to a perceiving human with his or her own image-processing system, the eye-brain. Numerical records of data can be accumulated, but they cannot be meaningfully processed by humans except, chiefly, through images. As *Remote Sensing of the Environment* argues, "An image is, of course, the most efficient way to convey a large amount of information to a human operator."

SPACE FORCE feels that questions on image-making and communication raised by space scientists can be answered effectively through consultation with artists. It feels compelled to respond to these concluding statements in *Remote Sensing of the Environment*:

Additional research is needed in three areas: (1) determining which wavelengths of the electromagnetic spectrum are most useful for identifying each earth resource...; (2) determining which color combinations, of the many that can be used in producing image enhancements, are most easily and accurately discerned by the image analyst; and (3) determining in representative instances the net gain, if any, resulting from the use of such image enhancement techniques.

It is concluded that a great deal of work must be done, not so much with the image-processing and production hardware as with the image-processing software – the programs by which intelligible color displays convey a great deal of information in a brief period of time. The "image analysts", or viewers, are now inundated with very often incomprehensible imagery, and it seems appropriate to call on artists to begin working with the imaging systems.

[George M. Chaikin, a NASA veteran who had also shown his computer art at The Kitchen attended the closing conference and volunteered then to join "SPACE FORCE". He has since become its chiefly proponent and hands-on-data practitioner.]

WEIGHTLESS NEWS

1983

WAIT LESS NEWS

DIRECT FROM OUTER SPACE

As always, to understand what's going on in a system, you have to get outside of it. To understand what's going on in Planet Earth, you have to get outside of it. Then you can see the State of the Earth.

You can see who's winning the Iran-Iraq war, what the Lebanese Army is up against, where the ships off Beirut really are and how vulnerable that makes them, what the actual invasion routes will be (or have been) for Libyans, British, Israelis, Syrians, South Africans and (in Central America) USers. You can see the drought which underlies South African and Nigerian unrest, the internal dispute within the Soviet Union on how to appease the Muslims, the Warsaw Pact and NATO war games, the impact of deforestation on Brazil, and the consequent flooding in both Brazil and Argentina. When we say see it, we mean SEE it.

If you can see far away, or far in advance of immediate events, you can foresee. Forecast. Predict. Wait less.

With views of economic and ecological conditions underlying human actions, with views of droughts and West Bank settlements, of river diversions and agricultural resettlement or land reforms, of pollution and extensive mining, or mineral depletion, the viewer can foresee what will happen to the people who live there. The coup in Nigeria comes as small surprise. The ferocity of uprooted Palestinians and Lebanese comes as small surprise. The poverty of Central Americans, without a soil base to support them, comes as small surprise. Little comes as a surprise.

With weightless news, you wait less for events which eyes can foresee. Events like the Soviet grain deal, the invasion of the Falklands, the bombing of Faya-Largeau, the riots in Sri Lanka, or the aerial confrontation over the Straits of Hormuz (coming soon to one of the networks). With weightless news, you get waitless news.

Why should everything come as surprise?

TELEVISION GOVERNMENT

1983

SPACE FORCE IN ACTION

The least function of government is to guarantee the conditions for good health. Virtually no government today succeeds at this. There must first be a guarantee of conditions for good health: there must be maintenance of territorial integrity.

If the air is polluted, or soil is depleted, or salt-marshes get filled in and die, or oxygen declines, or enemy bombs drop, or nuclear wastes leak out, the integrity of the territory has not been maintained. The conditions are not conducive to good health.

The public should be able at least to see how well its territory functions. It should be able to see if it's not being forcibly put to death, or disease, or the danger of death, by the powers that be.

Satellites orbit the earth which reveal environmental conditions, military threats and build-ups, and geological hazards. Their revelations can be image-processed by computer and transformed into video color surveys for public review on television. The public can see for itself what is going on, even what is being proposed, and they can then decide from the evidence what is to be done.

Armies were started in part to defend the integrity of a home territory. A populace must be protected from marauding tribes. Then there were navies, to protect sea routes. Then, with the invention of airplanes, there came to be an air force.

Now there are spacecraft, and explorations to new planets, new potential colonies, new turf. There is STAR WARS and STAR TREK and OUTLAND and E.T. The home territory will soon be Planet Earth and maintenance of its integrity will soon be the responsibility of the military force, the ultimate arm of political power, which succeeds the army, the navy and the air force:

SPACE FORCE.

Space Force effects public safety by showing the public what endangers it, be that pollution, soil exhaustion, mineral depletion, climatic changes, or hostile military preparations. Space Force exposes the dangers to public safety to public view, with state-of-art advances in video and film, in photo-

graphy and television, most dramatically and most instantaneously on television.

As television comes to include interactive cable, direct broadcast, narrowcasting, and other variants of the original broadcast industry, Space Force effects a global earth observation for continually up-to-date public decision-making.

Direct democracy results. A sort of feedback mechanism results. A biological control system for the planet and its regions results. In a political application of neurophysiology, the public extends its collective and even specialized eye-brain systems to commonly survey its conditions, its territory, its national trust.

As a biological control system, the eye in the sky, when telecast in near or live time, allows direct public response to conditions of:

- pollution,
- agriculture,
- land use,
- city planning,
- infrastructure,
- military danger.

The public sees for itself. Electronically, it can consider and respond by itself. While it may leave most monitoring to experts, it can demand a thorough telecast exposition of orbiting-eye data. It can demand an inquiry and review. It can achieve

TELEVISION GOVERNMENT.

THE MIRROR REPLACES THE MASTER

We now see how Space Force constructs the mirror, the television imagery, to help the public, or the specialist, see for itself its condition.

Space Force first went into action in the Falklands.

It began by contracting with the BBC and NBC to produce the first-ever telecasts of satellite-monitoring of a military conflict. While conventional military analysts for the BBC predicted a British landing on the West Falkland Island, Space Force imagery yielded the conclusion that the British would reasonably land on East Falkland Island and then – given the differences between their and Argentinian equipment – would cross the islands along relatively lowland, boggy routes. Satellite terrain analysis outlined what routes to take – and what routes were in fact taken. The British Government understandably requisitioned most of the imagery prepared by Space Force.

Negotiations, hindered temporarily by U.S. trade sanctions, have since been conducted for counter-balancing Space Force contracts with Argentina.

By 1984, Space Force expects to have developed a standard satellite-monitoring program for the Falklands/Malvinas which, when telecast to the islands themselves, will allow for independence of the islands from both Britain and Argentina. The islands could achieve economic and political autonomy.

The data shown here can be used for rational, self-sufficient administration of the islands. The giant kelp fields can be identified and managed for a large export industry in methane gas, raw fiber and food. The krill fisheries surrounding the islands, and part of a vast Antarctic-region resource, can be surveyed and systematically harvested for sustainable, massive yields of protein. Offshore upwellings can be identified and selected for thermal gradient and other energy systems. And the land, now made useless for sheep ranching by land mines, can be television-surveyed on a weekly schedule for what ecologists have come to conclude should repla-

ce conventional animal-farms: military-style management, in electronic-battlefield conditions, of wild game species.

Under Space Force surveillance, the Army, Navy and Air Force go to work – offshore and onland – at patrolling and harvesting a wilderness ocean and terrain, a no-man's land of fantastic commercial potential. Under Space Force surveillance, telecast to all, the function of warriors comes to resemble the main function of Indian and other aboriginal warriors – roving the earth for fish and game.

As Admiral Carroll of the U.S. Navy remarked at the first Space Force Falklands TV session, the type of imagery we produced could have been selected for sites on the Argentine mainland months before to reveal Argentine preparations for a military assault. All the world could have known, through television, what the Argentines were planning. Now, with further satellite-data processing, on larger scale, all the world can know, through television, by what ecological and economic reasoning the demand for British departure makes sense, and how the present methods of Falklands management make no ecological or economic sense.

In another contested area of the world, Lebanon, Space Force also produced network imagery and analysis. By indicating the actual alignment of Israeli troops – as inward-turning double doors rather than simply an East Beirut/West Beirut front line – Space Force made plainly clear the hopelessness of PLO resistance. It also revealed where and how the Israelis would press the siege – by attacking at the airport. With a telecast program, using this European Space Agency data in Europe, Space Force simulated the situation and what would happen four weeks before it happened. Actual warfare had been simulated with an accurate video-game technique.

Might the video-game telecast eventually supersede bloody conflict? Might not contesting parties quickly know, from the satellite evidence, what would be the outcome of at least some struggles? Might not checkmate be known sooner, and casualties be less?

Key to a military initiative is deception and surprise. If in 1941 a Japanese fleet were satellite-monitored and the imagery widely-telecast, would Pearl Harbor have been attacked? With television and television-like planet views, international competition enters the realm of media rather than missiles.

As Newsweek reported in 1982: "The best way out of the arms race is to change the rules of the game. If countries share reconnaissance data... it becomes in their own best interest to reject the arms-no-matter-what strategy."

Public safety is not simply a military matter. The main threat to well-being may be not that of nuclear conflict, but of ecological collapse.

Further breakdown of the habitat could precipitate major plague or famine. It already forces economic decline. More monies must be invested for less and less yield per acre. More must be spent to obtain less.

In a satellite survey of San Francisco Bay, Space Force produces an accurate and indisputable report. A known site of oil pollution is color-identified. Its spectral qualities are sifted and singled out. Then all similar spectral phenomena are displayed throughout the bay. Instantly, one can trace the course of pollutants, their accumulation in the vital fish breeding mudflats across the bay, and their effect on the overall respiration and nutrient exchanges of the region. The gradual deadening of the bay, unseen by human eyes, becomes plainly evident. The residents of the Bay Area, viewing this evidence on television, can see it is time to act. Further color-processing indicates how to act – what is to be done.

Consider what similar pollution and ecosystem monitoring would do for television audiences in London, New York, the Imperial Valley of California, the Mississippi Delta, the spreading Sahara.

A first consequence is decentralization of power. Each local news station, each local ground-station with a connection to satellite imagery of its own region, can achieve satellite evaluation of its own region on a weekly and daily basis. As satellite data becomes sharper, from the old 70-meter resolution to the 30-meter resolution of today and then to the 10-meter resolution of the French Spot satellite in late 1984, the procedures for local self evaluation become standard. The satellites may be global, but the governments utilizing them are local – as local as any television station.

Constructive as well as preventive actions can be appraised. And ecological demise would be only a modest, emergency aspect of biological-resource surveys. With timely updates and TV feed-ins, Space Force imagery can benefit agricultural forecasters, commodities brokers, farmers and multi-species land managers, civil engineers, ship captains looking for fast currents – anyone relying on changing, dynamic conditions of Planet Earth for their business.

Television Government eliminates any of the present apparent need for external economic aid, or internal price supports, or elaborate public-finance adjustments. It can provide information – a massive volume of information about resource and site conditions--for long-term and genuine economic strength.

Most dramatically, the Third World gains. As India has learned with its space program, the fastest way to catch up to the first and second world governments is to leapfrog their technologies and jump into satellites, television and direct-broadcast systems. Villages can plug in directly to visual reports of their condition--from outer space.

Meantime, regional and national planners can survey comprehensively the soil, agricultural and forestry situation in their nation, and they can plan a balanced, sustainable program of development. Space Force contracts with the Brazilian government for video surveys of large, mineral-rich sections of the Amazon. Brazil was broke only a few years before; now it can make rapid space-age economic gains.

The world public, in each distinct region, plugs into its orbiting eyes in the sky. Through Space Force comes the means to self-government.

TELEVISION GOVERNMENT.

[A version of this concept, translated into German as "FERNSEHREGIERUNG" was published in the catalog, along with a video/geographic exhibition, called "Kunst und Medien", by the Kunsthalle Berlin, in 1984.]

The following is a short excerpt from the company brochure to have been generated from the catalog pages.

ECOLOGICAL MONITORING

1984

Video combines multiple sources of data, multiple times, multiple color interpretations, to yield up-to-date tracking of dynamic phenomena on the planet – chiefly ecological systems.

The task is to develop a motile color language which, like written language, can be read and can lead to utilizable "readings" of a given landscape.

FUNDAMENTAL PURPOSE

1988

Ocean Earth is not interested in satellite monitoring for the sake of satellite monitoring.

It is not interested in satellite monitoring for the sake of geographical information. Or news. Or a new sort of consciousness.

It is interested in satellite monitoring for the sake of the planet.

Not just the planet as it is, but the planet as something we live in. As something we had better maintain in reasonable physical condition, or else.

The fundamental task of Ocean Earth, then, is to establish those means of production, those means of primary-resource exploitation, which sustain the biosphere that is our planet, even develop it.

And the fundamental purpose of any satellite monitoring project is to help effect the policies, the daily actions, which assure sustenance and vitality on the planet – for all life, including ours.

The historical challenge before us on earth is to restore and then develop the biophysical conditions. The historical challenge is to bring technology in line with ecology, and to assure a sustainable evolution of the species, including ours.

[In response to a prominent international attorney from Mexico, who hoped that Ocean Earth could develop a comprehensive program of observation for the Mexico City basin and for the coastal waters of western Mexico, with their cold nutrient-rich upwellings, Ocean Earth prepared a prospectus for an enterprise called to be called Global Survey. The subsequent Ocean Earth experiences with the Gulf and the UN rendered such a venture as too provocative, then.]

GLOBAL SURVEY
SURVEY GLOBAL

1985

Sources

AVHRR daily	METSAT 30 min	CZCS weekly
NIMBUS daily	LANDSAT (MSS, TM)	SPARX 20 m
SPOT 10 m	SPOT 20 m	COSMOS 40 m
TERS 8 m	ERS SAR, 20 m	MOS 80 m

The objective of Ocean Earth Construction and Development Corporation may be apprehended from this lineup of sources: to produce video signals or products of any site or situation on earth as monitored by any number of remote sensors with differing spectral capacities, resolutions and times.

Reliance on any one satellite source is not sufficient. The remote sensing industry fails to develop because (1) most image-distribution programs involve only one or two sources and (2) no streamline is formed from satellite-earth data flow to multiple-image, continuous display. A cascade of spectral data arrives from space at ground stations throughout the world. Only a trickle, occasionally, is converted into imagery, and almost always that imagery is distributed as, in effect, sample photographs. We intend to help sustain the cascade as a video flow.

1985

SITES UNDER INVESTIGATION

The observation work is not "satellite monitoring" but "site monitoring". Satellites just happen to be available nowadays. And as we are engaged ultimately in construction and development, the site monitoring is directed ultimately towards site engineering – or at least lessons on such. A list of areas now under investigation, as initiated chiefly for media clients, follows.

Confluence of Tigris, Euphrates, Karkheh and Karun Rivers, all conducting into the Shatt al Arab and bearing nearly all the freshwater entering the Arabian Gulf. Or: the southern, main front of the Iran-Iraq war.

Rio Coco Basin, bearing waters from Nicaragua and Honduras to the Atlantic, as distinguished from the Pacific Slope of those two countries and El Salvador. Data are processed to show soil degradation as well as possible military positions.

Estuary of the Kolskiy Zaiiv, Kola Peninsula, Soviet Union. One of the few sizable outlets into the Barents Sea which is not blocked by ice during winter. Now the site of the largest Soviet naval complex, and of Soviet missile launchers. Nuclear as well as conventional hydrocarbon contamination are suspected.

Fiume Torbido and the region of its immediate outfall into the Ionian Sea, Calabria. A three-dimensional model of the river basin and of its continuation as trench into the Ionian Sea has been produced. Thorough on-site studies of the river, which runs to the sea on two levels, chiefly the lower, subterranean one. Satellite studies are being prepared for offshore, to monitor upwellings from the subterranean river and consequent nutrient availability.

Amazon Basin. 3-D model produced at Woods Hole. Weather satellite studies show relation of Amazon to hydrometeorological movements (clouds and currents) into the Caribbean and mid-Africa.

Sahel. Studies so far with weather satellite data, correlated with pan-Atlantic studies extending to the Amazon, with its massive outputs.

Tuareg Mountains, Sahara. Chad-Libya border. Also, a region of relatively greater rainfall and artesian water surfacings. A characteristic mountain site from which de-desertification can begin.

Catskill Mountain watershed for New York City. A computer-generated three-dimensional model incorporating Landsat data, produced at Cooper Union in liaison with the New York City environmental-resource agency. A basis for subsequent mapping of hydrological storage relative to moisture and vegetation.

Eastern Slope of the Mediterranean Basin, north end of the Dead Sea Basin, western reaches of the Arabian Gulf Basin, and evidence of water diversions from the Mediterranean Basin into the Dead Sea Basin – specifically, from the Litani River in Southern Lebanon. We seek to show relation between agricultural conditions in the Bekaa Valley and alleged diversions of water towards the Jordan Valley. We have both winter and summer data, and we have produced spectral change detections over the period 1981 through 1984.

San Francisco Bay hydrocarbon pollution detection. Pan-optic but in-depth survey with certain algorithms which led to initially singling out hydrocarbon presence at refineries. Other ecological stresses studied, chiefly within the Bay.

Rocky islands surrounded by cold waters, from polar seas, that stream past: the Falkland Islands. We have identified large kelp fields. We seek there to develop ongoing and efficient monitoring of bioproductivity in the cold coastal waters. For

TV, we have also found military evidence, such as shore fortifications, sheep farms turned to encampments, and – through detection of oil slicks on grass – short runways. A development program for the Falklands could be formulated with the satellite studies, particularly of marine resources.

RESPONSE TO REQUEST BY ALGERIA

1984/85

In response to suggestions about systematic satellite surveys of the territory of Algeria, largely towards restoring its pre-desert ecological vigor, we propose a systematic satellite survey combined with groundwater and bioproductivity studies of one saltwater basin.

Examples: the Chott Ech Chergui or Chott El Hodna, two small intermountain basins.

The objective is restoration of present desert to verdant savannah. This is not an empty dream. It is possible – not with conventional forestry or planting techniques, and not with pumping up and irrigating of groundwaters, but with actions on the terrain, notably at the edges of salt pans and wadis, which build water-holding capacity in the near-surface soil. We seek to build that micro-ecology which supports soil animals, then migratory birds and insects in diffusion, then a full and rich complex of animals and plants. First a multi-specied wild system must be built up. Only afterwards can one consider ways of exploiting the area economically. Our plans for such multi-species management of terrain have developed since 1978, when a de-desertification scheme was first presented at the California Institute of Technology. Such plans, although scientific, are oriented towards action. Nothing can be truly found out until after real-world efforts – not just field experiments. We have long envisioned that the work of desert restoration, involving use of explosives and large earthworks, is best accomplished by the military.

SAME-DAY IMAGERY OF SITES FROM SPACE 1986

To build a business with civil observation data, one needs an ability to produce imagery the same day the satellite flies over a site.

This is technically possible. It is commercially realistic. In the world of administration and business, most information is delivered daily. Some information is delivered much more up to the minute. But for some reasons, neither technical nor financial, civil satellite imagery of sites on earth cannot be produced or delivered on the same day – usually not even in the same week.

The scientists who often work with earth-observation data have pointed out that great care and scientific method must be employed with the data, to avoid incorrect or premature release of conclusions. Publication of imagery within days, let alone hours, of satellite overflight, has been regarded as unscientific, hasty and dangerous. One should not, after all, descend into the marketplace of speculation and sensation.

Such arguments presuppose that earth observation is strictly a scientific enterprise, and that no one is entitled to regard the world from space until after painstaking and precise studies have been made with scientific data from space. This disregards the structure of information flow in the world.

As we all know, scientists and scholars work regularly with information gleaned and distilled from news reports, stock reports, commercial records and all other manner of daily and up-to-the-minute information. As we all know, the first reports on any situation in the world are little more than a

flood of statistics or words, without meaning, and sometimes useful only within strictly defined contexts, such as stock trading. As we all know, any responsible daily or long-term response to the daily flood of information requires careful and steady review of past information and a discernment of larger patterns and trends. But as we also all know, no economist or political scientist would dare suggest that the daily and instant information in economics or political affairs – the daily onrush of news reports, however inaccurate or misleading – be cut off in order to permit first a careful and proper evaluation by his scholarly fellows. Pictures of earth from space, part of the continuum of current technology, must be available to the public as soon as technically possible – i.e., the same day.

PRODUCT

1986

Ocean Earth seeks rapid, comprehensive monitoring of the globe. Towards this end, it seeks video output on the incoming stream of data, as automatically image processed, so that a low-cost documentation is achieved of all scenes taken.

As a rule, video documentation is organized within basins, comprehensive physical-geographic units, rather than nations, or mercator coordinates, or continents. This situates all data acquisition within an x, y, z space, where the z coordinate (elevation) is at highest points relative to coherent salt-water bodies the boundary.

Under this monitoring program, political considerations give way to scientific and economic ones. What country is observed, or what military constructions might appear, do not matter – except as there are regional-planning or ecological aspects. We scrupulously avoid political or military considerations. Our task is to develop a reliable, ongoing, professional but unprejudiced service.

EFFICIENT TRACKING OF NUMEROUS VARIABLES IN FLUX

1983

Earth observation can be panoptic, covering a large territory for detection of specific phenomena or conditions (e.g., acid rain damage, or kelp fields), or synoptic, combining (in merges and sequences) the information from different sensors, different portions of the spectrum, and different image-processing functions, to yield a comprehensive report on a given site or region. In either task video is a superior medium.

In panoptic surveys, video records the image processing leading to identification of a particular ground condition and then roams through more data-frames, more terrain, to yield in each case a precise chart of that condition. Mosaicing leads to a comprehensive map of a very large region. Comparisons through time, often crucial to showing whether a condition is truly nascent, can also be recorded easily in video.

In synoptic surveys, video can catalogue, repeat and split-frame for comparison, the data from airborne, ground and satellite sources, all in geometric register, all in correspondent frames. Multiple image scanning results. Ocean Earth offers – in video documentation – the economic and cognitive advantages of multiple imaging in rapid sequence, so that the resulting report on a given site quickly conveys, with comparison and contrast, all pertinent readings of the site. Even for a single data source on a single date, video is superior.

Efficiency begets economy:

- Video is less expensive than photography. It shows more with less expense and in less time.

- Video documents are inexpensive, portable, easily duplicated and easily played back. For industrial scale projects, even videodiscs are economic.
- Video documents allow for immediate comparison, within given frames, of multitudinous conditions. They can be readily updated when plugged into a deck and receiver for incoming narrowcast, direct-broadcast, slowscan or broadcast-video signals. The updates would correspond directly with prior video recording, so an accurate narrative can be built up. With sufficient playback capacity, these changes can be sped up, slowed down, frozen at times, time-lapsed or reversed. This is crucial to study of dynamic phenomena, notably with renewable resources, ocean upwellings and currents, hydrology and water supply, pollution and urbanism.
- Video, unlike photography, allows for rapid distribution from ground station to viewers in a host of specialties, with all imagery already image-processed for analysis of particular conditions. Reports can be up-to-date.
- Video documents can archive the pertinent results of image processing, and if they are catalogued for rapid retrieval they can serve as a prime reference to any area one would seek. Further custom image processing, if necessary, could then be accomplished with custom-prepared floppy disks, compatible with inexpensive micro-computers, since the video documentation would help one select what is required from the original.

In the long-term, observation of earth from space will be concentrated on dynamic phenomena. Relatively static conditions that have been of interest, such as geological sites, will have been thoroughly examined with the first wave of data. A steady flow of data thereafter will be of interest as it shows changes. Video, unlike photography, is a medium for portraying change. It is a medium for showing changes in activity, such that even minor details and shifts can be detected better by “flickering” between times or image-processes than by photogrammetrically poring through details. Video, monitoring change, is therefore the appropriate medium for much of satellite observation of earth.

With video one can show change three ways: (1) by parallel monitor display, one monitor showing conditions at time T, the other showing conditions with incoming data, say, at time T'; (2) by sequencing or going back and forth between time T and time T', with differences appearing in the sifting process; (3) by combining data from time T with that from time T' to yield color anomalies in a single image which correspond with the areas of difference, or change.

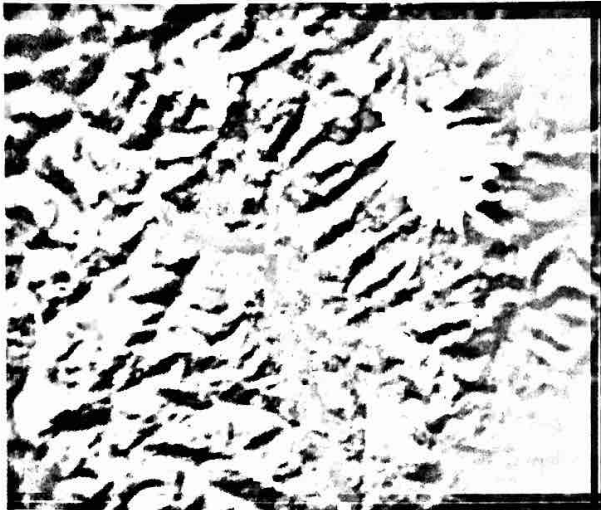
DISPLAY OF COMPARATIVE AGRICULTURAL DATA

1986

In the commodities trade, one tries to forecast yields of specific crops in specific regions. With satellites, this task is easier; market prices can be lower and more stable. The challenge is to functionally know the relative yields this year as against last year, or another benchmark year recently, for respective commodities – in all major producing areas.

For the trader, a balanced view of all major trends in commodities worldwide must be maintained throughout the trading day. One must keep in mind that China's wheat crop is less than usual, but its rice crop will be a record, or that drought in Brazil is quickly cutting back the soybean yields, or that Soviet rye yields are down, along with feed crops, but that wheat and rice – from the south – are up. The task is to

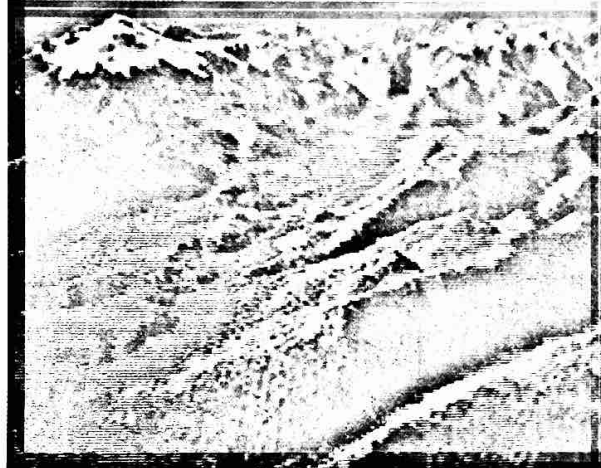
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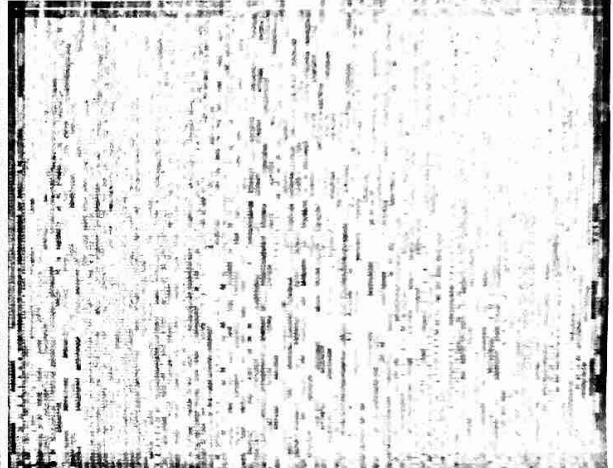
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3



4



1-3 Near-real-time three-dimensional modelling based on integration of Landsat data with terrain elevation data, as developed by Carl Weiman in cooperation with George Chaikin, under a log-spiral as opposed to fractile procedure

4 Strips of film in the multi-projector piece "N:O:T:H:I:N:G" by Paul Sharits, a founding shareholder and initiator of satellite monitoring as a first area of action by Ocean Earth. The decision to develop first the earth-observation part of the eight-part Ocean Earth corporate outline (p. 11) was made in 1981 with the largest artist-shareholder in the company, and the most internationally-recognized shareholder, Mr. Sharits. A good number of projects were envisioned with him, but will now, with his death, have to be done without him.

know everything everywhere about rates of commodities production, today.

The eye-brain system is the model for recent super-computer development. Massively parallel processing of data goes on simultaneously, through the retina-cortex continuum (or retinex), and this – in daily life – is called Vision. Not reading of words and sentences, not study of symbols, but direct vision of colors and objects. Our task is to find a means of displaying information which serves vision and mimics vision. It is to find means of showing – in mathematically correct colors – the actual crop conditions on the ground, and of showing these conditions in a rapid, summary manner that in balance reflects the overall market situation – and therefore allows astute traders to reach effective decisions. The task is to display crop conditions as they appear from above, in respective colors and patterns – as of recent days, in comparison with recent years for which production statistics are known. The result should

be, for each trader, a chance to read through the colors, the views of different producing areas, the comparisons from one time to another, and the statistics for the earlier time, so that some estimate might be quickly, almost intuitively calculated on current upcoming yields.

There is much satellite data gathered daily showing croplands, and there is much technical capacity to convert the data into imagery showing types of crops and sizes of fields. These data are not for everywhere all the time up to date: only so many satellites orbit, only so much data is ultimately available, and only so many days have few clouds. But for any producing area, such as the Danube Plain in Bulgaria or the High Plains of Nebraska, one may reasonably expect a clear view in one high-resolution satellite data frame (Landsat or Spot) from the past two weeks. And one may then be able to see how different crops are developing, compared to recent years, and what the yields are likely to be. To see, yes, but how?

The writings shown here are extremely reduced, leaving only an indication of areas of research.

SPLIT-SCREEN VIDEO DISPLAY

1986

On a trading floor, no one has time to sift through photographs. And no one has time to read through various maps and charts showing crop yields in respective producing areas, notably the two chief importing areas – Eastern Europe and China. Such studies might be made before the trading day begins, but then how would the trader keep all the factors in mind, throughout the day? Continuous visual displays.

In any news room, sets of clocks show the time in different parts of the world. In any commodities trading room, one or several video monitors show the comparative growth conditions in different parts of the world, from this year compared with one of the last years. And this presence of information, ever visible, helps create the balance of knowledge necessary to successful trading, therefore to efficient commodities trade worldwide.

The display serves analogical reasoning. On the left half of the screen is an antecedent sample scene, as of Prior Date. On the right half of the screen is the same area, or a reasonably adjacent area, or scene, from Current Date. Statistics on final yields and trends for the year of the Prior Date scene are displayed, with a sequence of simultaneous processing for both scenes, a sequence of simultaneous algorithms, simultaneous resolutions and zoom, simultaneous abstractions regarding densities and field patterns, and simultaneous mathematical projections. In parallel, for both Dates, a summary sequence of image-processed displays is performed. The pace of sequencing may change, or the sequencing may be repeated, at different rates, depending on viewer needs. The commodities brokers on the floor can learn to “read” the comparative displays of site information to anticipate what would be the

likely conditions at a given, sample site. Only the “reading” here, instead of being of words or numbers, is of colors.

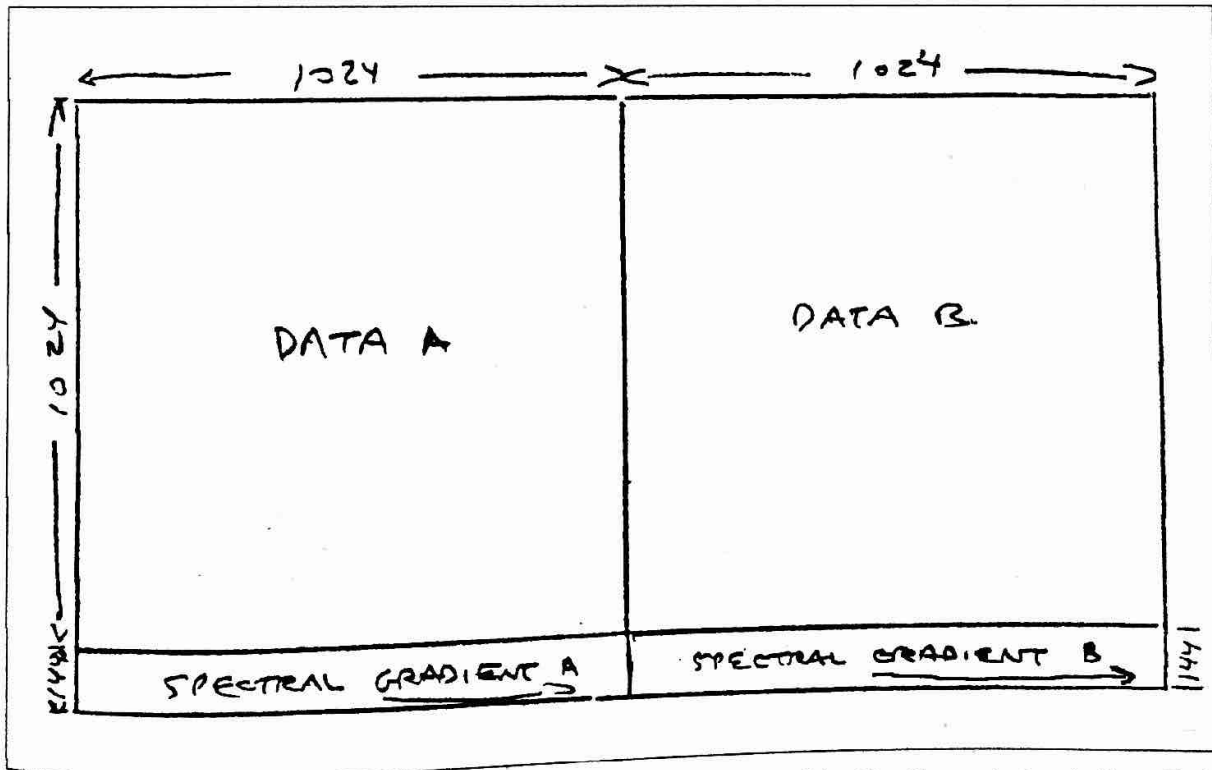
SOFTWARE FOR HIGH-DEFINITION TV

1991

Vision is a comparative process. Visual reasoning is analogical, with one thing being compared to another, in pairs. Television should therefore be on a big screen, allowing roam and zoom of vision, and – better – should present information comparatively, on two screens. At least two monitors, maybe three, should be displaying different aspects of a body of information – e.g., a scan by two persons, or data from two different but comparable dates – at the same time, in tandem. We propose developing software for parallel, synchronous display of high-density scientific imagery – each changing through time at rates which permit effective comparison, hence decision-making. Thus what has been known to be a “boob tube”, with one-way display of information, can become a critical comparator, a rendition of the two options occurring at each step in human reasoning.

FEATURES OF PARALLEL MONITORS HDTV 1991

1. All data and imagery can be on both monitors. You simply split the incoming data stream in half.
2. All data can be played parallel on both monitors, with different algorithms, or different pacing of image processing, on one as against the other.
3. Spectral gradient monitors can be converged towards each other, for easy comparison of color differences between one and the other set of data, or can be both graded in the same direction, presumably right.



5

5 Prepared for Japanese client on behalf of George Chaikin, Wolfgang Staehle, Colen Fitzgibbon and others in Ocean Earth. References: Animation II, Sonnier; four-square color grids, LeWitt; “Structuralist” films, Sharits; paired squares, Frank Stella.

COMPUTER TERRAIN-SURFACE MODELLING 1984
AND IMAGE GENERATION

Dr. Carl F.R. Weiman has developed a new method for generating computer images of terrain and water surfaces that provides much more realistic views and better physical modelling characteristics than current computer graphics approaches. It is based on a mathematical representation of the surface as a multiple resolution grid whose sampling mesh just exceeds that of the video display. Shading, coloration, and 3-D texture can be superimposed on real world terrain to depict surface material and changes in illumination.

Because surfaces are represented as grids rather than polygon networks, dynamic modelling of natural processes which modify these surfaces can be implemented using finite difference methods. Erosion, lava flows, basin sedimentation, and tectonic uplift can be simulated in the computer model and displayed in perspective from any desired viewpoint, under any illumination conditions. Water surface waves can be modelled, accounting for surface wind, currents, and bottom effects.

The algorithm can be simulated on a conventional mini-computer in software and displayed on a frame buffer at the rate of a few minutes per frame. Real-time image generation requires construction of special purpose hardware occupying two full size cabinets. The algorithm embodies proprietary algorithms for eliminating image sampling artifacts and uses mathematical shading techniques which yield sharp, vivid imagery of photographic quality.

[Part of a filing with the UN Environment Program.]

COSTS FOR VIDEO SURVEYS FROM SPACE 1982

The United Nations Global Environmental Monitoring System declares that with "the growth of satellite and computer technology... here are the advanced means by which... to view the earth". The System overlooks another technology commonly mentioned in conjunction with satellites and computers: television.

The emerging technology of digital TV will incorporate the developments of image-processing with those of video-editing. We are working in the nexus of that incorporation: we are working on bridging the gap between image-processing input and video-edited output. The gap is as narrow as our capabilities at both image-processing and video-editing allow. Our objective is to continually cut out intermediate steps, with the eventual consequence being various image-processing pre-programming setups automatically processing incoming digital-data from space and automatically generating a series of images on a video monitor which can be encoded in any number of TV signals.

Now, according to the UN's GEMS scientists, a Tropical Forest Cover Monitoring project for three small west African countries, relying almost exclusively (and very successfully) on Landsat data, cost 14-months time and 1,000,000 Dollars in money. That is, 25 Landsat frames (covering an area the size of California) cost 1,000,000 Dollars to process and ima-

ge for a thorough and expert analysis and documentation of tropical forest cover, including species boundaries and roughly fifteen different ecofloristic zones. The scientists remark that while some ground surveys and aerial photography are needed to establish baselines and check interpretation, "satellite imagery is an infinitely more cost-effective means of quantifying and monitoring vegetation." They say that 40,000 Dollars per 100 x 100 mile Landsat frame is cost-effective.

The Ocean Earth Construction and Development Corporation could conduct the same tropical forest survey, with the same expert analysis and image processing, and with a substantially better set of published documents, for no more than half the cost.

BIOPRODUCTIVITY TRACKING

1982

Agricultural monitoring may be broadly discussed to include surveillance of entire ecosystems, including entire drainage basins, for readings on bioproductivity and vegetal-animal speciation in forests, offshore waters (fisheries, broadly defined), wilderness, marshes (the generators of ecosystem wealth) and farmlands. The Food and Agriculture Organization of the United Nations, for example, conducts such broad ecosystem studies (e.g., desertification, ocean upwellings, wild vs. domesticated grazing regimes) rather than confining itself narrowly to "agriculture" and crop-yield studies. In view of this broad approach to the agricultural question, we of Ocean Earth propose to speak of "bioproductivity tracking." This emphasizes the dynamic nature of the phenomena being monitored, with many variables for a given site in vegetation cover and land use, and the necessity of monitoring on a regular basis. This corresponds with the description of "environmental monitoring" by the Global Environmental Monitoring System of the United Nations Environment Program: what is sought is a "tracking" of many variables at any given site, and of single phenomena throughout a wide range of sites, incorporating but going well beyond "agriculture" per se.

Because ecological systems are multivariate and in flux, with many different color views and detail shots revealing their many different aspects through time, and because an understanding of such systems through time - to identify trends - is crucial to successful management, video documentation, with regular updating, seems most suitable. Given that the flow of data from space is steady and at present overwhelming, and given that all such data can be systematically image processed and converted into video records with sufficient computer power and programming, we would venture into video documentation of ecological systems with the intent of automating as many steps in documentation as possible. Ultimately, ground stations would send out not occasional computer tapes, the discrete products which they can muster with their limited hardware and software, but would send out relatively continuous video streams - as with stock-market indicators. Just as there are multiple economic and market indicators, so there could be a video-format stream (ready to ship as tape, telecast, or narrowcast) of multiple aspects of bioproductivity for single sites (single data-frames) and broad regions (mosaics of data-frames).

IV.1. SPACE FORCE: EXPERIENCE

VERIFICATION IS POSSIBLE: PUBLIC
IMAGERY, FROM SPACE, REVEALS SOVIET
MISSILE BASES WITHIN RANGE OF EUROPE
Or, imagery towards a suitable course in history.

1986

Available through Sygma Agency, Paris

Ocean Earth has produced the first public evidence, from observation satellite data, of Soviet mobile-missile bases targeted towards Western Europe. Bases that accommodate SS-20s have been found, studied and discussed with highest military sources, who confirm the findings. Ocean Earth therefore has developed a methodology for tracking down and satellite-imaging other SS-20 or SS-25 mobile-missile bases in the Soviet Union.

As a result, promises by the Soviets to remove or dismantle their SS-20 bases, including the "stationary structures", can be subjected to public verification. Through efforts started by Ocean Earth, the public can see for itself how thoroughly the Soviets fulfill their pledges. Not only would the Soviets leave themselves open to inspection by certain government bodies, as they propose, but also to inspection by the TV & print media. Any attempts to conceal from public scrutiny could be detected, we believe, given the impending nine-fold improvement in resolution of satellite sensors. If there are deceptions, they will be found.

Arms control will be modified, we are told, by the practice of public verification, or public satellite observation. The secrecy of verification maintained between the US and USSR will be substantially reduced, and the privilege and glamour attendant to arms-control negotiations will decline. The public will be watching; negotiating parties will have to play to the public, with hard evidence of actual missile site progress rather than words or proposals. The center of attention shifts from solely Geneva, to pinpointed locations, scrutinized by satellite, in Eastern (or Western) Europe.

TELEVISION FROM SPACE

1986

Rapid and thorough dissemination of satellite surveys of dynamic processes on earth – e.g., urbanism, bioproductivity, pollution, drought, flood, ocean circulation, military construction and war – is effected best with television.

The Republic of Algeria, having learned of our site-video studies of the head of the Persian Gulf (now a war zone), asked us to propose a comprehensive video monitoring program for Algeria. They wanted to develop an ongoing cognition of all soil and water conditions, and of bioproductive patterns, towards transforming the desert back to its former state – animal-rich savannah. We ourselves had conceived such a scenario, relying on recent scientific understandings about ecosystem management, but we had not expected a political will for it. We responded with a proposal of repeated observation for an inward-draining saltwater basin, the Chott-El-Hodna. The question is whether a video-documented satellite-data program would lead to an understanding of the basin's hydrological dynamics, and then to schemes for integrating groundwater and surface water movement. The need to show trends underscores video.

ARCHITECTURE OF THE FUTURE NOW IN THE USSR

1987

Mobile-missile complex, near Yur'ya, USSR. Designed by Soviet military architects who probably have secret fantasies about Malevich, Archipenko and Leonidov.

With a satellite, roving the world, one can discover the state of the art in architecture. Here, at the crest of the world urban-renewal ('arms') race, the Soviets practice the art of targeting other cities or bases without themselves becoming a vulnerable target. A mirroring proceeds. According to the arms negotiators from both sides, it would seem that this complex – a third the size of Greater London – will soon be emptied of missiles and become suited to more civil ends. Like Constructivist living. In the wilderness.

More sober, we confine ourselves to taking lessons from the military designers.

Elsewhere in the wild, far away from cities or even those patchwork farmfields, a few railroad spurs could be linked to remote roadways connecting the very concentrated, integrated settlements advocated by the Megastructuralists in the 60s, or the Constructivists 50 years before. The entire complex connects with the outside world at the telecommunications and information-processing center (in military jargon, C³), at center top. Each surrounding base, accommodating, say, 10,000 inhabitants, functions as a unique combination of standard elements, added or removed on demand. A plug-in architecture, intermodal for integration with rail and road transport, ensues. The wilderness retains its vitality. Each settlement, though of uniform components, gains a unique and changing configuration, and all settlements in any complex connect with the world with the same instant technology enjoyed by the military. The plan is Archipenko; the on-site community-generated possibilities, Leonidov; the view from above, Malevich.

New towns need not be mini-cities, like Reston, or garden cities, like Tapiola or Benghazi. They can be inserts of industrial structure into wild terrain, ready to receive or discard components according to each localized demand – all connected with the world by the latest in transportation and communications technology.

As we observe with Benghazi's lagoon, the scale of habitat should not be human. The jungle or forest is not 'human'. Rather, the scale should be of wild and given terrain, intensifying the experience of that terrain.

BROADACRE RADIEUSE

1987

Benghazi. A city designed by an architect with a propensity for megalomania and a passion for satellites, Constantinos Doxiadis.

But as with Quaddafi so with Doxiadis, the megalomania ended up being... rather traditional. The satellite images ended up facilitating bigger versions of long-established visions. The city, though observed from space, became a fulfillment of blueprints from before.

The plan, derivable from reliable maps, situated an F.L. Wright low-density interspersed of fields and sprawling buildings (Broadacre City) in a classic radial plan enriched with superhighways (Ville Radieuse). The plan was suitable for people with plenty of oil and space, with fast cars and no possibility of traffic jams. Here is an old model for the century, based on the car.

Superpower secrets go public

By John Eisenhammer

SOME of the most closely-guarded secrets of the superpowers — the location and lay-out of nuclear-missile bases — are now open to public scrutiny, according to a New York-based firm, Ocean Earth Corporation.

It specialises in analysing satellite imagery data — anything from rivers and forests to clusters of nuclear weapons.

According to Ocean Earth, their pictures show one of the largest groupings of mobile-missile bases in the Soviet Union, at Yurya, 375 miles west of the Urals.

Peter Feud, head of Ocean Earth, says the complex contains five sites for medium-range SS-20 missiles, aimed at West Europe, as well as, at the time the data was being analysed, two sites under construction, for the new SS-25 mobile inter-continental ballistic missiles.

When Margaret Thatcher travels to Moscow at the end of this week, arms control will be one of the key points on the agenda for talks with Mikhail Gorbachev.

She is also likely to reiterate the serious concerns expressed in Capitals in West Europe over the need to have strict verification of any arms-control accord.

Whatever deals are reached between Americans and Soviet negotiators in Geneva, such as the removal of all medium-range nuclear weapons from Europe — the so-called zero-zero option — success or failure will depend on the ability to verify that each side really is doing what it says it is doing.

Almost all verification is done by the United States and the Soviet Union with powerful spy satellites. The information they gather is top-secret, and the Pentagon does not always make it available to its Nato allies.

Now, Ocean Earth claims to be offering "a public version, albeit low-grade, of arms control." The tale comes from two civil satel-

lites, in the case from Landsat, a US government satellite which is open to commercial use. Higher-resolution images can be obtained from the newer French Spot satellite. In theory, anyone can ask for this data and buy it from countries which operate ground-stations for the satellites, such as Sweden and Italy.

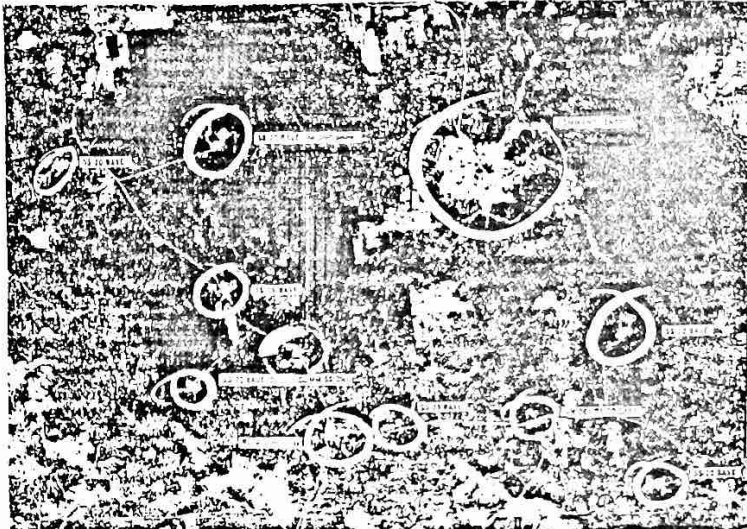
But, as Mr Feud emphasises, exceptional efforts are made, especially by the military, to prevent the data getting into the hands of members of the public. "Defence departments do not want people to get the idea that they can pursue their own verification inquiries," he said.

Sensitive work previously carried out by Ocean Earth covered military construction in the Falklands, Israeli attack routes in Lebanon, Libyan forces in Chad, and the Czechoslovak nuclear plants.

The work on the Yurya base is potentially the most important. "The diplomatic implications are enormous," Mr Feud says. "Up to now the ball 2 treaty has worked on the basis of verification exclusively conducted by the US and the Soviet Union. Now others can take a look at what is going on, and check that Mr Gorbachev, or anyone else, really is sticking to the letter of the law."

Satellite pictures are one thing. Understanding them, however, is quite another, and requires a great deal of expertise. This inevitably leads to some dispute in military circles about the implications of pictures of the type used by Ocean Earth.

"Anyone can look at the pictures," says Major Bob Elliot, of the International Institute for Strategic Studies, "but it takes a guy who spends his life on such matters to interpret what is going on." Mr Feud is confident that Ocean Earth has achieved just that.



A photo, taken by non-military satellite, of Yurya, Russia's main mobile-missile complex, which is larger in area than Greater London.

Forest hides huge Soviet missile bases

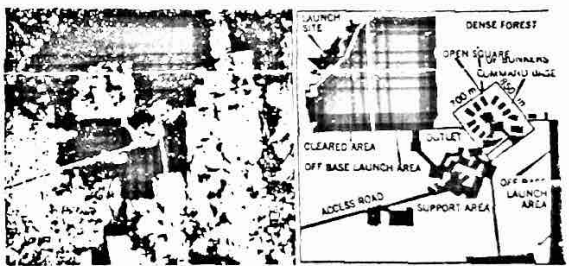
YURYA, according to Ocean Earth Corporation, is the largest Soviet mobile-missile complex. The chief development site for Soviet mobile missiles, the 780 square-mile complex west of the Urals houses five separate SS-20 bases, from which any target in Western Europe can be reached.

When the satellite picture was taken there was also evidence of work on two SS-25 missile bases. These missiles, with a range of 6,500 miles, are among the newest in the Soviet arsenal. An important training area, according to Ocean Earth, the Yurya complex is located in a forest, with the road network following old logging routes. It is also linked to the Soviet rail network.

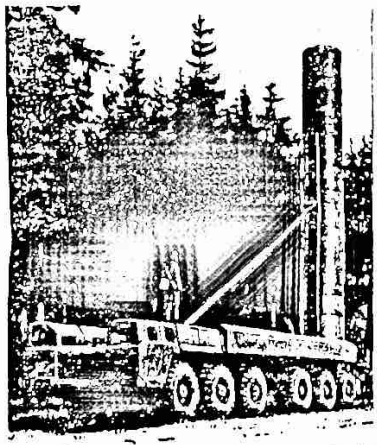
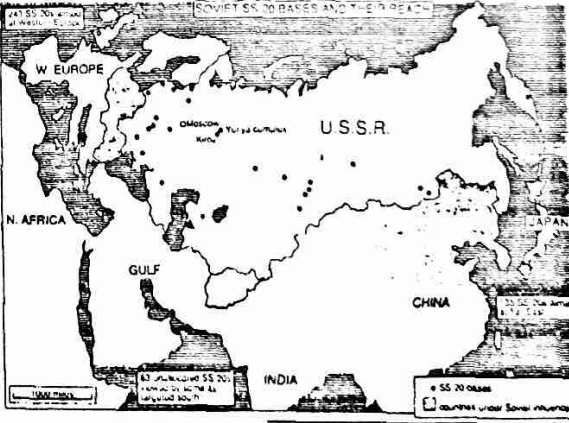
Each base usually has five SS-20 missile-launchers mounted on trucks in garages built in groups of three. The missiles, each with three warheads, can be rapidly transported from the garages to hardened launch sites near by. There are many more launch sites than missiles, with the actual launch site chosen at random just before firing to maximise deception in the face of incoming enemy missiles.

Despite this, the mobility of the SS-20 is limited to the complex, and it cannot be driven around on roads for vehicle-launch, like the American cruise missile based, for example, at Greenham Common.

The SS-25 missile, with a single warhead, is capable of either fixed-site deployment or operation in mobile form, using systems similar to those of the SS-20.



Detail (left) of one of the SS-20 bases and (right) the layout of the storage and launch facilities.



The SS-20 mobile launcher, of which 441 are said by the Pentagon to be operational. A more accurate SS-20 is being tested.

6 "Superpower secrets go public"; 1987, in: The Independent, Thursday, 26 March 1987, by John Eisenhammer.

A close-up at the shore reveals the contrast of old with apparent new: on the seaward side of the lagoon, the old city appears very condensed — as a smudge. It cannot be read. Even with high-resolution Soviet satellite data, it probably could not be read. So how could it be suited to Planning? Straddling across the lagoon, and continuing in the radial pattern there on out, a see-able and therefore plan-able Broadacre stretches. Not a sprawl, exactly. More, an articulate but flat fabric.

The close-up reveals what should have been done with satellites: identify the dominant geological features and build into them. Instead of imposing a fabric as if anywhere, concentrate on the given structure of the lagoon, then on the stream beds leading to the mountains nearby. As monitoring just inland sho-

ws, those stream beds — not the ruralia carpet — will make or break Benghazi as viable habitat. Over time, ground water is sinking, surface water is drying up, and waters from the sea rush in to satify the entire site. Such deterioration occurs along most of the Libyan coast — as monitoring satellites show. But Doxiadis, planning from photos as maps, didn't know.

The task is to go back to the lagoon, with its incoming streams, before building. This image was taken in the morning of the US Navy attack on Benghazi. It probably has not undergone any major change. It should have: Benghazi as it functions now, ecologically-monitored with recurring satellite overflights, appears to be better off unbuilt than thus.

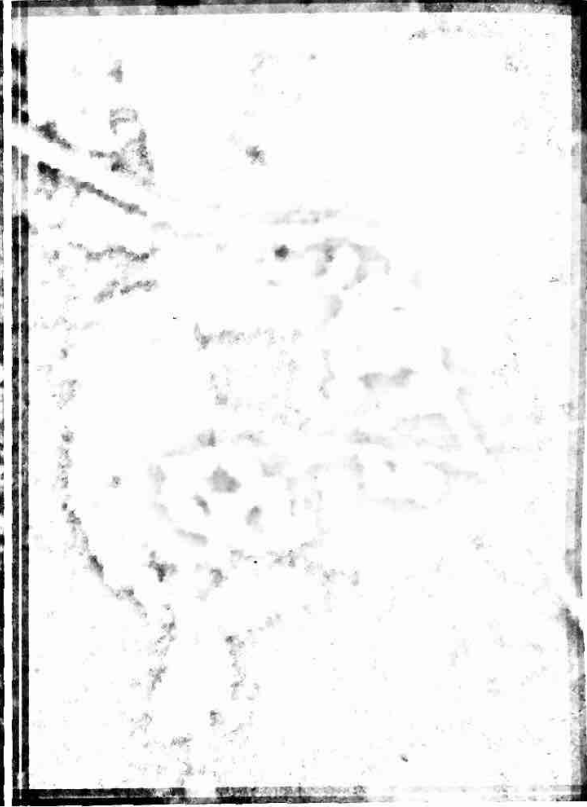


7 Black and white photo of Yur' ya mobile missile complex, the largest such complex in the world. Ocean Earth-EOSAT, 1985. Represented by Sygma Press.

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8-9 Landsat imagery deposited with Sygma Press of then-Soviet mobile missile bases. These demonstrated that one could detect changes in the "stationary structures", which were subject to removal under SALT II. Ocean Earth-EOSAT, 1985

10-11 Black and white photographs of Yur'ya mobile missile bases. Ocean Earth-EOSAT, 1985. Represented by Sygma Press.

From Eyes in the Sky, Profitable Images

A Small Business Is Built On Satellite Photographs

By Terry Trucco
International Herald Tribune

LONDON — Seated in the tea lounge of the Hyde Park Hotel, Peter Fend thumbs through his photo collection. Like most pictures of Earth taken from satellites, his do not look like much to the unschooled eye. But Mr. Fend's explanations help put things in perspective.

The big irregular blur on the shot of the border between Iran and Iraq is a gigantic man-made water obstacle built by Iraq to repulse enemy attack. Air views of the Gulf of Sidra area reveal a Libyan air base with SA-5 Soviet anti-aircraft facilities. And other photos show the sites of Soviet SS-20 missiles.

The subjects may be sensitive, but Mr. Fend's pictures are neither secret nor stolen. Taken by Landsat, the U.S. civilian satellite that regularly scans the globe, they are part of the public domain. Most already have appeared in newspapers and on television in Europe and the United States.

It is unlikely, however, that they would have been seen at all without the involvement of Mr. Fend's company, the Ocean Earth Construction and Development Corp.

Since 1982, Ocean Earth has built a burgeoning business by retrieving land images from civilian satellites, analyzing them with the help of experts and selling them to research institutes and news organizations. The British Broadcasting Co., Antenne 2 in France and television networks in the United States are among the customers.

Some of the company's site-monitoring projects have been straightforward, such as research on weather patterns in the Amazon basin and a study showing how the African desert has spread into the Sahel region during the past three years.

But its civilian spy operations, as one observer called them, are what has kept Ocean Earth in business. Since the 1982 Falkland Islands war, the company has processed and analyzed satellite data from such trouble spots as Nicaragua, Lebanon and Chad. Industry sources say the tiny company is probably the only one of its kind.

"What we do is contract work, and military sites are where the interest is," said Mr. Fend. Most of the company's projects are now initiated by news organizations, though research institutes have helped underwrite some projects.

Some of Ocean Earth's activities have provoked controversy. Much of this centers on the company's analysis of satellite data, which has not always earned the highest marks.

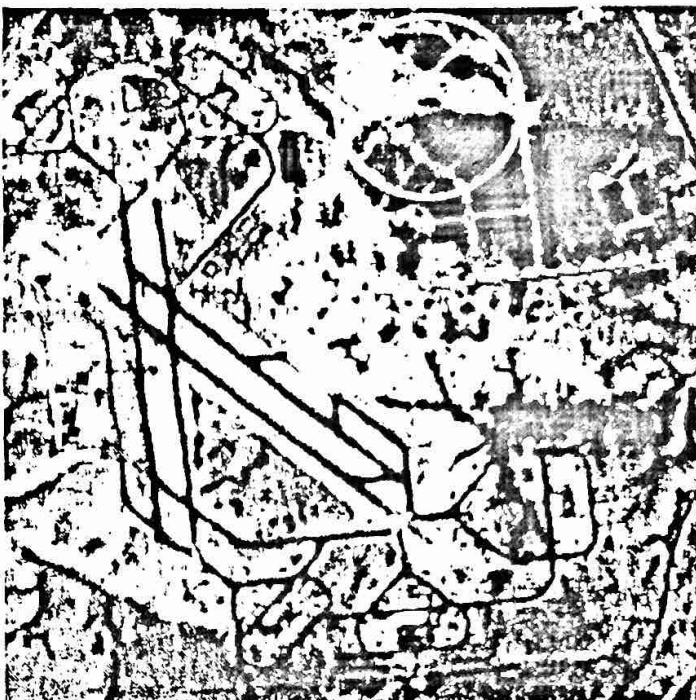
"They tend to be a bit hasty in publishing some of their findings," said one of Ocean Earth's North American strategic advisers. "But if they take enough time, they can be on target."

Others have criticized the clarity of the company's photos, which Mr. Fend admits needs improvement.

YET Ocean Earth's basic concept seems to have been accepted by at least parts of the Western intelligence community. Mr. Fend has managed to assemble a core of military and academic strategic experts in Europe and North America who are willing to study and analyze satellite data.

"Our feeling is that if the material does not compromise security and can be interpreted sensibly to provide better understanding, there is no reason not to make it available to the public," said a British military expert who has worked on several Ocean Earth projects.

The pictures are crude compared with the sophisticated U.S. Defense Department reconnaissance satellites that are said to be able to show people's faces or numbers on license



Ocean Earth identified this Libyan air base near the Gulf of Sidra as the site of an SA-5 installation. It said the missiles were being installed in the circled area.



Peter Fend

plates, all from an altitude of more than 150 miles (245 kilometers).

Yet nonmilitary satellites can provide a good overview when weather and other conditions are right, Mr. Fend said. "We can see enough to let the public know what various governments are doing and whether they are telling the truth," he added.

In many ways Mr. Fend and his company seem unlikely adjuncts to the spy business — as unlikely as Ocean Earth's origins. The company grew out of an art exhibition Mr. Fend held in the late 1970s at a New York gallery.

The show, entitled "Art of the State," explored the notion of artists as Earth monitors, using their visual skills to turn images beamed to Earth by satellite into art.

Mr. Fend founded Ocean Earth in 1980. Ac-

quiring satellite data takes time, but thanks to the "open skies" policy then observed by the U.S. government, everything the company wanted from Landsat eventually became available.

The original idea was for the company to take on general projects related to conservation, ecology and land use throughout the world.

But when Mr. Fend wound up with satellite data on the Falklands in 1982, he decided his company could just as easily process something in much greater demand — pictures of war zones. "We knew we had the means to grow," he said.

Though it is headquartered in Düsseldorf and New York, Ocean Earth has done much of its work at the museums, galleries, universities and other institutions where its loosely assembled staff happen to be working.

"One of the American network people told me, 'You guys have put this thing together with baling wire and bubble gum,' which is true," Mr. Fend said. "But at least we're doing it." Last year the company made a \$100,000 profit.

The future, Mr. Fend hopes, will be less precarious. President Ronald Reagan's repeal of the "open skies" law will make it increasingly difficult for Ocean Earth to obtain all the Landsat data it wants. But the company has already contracted to get material from Spot-1, a French satellite launched Friday.

At the moment Ocean Earth seems to have the field to itself, partly because of the difficulty of data retrieval and processing. A typical Ocean Earth project, like its study last year of Soviet SS-20 bases for CBS television in the United States and for Dutch television, takes at least six months.

In addition to dealing with satellite images, the company must work on high-resolution display computers, which allow the data to be mixed and matched in a variety of ways. Aerial radar data can be combined with Landsat data. Where applicable, Magsat data, which reveals magnetic concentrations and mineral deposits, is added. The final pictures come from looking at dozens of images.

CHERNOBYL
INSTABLE

1987

A new town that did not work: the industrial settlement just upstream from Chernobyl. The reason for failure: poor siting.

To gain access to large volumes of water, a massive reactor complex – with its own requirements for secure foundations – was built on a shallow landfill on top of a river bed, in the middle of meanders. Downstream and alongside, a giant cavity was excavated from the mud of the river bed so that a water supply for the steam driving the turbines could be recycled. This seemed to be a clever arrangement, for the complex could be isolated among marshlands far from any prominent river, far from view. Forgotten was the fact, plain to any child, that mud in a river bed will tend to ooze downstream, particularly during spring floods, and that anything sitting on a tongue of mud just upstream from a giant excavation can expect to be moved. As French and German nuclear authorities have confirmed to us, quietly, this happened. A shifting foundation led to dislocation of external water supply, hence to an unexpected shutdown of the reactor – during which ‘the operators on site’ made a mistake.

These photographs, from a French satellite passing over the site several weeks after the accident, then four months later, show evidence of the cause. From left to right, along the axis of the Pripyat River, with meanders about equidistant on both sides, the later image shows massive new plugs of concrete. The diversion itself is caused by concrete embankments. Then, in a line, appears: (1) the broad flat concrete square, holding rigid the water a meander that – unlike others – forms (2) a curious bulge; just downstream, at (3), a flat hollow once filled with water is dried and later plugged in with concrete; (4) downstream, parallel to the lake divider, more concrete emplacements: at the downhill side of the reservoir, where pressure to dislocate might be greatest, appears (5) a new, 200-meter long concrete buttress; and further down, by Chernobyl itself, appears (6) another concrete emplacement. All changes align with the Pripyat, as revealed in larger satellite views; the alignment passes directly through the one fatal reactor, No. 4.

A clue of the problem appears at the dark tracery at right angle to the river axis from No. 4. With the first public Chernobyl imagery, this tracery was attributed to smoke. But evidence from before and here, much later, shows a continuing presence. The dark line appears more as a fissure, or upwelling of moisture, in the landfill – a point of dislocation perpendicular to the line of movement.

The disaster was architectural. Given that the entombed reactor will be hot for a hundred years, and that the concrete plugs into the river channel are not expected to last nearly that long, more drama may yet ensue – not just for the Ukraine, but for most of Europe.

Kenzo Tange once designed a Tokyo Bay megastructural city that any satellite would reveal, and any Doxiadis-scale thinker would undertake. But the buildings envisioned were to be set over water, on artificial ground, in a region vulnerable to earthquakes and tidal waves. How stable could such giant structures be? How stable, by comparison, would be the structures evident from satellites to lie on faultlines, like Indian Point nuclear power station? With satellites the crucial site and foundation research, preliminary to any major project, can be economic – and customary.

ECOLOGICAL MONITORING BY
OCEAN EARTH

1989

George Woodwell of the Woods Hole Oceanographic Institution has been reporting to public gatherings a scientific understanding that the Greenhouse Effect is getting worse – at a faster rate.

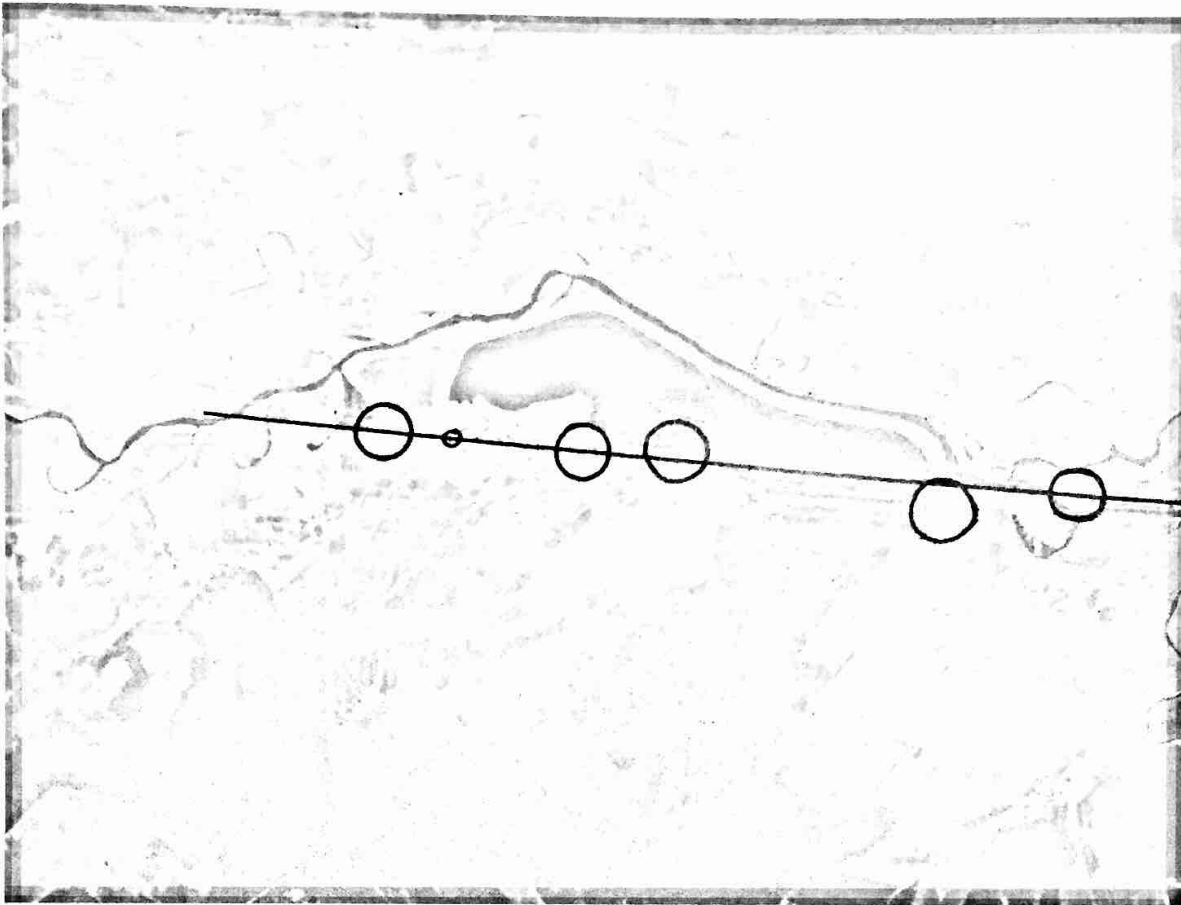
Required now – not some years from now – is a reversal of deforestation, with its many disastrous effects, and a full-scale shift away from fossil fuels. Mineral oil, coal and gas would be regarded simply as toxins: not for use.

Woodwell suggests that nuclear energy is not an option. He argues that if government incentives and policies were shifted away from fossil fuels to solar energy, and attendant hydrogen production from electrolysis, the current crisis could disappear within a few years. The technology for a post-fossil fuel era is here; where are the economic structures?

Ocean Earth works to help achieve those structures. The core discipline is architecture, including regional planning; the methodologies are practices of earth imaging, modelling and engineering derived largely from recent art and military practice. The company’s mandate on energy led to the company’s first project, a comprehensive re-development and re-industrialization plan for the Ruhr Basin in Germany, relying chiefly on biogas from the North Sea for the hydrocarbons required to produce steel. An ongoing project now, started in 1985, concerns comprehensive soil-basin management, extending offshore to upwellings to allow for kelp and, again, yield biogas, in Calabria, Italy. These projects build on experience at Caltech, where in the 1970s (before the Reagan-era shutoff of funds) research was conducted in long-term offshore energy systems, including biogas. At this time, leaders include the Italian state hydrocarbon company and several major utilities.

The company’s mandate has been furthered in recent years with satellite scrutiny of sites now suffering from the effects of mineral fuel consumption and of deforestation. Ocean Earth makes public the travail at those sites, and then indicates means towards more viable construction and development of those sites. World-rank scientists have collaborated with Ocean Earth to develop authoritative analyses, along with plans for action, at the following sites, all monitored by satellites.

1. The Persian Gulf. Amid the apparent impasse between Iran and Iraq, giant channels have been extended from the two main rivers feeding into the Gulf, the Tigris and Euphrates, to greatly increase the volume of flow – and to start releasing the pent-up settled waters that have been accumulating silts and salts, causing more land to become desert. Ocean Earth has chronicled the growth of engineering schemes of unprecedented size and innovation, extending from 1972, long before the war, through 1987, shortly before the final negotiations leading to the cease-fire. Although the constructions have military functions, they also can be continued as ecological benefits for the entire Tigris-Euphrates and Gulf Basin. A post-war policy must take the constructions into account and make sure they meet long-term regional needs, including gradual restoration of savanna and forest to the wadis and rivers feeding into the giant channels. Ocean Earth analyses and imagery appear in forthcoming books from the Oxford University Press and MIT Press.



- 13 Imagery of the Chernobyl reactor complex from SPOT data four months after the accident. The areas circled have been new installations, evidently of concrete. They appear lined up with the thalweg of the river. The small body of water just upstream of the reactor No. 4 has been plugged in. It would appear that efforts have been made to bolster the artificial landfill and artificial reservoir to prevent further slippage.

Landslip was factor in Chernobyl blast, expert says

14

By Nick Nuttall
Technology Correspondent

The Soviet nuclear disaster at Chernobyl was caused by land subsidence and mistakes in civil engineering rather than by scientists involved in unauthorized experiments, an expert on satellite imaging claimed yesterday.

The new evidence contradicts the official versions of the world's worst nuclear accident. Mr Peter Fend, an American expert in satellite imaging, who presented the evidence to a gathering of United Nations-backed scientists in Venice, said the explanations given by Soviet and Western governments were crucially flawed.

He also alleged that there had

been a deliberate cover-up to suppress the truth, particularly by West Germany.

Mr Fend claimed the German authorities had confiscated satellite pictures, providing crucial evidence that official versions were wrong, from one of their own scientists.

Various reasons could lie at the heart of these attempts to hide the truth, he said - not least the risk posed to a string of other Russian reactors along the banks of the Pripyat river, where Chernobyl was built, by land slip and subsidence. He feared they, too, had been built on unsound ground and might have shaky foundations.

According to scientists at the Open University in Milton Keynes,

Buckinghamshire, Mr Fend's New York-based company, Ocean Earth, is recognized internationally for its supply and analysis of satellite images of river and ocean basins.

Evidence for Mr Fend's claims are based on a series of satellite pictures taken before, during, and after the Chernobyl disaster in April 1986. The shots reveal a dark line cutting across the reactor that officials, including the US Geological Survey Department, maintained was the shadow of a smoke plume cast across the area as the nuclear pile burned.

Mr Fend, however, is convinced that the dark slash is a fault in the land, which gave way under the weight of the Chernobyl plant, causing the collapse of Reactor 4. He

said the prevailing winds at the time were blowing in the wrong direction for the contention that the dark line was a smoke shadow to be sustained.

Mr Fend argues that the line was still in place more than two weeks after the explosion, although the fire had long since been extinguished.

Further evidence that planners in Moscow sited the plant on unsafe ground comes from scientists at the Open University. Dr Steve Drury, of the Earth Sciences Department, said yesterday that his researchers discovered that the dark line was faintly but clearly revealed in satellite photographs taken before the accident.

Dr Drury said this refuted the smoke plume claim, and a sub-

sequent claim by Soviet authorities that the dark line was caused by blast damage.

There is a growing conviction among scientists that the expanding dark line is evidence of water seepage from the river into a land fault, and that this was what triggered a land slip. The sand and clay ground probably also had peat deposits that made it unstable.

The Health and Safety Executive's Nuclear Installations Inspectorate in London disputed Mr Fend's claims, saying its officials agreed with the International Atomic Energy Authority, which backs the Soviet Government's explanation that human error and unauthorized experiments were to blame.

- 14 "Landslip...", in: The Times, London 27 September 1989 by Nick Nuttall. The scientists were not "UN-backed" but were invited to participate in a conference sponsored by the UN Environment Program and UN Food and Agriculture Organization, along with the International Union of Foresters. No UN-sanction was made of any expressed opinions.

Responsive comment for media by Ocean Earth at that time:

The story is somewhat inaccurate: the "fault", or error, was not a problem of geology but one of hydrology. A large building requiring a stable foundation was placed in the middle of a river path, on top of an artificial landfill, with the meandering river being diverted and, to further weaken

the site, a larger reservoir placed immediately downstream, as a cavity subject to distension. Fend was never interviewed for this story, which was followed up elsewhere.

The authoritative imagery appears in the Oxford University Press and European Space Agency publications on Chernobyl.

2. Chernobyl. Those who suppose that nuclear energy is an option may realize, on reviewing the dossier of Ocean Earth photos, that human society might not be capable of handling it. The dossier includes crystal-clear images of the affected Reactor No. 4, including outfall from that reactor, as distinguished from the many erroneous or misleading images published by 'official sources' worldwide. The Ocean Earth images were produced after only 20 minutes of computer processing, and they became the authoritative images of the accident published by the European Space Agency and Oxford University Press. Unfortunately for the world public, the data for these images were withheld by the German 'information police' long enough to prevent publication by contracted clients, and they have since then been appropriated by those authorities, with various repercussions. Subsequent processing of SPOT data, within an overall chronology from a year before the accident to half a year afterwards, has shown that the accident was more a fault of central planners than of the workers on site. The reactors were built on a landfill in the middle of a river meander; an excavation downstream, built to allow for steam-water circulation, left the landfill vulnerable to tendencies for river-bed mud to slide downstream into the excavations; markings on-site at the time of the explosion indicate an irregularity in the landfill perpendicular to the river-path, which goes directly through the affected Reactor No. 4; large-scale bulwarks and plugs have been built since the accident, along a 30-km stretch of that river path. The reactor is live for another 100 years; the concrete encasing is expected to last another 50 years; meantime, the entire reactor array sits on a thin sheet of landfill atop a moving tongue of mud, ready for another dislocation and emergency need for shutdown – which, as we know from 1986, was not performed by the 'workers on site' very well. The Ocean Earth chronological sequence and analysis raises the question: how many other nuclear reactors are thus poorly sited, in violation of fundamental architectural principles?

3. North Sea algae bloom, 1988. In a one-day span, from May 15 to May 16, 1988, a concentration of extraordinarily-warm water, both suitable for and indicative of a deadly bloom of microscopic algae, expanded four-fold from portions of the Danish coast to virtually all the Kattegat-Skagerrak arm of the North Sea. Thus exploded an epidemic pre-empting most other life forms in the ocean off southern Norway, western Sweden, all of Denmark, and – soon – the other countries of the North Sea. The data base covering nearly all of the span show that the concentration and bloom in the Kattegat-Skagerrak arm of the North Sea ensued materially from similar warm-water concentrations drifting northeast from the outlets of the Rhine and Thames, then spinning to north after impact and agglomeration from effluent of the Elbe. Scientists have attributed the algae bloom to run-off from the main rivers into the North Sea; Ocean Earth imagery confirms their point. The two color close-ups here shown were used by collaborating University of Kiel scientist Ulrich Horstmann for him to make his point – at several governmental conferences on the pan-European problem of regional-sea breakdown during the now-famous Summer of 1988. The causes of the breakdown are widely known; excess fertilizer run-off, acid rain run-off, urban chemical run-off, hydrocarbon run-off all chemically-derived chiefly from fossil fuels. Ocean Earth data for this study have been appropriated by Dutch authorities, who have since made public an official view that the death of sea mammals in the North Sea results not from algal blooms per se, nor from the detectable track of pollution plumes, but from a certain contact of sea-

hounds with land hounds (dogs) infected with rabies. Nonetheless, the Oxford University Press publishes our results.

4. Nicaragua-Honduras highlands: deforestation. In a comparison simply of negatives from the chlorophyll-sensitive Band 2 of MSS data for the Nicaragua-Honduras border, what stands out is not some new military installation somewhere but a substantial darkening among highlands on both sides of the Continental Divide, partly in Nicaragua, partly in Honduras. The darkening indicates, in the positive film, less reflectance, therefore less chlorophyll, less vegetation. Dr. Forest Hall at NASA says we have a sure indication of environmental degradation. Probably deforestation, among precisely those mountains where water and soil run-off should be prevented with sturdy forests. We know where to look for more evidence, for more thorough digital data. But it conforms with the widely-published scientific warning that while the Central American republics undergo political turmoil the forests and highland catchments essential to the well-being of all are being weakened and destroyed. The imagery here compare January 1984 with January 1985: what has occurred since in this region, largely contested? As we learned recently from a professor at West Point familiar with Central America, what has occurred since is further economic and ecological deterioration – with no bold initiatives by US forces, e.g., engineering corps, to reverse the slide.

5. Amazon-Sahel relation: impact of deforestation in one region on rainfall in the other. This phenomenon is well-documented by a NASA scientist. Ocean Earth understands from a NASA administrator that a change in rules may occur to promote more rapid publication of the scientific documentation, even if all procedures of scientific proof and disclosure have not been completed. We may expect more widely-publishable imagery soon. Meantime, Ocean Earth's George Chaikin cooperates with a scientist from Woods Hole to produce a composite of geostationary weather satellite views of both the Amazon and Africa, to show the impact of cloud flow from one on the other. Chaikin also conducts a contemporary detail study of an indicator Sahel Belt site, with Landsat data. Joan Waltemath manages a stock of motion-pictures and stills showing the dynamics of cloud formation in the Amazon and its impact both on North America's rainfall and Africa's; this is a first part of her overall Earthbelt Project; she conducts further data acquisition in Germany now. As a foundation for public disclosure, Ocean Earth builds on its three-dimensional digital elevation models of the Amazon Basin per se, for a TV client, formed at Woods Hole Oceanographic Institution, showing how critical forest cover is, particularly in the mountainous west.

6. Sirte, Libya. Comparison from January 4 to March 24, 1986, although ostensibly of interest to military historians (the US air raid occurred on the latter date), yields information about the steady destruction of freshwater systems near the Sahara coast. In both images, also, one can identify the single major blockage to restoration of freshwater flow through the region's wadis, which extend ultimately into most of the Sahara sloping into the Mediterranean: salt and silt accumulations just at the outlets of the ancient rivers. On the advice of experts in Libyan ecology in England, Ocean Earth would propose as a first step in site restoration the rather simple removal of those salt and silt accumulations by the Sea: probably less expensive, complex or daring than the construction of the now-famous air base there.

7. New York City. A single Landsat scene, processed to reveal turbidity in the water, shows the No. 1 problem for the entire region: agglomeration offshore of dangerous, toxic wastes. The City – rather, the entire Hudson-Raritan Basin with the City as end-point – is plainly damaging, if not destroying, its primary support biosystem, the Ocean nearby. The sources of the run-off spewing out from the two rivers, all very cloudy, include acid rain run-off, motor-vehicle exhaust, industrial-chemical outflow, and agricultural-chemical, including fertilizer runoff. Fossil fuels comprise the main portion of this runoff. Meantime, at just where the Hudson-Raritan outflow starts meshing with the Ocean, a giant globule the size of Manhattan appears. This has been confirmed to us by scientists as the site of ocean dumping. It's where non-biodegradable and non-combustible residues of the City as throwaway consumer goods are dumped, as if they might go away. As everyone learned in the Summer of 1988, the residues of such dumping began drifting into everyone's beaches, as if the Ocean could no longer filter or handle the load. Here, in one image, is a portrait of most of the great cities of the world. What happens here is little different from what occurs off the coast near Tokyo, London, Los Angeles, Buenos Aires, Osaka, or Hamburg. What is to be done? First, eliminate ocean dumping; second, develop industrial materials and consumer-throwaway products, along with agricultural fertilizers, which have no base in fossil-fuels or any toxic metal often refined together with fossil fuels.

Whatever might be one's judgment of the numbers presented by Dr. Woodwell, compelling a conclusion that fossil

fuels must be immediately replaced by 'alternative sources', there can be little denial of the facts presented by the satellite imagery here cited.

SUMMATION

Something enormous is being built at the Head of the Persian Gulf, with long-term effects for the entire region. Some things enormous are being built along the axis of the Pripyat River, which cuts directly through the location set on a movable landfill, of the fatal Reactor No. 4. Some toxic organisms spread among unduly heated waters throughout the eastern North Sea, with devastating consequences for the entire Sea. Some distinct lessening of chlorophyll, hence of vegetation and ecological vitality, with serious effects given the tropical conditions, occurred while the people there – of Nicaragua and Honduras – continued fighting over forms of government. Some relationship exists, as images show, between cutting down trees in the Amazon and the southward march of the Sahara: any tropical rainforest or savannah can become a desert; witness parts of Panama. Some thing could be done about the now-dry river beds of Libya, with consequences far more vast than whether Quaddafi has any say on navigation in the Mediterranean of fossil fuels. Something floats off the coast of New York, every now and then spinning off a giant strand of toxic wastes to destroy life at sea, on the beaches – or in the air. Are the images here chronicled scenes from a terrifying film, or might they become part of a deluge of images and reports that could persuade the human race to maintain its credibility as a viable proposition?

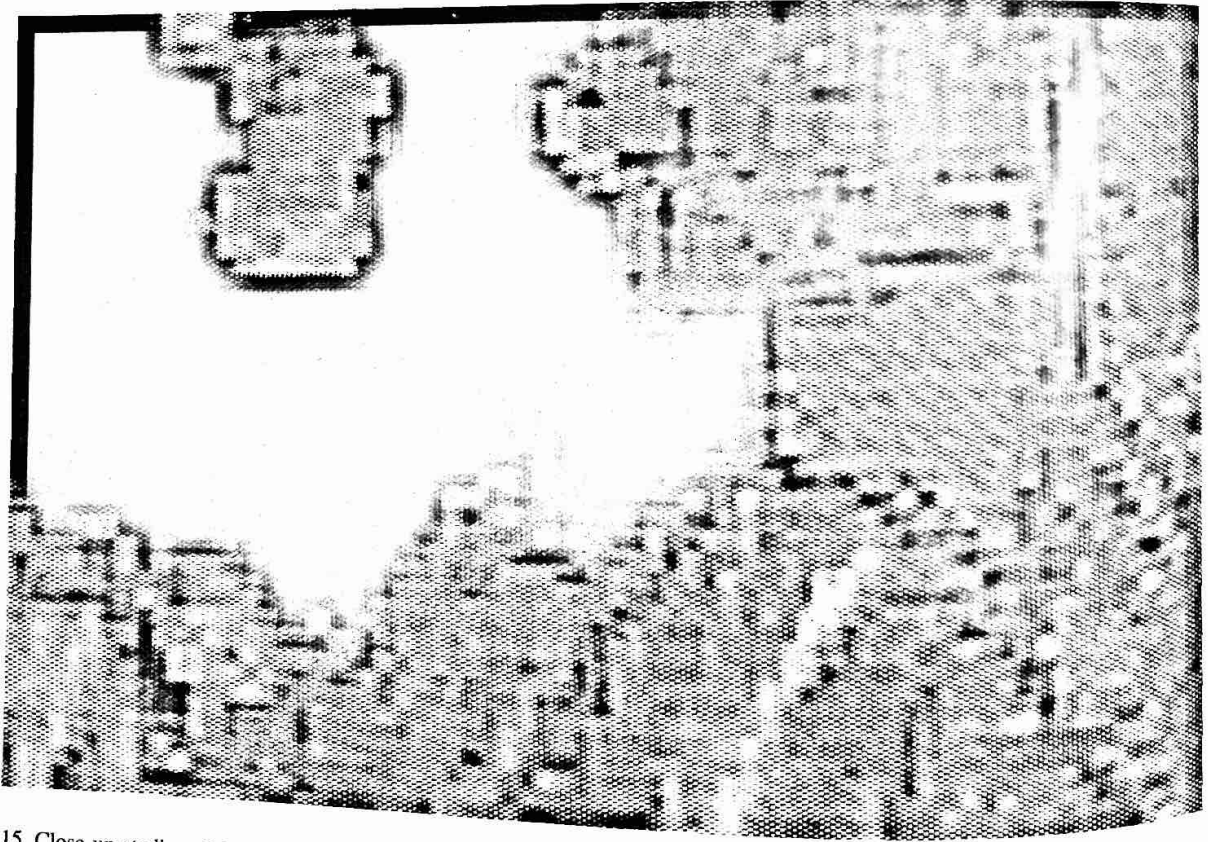
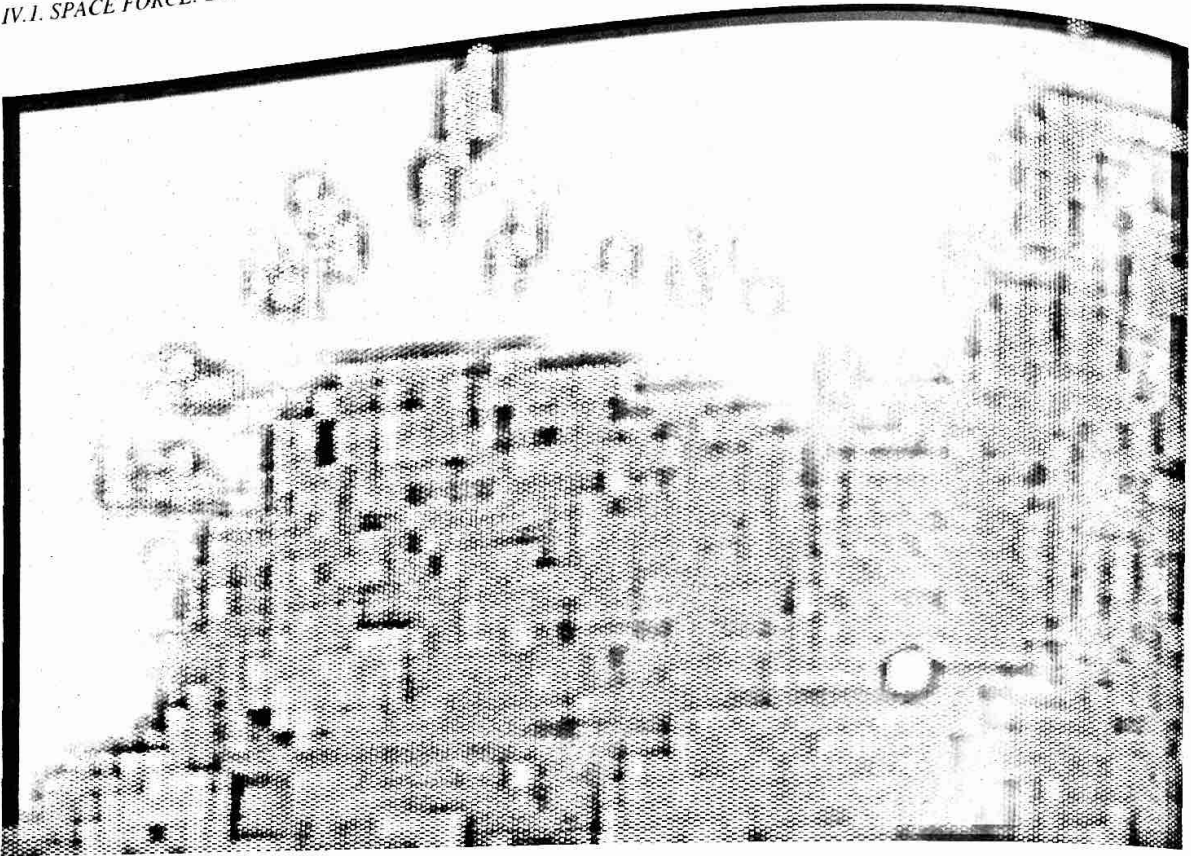
The listed participants in the first SPACE FORCE exhibition, "Art of the State", at The Kitchen Center for Music and Video, NY, in February, 1982, were:

Bill Dolson	Wolfgang Staehle
Peter Fend	Glenn Steigelmann
Colleen Fitzgibbon	Taro Suzuki
Win Knowlton	Eve Vaterlaus
Paul Sharits	Joan Waltemath

Scientists credited for collaboration with Ocean Earth on this exhibition were:

Janet Bare, Lawrence, Kansas
 Chuck Bohn, Goddard Space Flight Center, NASA
 Rick Pendergrass, Imaging Systems International / Logtronics, Virginia
 Lothar Beckel, satellite entrepreneur, Bad Ischl, Austria

15



15 Close up studies of Soviet naval bases in the Tuloma Fjord. The large flat area singled out by a cursor (upper frame), or appearing in the cove at roughly the same position on both is a giant roof, which some say constitutes a violation of SALT II. Data are from April 1985. The release on Norwegian TV and ABC News was in January 1986.

IV.2. SPACE INDUSTRY

SATELLITE MONITORING OF THE EARTH 1987
IS ARCHITECTURAL ENDEAVOR

1. The practice of satellite monitoring of the earth is a practice of architecture.

2. It is a practice directed towards planning and maintenance of the planet, presumably as physical property and habitat – as real estate.

3. While of course scientists and geographers will conduct research with satellite data, their work simply establishes knowledge. Application of that knowledge in the physical environment and its management, whether by the same scientists or by engineers and administrators, constitutes the practice of architecture. When satellite knowledge is applied to help determine the course of tracks for the TGV, or to help determine efficient cropping schedules, that falls under the general rubric of on-site physical management and, according to the thought published in recent years in Casabella, AA and other leading architecture periodicals, that constitutes architecture. Policy based on satellite evidence regarding pollution sources near a city may be adumbrated by scientists and administrators, but its impact is on the city as House.

4. Imagery of sites on earth is neither the purpose nor main consequence of satellite monitoring.

5. For this reason, the satellite monitoring agency (e.g., Spot Image SA) should limit itself to the production of quality data, in ample quantity, and not of imagery. To attempt entering or dominating the field of satellite image production would be like attempting to dominate the field, among architects, of drafting site and building plans. Raw data yes, and standard data products okay, but not site studies and specific site imagery, should be produced by the satellite monitoring agency. The site studies are to be left to those who profess to learn about sites and how to act on them.

From: George M. Chaikin, Space Force 1987
To: Peter Fend, Ocean Earth

[Prepared for the first press conference arranged by the UN Correspondents Association, 3 December 1987]

Remote sensing and imaging of the Earth from space must not be restricted by attempts to limit access to persons with approved viewpoints. To do so would severely inhibit the freedom of the world's people to be informed about what nations are doing to the environment, to the air, landscape, and seas, and in essence denies people all over the world the right to control their own destinies.

Remote sensing technology has brought a new level of opportunity to people to free themselves of the vagaries of weather, plant disease, and other environmental tragedies, or in the case of accidents like Chernobyl, to minimize their harmful impact. Only full and free access by all parties in disputes to the information necessary for their resolution will aid the search for peace. As an artist who has contributed to the development of current remote sensing systems, I feel that no unreasonable restrictions, either political or financial, ought to be placed on these data. Current and foreseeable capabilities do not pose any meaningful threat to the right of individuals to the privacy of their homes, so the only motivation

which can be inferred to those who would limit access is that they feel they have a right to determine what the rest of us can be allowed to know. Such arrogance is fundamentally contrary to democracy.

THE WAY IT'S BEEN 1986
1982-1986
[Opening Pages from Commissioned Report to US Congress, Office of Technology Assessment]

We are the first company to make a business of producing news reports with data from satellites. We started in 1982, with a Falklands survey for NBC and the BBC, and then a Beirut survey for CBS.

Until this year, 1986, it appears that we have been the only company producing news reports with satellite data. In a Wall Street Journal article from July 3 headed "Satellite May Give Journalists Potent Tool. Lead to Showdown Over National Security", every news project there cited by the interviewed news companies, ABC and CBS, was conceived, proposed and contracted by us.

This includes projects that were rejected by US news companies but sold elsewhere. David Martin of CBS News is quoted as saying that "show(ing) a U.S. fleet assembling off the coast of Libya" is "one more way for the cat to get out of the bag"; but around March 24, 1986, when we offered a satellite view of the U.S. fleet off Libya to CBS in Rome, after selling the project to Italian TV, we were told by the foreign news editor in New York – as well as by ABC and NBC – that there was no need for such satellite pictures since reporters were going to be on board the *Saratoga*. We ended up seeing quite a bit. The news companies ended up complaining to the Pentagon about being left in the dark while shooting footage on the *Saratoga*.

But seeing ships from space, especially "our" ships, seems to be both a tantalizing and forbidding prospect. The Wall Street Journal article says that in coverage of the Falklands War "the press was forced to rely heavily on official government accounts." Actually, NBC and the BBC both obtained nearly two hours of footage from us of computer-displayed satellite data for the Falklands, but neither of them showed any ships. The BBC report displayed views of the Falklands with the surrounding waters, occupied by ships, simply cut out. Ironically, what clinched the deal for NBC was a sample tape of ours showing a mothballed US fleet near San Francisco: the foreign news editor exclaimed, "Ships", and a contract for 10,000 dollars was promptly discussed. Our last contract with NBC, for nearly 5,000 dollars, also concerned ships, this time US and French ships off Lebanon; but in the end the pictures were considered to be too abstract, too weak in resolution, and too late. We went on to develop an analysis of French and US naval coordination in covering the withdrawal of the PLO from Syria.

These anecdotes illustrate our experience with satellite monitoring for the news. They show that often what appeals to the media is the semblance of "intelligence", the mimicking of the process of espionage, and that often when such opportunity occurs it is not in fact seized. As I will explain later, we have no desire to mimic espionage or spend much time detecting military hardware. As a company predicated on architectural principles, on considerations of site and

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- 16-17 Satellite data of the reactor complex in Chernobyl after processing by Ocean Earth in Munich. The intense radiation is revealed in the red dot. Note the tendency of movement in the reservoir north and west, along the track of the river diverted around the larger reservoir.
- 18 Data from one week later, showing in the large arc of red a vast deposition of a hydrocarbon or tar substance, which probably has been deposited on purpose to minimize possibilities of water – of course radioactive – rising to the surface. This underscored the distinction between normal dry terrain, somewhat upland, and the floodplain with an artificial landfill (recall the rocks in news photos on which the reactor complex was situated, rocks in the middle of a meandering, marshy riverbed). The black track alleged by US government scientists to be smoke remains, and it is 90 degrees at angle to the course of the river. The Reactor No. 4 sits on the thalweg, the deep centercourse, of the river bed. Of course this bed would be destabilized by the reservoir. The day that these were produced, we were confronted in the image processing laboratory (in Munich) by five agents of the secret police. Earlier, to make sure that most media deadlines (in the Western world) were not met, they had intercepted data arriving at the airport from a colleague of ours in New York: we got that data back temporarily.
- 19 Imagery from SPOT data four months later.

its practical utilization and planning, we seek rather to understand war as a form of land use, a form which eventually is resolved, often in a novel way, with major implications.

From our experience, a policy has emerged on what to show and how to show it. The policy is: (1) to direct attention on the site as engineering and land-use case, and to identify the various options for development; (2) to relate events at the site to a much larger geographical context, sometimes a global geostrategic context, so that why substantial efforts are made precisely there can be understood. Finding ships, or missile installations, or other hardware, is not an objective, unless it bears on questions the public could practically consider regard-

ing geostrategic options or longterm site development. Observing southern Lebanon or the Basra region can yield a public understanding of major river diversion projects with profound long-term consequences. Observing Euro-missile bases can show that verification need not be done solely by Superpowers, particularly in view of negotiations about "dismantling stationary structures", and that with civil satellites the world TV viewing public can participate in the process of treaty enforcement. And observing ships off Libya, as first demanded of us by telex from Swiss TV, is instructive only as it underscores the policy question of international access to international waters: more instructive, in that particular survey



20 Top: Before the accident, from data a year earlier (1985). Bottom: Shortly after the accident. Note also the glowing yellow spots to the west of the reactor. There were very interesting, for example, to CNN News. What they are remains to us unknown.

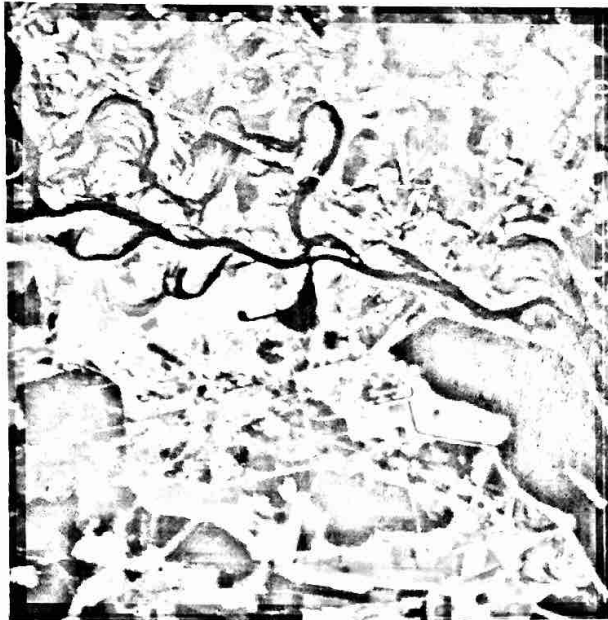
project, is revelation of SAM 5s, the medium-range missiles which threaten international access across the entire Mediterranean, and which consequently have been a key target of US force. We have been asked by news companies as august as the BBC to look for ships, tanks, even helmets; we say we are not interested in such a search for objects, better left to military satellites for military purposes.

Before us now, as a private company seeking a future in satellite monitoring for the public, is the task of defining an industry policy. For with the media eclat of Chernobyl, suddenly the public became deluged with satellite images as news, and suddenly most of those images came not from private, independent sources, conducting the independent research

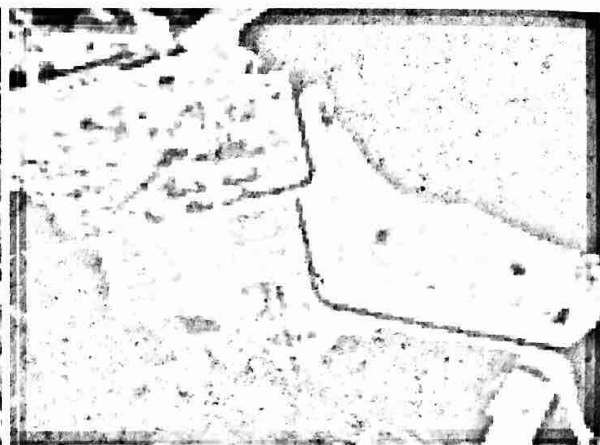
normally expected of satellite data, but from the official satellite agencies themselves. Suddenly we found ourselves swamped with competition – from the official sources of data.

As scientists throughout Europe observed to us in alarm, the traditional distinction between data and information, between what is produced by a data source, as pure numbers, and what is published by independent researchers, as scholarly analysis, was shattered with the media rush of Chernobyl. Suddenly the public saw that authoritative information could be obtained direct from satellites. Not from independent companies or institutes working with satellite data, but from the satellite agencies themselves. Or from other government agencies like the US Geological Survey (USGS). Companies like Satellitbild,

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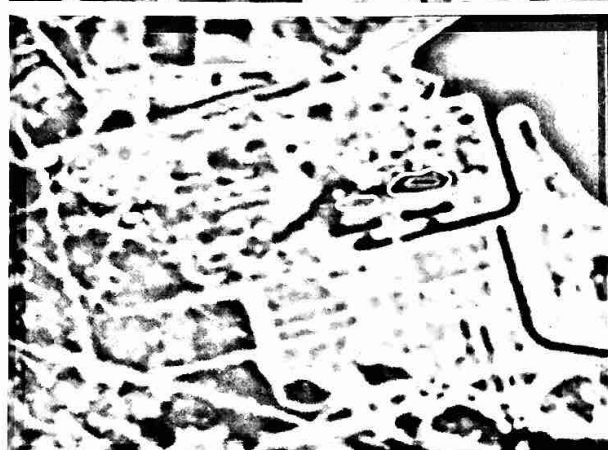
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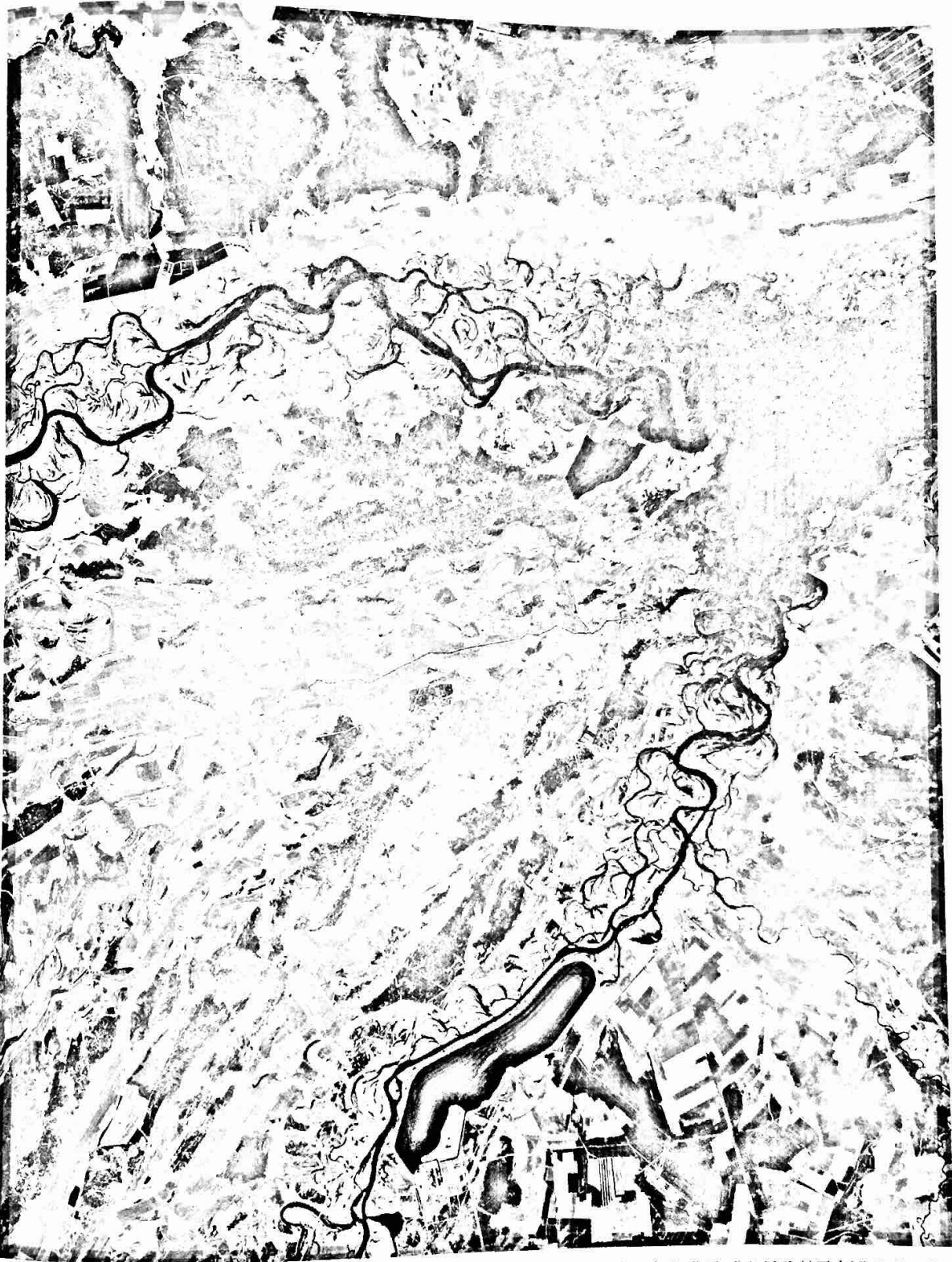


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21-22 Appearance of the standard "official" release. Imagery from our data after initial processing. The first image here is actually produced under our authority, with our data, but it reveals only what can be seen at a relatively early, unimportant stage of the image processing effort. The second image indicates a further stage in the processing of data, but still is not revealing. These images are similar to the official ones, being derived from the same data, but were produced by Ocean Earth.

23-24 Utterly misleading imagery of the Chernobyl disaster, based on the accurate but irrelevant use of thermal data. These were attributed publicly to Ocean Earth but were not produced by Ocean Earth. The thermal band registers changes in temperature only within several tens of degrees centigrade, within the range of normally significant temperature changes in the environment. The several-thousand degree increment in temperature due to the reactor core as exposed can not be thus sensed. To show that there is more low-grade heat with a thermal sensor, specifically around the reactors 1, 2 and 3 that were still functioning, particularly 1 and 2, is similar to showing that the engine of a wrecked car is still (if not damaged and shut off) running. Image No. 18 was produced by a former colleague of Ocean Earth, who since disclaimed to the data source, EOSAT, any property or research rights in the data. Image No. 19 was deposited in Sipa Press, presumably by French agents, with attribution to "Ocean Earth" (as hand-written), the authentic images were removed, sometime in 1992. Ocean Earth has no comment here regarding nuclear energy, or even whether civil satellite data should be available to the public, on such matters, but only that if they are available--as confirmed by the government-agency releases with such data -- then property rights in such data, and in any intellectual value added to the data, as in site studies, must be secure.



Chernobyl region on 6 June 1985, nearly a year before the accident. Two rivers, the Pripjat and the Dnieper, meander along fairly straight troughs to a convergence, a large marshland, 30 km downstream. One can assume with each spring flood, at least, a changing of the meander shifting downstream of the mud stream of the mud in each trough. But while one river is naturally winding, the other — with the reactor complex—is diverted away from the axis of the trough. Difficulties could be expected. They appear already in the line running at 90 degrees to the axis of the river, a line which — become thicker later — was attributed by no less than the US Geological Survey to smoke. Standard architectural training about foundations would suggest that problems would sooner or later occur. Now, the problem will have a duration of at least 100 years. © Ocean Earth/EOSAT

EOSAT and Spot Image, all government monopolies licensed to sell data, put themselves before the world public as official sources of authoritative analysis. And for the most part, particularly with the first official Landsat images, the authoritative analysis was at least incomplete if not outright incorrect. To the public, it appeared that satellite data had only one or two official and correct methods of analysis, without need for various scientific researches and debates. There is official information from official data, not much to discuss or debate. Yet as any trained analyst of satellite data knows, this is untrue.

On the same day that we were furnishing to Time Magazine, under a 2,500 dollar contract, our uniquely-processed Landsat imagery of Chernobyl showing the one reactor, not two as earlier reported, as the damaged site, an express package was arriving at Time with a somewhat similar image, a clear upgrade from the image released earlier by EOSAT from identical data. The image was available at absolutely no cost – from the USGS.

On the morning of April 29, when we telephoned the Kiruna, Sweden ground station with an urgent order for Landsat data from that day, we were told, by people who remember us well since our 1984 visit, by people who send us Christmas cards, that the ground station computer was broken and could make no data tapes for release... [23 pages follow]

SATELLITE MONITORING FOR THE MEDIA 1989

After discovering that media releases can involve national security, Ocean Earth began formulating a set of principles which it believed would be vital to sound development of the civil satellite industry. Ocean Earth has refined some of those principles, fixing them rather firmly by mid-1985, and it has chosen to stand by those principles. Ocean Earth has been conscious that satellite monitoring bears serious political implications, and that establishing a stable, private-enterprise procedure may be more a political than technical challenge. For this reason, Ocean Earth has maintained attention more to precedent, more to the long-term consequences of one or another action, than to convenience.

The principles held by Ocean Earth, and individually voiced by its participants Taro Suzuki, George Chaikin, Colleen Fitzgibbon, Paul Sharits, Eve Vaterlaus, Joan Waltemath, Sante Scardillo and Peter Fend, reflect rather common codes of conduct in academic research and journalism.

1. If scientific data are to be commercially available, then the supplier of the data shall have no control over the use, interpretation or publication of findings from that data, except of course to prevent outright abuse or fraud.
2. If satellite data are to be commercially available and releasable as well through mass media, with or without interpretations, then only independent, unattached parties may release the imagery. Release is a function of the press, and the press must be independent of governments.
3. Any governmental or other supplier of satellite data can choose to not release to the public certain data for a certain site, but it must declare that as a matter of policy, and must therefore – in effect – declare certain sites to be off-limits to public scrutiny for a certain length of time.
4. Contracts are sacrosanct. They must be kept, and – if violated – must be enforced.
5. In matters of vital public importance and not affecting national military security, in matters central to public decision-making about long-term policies, the public has not only a right but also a responsibility to be informed. Otherwise democracy has no meaning.

6. Although of course the military or intelligence services may work with civil satellite data, and although they may even (as they do) give themselves priority or exclusive access to certain civil satellite data for certain sites, such intelligence work should be kept totally separate from whatever private, unattached parties might do with whatever satellite data might be made available to them.

In line with these principles, Ocean Earth and its individual participants have formulated, in their different voices, a number of operating rules for Ocean Earth. The rules have been proposed for the civil-satellite industry.

1. No sales or services to any military, or to any government agency with any covert or intelligence-related objectives, shall be mixed in with or related to sales or services to the press, or to other non-military clients. One cannot mix media and the military.
2. If satellite data are not made available to private parties for public release, then such data shall be considered as classified, and public record should be made of that fact.
3. Any interpretation gleaned from satellite data, along with whatever other sources might be found, shall be considered as just that, an interpretation, subject to counter-mandating interpretations by other parties, in the open and free competition of publishing parties. It is better to have a variety of errors by private parties, with truth being found only after public disputation, than to forcibly prevent the airing of conflicting or even erroneous views.
4. Copyright shall be assignable to the parties responsible for distinct aspects of publication: it is divisible, for example, among the supplier of data, the analyst of data guaranteeing scientific calibre of imagery, and the interpreter or chronicler of site-analysis from the data and selected imagery. This allows for various versions of copyrighted imagery, or even of copyrighted interpretation of imagery, on a given body of publicly-available data.
5. In the case of international mediation with satellite evidence from publicly-released commercial satellite data, as it might be conducted by, say, the United Nations, the sole source of any evidence, imagery or interpretations must be private parties unattached to any government. If the data released are commercially available, they must remain commercial; they must remain unclassified, available as a commercial product, with or without interpretations or analyses provided by non-governmental entities.
6. In the event of violations of any of the cited principles or rules, any individual or entity engaged in civil earth monitoring must – for the sake of precedent – speak up. As a political scientist at the Council on Foreign Relations told us, we can come to a situation where, for reasons of security, there is no choice.

RULES FOR BUILDING AN INDUSTRY [Intro.] 1987

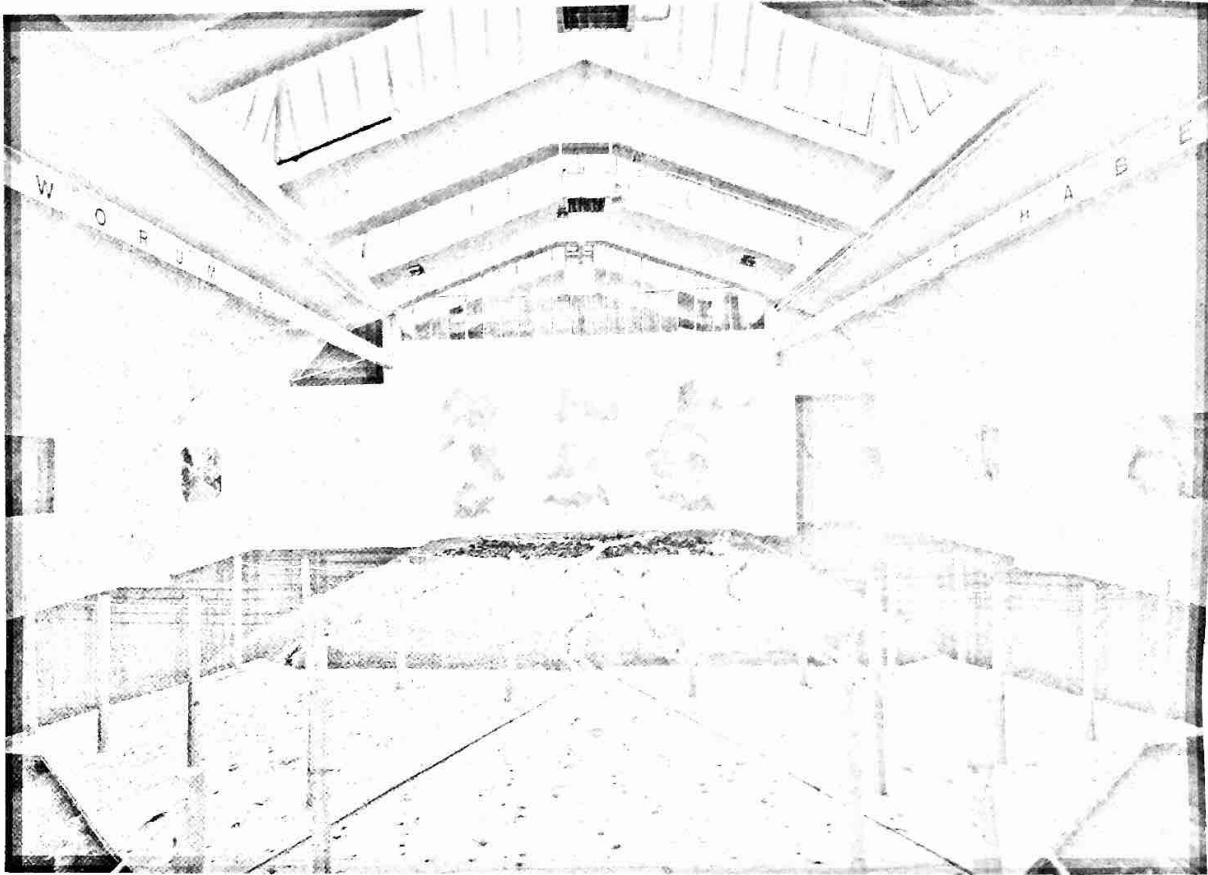
All satellite monitoring is “commercial news gathering from space”. It is newsgathering because by now nothing you get from space has value unless it is new.

It is commercial because the satellites themselves, the sources of information, are commercial. Sales and distribution are the ultimate objective.

However, no one satellite is sufficient for comprehensive news coverage. Each satellite is just a photographer, remotely controlled, and the work of any one photographer is usually insufficient to make a news story. Information gleaned from several types of satellites must be combined with other information for commercial news production.

EARTH WORKS

Primary Production Upland



City of the Dead was the first exhibition of Ocean Earth in Europe, in 1990.

This book, and the show, resulted from an invitation by Tanja Grunert for Ocean Earth to exhibit with and be represented by both her and the Galerie Esther Schipper.

This was an extraordinary proposition. Normally, no gallery in Cologne would seek to share representation of an "artist" with another gallery. There had been overtures of various sorts from altogether five galleries. Ocean Earth remains conscious that it is somewhat surrogative of and adjunctive to the gallery system, such that it is not an "artist" but rather more an "architect", or even an other sort of pooling of art ideas, nowadays a function of the gallery.

The Gallery Tanja Grunert has taken the lead in breaking new ground for manifesting and exhibiting work such as that produced by Ocean Earth.

The Gallery Esther Schipper plays a role equally as important, but more likely downstream, as there has been a distinction between what is shown at Grunert – the earthworks and regional projects, which require huge investments and not just collector purchases – and what is shown at Schipper – the City Bild and Beach Party (entertainment) projects, more suited for consumer consumption.

A relatively few images are shown in this book from the two Ocean Earth exhibitions at Tanja Grunert. This fact in no way reflects the historical importance of those exhibitions. It reflects rather the consequence of those exhibitions: we have been asked to repeat what was shown at the gallery in the museum or kunsthalle context, and in those later presentations – more thoroughly evolved and developed – we have been able to show more clearly what was initially shown at Tanja Grunert.

A historical account of Ocean Earth, instead of than this rather-more prospectus, would be replete with imagery from the two solo shows and various other presentations specifically conducted by Tanja Grunert.

The Gallery Tanja Grunert endeavors to find a way of exhibiting works of artists resolving questions of economy and ecology. Ocean Earth, meantime, tenders concepts on how to adapt the machinery for selling and presenting art to effecting the same for Ocean Earth's domain: architecture.

In this the company works with Grunert and Schipper in Cologne, American Fine Arts in New York, the Gallery Anne de Villepoix in Paris, and le Case d'Arte in Milan. The company is conscious that for legal reasons an architectual representation may require a licensed architect: this is being discussed with several dealers who are also licenced architects.

For the period of time in which Ocean Earth had retreated from the media world to re-enter the art world, from 1988 to 1993, Ocean Earth has been exclusively represented world wide by American Fine Arts Company, Inc., New York. This relation will be modified in deference to the German galleries but will in essence continue.

V. EARTH WORKS

PRIMARY PRODUCTION UPLAND

EARTH NET: AN ECONOMIC SYSTEM

1978

On September 7, 1976, Niccola Palladino, technical vice-president for Snam Progetti USA, a North American subsidiary of the Ente Nazionale Idrocarburi (ENI), asked for details on a proposal that microorganisms produced by ENI from hydrocarbons be supplied not to domestic animals but to marshes. This proposed action was to be integrated within a sequence of urban-industrial functions, including: (1) reducing wastes by pyrolysis to hydrocarbons, ammonium and a small residue of metals; (2) harvesting wild animals and plants from large stretches of terrain affected by marshes; and (3) removing nutrients accumulated in coastal and other saltwater sinks, yielding not only foods and fibers but also the kelp that with industrial decomposition would release enough methane to meet present energy needs. The entire sequence would obviate the use of biocides, artificial fertilizers, irrigation, carcinogenic fuels and relatively-inefficient composting programs.

The sequence was conceived through recollections of Josef Beuys' Fat Corner (Fettecke). In a number of Aktionen, Beuys had set a clump of paraffin in a corner of a room, entitled it Fat Corner, and suggested that it represented the energy reserve, or base, through which all processes in the environment must pass. This paradigm became interesting in relation to a project with Columbia University law students regarding New York City wastes. Processes were being studied which involved degradation of some or most wastes to a hydrocarbon substrate, in effect a form of Fat Corner. Given the paradigm, one could couple together various hydrocarbon-related technologies, including "single-cell protein" technology and wastes-hydrocarbon conversion technology, to come up with an ecosystem-extensive program of materials cycling. The paraffin in Joseph Beuys' Fat Corner was related to the paraffin used by certain oil companies in the cultivation of the monocellular organisms. It was soon learned that other hydrocarbons, including methane, were employed as substrates, and that precise mixtures of ammonium and trace minerals could yield a wide variety of organisms. Reduction of urban industrial wastes to these ingredients had become standard technology: it seemed that a city could be subjected to the linearity of the digestive tract.

Mr. Palladino had asked precisely how the organisms would be introduced, in what form, and with what economic implications.

To answer these questions, we turn to concepts from other artists. We focused on the work of Dennis Oppenheim and Robert Smithson, among other Earth Artists.

Earth Net: An Economic System presents a construction program for an industrial landscape in which most of the component events or structures have been modeled first by Oppenheim and Smithson. Perhaps greater coherence could have been achieved now if Smithson had not been killed in 1973.

From other artists have come ideas vital to the activation and operation of Earth Net: An Economic System. The ideas have been assembled to form an earth architecture, a scheme for integrating the metabolic processes of human populations with the metabolic processes of other species, so creating a habitable space. Gordon Matta-Clark directed attention both beneath and above the ground: subterranean effects of placing

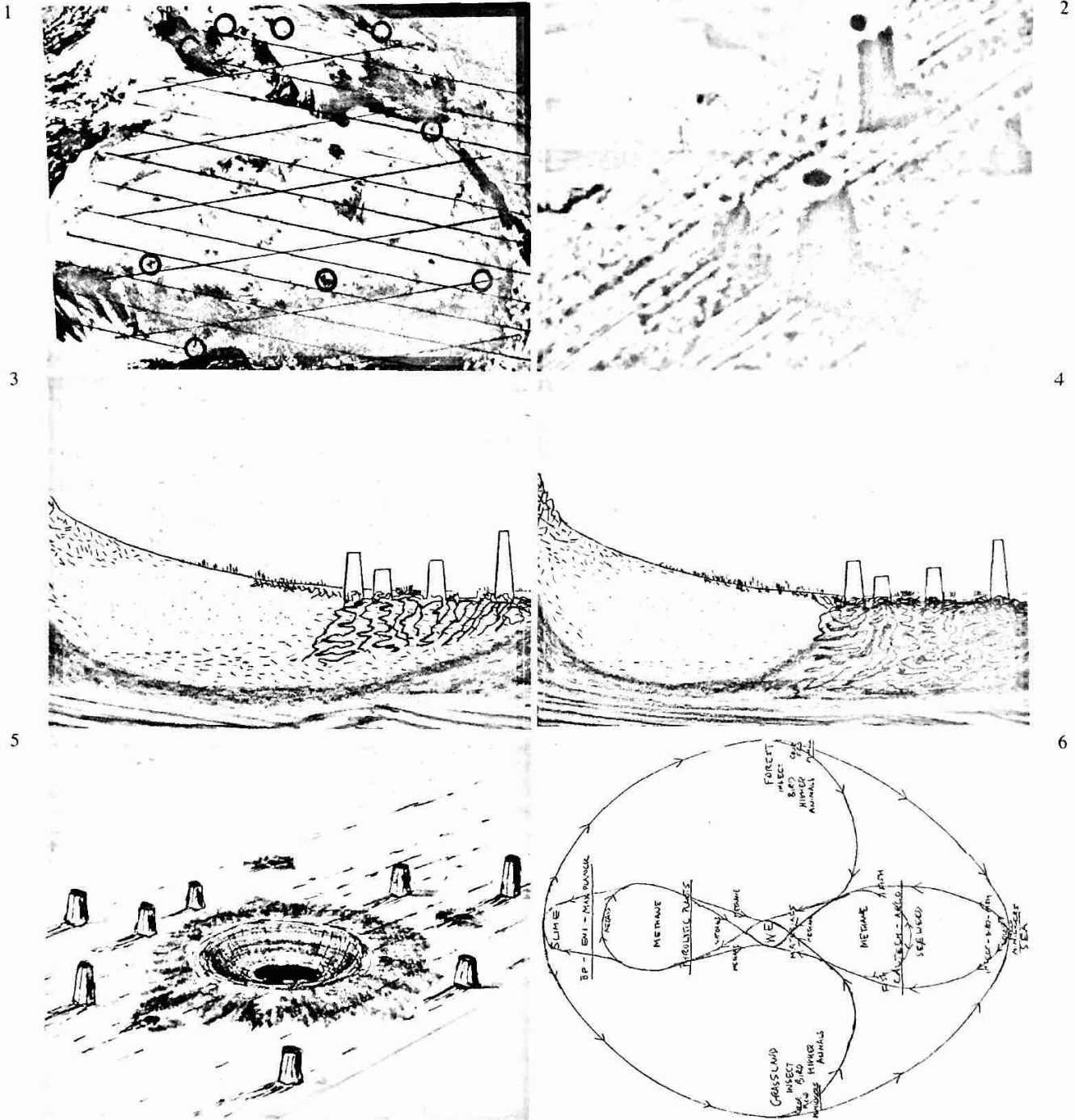
cones near an arid sink became apparent; specific designs for stationary aerial viewing platforms could be drawn. The design of Electric Fields developed through study of drawings by Sol LeWitt and through unstinted replication of Lightning Field by Walter De Maria. The two artists seem to manifest an emerging view of space as a neurosensory continuum suited to electric organization.

An overall framework, or sense of purpose, came less from architecture than from three women. Agnes Denes reinforced a view that technological evolution, including warfare, fell within the province of art: Mary Beth Edelson affirmed the premier role of oceans in fertility cycles; Carolee Schneeman set forth flesh as a standard of value. While the imagery of *Production Lines* is derived from Dennis Oppenheim, its rationale comes from Vito Acconci, Les Levine and Alan Saret. Those artists have called for a direct entry by art into the political economy – an entry not only with media but also with an architectonic organization through group venture of primary production. Earth Net: An Economic System was intended to help effect such an entry. If it works, it would help to make art become – as artists in Milan declare – "the appropriate response to recognized conditions."

Sequence of Construction

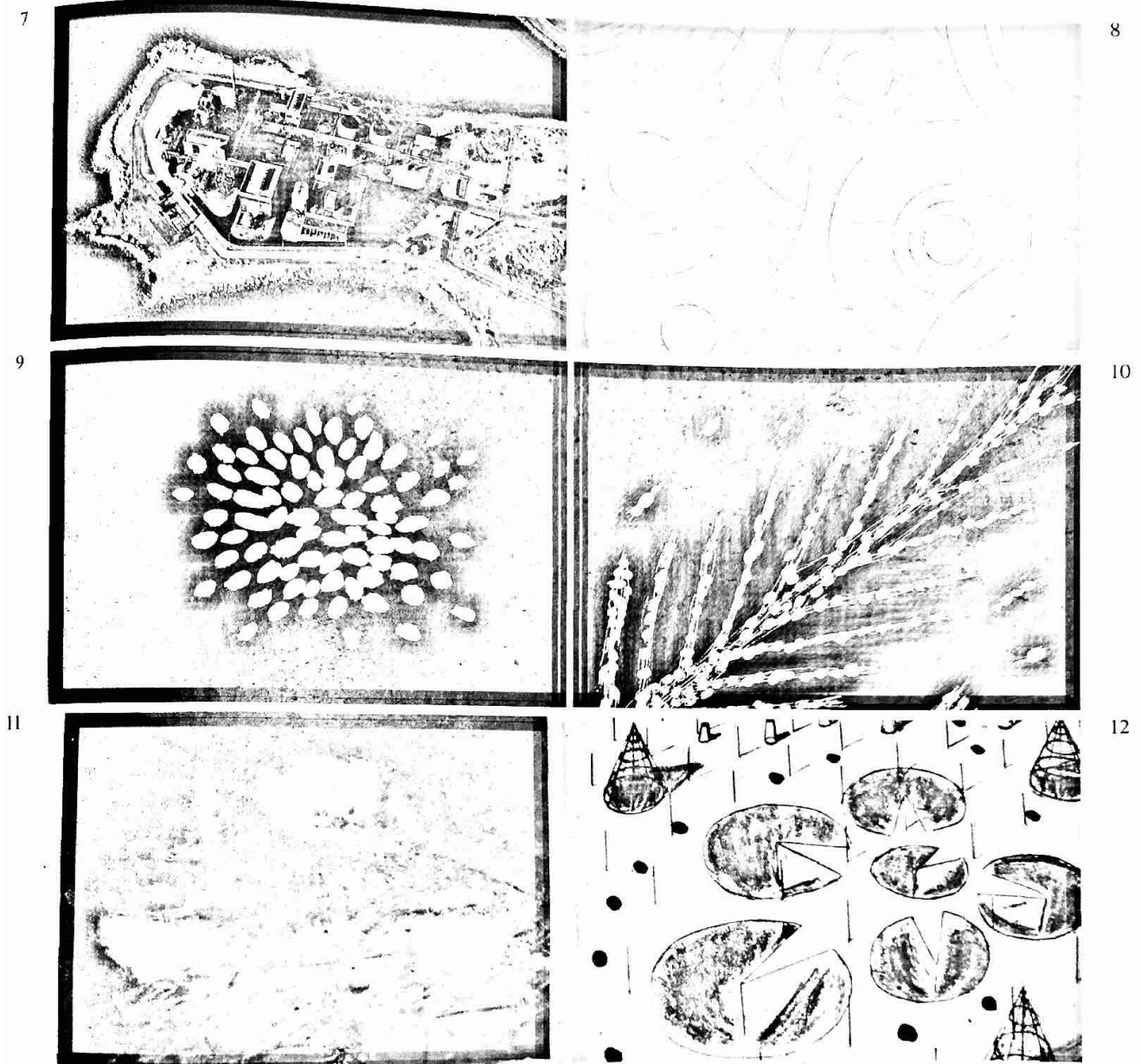
- 1 make water by making habitat for animals
 - 2 make feathers by converting habitat of humans
 - 3 make whirlpools by inserting food into animal territory
 - 4 make grazing pattern of higher animals by organizing electroconductive exchange fields, by organizing salt fields
 - 5 make intense animal concentricities, animal cities, as electric range by constructing snares
 - 6 make large marshes which, like cities, disperse wealth to hinterlands
 - 7 make networks of marshes supplied by migrating birds
-
- 1 dig hole
 - 2 convert wastes
 - 3 introduce wastes to hole
 - 4 introduce ordering agents
 - 5 snare the agents
 - 6 continue the constructions throughout a river basin
 - 7 extend throughout a saltwater basin
-
- 1 hole
 - 2 city
 - 3 city to hole
 - 4 species about hole
 - 5 species to species
 - 6 river
 - 7 ocean

Altogether, 70 panels presented a plan for construction in the same spirit as the military architecture and landscape engineering effected, in centuries before, by artist-engineers such as Da Vinci and Vauban. The METEOSAT imagery were here exhibited for the first time, before the official release of the European Space Agency, with ESA permission.



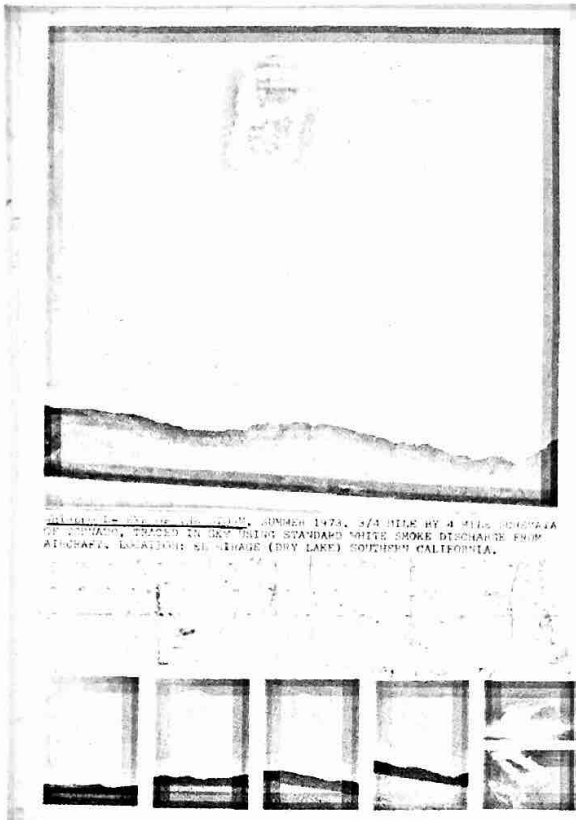
Construction of migratory flyways, a strategy for ecological development using earthworks vocabulary from Oppenheim, Nauman, Smithson, Beuys, De Maria and emerging technology of the hydrocarbon industries.

- 1 Situation now, broad and diffuse waves of migration from Southern to Northern Hemisphere, with difficulty of passage across the Sahara, the dry belt; situation not as severe in the Americas, but also severe in central Asia.
- 2 Dry Wells, Dennis Oppenheim, proposal for Iran, not dissimilar to ancient Persian structures in desert. Construction co-copyright with Ocean Earth. Function: to assure underground habitat.
- 3 Expansion of underground habitat towards aquifer rising near playa.
- 4 Absorption and upwelling of aquifer by Dry Wells.
- 5 Expansion of structures after collecting of water allows for excavation and water hole, or – given the attraction of species and consequent predation – Death Hole.
- 6 First systems diagram for the entire project, based on visual logic from Sol LeWitt. The question always is how to return materials from the “we” to the site allocated to “them”, the non-human animals subject to predation. The Fat Corner Triangle in Rotation (Fig. III-6) is a hydrocarbon-centered version of this diagram.

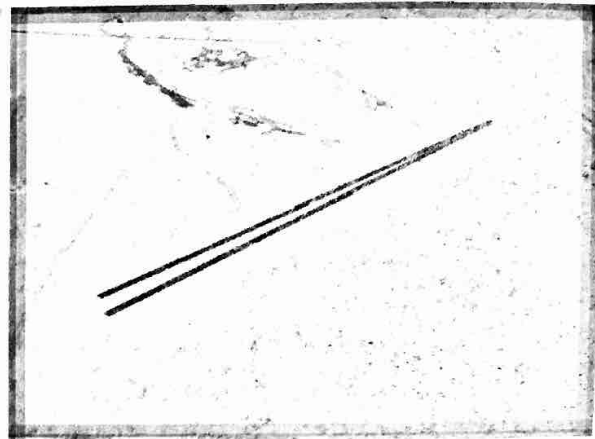


- 7 The hydrocarbon gases are used as a substrate for production of single cell proteins, usually a bacterium or yeast.
- 8 The single cell proteins can be processed by membrane mediation of information into...
- 9 ... agglomerations of keratinaceous proteins with alpha- β keratins
- 10 These in turn can be extruded into various sorts of keratin tissue suitable for uptake by higher species, not degrading or decomposing ones. A feather form is suitable. The feather extrusion proceeds as groupings of the keratinaceous protein occur from the feather follicle on out.
- 11 A scenario of deposition of the feathers on to a substrate, on to a site. Part of Feather Ridge scenario, by Oppenheim.
- 12 An expanded marsh site: what we have constructed by now is a combination of works of De Maria (Lightning Field), De Maria and Heizer and Oppenheim (the pits, with wedges creating danger zones for killing and species exchange), the Oppenheim (occasional penetration of the salt flats or crusted surface, to accelerate mixing of salt and fresh waters and allow for uptake by calcium carbonate collectors, such as starfish), and Beuys/Denes/Smithson (the spiralling outspreading of the pits, which become ever-stabler as a interspecies intersection, as a marsh version of city). Outlying, are conical Cages and Dry Wells, meant to attract birds and other migratory animals as sources of dung. There are arguments that birds, like the giant algae we advocate, are descended from the dinosaur era. Perhaps an exploitation of such speciation is vital.

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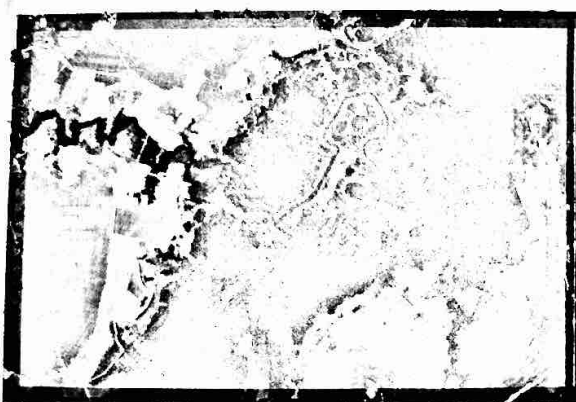
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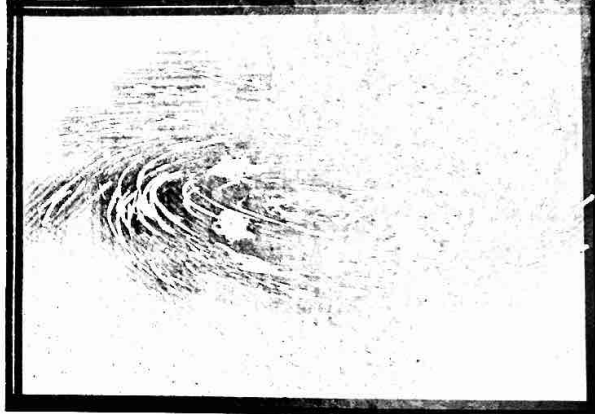
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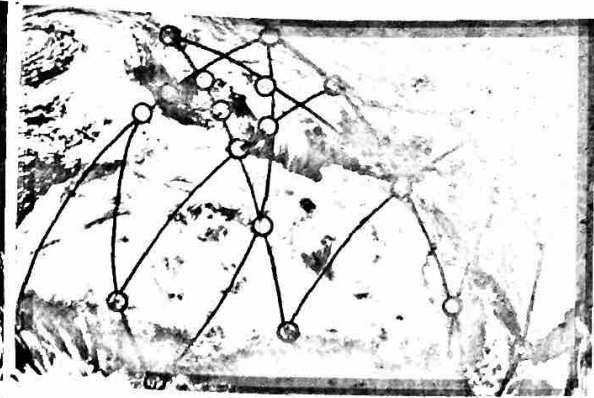


- 13 The objective, in air: production of clouds, opening a cycle of water vapor, which could return of course to terrain to build up river flow.
- 14 Cobalt Vector, by Dennis Oppenheim, describes a technology for river buildup. Too often the rivers of dried lands fail to reach the sea. Too often they go underground, leaving the cycles, and of course the variety of species, weak. In a given playa or flatland, where there is weak through-flow, straightened lines of flow can be built, by digging trenches. By incising. A first proposal by Ocean Earth, based on a request from the Embassy of Algeria to France, would be installation of Cobalt Vectors structures in the interior basins which, if penetrated, could break through with surface river flow to the Gulf of Gabes, south and east (see maps 81 and 83, V.2.).
- 15 Scene from Earth Net of salt crystal formation in living systems. The producer is Smithsonian, the site Spiral Jetty, the effect a substrate for organisms. The consequence of "Great Western Salt Works", as Jack Burnham would describe them, was to develop a new vocabulary of construction to establish a fertile network of species.
- 16 The objective, in each oasis or playa an "activated" marsh. Observation from above, commonly by balloon, assures a bio-feedback process. A single view will not suffice: constant periodic monitoring must rather be established.
- 17 Tracks of movement in the marsh as observed by balloon-borne camera sensor, through time. The richer the tracks, the more healthy the system. Monitoring will be more the recording of movement than of a moment. The practice of Still Life, or Nature Morte, is replaced with the practice of observing tracks – of recording and showing the signs of movement.

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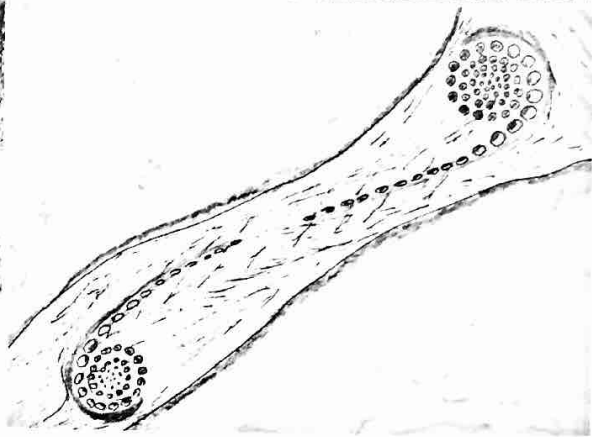
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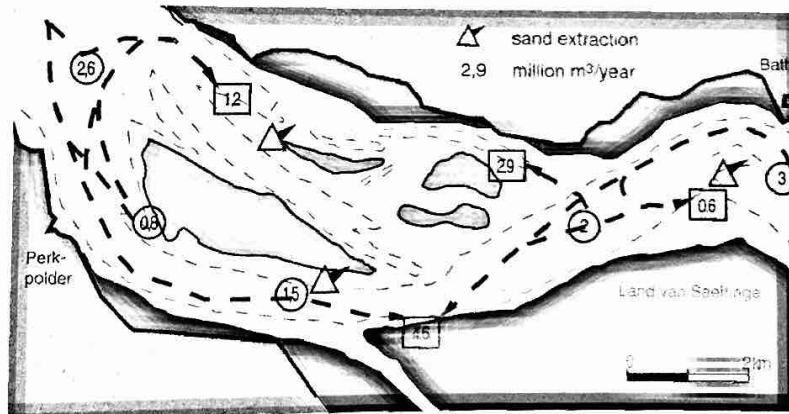
18 Not one site but a line of sites must be activated at the same time: working along a corridor of nutrient transport assures the diffusion from each, much as airports or train terminals serve as hubs for each local economy.

19 A consequent net of migratory bird and insect traffic, building up a circulation of nutrients, restoring the Sahara to the savannah it once was. This is a constructive use of marshes, along the lines of Live Random Airborne Systems identified by Haacke, or other migratory projects of artists such as Oppenheim.

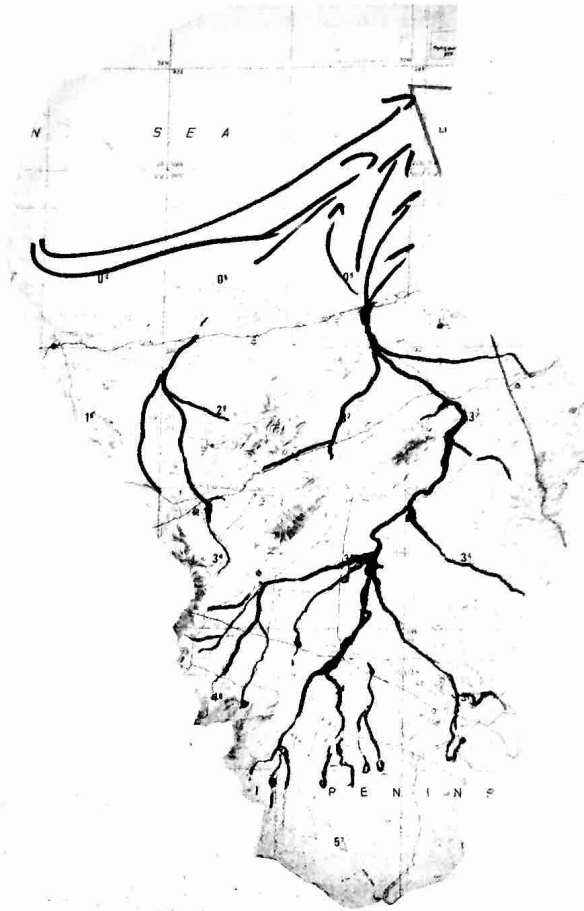
20 Double convex disc marsh structure, set on facing sides of a valley, to bank and shift, or slow down the river. A river control project that is not like a dam, but that effects the same result in preventing disastrous floods, metering the flow of water and providing energy. The energy comes indirectly, from a stable river flow that assures viable offshore algae industry. The structure has been built up from the marsh established in Image 12. Saltwater and freshwater mix can occur in each relatively flat area, not unlike what occurs in the electrolytic environment of lakes and marshes at each level step on the ascension of a valley.

21 Manifestation of the principles in an estuary. Mixing of waters is better for productivity. As waters are mixed, there is greater productivity. The task is to accelerate the freshwater and saltwater mixing with a variety of sops, or troughs, or ponds, which can collect either freshwater from upstream or saltwater from downstream, then hold it, and receive a fresh input of new waters in short order. The twin spirals, being gradually built outward, are sloped inward, so that there is a gradient of soppage and holding. Shipping channels, in and out, are dredged on flanking sides, so that rapid movement of water through the system, flushing the sloped gradients, is frequent.

22 Image of Scheldt estuary. It goes with estuary image by Ocean Earth. Here is a site in which the structure could be engineered. A project here would continue the North Sea Basin and East Atlantic migratory work. (From: Prospects for the Scheldt estuary, Ministry of Transport and Public Works, Tidal Waters Division, Directorate Zeeland, Middelburg 1992.)



22



23 SINAI PLANS 1978

Integrate a small saltwater catchment with high economic potential, little cloud cover to obscure aerial surveillance and a relatively undeveloped surface.

Capitalize on these factors.

Flamingos regularly flow over and stop in the Northwest Sinai, just east of the Nile Delta. Flamingos are at the peak of an ecological system, and represent an aesthetic signature of the health of such a system.

Flamingos are among the few highly developed species that directly consume microorganisms. They directly consume many of the organisms now developed, or cultured, by certain oil companies on hydrocarbons in solution with trace elements and ammonia.

It is supposed that the waste conversion cycle for urban populations can proceed from pyrolysis plant to hydrocarbon and ammonia refinery to microorganism culture (single-cell protein) plant at last to marsh.

Oil companies and research agencies now introduce the microorganisms cultured on hydrocarbons to domestic animals and people; it is proposed instead that such organisms, before or after conversion into keratinaceous tissue that would resist desiccation and decay, be introduced to marshes for uptake by wild animals.

Flamingos are one such species of wild animal. They could directly consume within an ecological setting the ultimate residues of urban metabolism.

The other organisms that would consume the organisms can be prey for other birds and migratory animals.

The Sinai is a lynchpin in a number of pathways of airborne animals. Flights to central Africa and East Africa pass through the Sinai, as well as the Nile Delta, and they proceed to Persia, central Asia, Russia and Europe.

According to the procedures outlined in Earth Net, An Economic System, it is possible with earthworks to gradually induce the underground and aerial animal activity that eventually builds a savanna habitat for many land animals, including the cloven-hoofed animals commonly used for food.

The waters due north of the Sinai are very rich in nutrients because the prevailing currents bear sediments there from the Nile Delta, and because they mix substantially with deep water just "downstream" from the delta outlet.

Those waters are also quite shallow, until the longitude line at the eastern end of the Sinai. Offshore fish gathering and kelp rigs could easily be installed there. The same rigs could use giant upwelling vents to increase surface life.

The kelp and fish situation north of Sinai has been remarkably good, but it is now deteriorating due to pollution, which could end with a new waste processing program.

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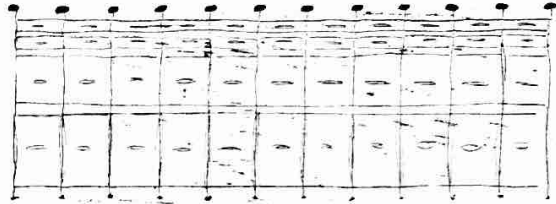
24-26 Tail Spin, three projects for a marsh circulation system for Jamaica Bay, to be seen by flying passengers only, as a sort of gateway to the US, 1979

27 Tidal flow control system designed for Bay, 1979.

28 New York as Basin, the site of the work. The impact is throughout the Bight, and the finance base can be the Bight. First project site of firm, initiated by Queensites.

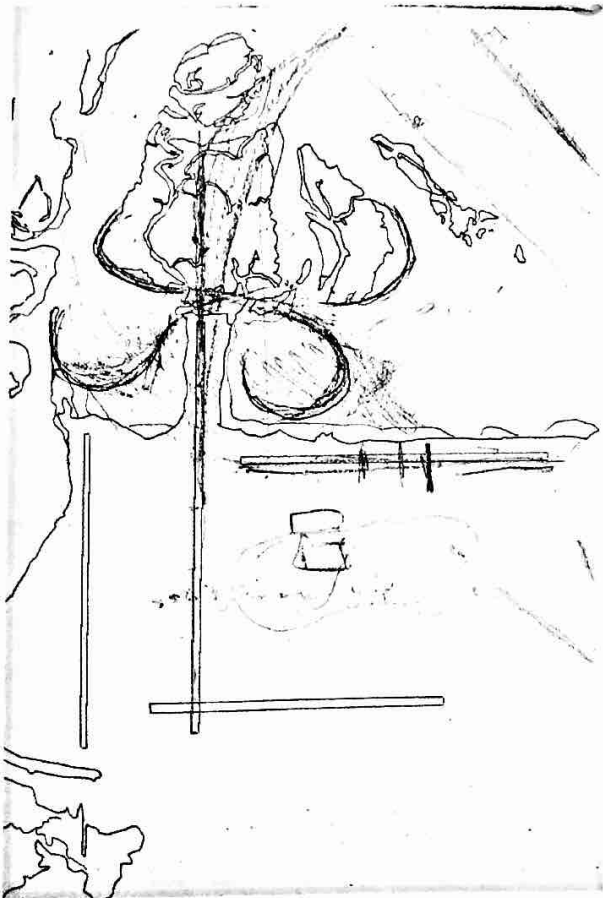
INSTEAD OF BREAKWATER,

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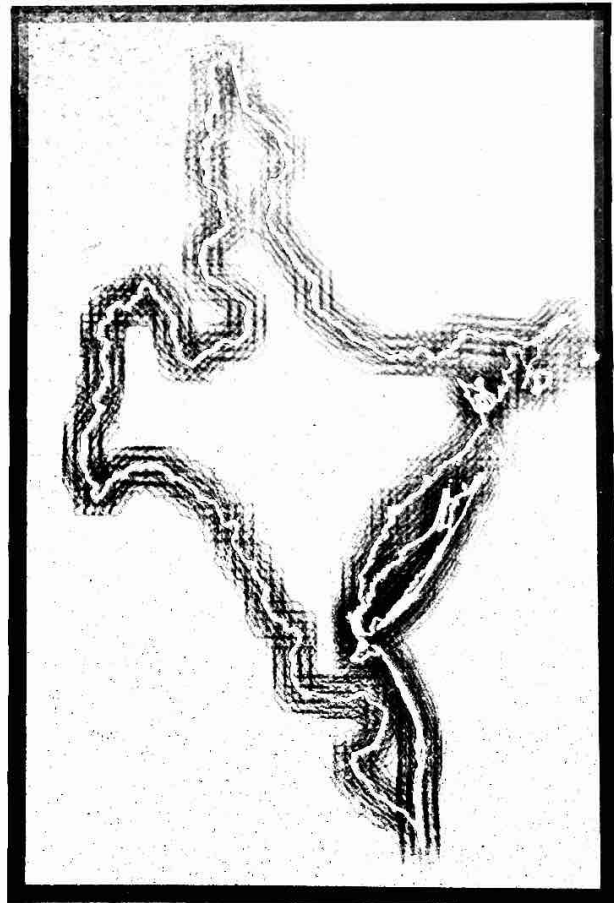


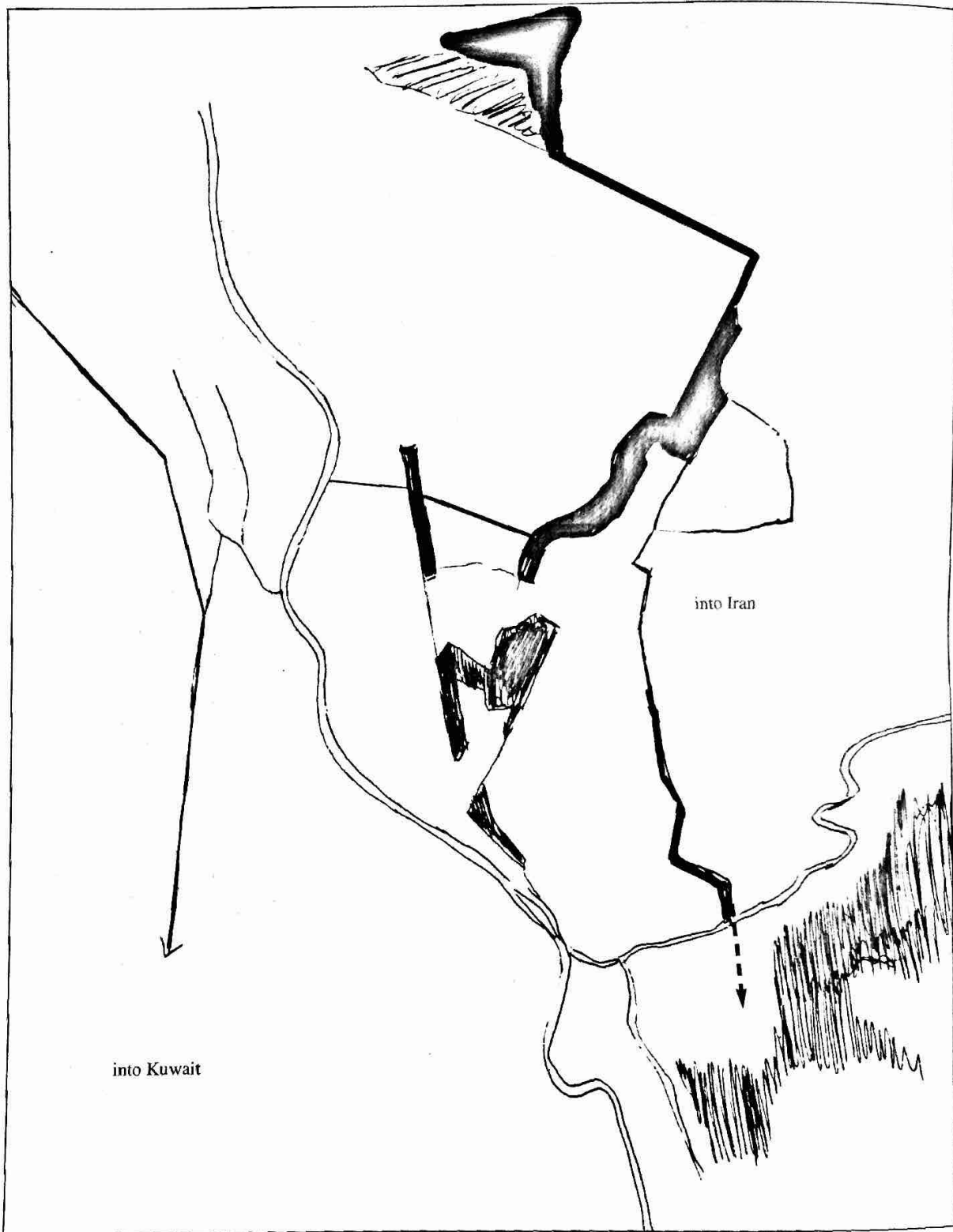
WATER SCREEN ELEVATION

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From the experience of Ocean Earth, it appears that a primary arena for the sort of earthworks and siting developed by American artists in the 1960s could be this array of giant, ecologically-functioning earthworks in an area once known as "Paradise." These particular structures, however, were designed - we have been quietly told - by Russians. And these earthworks, while functioning ecologically and -given the overhead view preferred by the 60s artists-aesthetically, have been located at the center of global conflict: the Persian Gulf. We say "center" still because, as has also been learned in the experience of Ocean Earth, it appears that episodes subsequent to the fighting in the Gulf in areas like Yugoslavia and Somalia are part of the same struggle. We would try to work with the struggle as a crucible for change in material culture, like civil use of such giant constructions as these. We can cite much precedent: artists Leonardo da Vinci and Samuel Morse, noted artists in their time, also engaged directly in the development of cutting-edge technologies which were first used, very effectively, in war, and which later had worldwide consequences in civil life. Are we out of line suggesting that there might be a constructive use made of art ideas now manifest above?

V.1. PROJECT SITE: PERSIAN/ARABIAN GULF

A LONG-TERM CONSIDERATION OF OCEAN EARTH FOR PERSIA 1988

The works here discussed were largely commissioned by the art museum in Tehran before the Islamic Revolution.

They have never been executed.

We of Ocean Earth believe that they should be executed, and we are preparing now to reveal plans for execution of a "City of the Dead" in the war zone between present-day Iran and Iraq, where so many have died in what may rightly be considered as territorial confusions extending at least from when the British established boundaries during World War I.

The task now, in our view, is to integrate the Soviet Earth Engineering with American Earth Art, two parts of a parallel-evolving tradition of thought, within the specific constraints of the Islamic peoples of the Persian Gulf.

OBSERVATIONS OF A PERSIAN SITE 1987

[Submitted in response to a request of the Office of the Under-Secretary-General for Special Political Affairs, United Nations, following several years of talk, 24 August 1987.]

For nearly four years our company has been surveying the Iran-Iraq war zone, chiefly at the Head of the Persian Gulf. We have studied satellite data dating back to 1972, and from these data we have observed the Iraqis to be steadily building new canals on either side of the Shatt-al-Arab to effect a continuation of the Tigris and Euphrates Rivers as separate streams rather than their convergence into one stream.

The scale of construction is enormous. The canals extend for nearly 200 kilometers. Since 1985, we have published reports that the canals will very likely benefit the Gulf by increasing the flow of freshwaters into the hypersaline Gulf. We have published also that the canals would tend to dry up the bogs and marshes upstream from Basra, and simultaneously leach out the salts deposited in the dry, encrusted areas through which they flow. The entire Head of the Gulf would consequently be improved. Sodden marshes would become drier land, suitable for agriculture. Saltflats would be rid of their salts and other deposited residues, left there largely by irrigation. The evaporation rates throughout the region, sometimes up to 90% of river volume, would diminish, and more freshwater would be available for both cultivable lands and the Gulf.

The historical effect could be immense, as well. By human construction rather than by geological accident or unforeseen consequences of irrigation, the channels of two major rivers – the Tigris and the Euphrates – would be radically relocated. Rather than converge at Al Qurna, which scholars consider to be the ancient site of Eden, the rivers would maintain their separate paths clear to the Gulf. The Euphrates would pass in part through what is now Kuwait. The Tigris would be diverted to pass in part through what is now Iran. What has long been regarded as Mesopotamia, a land between two rivers converging on the Gulf in a much fabled "Cradle of Civilization", would become a region of two separated streams, each positioned to receive waters from two respectively separate

countries. The Euphrates would become contiguous with the Batin, allowing a buildup of that river flow in the Arabian Peninsula. The Tigris would become contiguous with the Karun-Karkheh complex, allowing a restoration of bioproductivity to the salt flats and bogs on the Mesopotamian Plain inside Iran. The entire Persian Gulf basin extending upstream from the Head of the Gulf could become subject to an ecological vitalization unknown since Ancient Civilization.

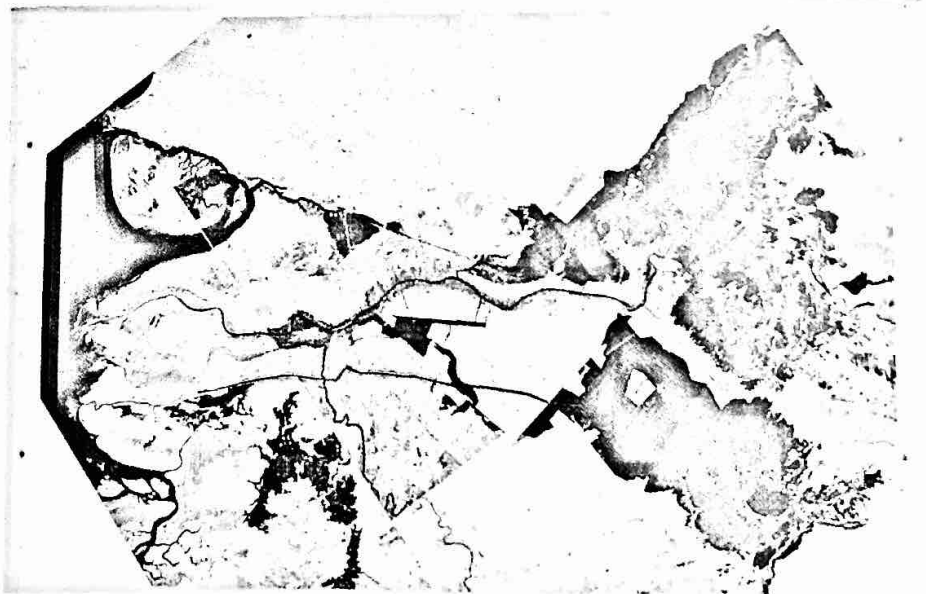
As Ocean Earth demonstrated in its on-site observation project in the Bacino Torbido, in Calabria, Italy, the observation of a river is incomplete and meaningless without observation as well of its outflow, of its impact on the ocean. To look at the Nile, particularly since its alteration due to the Aswan Dam, without also looking at the salinity and bioproductivity or upwellings in the eastern Mediterranean, would yield no understanding of the changes in the Nile.

Any study of the Gulf Head is insufficient and useless without a study as well of the saltwaters directly impacted by changes in the Gulf Head. Inasmuch as virtually all freshwater flow into the Gulf passes through the Head, and inasmuch as virtually all nutrient and mineral flow passes through there as well, one can gain a rather comprehensive view of the Gulf as ecosystem by monitoring the Gulf Head and the Gulf together as one. Observation of the Persian Gulf as life-support system for the region, as oxygen source for example, should include intensive observation of the Gulf Head, where virtually all material and freshwater input takes place. For scientists, the situation is ideal: the Gulf is a nearly enclosed oceanic system: the river input occur almost entirely in just one place; the premier engineering questions on river impact in the Gulf, in the nearly-enclosed saltwater body, occur largely in the Head of the Gulf. The task of observation is very localized and very simple. Imagine, by contrast, the task of trying to monitor changes throughout the Mediterranean or the North Sea.

[Given the desiccating diversions at this time of the Tigris and Euphrates, we tender the view that the chief contribution of freshwaters and nutrients to the Persian Gulf comes not from the Tigris and Euphrates, which flow through Iraq, but from the Karun River, the main river of Iran. (The ratio is roughly 4 to 1, for the Karun.)]

Ecologically speaking, Iran is the main contributor now to stability in the Gulf. This is not a political fact, as such, but a physical-hydrology one. It is a fact resulting from a natural dam caused by a faultline passing through Basra, and forming the dry-land passageway from one side of the Gulf to the other that is so conducive to the present fighting. It is also a fact resulting from centuries of irrigation practices in the Tigris and Euphrates basins, in what is now Iraq, rather more than in what is now Iran.

The ecological task, for all countries in the Gulf region, is to make the countries in the Tigris-Euphrates system – chiefly Iraq – become much more substantial contributors of freshwater and material discharge into the Gulf.



30

Fertile Body/Infertile Body, 1980/1990s (projected). Proposal for a major change at the Head of the Persian/Arabian Gulf, from 1980 at the beginning of the war to a proposed time of completion, in the 1990s. We propose the continuation of construction work started by Iraq, but, curiously, building on earthworks vocabulary initiated by American artists and several decades earlier, included in large-scale art projects sold in 1978 to Iran. Subsequent American "sales" to Iran, embodied in the Iran-contra deal, started in 1986 to block the scenario from taking place. The Fertile Body is not achieved. Doing this means continuation of the structures started. Thus we will present also the trajectory of construction of the canal from the Euphrates to Umm Qasr, towards Kuwait. In 1985, a penetration of the Kuwait frontier could be foreseen. This form is like that of a torso. This of course makes sense given that it follows the laws, as does a human body, of hydrodynamics under force of gravity. It has been astonishing to Paul Virilio. Is not there a certain structuring of the flows at the Head of the Gulf? And would not the structuring help revive the now-weakened ecological cycles?



31-34 Three black and white photographs showing the progression of the Iraqi constructions between 1980 and 1990. Recall that the UN peacekeeping force with privileged access to this region, and knowing what we have shown with the Landsat SPOT and Soviet data, all usually contrary to the standard news reports, was led by Yugoslavia.

All images are of the Head of the Gulf, with outlets from the Tigris (east) and Euphrates (west) to the Gulf, each one passing through territory adjacent to that consigned to Iraq shortly after World War I – i.e., Iran and Kuwait.

The scale of the site, and the political geography, is similar to that of another area with borders imposed by British forces: New York City. Kuwait is to New Jersey as Iran is to Connecticut, with Iraq occupying a narrowing wedge to the sea, like New York State. Fortunately for those in New York, there is also, as an appendage sand bar, Long Island. Those in Iraq are rather more confined.

All images and analysis copyright by Ocean Earth, with data sources (and commensurate co-copyright) attributable to EOSAT (US), CNES (French) or Sojuzkarta (Russian/Soviet).

Here, on this page: As of 1980.

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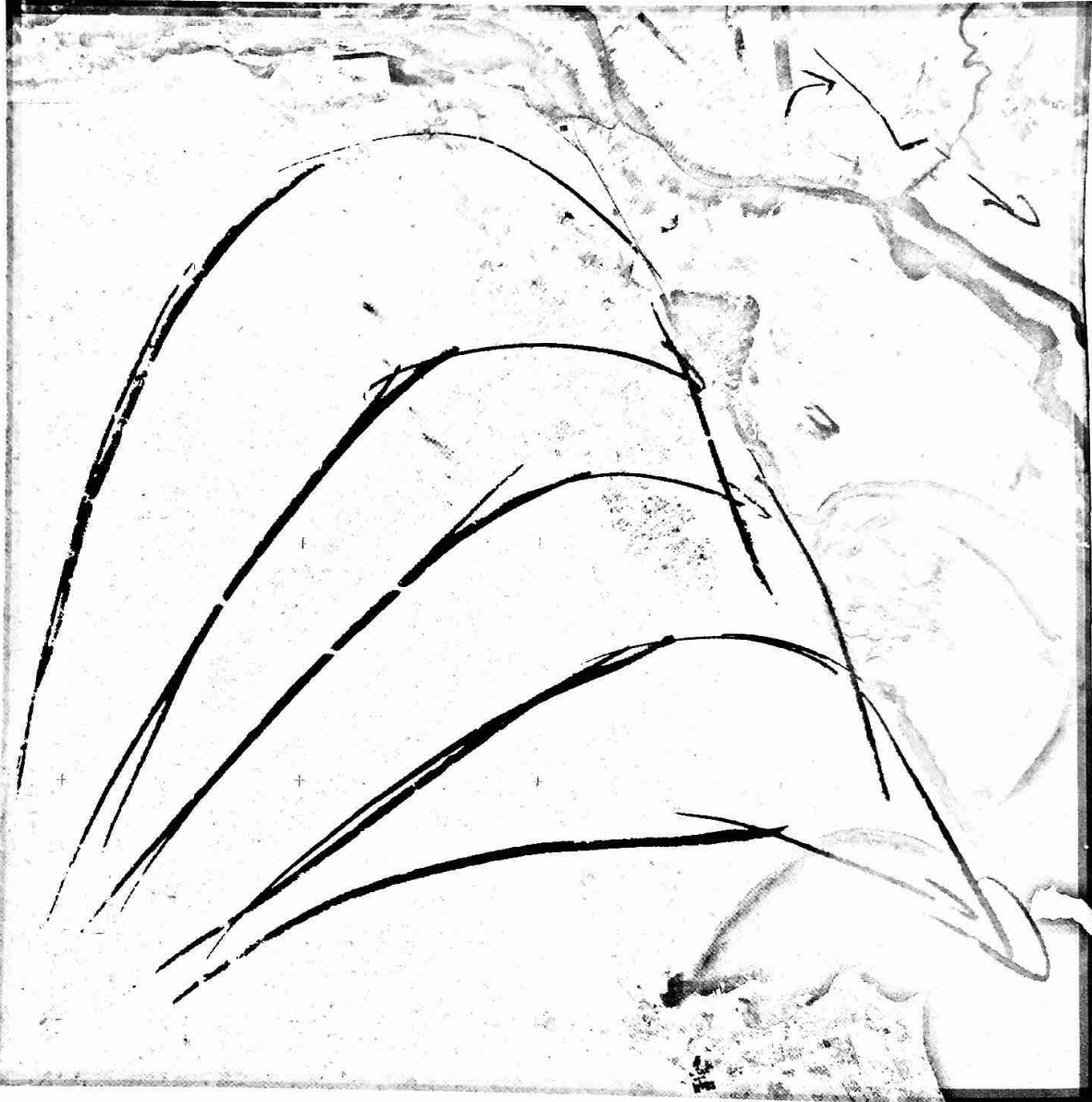


As of 1987



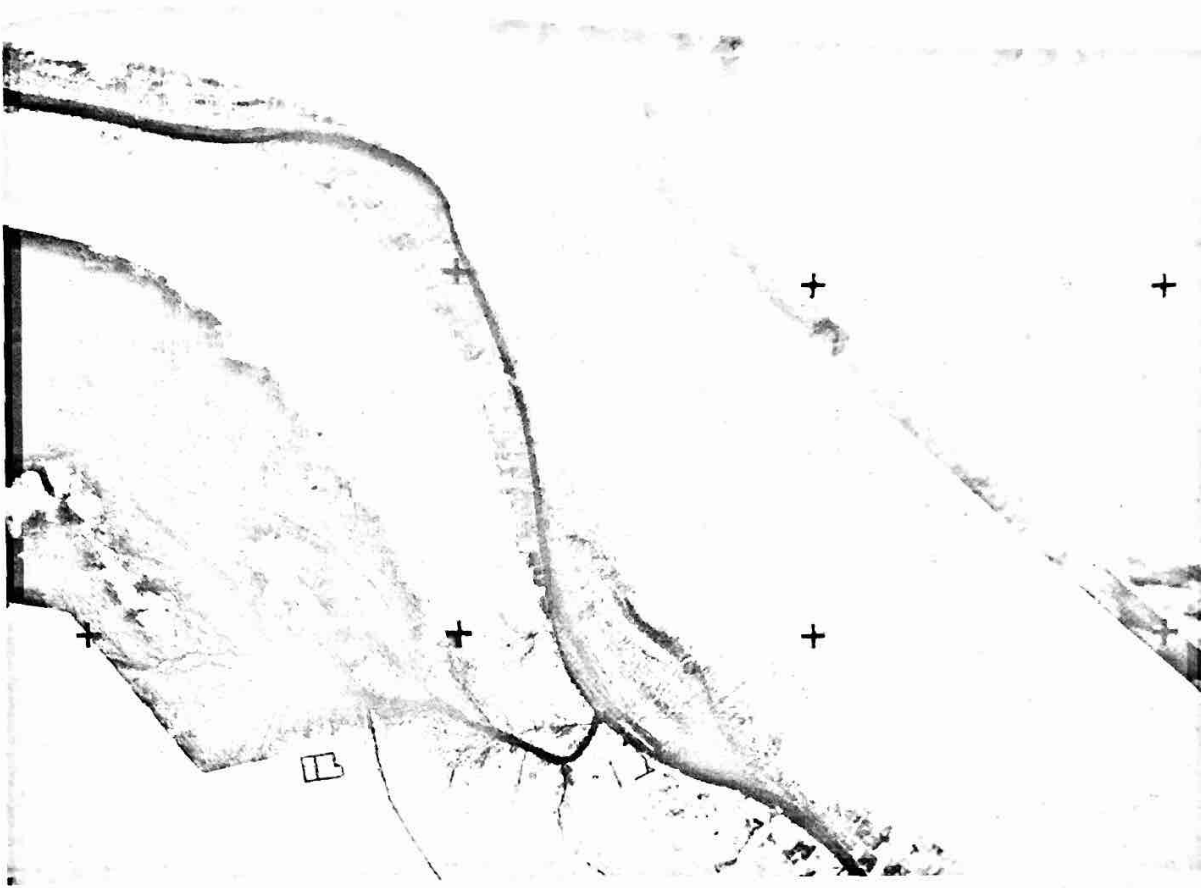
As of 1990

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As of 1990, with tracery of what have been, and could soon be, outflows from the Wadi-el-Batin in Saudi Arabia, out along the border of Iraq and Kuwait. At the top is tracery of a potential continuation of the Tigris diversion through Iran, to the sea.

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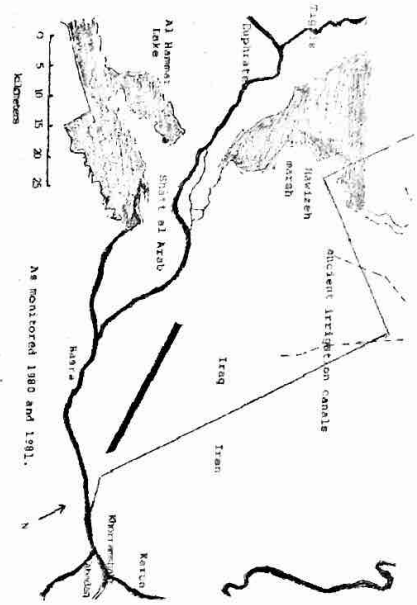


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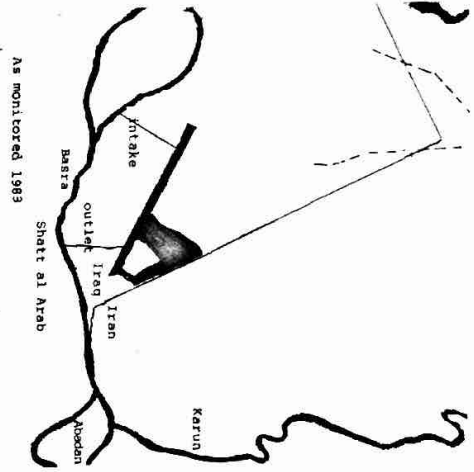


- 35 As of 1980: Trench. The Iraqi defense line against Iran, operational this year. It has been euphemistically called "Fish Lake"; actually, it seems to have accounted for about half a million Iranian lives. As this Landsat shot shows, an enormous trench 20 km long and 1.2 km wide was already constructed, with the evident effect of connecting waterflows between two occasional salt lakes. The morphology and siting of the trench is virtually the same as to that of work done over ten years earlier by Micheal Heizer and published in *Arte Povera*, by Germano Celant.
- 36 Trench: "Double Negative" by Michael Heizer, 1969-70, rhyolite and sandstone, 240,000 tons displaced, 457 x 15 x 9 meters, Virgin River Mesa, Collection Virginia Dwan.

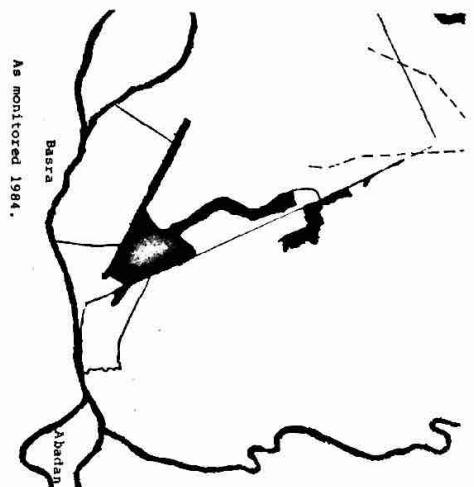
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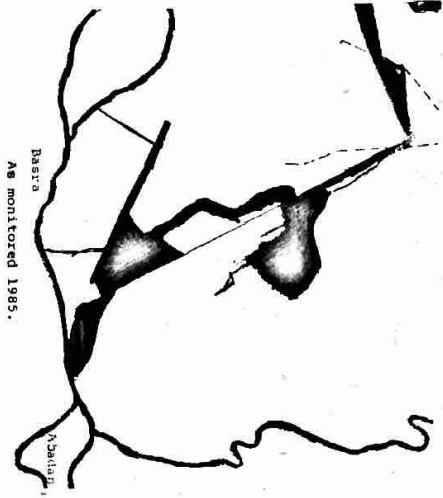
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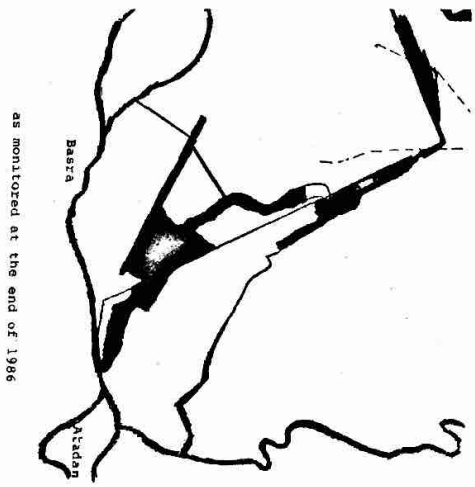
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37-42 Evolution of Fish Lake, the allegedly "defensive barrier" of Iraq against Iran, which by the end of 1986 was allowing Iraq to occupy what the NY Times reported as 486 square miles of Iranian territory - a No. 1 threat to the Western arrangements for a balance of power between the different States granting oil concessions.

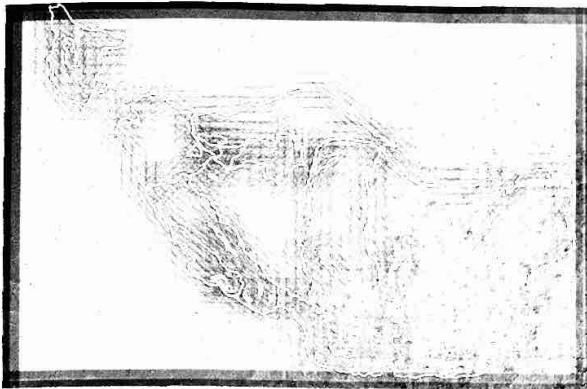
We note: rather, a correspondence with forms from recent Earth Art.

37-38 What might be regarded as a "Michael Heizer" structure.

39-40 Then, a "Robert Smithson" extension, ramping up to the border.

41-42 Finally, a "Dennis Oppenheim" extension, deep into Iranian territory, towards the Gulf.

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Towards Achieving Throughflow from Desert Uplands to the Arabian Sea: Solving a Problem, for example, of Iran

- 43 Analysis of interior watersheds in Iran. Based on studies published by the Cambridge University Press. Produced in response to artists' contracts with the Shah of Iran, 1978. Considerable discussion then in New York was also with the revolutionary groups inside Iran; the task for us was to gain information about the site, regardless of who the "client" might be.
- 44 Chart of entire Arabian Sea Basin, including the interior basins of Iran, potentially within the Sea's catchment.
- 45 Head of the Gulf, 1980. Ocean Earth copyright, 1988. Note salt flats and periodic salt lakes just east of the Shatt-al-Arab.
- 46 Land Incision, Dennis Oppenheim, 1967. The concept of cutting a way through to the sea was manifested by the conceptual artists early on. This same concept was conceived by engineers in Iraq at least since the early 1950s, long before Saddam Hussein. One may note further that the Iraqi strategy at the outset of the war was prepared for them by their military advisors in 1953 - the British. And dreams of a greater Mesopotamia, or of finding ways of releasing pentup and backed up waters to the coast, have lasted as long as civilisation there, which is almost as long as civilization anywhere.
- 47 The waters are backed up in the area modeled here, at the Ocean Earth exhibition in Neue Galerie im Künstlerhaus (Graz), 1993. Model first shown at Galerie Tanja Grunert, 1990.
- 48 The Tigris was diverted along the border. And it met waters diverted from the main, single channel, the Shatt-al-Arab, as put east and back upstream into a new channel by the simultaneously defensive and offensive waterworks of Iraq built during the war with Iran.

Quoting a scientific text furnished to us by consulting geographers at the University of Cambridge, as part of our analysis of Landsat and Spot data for the period 1972-87, we note: "Iraq desperately needs a comprehensive irrigation and water resource development programme... a plan for basin-wide development. But, as this would involve Turkey, Syria and Iran, such a proposal does not appear to be politically practicable at the present time.

That text was written before the current war between Iran and Iraq. It was written before there might have been any public knowledge of the massive river engineering schemes being devised by Iraq, chiefly in the war zone, which could help institute de facto "a comprehensive irrigation and water resource development programme."

Remaining, however, is a plan for basin-wide development. Even more important, we of Ocean Earth emphasize, is a plan for basin-wide development of the entire Gulf as affected by the Tigris-Euphrates-Karun, not just of the rivers. Political practicability may ensue in some manner by overtures from Turkey regarding a river-management approach to the current tribulation between Iran and Iraq (as reported in *The New York Times*).

Although we of Ocean Earth have pioneered the civil monitoring of the Head of the Gulf, starting with our analysis of changes at the Iran-Iraq border near Basra commenced in 1984, we expect that such monitoring would lead rapidly to the necessary counterpart of land studies: civil monitoring of the Gulf as saltwater receptacle, of the Gulf as single body. While of course there can be some tracking of army and navy movements with civil satellites (notably from the Soviet Union and France), the main task and fruit, we foresee, will be the observation requisite to ecological revitalization of the Head of the Gulf – hence of the Gulf.

OCEAN BASIN MODELING AND MONITORING 1989 Part II: Arabian/Persian Gulf

[Excerpt from paper, one of two, filed at "Global Monitoring and Assessments" conference, sponsored by FAO, UNEP and International Union of Foresters, Venice, Italy, 1989]

Abstract

Comprehensive inventory of the resources on earth's surface, and of the saltwater seas or currents into which the upland surface slopes, can begin with a division of that surface along the lines of watersheds surrounding salt seas, not just rivers. When sites under remote scrutiny are organized within the context of such basins, lines of inquiry lead to insights, then to policy options, affording specific programs of action in response to observed conditions. Now, at the apparent end of a conflict which – like most intense competitions – yields new technologies and new economic capabilities, the head of the Arabian, or Persian, Gulf has undergone an enormous re-engineering of its inflowing rivers, chiefly the Tigris and Euphrates, that could trigger a restored river flow and ecosystem vitality throughout nearly two-thirds of the lands draining into the Gulf, thus restoring the Gulf as a marine resource.

Preface

Despite the often-stated concern about the Persian and Arabian Gulf as a "sensitive region", or about the necessities of statecraft or intrigue in dealing with such a region, we have learned from experience that those who deal in intrigue, and

who believe that the public should not be allowed to see with Landsat or Spot civil data what takes place in that region, at least not in a timely manner, fail to grasp two basic facts about all that has seemed so sensitive:

- (1) the oil gas exported from the region, and allegedly so critical to geopolitical power, have only negative value ecologically, and cannot contribute to the future stability of either that region or the world;
- (2) the vast and historic engineering achievements of the war, attributable to both sides, can be brought to public light so that what could benefit that region, with its problems of saltification and desertification, can be completed – and so that the new technologies of river engineering and ecological restoration emerging in the war can become part of standard human endeavor.

What has been accomplished in the travail of the latest war can be transformed into a standard of civil engineering that restores large stretches of terrain now declining into desert. We have been able to apply lessons from the war zone to desiccated sites like the Bacino Torbido in Italy, the Chott-el-Hodna in Algeria, and salt accumulations of the Upper Missouri Basin in the U.S. At issue here is whether a technology can emerge, with a commensurate labor force, for comprehensive engineering of saltwater basins as units.

Summary Statement

The ecology of the Persian/Arabian Gulf, and of its Basin, extending into present-day Syria, Kuwait, Jordan, Turkey, Saudi Arabia and various emirates, as well as Iran and Iraq, will almost certainly improve with the completion of the diversions constructed from the Tigris and Euphrates Rivers through adjacent alluvial fans in the course of the war. These diversions make the two rivers continue in greater volume to the Gulf, greatly decreasing the hypersalinity of the Gulf, and capable of greatly reducing the evaporation and salinization plaguing lands upstream from the Gulf.

The fact that these diversions, or continuations of the sinusoidal Tigris-Euphrates form, were built chiefly by the Iraqis, or that they were built with certain foreign advice, should not lead to delays in their completion. Iran does not have to "lose," nor Iraq "win," if the two main rivers of their common basin happen to flow more completely down to the Sea. Further, given the cease-fire, Iran is now trying to take advantage of at least parts of what Iraq built, so the question of separateness or authorship is moot.

The benefits of the new channels extend not only to the Sea, which could be considered as a common source of wealth, but also far upland – into the mountains of Saudi Arabia, of Syria and of Iran. For converging on the twin new legs of the Tigris and Euphrates, and potentially revitalized by a completion of those legs in their flushing out of now clogged and desertified alluvial fans, are two other river systems, almost directly opposite to each other, descending respectively from Saudi Arabia/Kuwait and from Iran.

The western channel, from the Euphrates, can help to wash out the alluvia deposited over centuries at the mouth of an ancient river approaching from the west, now called the Wadi-el-Batin. This could improve flow in the Wadi much as unplugging a hose can improve flow throughout, far upstream; for centuries, most flow along this course, blocked up, has slowed down to then evaporate or go underground; opening up the outlet can set the stage for restoring a dendritic pattern of surface flows.

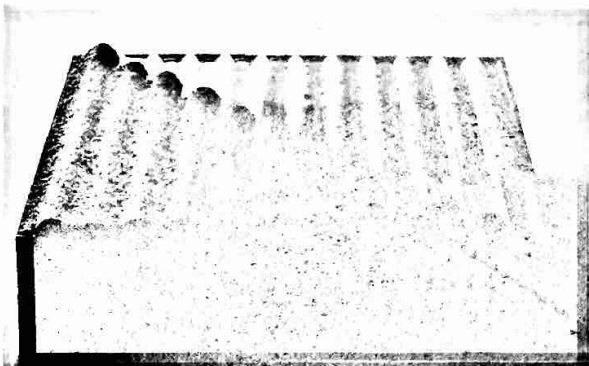
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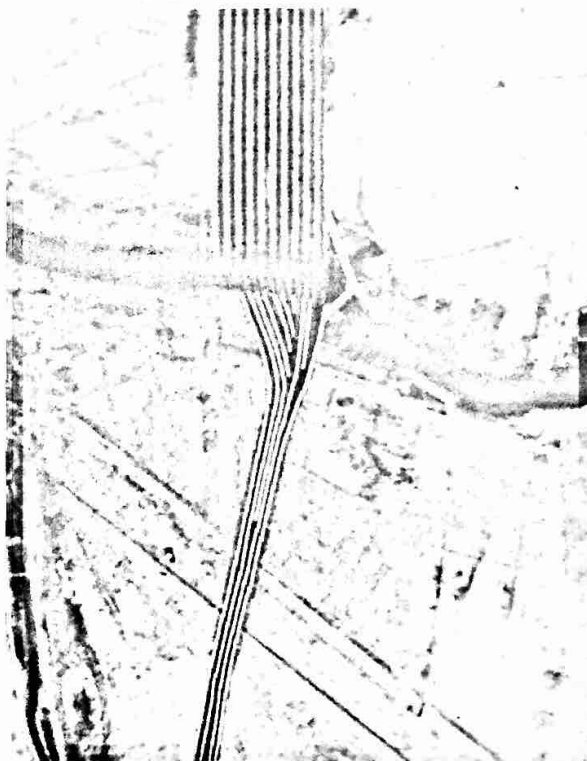
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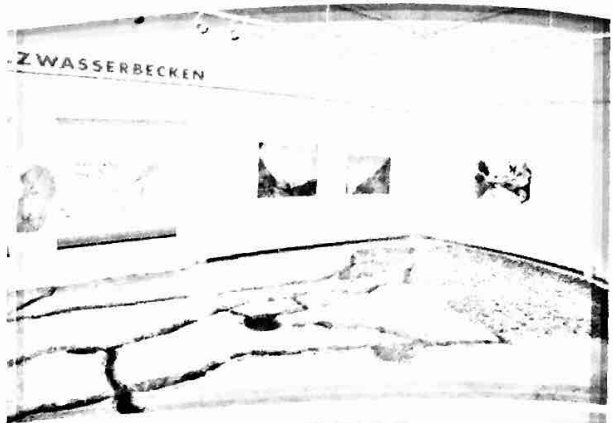


- 49 The Tigris diversion was elaborated into a multi-channel canal, as these SPOT photographs from October 1986 show. The imagery are legally and contractually allowed. But when they were purchased in Sweden following a curious non-delivery under contract by the French data source, a bit of commotion occurred. In a news magazine article, which was impounded at the US border and evidently caused some events in Paris, the French authorities explained that Ocean Earth was guilty of "overselling" and, besides, failed to respect its contracts. The substance of the article was not about satellites per se but about the fact that Ocean Earth offered imagery and analysis to the UN for what the UN called peacekeeping purposes, and such material had been given by the UN negotiator solely to Iran, not to Iraq.
- 50 With this image processing generating these photos, Ocean Earth was able to determine for sure that the extension of a canal from the border indicated here as a multi-channel Land Incision towards the sea (scenario projection) in image 53 was committed by Iraq, meaning that Iraq was well inside Iranian territory (north of Karun) and was "winning the war", contrary to the news reports published in the West. Since the West would have a "need" to maintain parity among the competing powers in the Gulf, there would be a "need" for covert aid to Iran, called the Iran-Contra arrangement. Such aid led to the blockage, as we learned from sources, of the multi-channel-"canal"-blockage, and later deconstruction, at the Karun.
- 51 An antecedent to the multichannel "canal" built by Iraq, probably with Soviet military engineering advice (according to a Dutch engineering firm in the region), is Dead Furrow, Dennis Oppenheim, 1968. This is only modeled. It was never built by the American or any other artist. The one time that such a structure was built and was to have functioned it was blocked from completion by successful military action, assisted effectively by covert military assistance, arranged by the United States. American covert activity versus American-conceived construction, as monitored with American civil satellites, against the interests of certain American corporations (like Chevron) and for the interests of certain other American corporations (like Ocean Earth).

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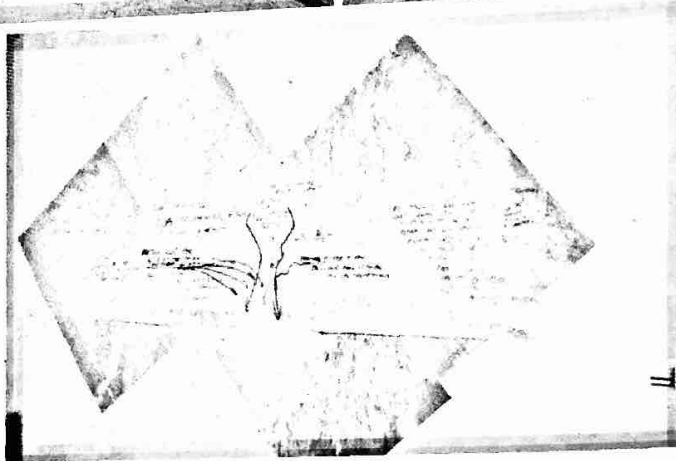
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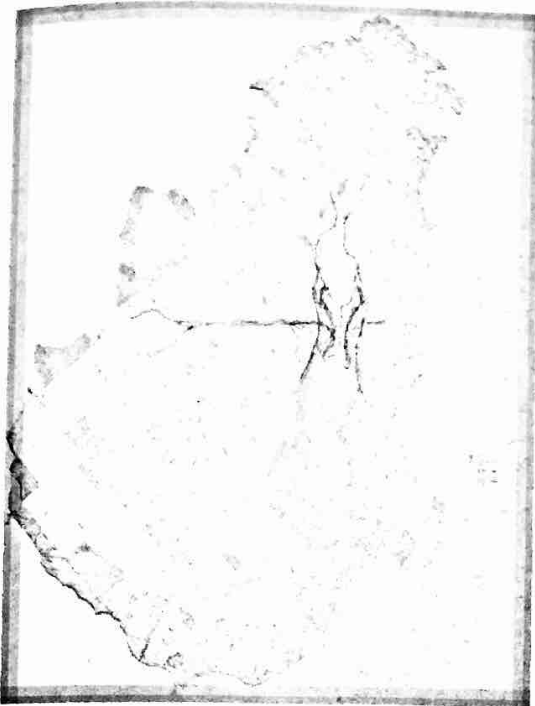


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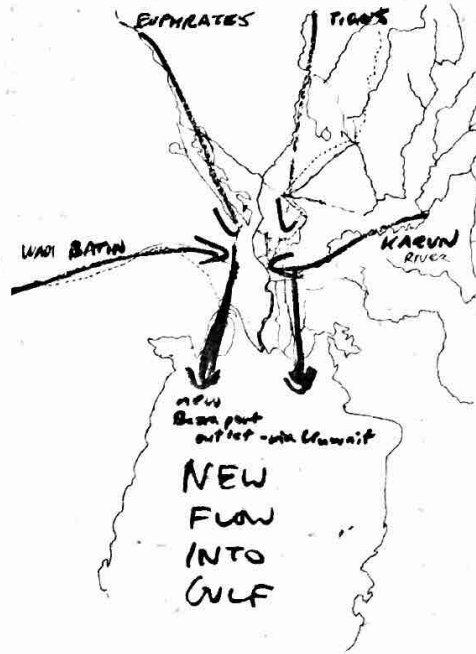


- 52 The proposed continuation across the Karun of the Tigris diversion, towards the Sea. American Fine Arts Co., BODY, 1988. The specific photo-montage scenario is called "River Rifle", named after similar earth-art work.
- 53 Throughflow to the sea, to create a "Time Pocket", a conceivable "No-Man's Land", possibly even a wildland, which might even be acceptable to both Iran and Iraq if there were not substantial underground deposits of the residues of the decomposition of suddenly-trapped populations of giant algae. We use the term Time Pocket, in line with work earlier by Oppenheim, because the zone here established, between one outlet to the sea and the other, prior one, the Shatt al Arab, would be 15 minutes plus or minus the adjacent time zones, only thirty minutes apart.
- 54 All such development shall be situated within the flyway of migratory birds and insects, from Lake Victoria up the Rift through the Red Sea and Gulf on to Central Asia and Siberia. The giant lake structures started by the Iraqis pose a fresh opportunity for intensive migration, as of flamingos. Installation at CEPA Photo Gallery, Buffalo, NY, 1985.
- 55-56 Summary of situation west of the Shatt-al-Arab and Gulf Head. Giant alluvial fan pressing into the Euphrates path, as shown in the two color photographs. The bulk of this fan constitutes the territory of Kuwait. On the column, left, appears a chart of the entire basin which could with military-scale engineering be restored to active surface-river flow.
- 57 The outlet from the revived Wadi-el-Batin could well be one or several canals arching along the path of the current Kuwait-Iraqi border into the Gulf past the large alluvial island, Bubiyan. Ironically, this is precisely what becomes possible as Kuwait now builds a trench, presumably fillable with water, along its border with Kuwait. To fill that trench with water, the Saudis would need to revive river flow across a vast stretch of sand dunes apparently produced during the same upheaval or collision of tectonic plates which caused the deposit of oil and gas.
- 58 Scenario of construction for revival of the Tigris and Euphrates sinusoidal flows to the Gulf, each in separate tracks, with revived river flow from Saudi Arabia, the Arabian Peninsula, and the confluence of Rivers Karkheh, Karun and Jaffa in Iran.

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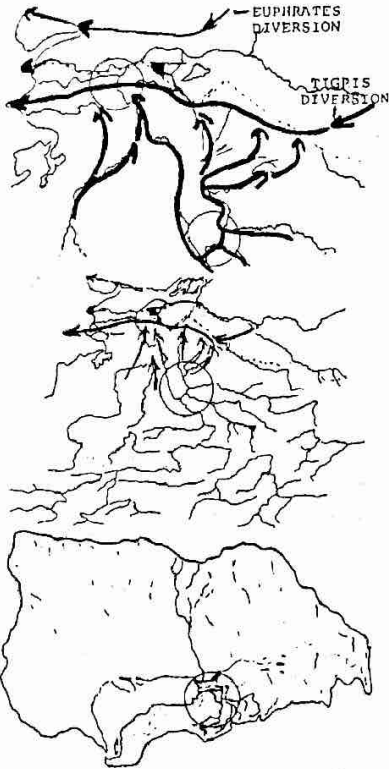
- 59 Net effect: restoration of the four-river confluence at the head of the Gulf, with restoration of active marshes and river through-flow, as opposed to standing waters backed up by alluvial clogging, all in a somewhat subtle balance, given that the confluence of the four rivers persistently threatens to clog the very marshes there. Hence a need for continuous washing out and uptaking of the nutrients. Ocean Earth is prepared to propose certain algae for nutrient (i.e., sediment) uptake, before it would clog the system and cause desertification. Hence the possibility of Paradise (which this area was called). This form of the Arabian-Persian Gulf Basin was produced for a press conference at the United Nations Correspondents Association on 24 January 1991. At that time, Mr. Zamani of the Iranian Mission to the UN made some remarks.
- 60 Schematic of the confluence of four rivers – remarked in geographical journals as unique, and as a site of alluvial collision – leading to greater overall oceanic circulation and regional water cycles. A Kuwaiti influx, from the Wadi-el-Batin, could arguably strengthen the counter-clockwise circulation in the Gulf, much as the Po does in the Adriatic.
- 61 Position on the global spiral, corresponding with the collision and overlapping of plates, or basins, during what appears to have been a catalysm by which the North Pole shifted from where it was then, Trondheim, to its current positions.
- 62 Installation in BBK, München. Photographer Pia Lanzinger. Implications of a Gulf Basin integration project, as shown on the floor, are manifest in the integration of outlying basins within the global spiral. The basins are:
- | | | | | |
|---------------------------------|---|--------------|---|--|
| North Sea/Irish Sea/Channel | / | Baltic Sea | / | Barents Sea |
| Eastern Mediterranean | / | Black Sea | / | Caspian Sea |
| Red Sea, with Rift and Dead Sea | / | Persian Gulf | / | Arabian Sea, including interior basins of Iran |
- The proposal on the floor has never occurred. It has been blocked by military action, both covert and direct.

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The U.N.'s Gulf War Balancing Act

By PAUL LEWIS
Special to the New York Times

BAHDA, Iraq, March 24 — Every Thursday a small white plane bearing United Nations insignia ferries a Yugoslav pilot to the desert region of the Tigris and Euphrates rivers in Iraq. The plane carries Maj. Gen. Slavko Jovic, commander of the 400-member United Nations Iran-Iraq Military Observer Group, the international force monitoring the cease-fire in the Persian Gulf war between the two warring nations.

The two officers, and the general's weekly shuttle symbolize the precarious balancing act the United Nations performs as it seeks to persuade the two nations that its monitoring of their seven-month-old truce is impartial.

"Everything Balanced"

"One week at my headquarters here, then one week at my Teheran headquarters — everything, balanced," General Jovic said the other day at the

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...miles wide near the southern Iraqi city of Basra, as it promised it would in January. On March 13 and 14, this flooding — which the United Nations said was the result of a ceasefire violation of a ceasefire — killed 100 people, including 50 children, and destroyed 100 houses and other buildings. The United Nations said the flooding was the result of a ceasefire violation of a ceasefire.

...Iraqi forces, which hold a small section of Iranian land in the area, tried to knock out Iranian pumping stations they said had resumed pumping water into the Persian Gulf. The United Nations said five dead and eight wounded diplomats, say, Iraq has not admitted any casualties. Iraq is said to hold in total, four or five sections of Iran, or about 386 square miles of territory.

Hopes for Political Settlement

Last month in a report to the Security Council, Secretary-General Javier Perez de Cuellar criticized Iran for holding up plans to install satellite communications equipment at the Teheran headquarters and for delaying imports of needed vehicles.

But what worries Western diplomats more than such infractions is the failure of Iran and Iraq to make progress on a political settlement that would end the need for a peacekeeping force.

...arming reports of cease-fire violations, but also to "consolidate the cease-fire." This includes encouraging the Iraqi and Iranian commanders to pull their troops back to their original positions. In some areas the two forces are dug into positions barely 10 yards apart.

The observers are divided into two groups and deployed on each side of the 100-mile cease-fire line, monitoring cease-fire conduct and accepting complaints from the observer force. The all-officer observer force is drawn from 26 countries. Its members are unarmed.

"When we find something wrong," General Jovic said, "we have only persuasion to use with the commanders."

63 Situation in the Gulf at 7. 1. 86. The "Fish Lake" structure was clearly advancing. Astonishing aspects of these and other satellite photographs include: (1) the fact that no one in the public, not even most experts or heads of state, had any knowledge of these Titanic efforts, with the cost of a million lives; (2) the fact that the structures aligned conceptually, visually, physically, structurally and functionally with works by Earth Artists from roughly ten to twenty years before. What artists had been conceiving in the West was here, in the non-West, being not just conceived but also realized. Only military and covert efforts by outside parties blocked realization. Ocean Earth / EOSAT.

64 The overlay indicates where the Iraqis were, inside Iran.

65 From "Proposal for Iran", in Museumjournaal, Amsterdam. Hence the focus on the Karun side.

- Top: New flows: soon possible
- Middle: Effects in Iran
- Bottom: Effects in Gulf as Basin

66 Excerpt of New York Times article from 1989 indicating that the Iraqis had indeed controlled the area behind the canal, inside the Iranian territory. Until 1988, Western news reports — even a 1985 German telecast of our imagery with commentary by a Dutch general — portrayed the Iraqis as losing. To the contrary: their barrier was advancing.

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The eastern channel, from the Tigris, already helps wash out the alluvia deposited over centuries by the various ancient mouths of the Karkheh, Karun and Dez Rivers, all confluencing from Iran. The alluvia have formed vast wastelands, largely of salt and silt. They are the residues surrounding ancient civilizations, as at Susa, and until they are washed away by river flows – and not by conventional irrigation, which tends to accumulate salts – the trends of desertification will not likely be reversed. Flows from all the main Iranian rivers, which converge and have intersected, feeding each other, well upstream, will improve as they feed into fresh, rapid channels to the Gulf, rather than into marshes and playas, along with a shallow, silt-laden Shatt-al-Arab, until recently the only outlet to the Sea for most of the Basin.

Together, the two new channels of the Tigris and Euphrates, extending over several hundred kilometers distance, can help unplug much of the Mesopotamian backup, now accounting for the rapid drying up and saltification of soil throughout the Plain. In the area of backed-up waters, or rather impassable marshes with slowly-growing evaporation and clogging, there have dwelled for centuries a people called the marsh Arabs. The habitat they have known will change. But it was already deteriorating, and it would have been untenable within decades. A new structuring of the rivers flowing into the Head of the Gulf, two from the north, one for each flank, can restructure the ecology of the region, both upland and offshore. We would anticipate this restructuring extending to the production of energy resources, not from dangerous fossil sources, but from the intrinsic solar-energy conversion capacities of organisms in the Basin, particularly in the Sea.

Excerpt from a letter to Mr. Zamani, Counselor at the Iranian Mission to the United Nations, 9 November 1987

The new means of production include: (1) remote sensing; (2) excavations and earthworks, yielding marshes and rivers; (3) offshore rigs, for marine biological as well as mineralogical purposes; (4) nutrient transfer from cities to country, chiefly in migratory feeding grounds.

These new means of production are the materials, the subject matter, the day-to-day substance, of the war in the Gulf. They have been developed by both the Soviets and the Americans.

THE WADI-EL-BATIN AS SITE FOR CHANGE 1990

[Proposal regarding Saudi Arabia, filed upon request by the Iraqi Embassy in Paris for an Ocean Earth plan for the region, October 1990.]

At this time, end of September 1990, military forces converge on a region somewhere between the Euphrates River and Shatt-al-Arab, on one side, and the wastelands of northern Saudi Arabia on the other. In the midst of the convergence lies the primary ancient river of Saudi Arabia, now a dry river, the Wadi-el-Batin.

Most of the alluvial delta for this river happens to be the territory of Kuwait.

Consider these facts.

1. The territory of Saudi Arabia is, effectively, the Arabian Shield – the geological formation making the Arabian Peninsula. It occupies virtually all the Arabian Peninsula, with the exception of emirates along the Gulf shore and a few countries, e. g., Yemen, on slopes outward towards the Arabian Sea.

2. With the exception of mountains in the far southwest, the territory is a desert.

3. The territory used to be a savannah rich in wild animals.

4. There is one major river system, and this used to flow abundantly. It extends across the center, from west-southwest to the confluence, of four rivers unique to the Gulf basin – the confluence, described in ancient texts as the site of Eden, of the Tigris and Euphrates in Mesopotamia, of the Karun and Karkheh from Persia, and of this river, from the Arabian Peninsula, from present Saudi Arabia. The river is now a wadi, usually dry.

5. The fan of this one-time river spreads from Al Nasiriyeh to Basra to Kuwait City: it constitutes most of the area in southern Iraq now occupied by coalition forces.

6. If river flow were restored, possibly by drawing upon underground reserves, much of the fan – therefore, of Kuwait – could be washed out. Part of Kuwait used to be under water. Now, as an accumulation of salts, sand and silt, it blocks through-flow from the wadi to the sea.

7. The tributaries of the Wadi-el-Batin concentrate water around Buraydah, one of the few cultivated areas not requiring irrigation or wells. From there, however, they go underground. They travel east beneath an 300-km wide swath of desert called the Ad-Dahna. Only just before Kuwait do waters begin to re-surface. There, usually, they end up caught in shallow pans, where they evaporate, further encrusting the surface and making it lifeless.

8. During the Iran-Iraq war, the Iraqis built giant diversions and reservoirs, with pumps to maintain through-flow and reduce evaporation, with the effect of diverting the Tigris and Euphrates Rivers into channels well east and west of their normal one outlet to the sea, the Shatt-al-Arab. As the diversion systems enlarged, most notably – so far – on the Iranian side, they could leach and wash out the alluvial fans of incoming rivers on each flank. They could wash out the alluvial fan of the Karkheh-Karun, from Iran, and if continued on the Kuwaiti side, could wash out the alluvial fan of the Wadi-el-Batin, from Saudi Arabia.

9. In their 1980–88 contributions to the Iraqi war Iran, both Saudi Arabia and Kuwait largely financed the Tigris and Euphrates diversions, with potential for slicing through and washing away the alluvial deposits not only in Iran but also in Kuwait.

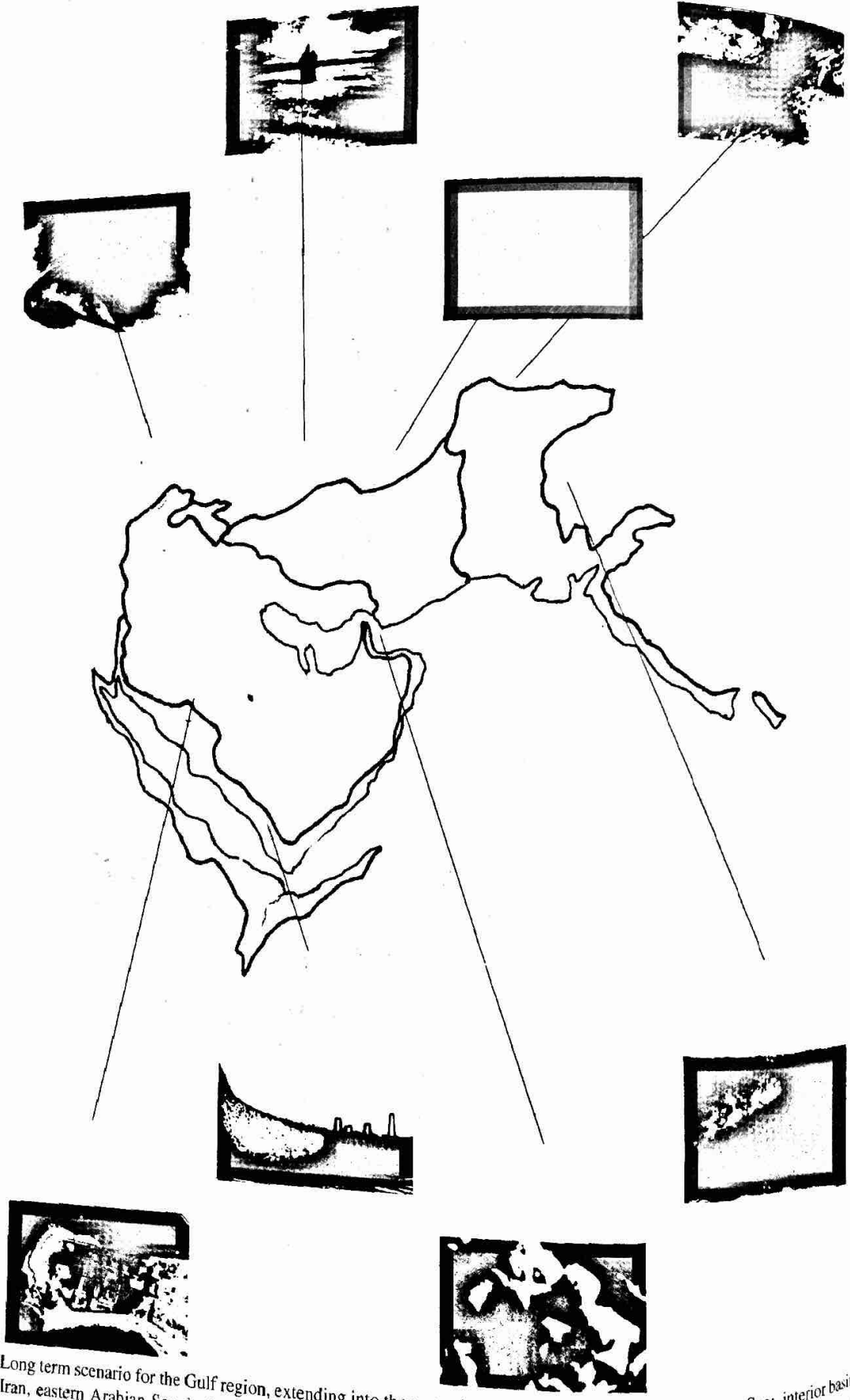
10. Throughout 1991 and the rest of the decade, a disastrous pollution of air, water and soil will be the chief legacy of the coalition's war with Iraq. Survival of the Gulf as ecosystem will likely become the top priority.

What is to be done?

Ocean Earth proposes that Saudi Arabia impress upon Iran the ecological necessity of completing the Tigris diversion started by Iraq in its eight-year war, and therefore of abandoning its efforts to undo that diversion by directing water flows instead along the precedent border.

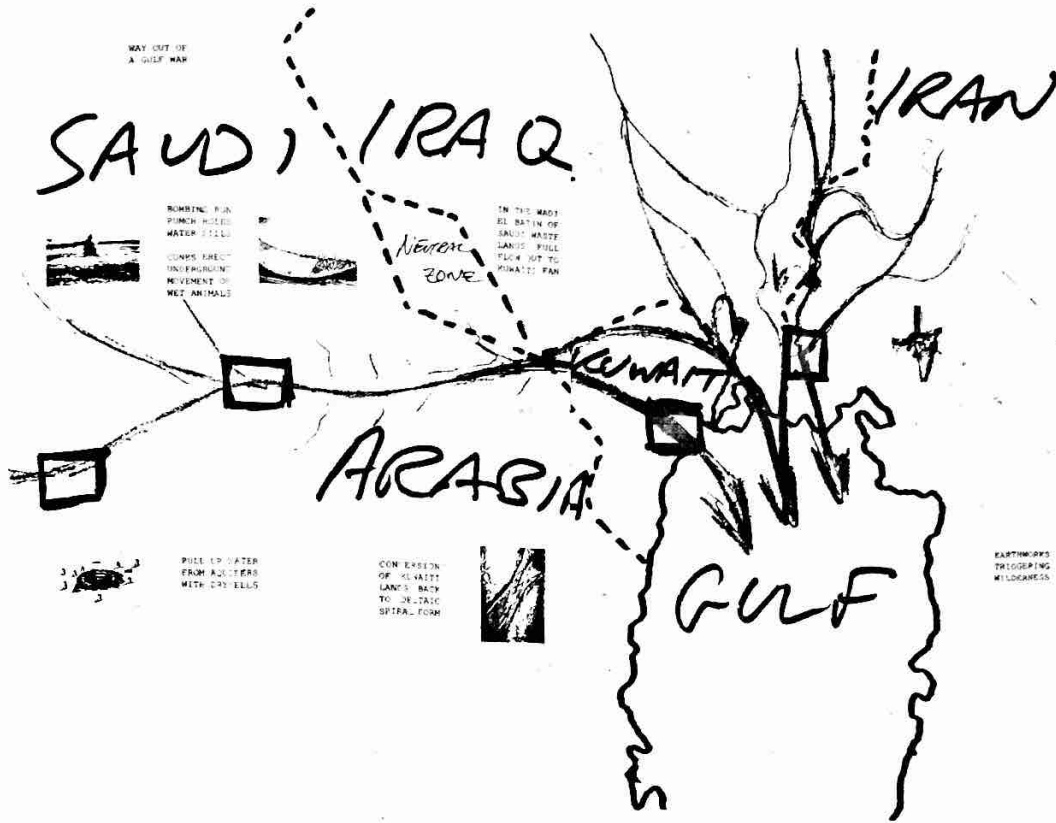
Decisions should rest on scientific grounds, on the necessity of saving the Gulf as ecosystem.

The legal instrument is the Kuwait Action Plan, the treaty organization for the Gulf of the Regional Seas Program of the United Nations Environment Program. Saudi Arabia, as one member, can trigger action by starting within its borders. It can revive flow in the Wadi-el-Batin, flush out a bulk of the surface in Iraq and Kuwait, then call upon Iran to do the same, including continuation of the Tigris diversion started by Iraq, blocked by Iran over fears of losing territory, but vital to an overall improvement in what has long been a war zone and is



67 Long term scenario for the Gulf region, extending into the watershed systems surrounding the Arabian Sea: interior basins of Iran, eastern Arabian Sea, including Indus, Persian/Arabian Gulf, Red Sea with Dead Sea (interior basin). Kurdish region interior basins (Lake Van, Lake Reziyah). From "Proposal for Iran", published in Museumjournaal, Amsterdam, 1989.

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68 WAY OUT OF A WAR, in: ZYMA No. 5, Nov./Dec. 1990. A more poetic presentation, for all four river inflows.

69 Blast Nafud Away, 1993. A scheme for river restoration by literally blasting away or excavating the enormous sand blockage from a previous geological cataclysm. The sand barrier, also called the Ad-Dannah, is about 300 km wide, and forces the Wadi-el-Batin underground, at Bardayah, only to re-emerge, much reduced, just before the present Kuwait-Iraq border.

SCHEDULE OF CONSTRUCTION: SHATT-AL-ARAB REGION

1988

To build up the flow of rivers into the now-three channels of the Shatt-al-Arab, and so begin the restoration of river flow throughout the greater part of the Gulf Basin, this schedule of construction is prepared by the Ocean Earth Construction and Development Corporation.

Throughout the construction and eventual operation of the earthworks, video earth monitoring of upland engineering and both upland and offshore bioproductivity is conducted – largely through data from a ground station in Saudi Arabia.

Cancelled Crop	Oppenheim
Infertile Body	Fend
Site Markers With Information	Oppenheim
Dead Furrow	Ocean Earth
Dead Furrow	Oppenheim
Viewing Station	Oppenheim
Boundary Split	Oppenheim
River Rifle	Fend
Wedge	Oppenheim
Variations on Excavated Structures	Oppenheim
Indentations/Removals	Oppenheim
Land Incision	Oppenheim
Wolf It Down	Oppenheim
Star Skid	Oppenheim
Time Line	Oppenheim
Time Pocket	Ocean Earth
Between the Shatts	Ocean Earth
Fertile Body	Fend
*Dream Lines	Oppenheim
*Tank Skid	Oppenheim
**Dry Wells	Oppenheim
Salt Flat	Oppenheim
Gesture	Heizer
Double Negative	Heizer
Three Downward Blows	Oppenheim
*Buckshot Trails	Oppenheim
Lightning Field	De Maria
*Cobalt Vectors	Oppenheim
*Rainbow Pass/Color Mix	Oppenheim

Asterisks indicate works presented to Iran for construction: single asterisk, for works shown to Iranian officials; double asterisk, for works commissioned by and sold to Iranian officials. Construction was to have been executed by the Iranian military – starting in 1978. All documents have also been furnished later, in precise balance, to Iraq.

The task now is to show precisely how and where these new and important designs can be built, as a positive outcome of the technological evolution and struggle that has embroiled both Iran and Iraq for nearly a decade.

Circular Displacement	Heizer
*Devil's Hole	Oppenheim
*Silver Disk Landing Field	Oppenheim
Convergence of Species	Fend
Depression	Heizer
Expanding Slough	Fend
**Death Holes	Oppenheim
**Cage	Oppenheim
Death Array	Fend
**Shape Collectors	Oppenheim
Amarillo Ramp	Smithson
Convex Double Disk	Fend
Spiral Jetty	Smithson
Concave Double Spiral	Fend
Sky Hook	Matta-Clark
Reverse Processing	Oppenheim
Feather Form	Fend
Directed Seeding	Oppenheim
*Feather Ridge Transfer	Oppenheim
**Land Clouds	Oppenheim
Activation	Fend
Mud Flat	Oppenheim
Whirlpool – Eye of the Storm	Oppenheim
Protection	Oppenheim
Electric Range	Oppenheim
Migratory Alteration of Time Zones	Oppenheim
Production Lines	Fend

The ultimate effect of this sequence of construction is to establish marsh ecosystems along migratory-animal flight corridors throughout the now-desertified regions of North Africa, Arabia and Southwest Asia. By these means the vital nutrient transfers from ecosystem to ecosystem will continue, with potential for animal-plant expansion out from

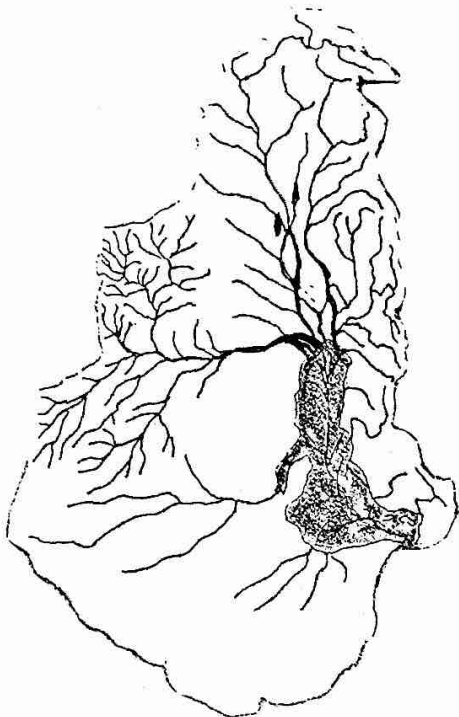
oases or sub-river upwellings, as well as from surface-water marshes, into the surrounding uplands.

Ultimately, success of these engineering projects depends on biological vitality and strong evapotranspirative cycles in the sup-tropics and tropics of Africa and South America.

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Kuwait to Dig a Trench All Along Its Iraq Border

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By Youssef M. Ibrahim
New York Times Service

RIYADH — Kuwait will dig a 200-kilometer ditch along its entire land border with Iraq, primarily to discourage infiltration by Iraqis but also to symbolize the depth of the political and emotional rift between the two governments that resulted from the Iraqi invasion of Kuwait in August 1990 and its seven-month occupation.

The move, recommended by the minister of defense, Sheikh Ali as Sabah as Salim as Sabah, was approved by the cabinet last week and announced by a parliamentary deputy, Ahmad Baqer, on Sunday. Mr. Baqer said the 120-mile-long ditch will be 3 meters deep and 5 meters long, will extend along the entire border and will be topped on the Kuwaiti side with sand hills that will rise 4 meters.

The project was adopted after

Kuwait announced that a group of Iraqis had infiltrated by car across the open border to Kuwait last month to attempt the assassination of former President George Bush, who was then visiting Kuwait. Authorities said all the group had been arrested and would be tried.

The plotters allegedly included Kuwaiti residents of Iraqi origin as well as Iraqis who arrived from across the border, underlining the ease with which cars can move between the two countries across the desert.

The Kuwaitis said they seized two cars loaded with explosives and rigged to be blown up with remote-control devices.

Observers said that the ditch-building project seemed to have full support from most Kuwaitis, even from those who once favored closer ties with all Arab nations, and from leftist groups.

70-71 Wadi-El-Batin Deltaworks. Consequence of Desert Flood.
72 The article, from the International Herald Tribune of May 3, 1993, gives reason to propose a hydraulical expansion of the border project. The main course of the Wadi-el-Batin follows this borderline.

now threatened even more by pollution. Iranian fears can be allayed by treaty arrangements, subordinate to the Kuwait Action Plan, for a "neutral zone", or joint environmental zone, including all territory between the Euphrates and Tigris diversions initiated by Iraq, from Al Nasiriyeh on one flank to Amara on the other. The target city of Basra thus finally becomes subordinated, not by force but by environmental-treaty mandate, from both its western and eastern flanks. Meantime, regarding oil concessions and other fixed capital, the borders can remain as before the war – if that is decided. For if much of Kuwait is submerged, the oil concessions remain, yet legal instruments are employed for a transition to a post-oil, more ecologically-suitable era.

How might this be accomplished?

For both the Saudi and Iranian projects, for both the through-flow actions to be centered on the twin diversions of the Tigris and Euphrates, as extended into ostensibly Iranian and Kuwaiti territory, a vocabulary of construction comes from American and Western art. Examples were sold to Iran in 1978, for execution by the military. They were never built. The same vocabulary, as developed – probably in parallel – by the Soviets and Iraqis, has been utilized by Iraq. The sequence starts with a slit like that of Heizer, continues with ramps in S-curve along concepts of Smithson, then concludes with the multi-channel canal invading Iran and virtually identical to a work 20 years earlier by Oppenheim. Works sold to Iran in 1977 could be installed in Saudi Arabia towards systematic upwelling of aquifers and entry into stable streams. They include: Dry Wells, for protecting waters from evaporation and building up subterranean sponginess; Cage, for attracting nutrient-transfer aerial migratory animals; Death Holes, for building up headers so that waters can flash through once released; Shape Collectors, for building a marsh, starting at Hafar-al-Batin, then extending upstream through the Ad-Dahna. Munitions must blast away that barrier: cues on bombardment were made recently for Ocean Earth by Dennis Oppenheim, under a joint-copyright contract.

DESERT FLOOD

1991

Is it not ironic that a military operation named Desert Storm should be hindered chiefly, say the officials, by desert storms?

And is it not curious that when the operation, at a prior stage, was called Desert Shield, the region being protected, or contexted, was the layers of sediment inclined on top of a giant geological formation, a sloped plate, called the Arabian Shield?

When in Nature a geological shield tilted towards a Sea and bearing on its Slope a succession of sediments happens to undergo a desert storm, then – as we know from warnings before venturing into the desert – there are desert floods. This is particularly well known to Mesopotamia during the rainy season: the natural sequel to Desert Shield is Desert Flood.

CONSTRUCTION PROJECTS

Using a vocabulary of earthwork designs sold to Iran in 1978, build along wadi courses throughout the Gulf basin a series of underground holding ponds and above-ground microclimatological shelters where seepages occur. Assure micro-habitat for underground animals, to build up soil. Install cages and cave structures, also sold to Iran in 1978,

which attract migratory species, notably birds and insects, for nutrient deposition. Monitor the seepage sites. Make sure the vegetation takes hold and spreads. Re-introduce wild animals as well; let them gradually establish savannah. Clear away the outlets of wadis, if they are clogged with encrusted salts or sands; pierce the outlets with transverse flows drawn from streams like the Euphrates or Tigris. In effect, expand the water diffusion of what is now a two-river system. Use none of these waters for conventional or even drip irrigation; serve open systems rather than croplands. All sites are monitored with a 1-km resolution satellite observation program covering the basin within a four-hour cycle. Ocean-land relations are closely monitored.

1. Continuation of multi-channel Tigris diversion across the Karun 20 km east of the Shatt-al-Arab, across 4 km of alluvia to a tidal flat, ending in a one-time mouth of the Shatt. Inside Iranian territory, to be built by Iran, with intent of leaching away encrustations from the alluvial fan of the Kark-heh-Karun-Dez confluence, in turn modified by spiral-disc structures upstream.

2. Further diversions of the Euphrates across the alluvial fan of the Wadi el Batin, west of the Shatt, to cut through and wash away most of the alluvia, exposing the surface to seepage from underground flows of the Wadi. In effect, complete the watercourse "invasion" of Kuwait. Thus, complete the sinusoidal form of the Tigris-Euphrates pair of rivers, flanking the Shatt.

3. Upwell from aquifers at Hafar el Batin, spreading waters and vegetation among depressions and channels just east of the Ad-Dahna sand strip, now cutting off the main river system of Saudi Arabia from the Gulf. Start restoring the delta, largely underwater, that is most of Kuwait. This begins to restore the main river system, as recorded in animal cave art, of Saudi Arabia.

4. Blast away the Ad-Dahna sand barrier, about 300 km wide, to allow waters now disappearing at Buraydah, one of the few areas of unirrigated crop growth in Saudi Arabia, to continue through to their outlet. Assure rapid flow, or run pipelines underground. Bombardment is in the direction of Mecca: a significance can be established for the public.

5. Vastly increase surface water in present-day Kuwait: convert the land to coastal mudflat or marsh. As waters arrive, on surface or underground, they are either taken up by vegetation or directed to the Gulf. At issue is how much freshwater should reach the sea. The ultimate arbitrating agent is the Kuwait Action Plan, sanctioned by the UN Regional Seas Program.

6. With designs first shown at Caltech in 1978, build variable-level header pools, from which waters occasionally collected can flush through a stretch of wadi, then be absorbed not by sands but by absorbent soil. These are placed at drops in elevation among the many wadis extending from the western rim of the Arabian Gulf Basin to the Euphrates and the Gulf coast.

The dramatic possibility, within reach, according to scientists with whom this architect has consulted, is a restoration of savannah conditions – hence of traditional hunting and wilderness culture – in a core of the Arabian world.

V. 2. PROJECT SITE: EUROPE/AFRICA

ECONOMIC DEVELOPMENT OF THE
BACINO TORBIDO, CALABRIA

1985/86

The Bacino Torbido, like many river basins in Southern Italy, usually does not even have a river. It has a deep river valley clogged up with mud and rocks, beneath which, in a subterranean stream, waters flow unseen to beneath the sea. Only in late winter or floodtime could some sort of surface river be said to exist, and then it is often a muddy torrent.

Some of the subterranean waters are siphoned off for irrigation, but most of them enter the sea under the sea, well offshore. They rise to the surface, through hundreds of meters depth, releasing their nutrients at last for uptake by organisms. This upwelling is well-known. It is called the Santa Ana. And when it happens most forcefully, it often means, for the fishermen up and down the coast, a big catch.

But the Santa Ana could be more regularly exploited. It could be tracked and could be converted into a primary resource for a larger region than the Bacino Torbido. Given what we know so far about the Bacino and its offshore impact, extending ten kilometers offshore and stretching along the shore another twenty kilometers each way, it appears that the Santa Ana has extraordinary powers.

An upwelling offshore of course attracts fish; but an upwelling, if properly monitored and engineered, could also produce vast quantities of giant algae. What is required are some structures or rigs onto which the algae can hold. Similarly, there might be need on shore, or as expansion of rigs, for sites where fish can not just feed but also spawn. For if both algae and fish can be present where upwellings bring the nutrients from the sea bottom, accumulated over centuries from runoff from the land, then the possibilities for large-scale industrial production are at hand.

Upwellings are prime resources for production of what major industrial companies, such as General Electric, the Italian State Oil Company (AGIP), Southern California Edison, Ruhrgas GmbH or major universities, such as Caltech and MIT, or major trade associations, such as the Milan Fair and American Gas Association, consider to be a primary fuel of the future – biogas.

And, given what we understand of the well-known Santa Ana upwelling, the Bacino Torbido could be a major producer of biogas. Not only for itself but also much of Italy.

As Ocean Earth has learned in its satellite news projects, of the Falklands, of Lebanon, of Sirte and Benghazi in Libya, of the head of the Persian Gulf or the mouths of the Dnieper and Tuloma Rivers in the USSR, the interface between nutrients and waters from land with saltwaters in the sea is a primary source of life. That interface can be more or less fertile, depending on thoroughness of mixing and habitat for breeding and growing organisms. We study that interface, to build it up.

INTEGRATION OF OCEAN EARTH EXPERIENCE

The Bacino Torbido extends inland 18 kilometers and uphill 2,000 meters. It includes a basin offshore dropping 1,000 meters extending out 10 kilometers. It is small, but complete as a saltwater system. In one site are: forests, steep runoff, farms, irrigation, erosion, rivers and sub-rivers, marshes, upwellings, kelp beds near to shore, fish spawning grounds, and major infrastructure construction. This construction included the longest continuous bridge-highway in

Italy, built to link two shores of Calabria, intended to become an armature for economic development: there are dreams of turning the basin into part of a high-tech research corridor. Calabria as California: the Bacino Torbido as Silicon Valley: the governments in Rome and Catanzaro/Reggio Calabria invest. And this physical unit, this basin from mountain ridge to well offshore, can be an efficient producer of biomass yielding biogas – a non-polluting fuel for itself and for export. We confront a microcosm, a physical unit which, properly managed, can become its own economic engine.

Ocean Earth is prepared to monitor and display the basin as unit, and to help in planning of physical development of the basin as unit. It draws on its experience with monitoring and display of data for war zones. To wit:

Falklands: spectral identification of kelp beds, integrated with three-dimensional modeling, with roam-through, of offshore

Lebanon: hydrological analysis, winter and summer, of main rivers – both on surface and subterranean – feeding into the Mediterranean.

Murmansk: thermal-sensor studies, both in weather data and Landsat of current flows throughout fjords, and of interaction between fresh and saltwaters.

Chad: identification of springs and nascent stream-flows; erosion measure.

USSR: forest and farmland studies, with split-screen comparisons year-to-year; vegetation stress analysis; infrastructure analysis, discernment of various types of construction.

Libya: wadis at Sirte and Benghazi are similar to river/sub-river structure of the Torbido, with similar problems of ground-water depletion and saltwater inflow near shore: also, similar offshore upwellings and potential for open-sea biomass production.

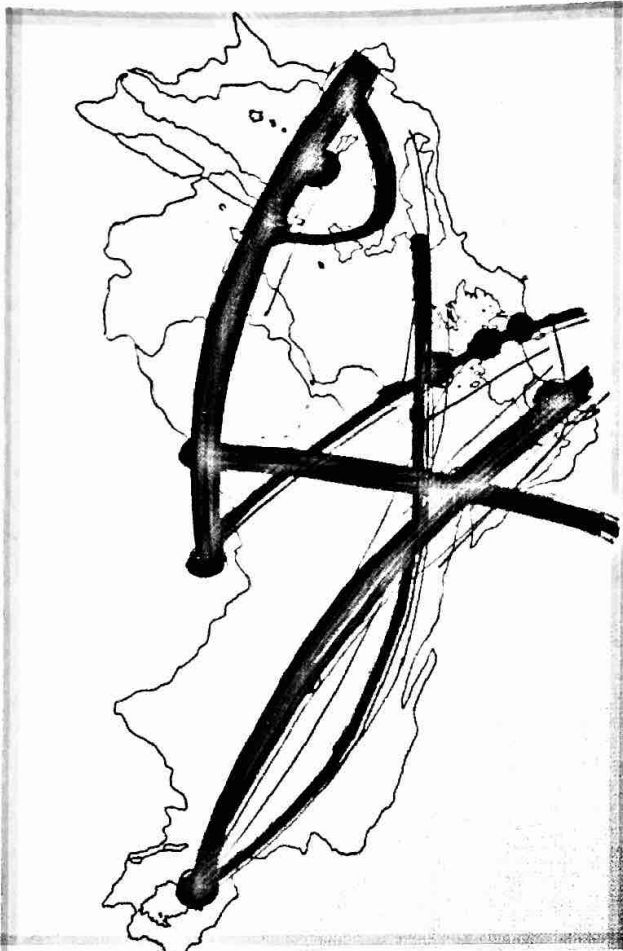
Gulf: river engineering amidst salt flats and residues of failed ancient irrigation: state of the art schemes for hydrological development applicable to similar legacy of failed irrigation and river blockage in the Bacino Torbido.

Added to these experiences, Ocean Earth brings in its experimental technologies of biomass rig design and siting, bioprotein introduction to food chains in marshes, estuarine engineering, and upstream integration of surface and sub-surface waters.

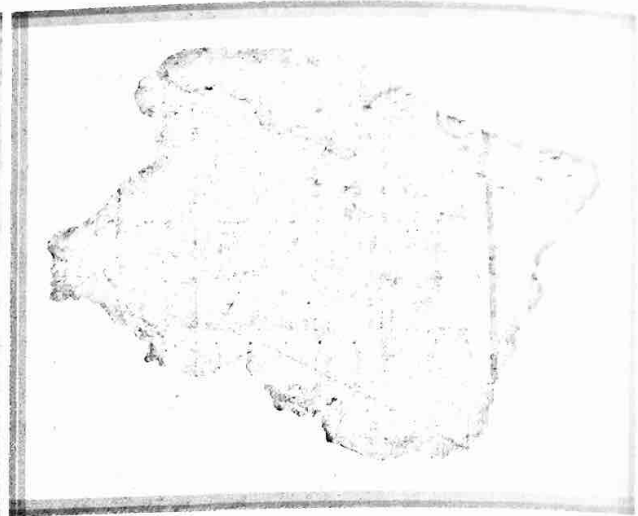
The question now is less technical than political. Or, rather, aesthetic. There must be an image, a sensation, of the basin as physical thing. There must be images of the nutrients upwelling offshore and descending from the mountains. There must be an sensation of symmetry between terrain emerged from the sea and terrain still beneath the sea, as evinced in the scale model produced by Ocean Earth at the Museo Santa Barbara in Calabria, 1985 (Image 75). And there must be an identification of common soil and common sea for all those who live, or attempt to make a living, in the Bacino.

At the Museo Santa Barbara, political leaders from towns in the basin and the government of Calabria have witnessed a presentation of a scenario, complete with scientifically-correct imagery, of the basin as economic unit. Now, with impending funds to the Museo from the European Community for the Mediterranean, there are opportunities to again establish a basin identity. Towards, of course, a basin self-reliance, in essentials at least.

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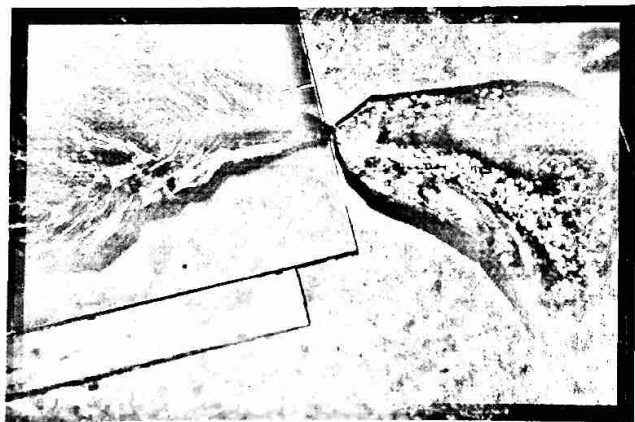
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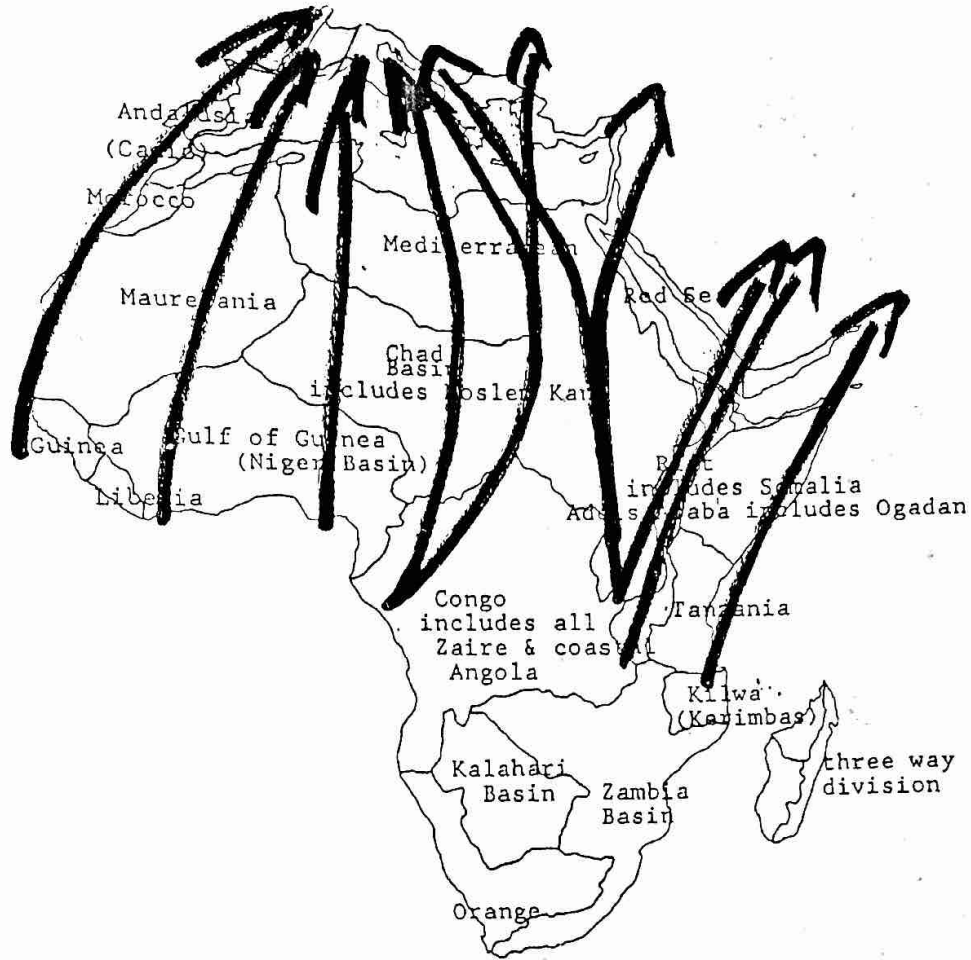


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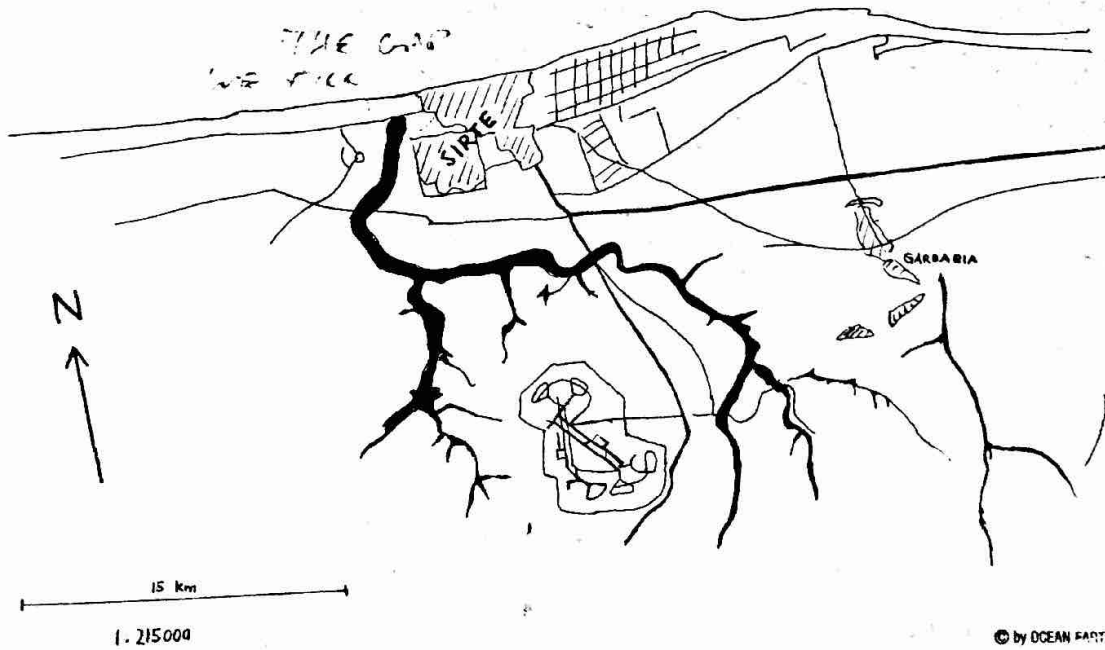


73-75 When set within the context of the Mediterranean Basin, a concavity legally identified by the United Nations Regional Seas Program, of the United Nations Environment Program, the flyways and ensuing oasis – marsh buildup restore surface water flow and active basin identity. For example, the Mediterranean Sahara, expanding thus.

76-77 This is the concept for planning the land and sea together, hence, the inclusion of the Gulf of Sirte for Libya, or the Mediterranean Sea. A nearby land-sea system, also accomodating an estuarine structure as well as marshes upland, would be the Bacino Torbido, in Calabria. Here, an orthogonal view of the model of the land/sea system. The chief problem of the slope is alluvial blockage at the mouth. Thus most of the river flow goes underground. A channel can be opened up between the upwellings, were digitized and entered into a near-real-time image processing system, such as the PIPE (developed by Chaikin), an architectural instrument for modeling and planning the entire Bacino as soil unit would be ready for use.



GULF OF SIDRA



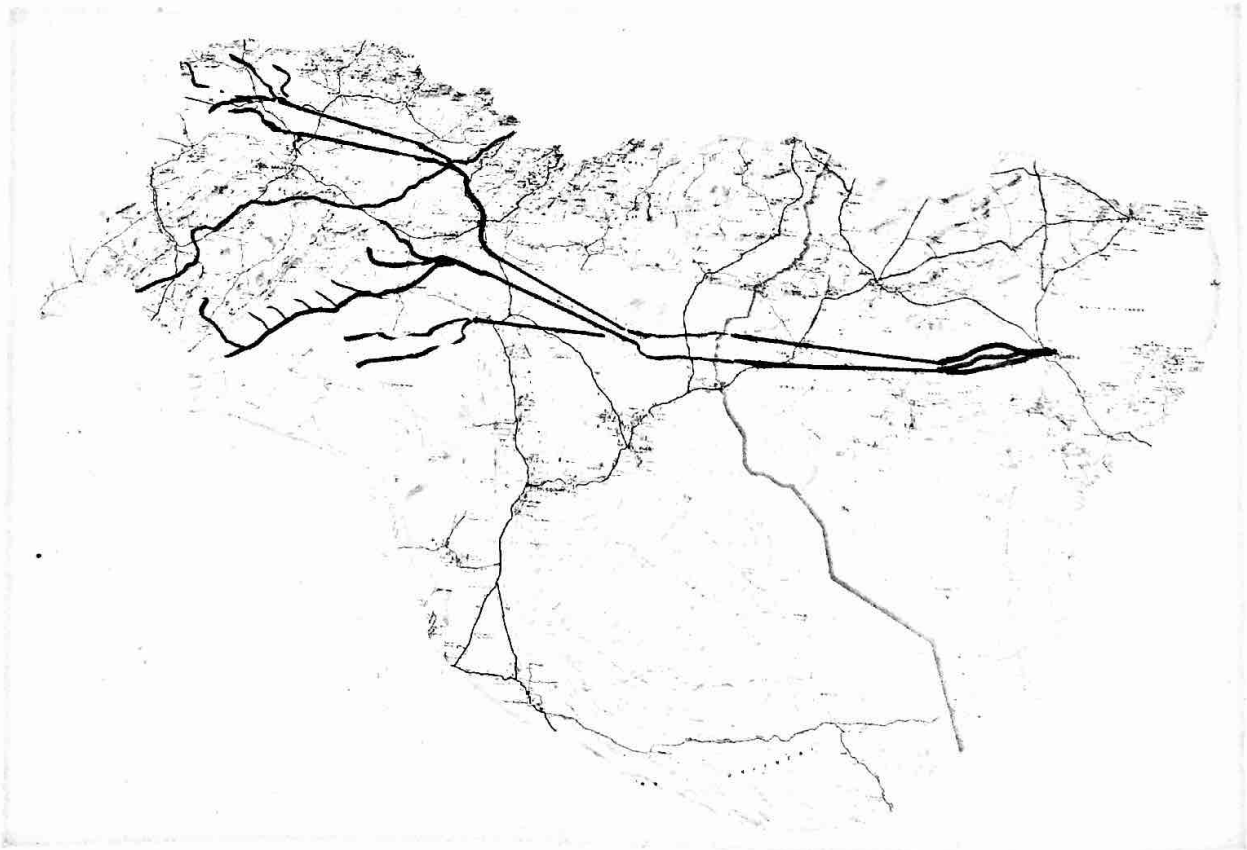
78 Source for migratory nutrients for Europe, 1982

79 Drawing of Sirte air base region, site of US attack and Ocean Earth monitoring (first for ABC News), but also – as noted here – a site where the one-time river, the wadi, does not reach the Gulf, but could do so through “The Gap” we fill.

80



81



80 With blast-through at blockage by Sirte, then revive river flows from the Grand Erg Oriental and Tibesti Mountains to the Gulf of Sirte.

81 Cobalt Vectors project for flow from the Chott el Hodna in Algeria to the Gulf of Gabes, Tunisia.

90

OCEAN EARTH
TOWARDS LIBYAN DEVELOPMENT

1986

A few satellite photographs on television showing an alleged chemical-weapons factory near Tripoli in Libya may well do little more than deepen the popular worry about terrorists and covert actions.

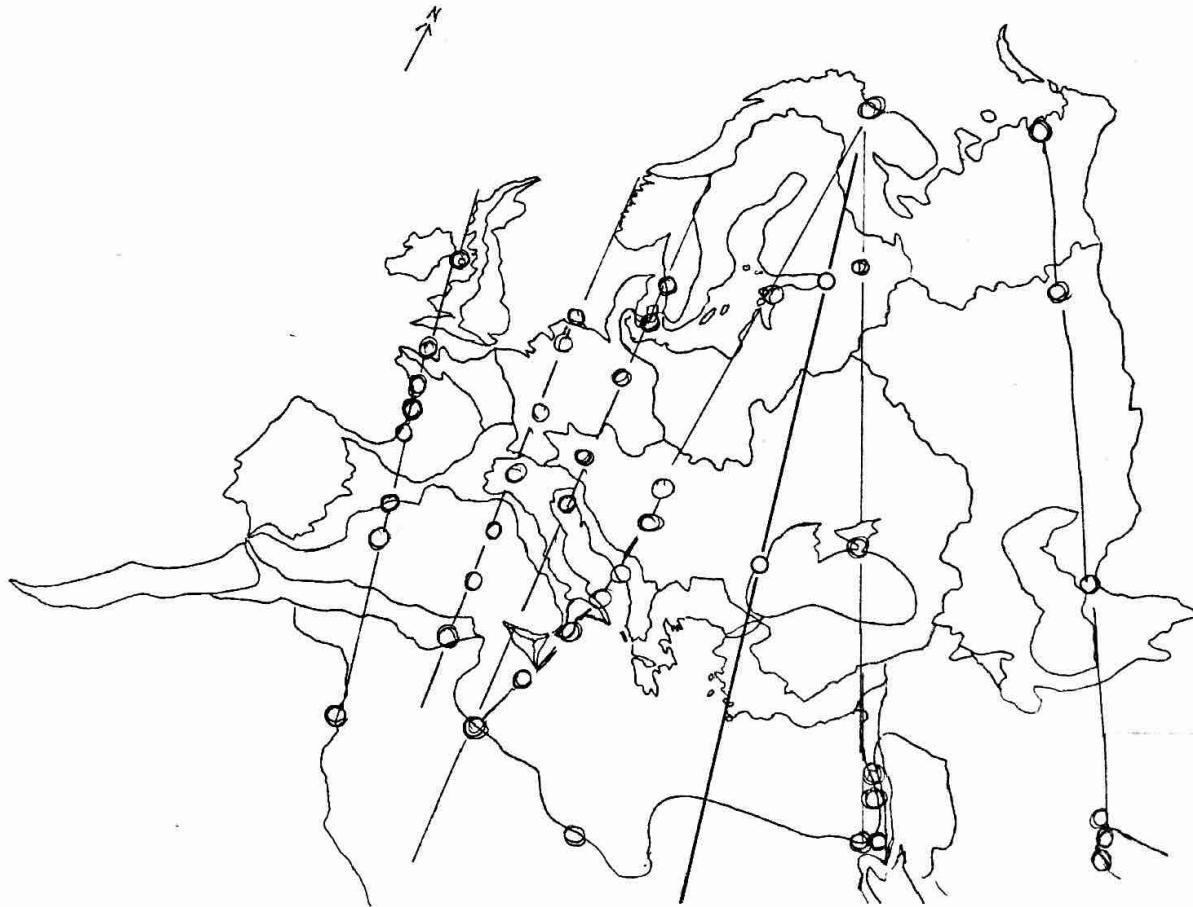
The task is to broaden the inquiry to cover all the area that can be seen, that is, to cover the conditions of economic and ecological geography which would orient a government in Libya to little alternative but outlying acts. What garden is there, within Libya, to cultivate? We seek an answer... with satellites.

For the peoples of the Mediterranean Sea, as well as of other nearby countries in Europe and Africa, the singular question is not whether Libya will be attacked by several US air strikes, as perhaps a dramatic gesture, but whether Libya will

become even more part of an enormous Void in the biosphere of the planet.

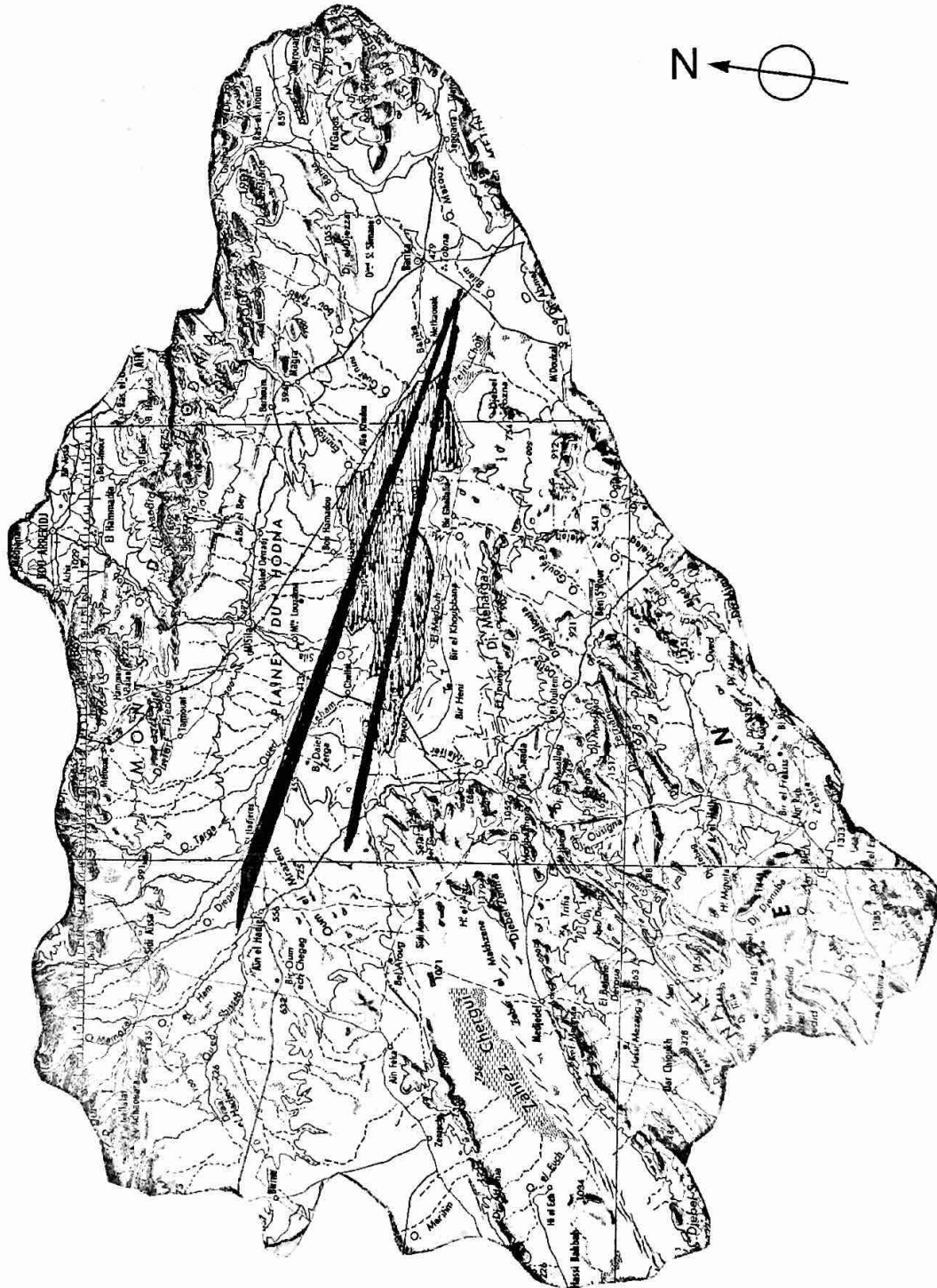
The Sahara is expanding. It expands faster than ever in recorded history, and it expands faster throughout northern Africa, faster than it had during the Roman Empire, which is allegedly responsible for much of Libya's current emptiness. Shall we humans in modern times now outpace the destructiveness of the allegedly careless Romans?

It is not just desirable to restore the Sahara to the vast, animal-rich savannah it once was; it is vital to do so. It is critically vital to at least stop further degradation into desert, to stop further depletion of underground freshwaters, to stop further saltification and desiccation of the coast, to stop further deterioration of oases and wadis, the infrastructure of verdant landscape. The heat waves of recent Mediterranean summers confirm this necessity.



82

- 82 Migratory Structures to Build in Europe, 1990s. As this book goes to press, Ocean Earth is concretely engaged in projects along the corridors from Chad through Malta to Scandinavia, and from the Gulf of Guinea through Corsica to the Rhine. A fly line through the Danube Delta, from the Nile through... Chernobyl, is also being prepared. Work is underway with specialists in radar observation of migrating birds, and in the deposition of products similar to "single-cell proteins".



83 This inward-draining (endoeric) salt-lake basin, the Chott-el-Hodna in Algeria, could be a starting point for trans-Mediterranean projects. It is a microcosm. It is a stop-over point for migration between Europe and Africa. Its gradual upgrading into savannah, occasioned by the increase of throughflow of freshwaters, with possible breakthrough towards the sea, can become a test-site model for development throughout the Sahara, and on into the inward-draining basins, also isolable and model-like, of the eastern Adriatic region. Lessons learned here can be applied to the Adriatic and Mediterranean slopes altogether, notably along a fly-line from central Africa through Malta to Calabria, and on up the Danube. With this we can signify a methodology for working within the also-confined Adriatic Basin, including the inward-draining salt-lake basins adjoining, as in Image VI.1, 31. The objective, as shown in Image 81 here, is building up surface water flow to the point of a through-flow to the sea, not just occasional underground flows.

SITE STUDIES

VI. SITE STUDIES

VI.1. PROJECT SITE: ADRIATIC

PRIMARY DEVELOPMENT OF THE ADRIATIC BASIN

1989

The basic resource in this project is the Adriatic Sea.

All the terrain sloping into the Sea contributes to its chemistry, with nutrients (i.e., soil), pollutants (including an excess of nutrients) and fresh water. This terrain can be precisely mapped, and within its map can be surveyed and located any events causing a change in the contribution to the Sea of nutrients, pollutants or fresh water.

Together, the surrounding terrain and the Sea can be called the Adriatic Basin.

Considerable inflow and outflow to the Sea comes also from the Ionian Sea, hence from the Mediterranean/Black Sea complex. We take note of this, particularly in the monitoring program, to identify what can be done about the inflow and outflow relative to the contributions by the surrounding terrain.

There are two parts of the project. At end, they should be joined, but also one or the other can be conducted separately.

I. PANOPTIC BIOPRODUCTIVITY MONITORING

Conceptually, the task is to build a television company. The task is to assure a flow of visual information about bioproductivity, pollution and other ecological conditions that reaches its audience within hours of satellite overflight. The orbiting cameras in space, along with other sensors on the ground, become part of a timely effort at tele-vision, specific to one market territory, the Adriatic Basin.

It presumes utilization of the full range of civil satellites now available: Sojuzkarta, SPOT, MOS, ERS, Landsat, AVHRR.

The price for the first year can be as little as \$ 3,000,000. After conversations with television companies in Italy and Yugoslavia we believe operations for one year can be sustained for this low a startup budget.

Most television distribution would be from a combination of Geneva, Belgrade and Milan. Comparative logistical investigation has been conducted in the Rome area and in Switzerland; for daily data, and for Sojuzkarta-scale cartographic data-basing, we propose the Swiss sites; for the US and Japanese satellites, we would continue to rely on Rome.

II. PRODUCTION OF GAS FROM MARINE ALGAE

Conceptually, the objective is an entirely new system of city-service. It is an entirely new scheme for supplying urban concentrations, outlying regions being secondary, with ample quantities of portable fuel.

If the energy source is substantially changed from polluting fossil fuels, or soil-depleting land-based biomass, to marine algae, and if as a consequence methane gas, or co-generable hydrogen gas, become primary feedstocks for urban and industrial markets, then entirely new infrastructure can result.

1. As traffic is not polluting, structures can be built above traffic corridors, including highways.
2. As pipelines gain ascendancy in importance, above-ground construction, integrated with structures for habitat, becomes more feasible.

3. As the chief source of fuel is in the Sea, coastal development becomes evermore economic, but not in any way occluding marshes vital to Sea bioproductivity. Infrastructure emerging from the Sea, with attendant urban development, must not interfere with marshes or lagoons. The rationale is not just ecologic but also economic.
4. Public finance would tend to shift from an individual-income base, which encourages earnings and consumption, to a bioproductivity base, which encourages conservation. Substantial savings therefore result from mass-transit infrastructure and energy-efficient architecture.

We propose complete on-site testing, from upwelling with macroalgae and offshore platforms of various design, to on-shore conversion and then upland distribution along a new above-ground infrastructure, in the Bacino Torbido, on the Ionian slope of Calabria.

EFFICIENT INDUSTRIAL SYSTEM FOR MONTENEGRO

1991

The Ocean Earth Construction and Development Corporation has concentrated attention on the Gulf region and, more recently, on the link between Europe and the Gulf, the Balkans. Given a historical decision-making stage now in Yugoslavia, we direct efforts there.

Specifically, now, we work to realize an efficient industrial system – a complete energy-wastes program for a self-reliant settlement – in the lands sloping into the oceanographic entrance to the Adriatic Basin, the lands of southern Illyria, the lands extending from Korfu past Albania and Montenegro and on through Dubrovnik to Vis. This is an ecological unit. It is an oceanographic unit. It could be a coherent planning and development unit, with its own non-dependence on outside sources of food or fuel, yet nonetheless part of the larger Adriatic Basin as unit, in turn part of the Mediterranean Basin, now so much the subject of diplomatic initiatives by Gianni de Michelis [the-then foreign minister of Italy].

The ocean-basin approach to territory falls within the legal purview of the UN Environment Program, notably its Regional Seas Program, headquartered in Nairobi. The first director of the Regional Seas Program, just recently retired, was a Yugoslav marine biologist named Stepjan Keckes. We have been referred to him by the Director of the UNEP office in New York, and we understand from various legal and UN sources that our ocean-basin maps can serve as documents of precisely what, for each Sea, would constitute the territory for which there is often-espoused jurisdiction over “land-based sources of pollution”.

When this ecological reasoning is extended to architecture and planning, it yields a development policy organized within ocean basins. In the case of Yugoslavia, it yields a development policy for three parts of the overall greater Mediterranean Basin, the Black Sea Basin, the Adriatic Basin and the Aegean Basin. We focus for now on the Adriatic Basin.

We summarize the applicability of the program – its feasibility for immediate start-up – in the Korfu-Vis continuum, starting with a linkage from Tivat Bay to Dubrovnik.

PROGETTO ADRIATICO

1991

Montenegro, one of the republics of Yugoslavia, has been declared to be the first ecological republic in Europe.

Two thirds of Montenegro drain into the Adriatic Sea, which itself can be considered a relatively closed system within Europe.

From various quarters, including participants in the Global Natural Resources Conference in Venice in 1989, has come a concept of forming a comprehensive soils-water-pollutants administration of the Adriatic Basin.

Montenegro is part of this Basin. We focus on a region within, a semi-enclosed saltwater basin on its own, the basin of Tivat Bay, or Boka Kotorska.

By "we" is meant a joint venture consortium of three entities:

1. Ocean Earth Construction and Development Corporation, New York.
2. International Centre of Theoretical Biology, ICTB Applied Sciences Group, Venice.
3. Center for Planning and Urban Development, Belgrade.

Although all parties cooperate and consult on work done by the other, each has a direction role in one of the three successive phases of any on-site activity.

1. Ocean Earth is responsible for primary sector development, viz., surveying the basin, determining where or how to increase its monitored bioproductivity, locating optimal sites for biological resource harvesting – for now, in the sea.
2. The International Centre of Theoretical Biology is responsible for specifying the industrial biotechnology best suited to yield products of five types: (1) biogas, (2) fertilizer, (3) fine chemicals & pharmaceuticals, (4) food, (5) plastics.
3. The Center for Planning and Urban Development, a private venture of architects, engineers and planners which has much experience in large-scale community-wide projects, is responsible for the third stage, the design and construction of town structures among various sites, some ancient and some modern, in the Tivat Bay basin as centered around Tivat City.

The project is regarded as a test-site project. It is meant to be a demonstration of an integrated approach to regional development, with the saltwater basin as region, with the three sectors being the successive primary, secondary and tertiary sectors in macro-economic analysis, not the "sectors" of "electrification" or "rural development", and so on, adopted by the World Bank. The objective – the proof of success – is an urban settlement with, by present industrial standards, virtually no pollution.

The head city for the Progetto Adriatico is Venice. The head office for the consortium is also Venice, in a three-way joint venture called "Ocean Earth Adriatico S.p.a.". The direction of the venture rotates. The head of the First Test-Site Project is a person with both building experience and direct cultural access to the governing ideas and invention: Kevin Gannon. The tenure of direction is the duration of the Test-Site Project, set now as Two Years, approximately, ending 1 September 1993.

By extension further three-part arrangements are possible, worldwide, but always within the territorial service and planning framework of saltwater basins. The governing term in all operations will be "Ocean Earth". Basins now within range of substantial development and investment are: LA Slope; Baltic Sea; Ijsselmeer and, in turn, North Sea; Western Mediterranean; English Channel.

Although in most basins there are considerable upland bio-productivity and harvesting questions, the Tivat Bay test-site does not raise them. Upland resource harvesting is not and probably will not ever be a major economic fact. There is a bay and there is enough hillside land around it to afford a view on the bay. It is an amphitheatre, not unlike the amphitheatre of Los Angeles.

The Los Angeles region has legislated that before 1997 – or, at least, the end of the decade – no motor vehicles will be running on polluting fuels. Our task is to start this transformation and build a post-petrochemical industry, partly to secure wealth and largely to assure urban environments in which basic functions like breathing are not toxic.

A joint venture of Ocean Earth, the International Centre of Theoretical Biology and the Center for Planning and Urban Development will seek to make that condition real. First in Tivat Bay, then in Montenegro and the Adriatic Basin, eventually in those cities – like Los Angeles – determining the direction of material culture.

[The project was to have started in September 1991 in Tivat.]

LEGAL FOUNDATIONS
FOR PROGETTO ADRIATICO

1989

The project was requested by Dr. Alberto Bernstein, director of the Consorzio Venezia Nuova, at the end of September 1989.

An introduction to Dr. Bernstein was arranged by Dr. Alfonso Maria Liquori, a biologist from the University of Rome and the International Center for Theoretical Biology in Venice. Dr. Liquori thought the thinking of Ocean Earth could be useful to the Adriatic region, specifically to Venice.

Inasmuch as Bernstein pointed out the need for international partners in the project, specifically the Yugoslavs, Ocean Earth determined to seek partners from all states with waters flowing into the basin, namely Switzerland, Italy, Yugoslavia and Albania.

After various discussions with scientists, including the strong desire to cooperate voiced by Dr. Michael Baumgartner of the University of Bern, it was decided that a test site within the basin would be essential to success.

In July 1991, architects at the Center for Planning and Urban Development proposed that Ocean Earth cooperate with them in Tivat Bay. As we have observed on the ground and by satellite, the Bay is an ideal site for first stage projects.

Dr. Liquori has confirmed this, and he proposes moving as quickly as possible (the only delay being the current war) to work on what he calls a microcosm of the open ocean.

Dr. Liquori also observed that excellent upwellings and open-ocean conditions for macroalgae growth occurred along the coast of Albania. He proposed that Ocean Earth also seek to work there.

We may observe at this time what legal precedent there is for a series of business activities set within the framework of the entire Adriatic Sea Basin, like any number of other such saltwater basins.

1. The United Nations Environment Program's Regional Seas Program, which includes rules now for the land-based sources of pollution, which are the greater proportion of pollution cause. Dr. Noel Brown at the UNEP office in New York has recommended that Ocean Earth file its works with the UNEP and the Regional Seas Program.
2. The Mediterranean Regional Seas Program, or Mediterranean Action Plan, based in Athens.

THE NEW YORK TIMES, TUESDAY, JUNE 13, 1989

Now, Venice Is Under Attack by Giant Algae

By MARLISE SIMONS
Special to The New York Times

VENICE, June 6 — Venice is no longer sinking into the mud of its lagoon, and new sea walls are under construction to stop the tides from gnawing at its slender walls.

But the island's legendary powers of endurance are facing a new test this summer: Tons of algae, unprecedented droves of them, have sprouted up in the salty water and are threatening to suffocate the lagoon.

"This is the worst year — almost the entire lagoon is covered," said Antonio Castellati, the Mayor of Venice. "Those algae are changing the whole environ-

ment."

The Mayor, to be sure, was not speaking of the tiny leaflets that put slippery dark cuffs on Venetian jetties and bridges. The algae running amok out in the lagoon were giants, large as lettuce leaves, some of them the size of tablecloths.

"The fertilizers from the farms have also fertilized the lagoon," said the Mayor, offering a wry and abbreviated explanation. For 20 years, he lamented, Venice has thought only about its income from tourism and not produced a serious strategy for the environment.

Industrial, farm and household sewage from the mainland, experts say,

has profoundly changed the lagoon biology — and allowed the large, tough weeds to get the upper hand. Six clusters of them have even been registered by satellite.

Last month, a fleet was hastily sent to attack the algae. More than a dozen harvesters have already scooped some 40,000 tons from the shallow waters close to the town. This harvest must be tripled before August, when warmth and sunlight will induce such overload that vast rot will set in.

"It's a battle we cannot win," said Alberto Bernstein, an architect from Milan who is in charge of the operation. "These algae double every 15 days."

The goal, he said, is to remove some of the excess. That might avoid last summer's debacle, when a drive against algae started late and a carpet of rotting weeds on the lagoon sent foul vapors into the city. The froth spawned millions of tiny flies that invaded the homes and hotels of Venice and on the mainland stopped plane and train traffic for several days for lack of visibility.

Last year, as the decaying algae robbed the water of oxygen, they also killed off most other life, including crabs, mussels, fish and most other plants. Facing less competition, the more tenacious weeds have thus returned this year in greater volume.

While much of the 212-square-mile lagoon and the hundred-odd canals of Venice are meant to be cleansed by sea tides, recent studies have shown that

both sea and lagoon waters are heavily polluted. Two vast chemical complexes still pour toxic material into the lagoon, though they have reduced their waste in recent years. It also receives the raw sewage and household waste of more than a million people from Venice, other islands and mainland towns.

Beyond the lagoon lies the Adriatic Sea, now one of Europe's most polluted waters and suffering its own plagues of microalgae. Last summer, algae and fishkill exasperated tourists in resorts like Ancona and Rimini, and in recent months hotels there have reported a steep drop in reservations.

This week, Rome announced a \$20 million plan to start cleaning up the Adriatic, much of which will depend on dealing with industrial and urban discharge into the filthy River Po.

"Compared with the Adriatic, clean-

ing this lagoon may be simple," Mr. Bernstein said as he was showing a visitor the day's algae catch between Venice and Lido Beach. A dozen harvesters, dipping their mesh noses into the water, brought up the slithery brown and green mass. Barges were ready to ship this to sandy farmlands where the algae, rich in nutrients, would soon be mixed into the soil.

The method may be new, but algae here is not. Records say a 17th-century doge once sent 15,000 men with pitchforks to scoop algae from the lagoon.

Such familiarity may explain why it took Venice more than five years to react to the present green invasion.

"If we remove just 10 or 15 percent, we may begin to restore the balance of the habitat," Mr. Bernstein said. "The algae will stay. They are part of the lagoon's environment."

1 "Now Venice is under attack by giant algae"; 1989, in: The New York Times, June 13, 1989 by Marlise Simons. Ironically, the algae were not giant, such as brown algae like *Macrocystis* or *Laminaria*, but a rather perfuse, smaller green algae (*Ulva lactuca*), which causes much of the eutrophication and "green tides" now fouling Europe's beaches. So-called giant algae, being non-eutrophic, would actually benefit the plant-fish cycles, if present.

3. The Adriatic Initiative, part of the Mediterranean Action Plan, based in Split.
 4. The mandate of the Consorzio Venezia Nuova, which includes all the territory for the Adriatic Sea.
 5. The project of Telespazio to conduct systematic and timely AVHRR and Landsat monitoring of the Adriatic as a whole.
 6. Initiatives of the European Space Agency for comprehensive Mediterranean monitoring.
- The chief director of the UN Environment Program Regional Seas Program has been a Croatian Yugoslav named Stepan Keckes. We have been asked by UNEP officials to submit our work to him, and to his successor, a Dutch scientist.
2. The objective is to assure supplies of fuel that are not polluting, either directly or through planetary warming, and are readily replenished.
 3. Ocean Earth has pursued this objective as part of its founding papers, since 1980. It therefore has a clear conception of what is required for a successful primary-sector development based on marine biology. Ocean Earth believes that what it thinks is required in a biological ocean industry would conform with what the MITI thinks is required.
 - a. An efficient rig or system for harvesting, able to keep plants from being torn apart during storms.
 - b. An inventory of marine resources according to regional seas, accounting for all the lands draining into each respective sea, as contributors to its chemistry.
 - c. Satellite monitoring many times per 24 hour cycle to assure timely response to blooms and anomalies.
 - d. Engineering of river outlets and estuaries to increase the stability and fertility of coastal waters — the zone most critical to ocean bioproductivity.

MITI DEVELOPMENT OF BIOLOGICAL OCEAN INDUSTRY "MITITALIA"

1992

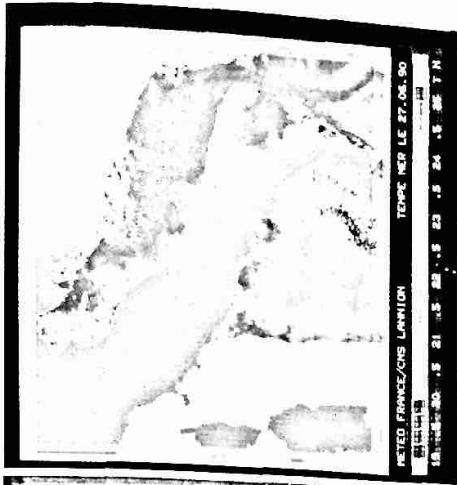
1. The Ministry of International Trade and Industry of Japan ("MITI") has decided to develop a marine algae industry as a foundation of energy supply in the future.

2



- 2-3 Ocean Earth has reached an understanding with the Geographical Institute, University of Bern, to produce a four times daily satellite survey of the Adriatic Basin thus outlined, with software prepared for the project, for television distribution – in both normal and HDTV format – throughout the basin. On-site work has seemed most suitable, further to recommendations from scientists, in the entrance to the basin, visibly distinct along the coast of Albania and up along to midpoint.
- 4-6 AVHRR of Adriatic, showing turbidity, with clarity at the entrance. The orange indicates fresh agricultural growth. The date is from April 1990. Cut out to conform with the figure of the Adriatic Basin: under contract, later, this cut-out would be in the computer. Co-copyright Geographical Institute, University of Bern/Ocean Earth.
- 7 Same AVHRR, showing sea-surface temperature, gradient from dark blue to red. Note upwellings in the center of the Adriatic and along Dalmatian coast, probably quite suitable to macroalgae production. Co-copyright Geographical Institute Bern/Ocean Earth.
- 8 AL/LA parallel project. The entrance to the Adriatic is comparable with the coastal basin of southern California, affording – for reasons of convenient labeling – the term “AL/LA”, for the Albania/Montenegro/Dubrovnik continuum, in comparison with the San Diego/LA/Santa Barbara continuum. The comparable California current runs from Point Conception to Tijuana. Using the term “AL” is strictly poetic: there is no political-boundary statement implied; and the allocation of an area to “Albania” is no more than that of generally referring to Southern California, for convenience, as “LA”.
- 9 Adriatic Entrance, as imaged in map, as satellite monitored (the data shows the distinctiveness of this slope), with an additional interior basin for consideration, now in Bosnia-Herzegovina.

7



6



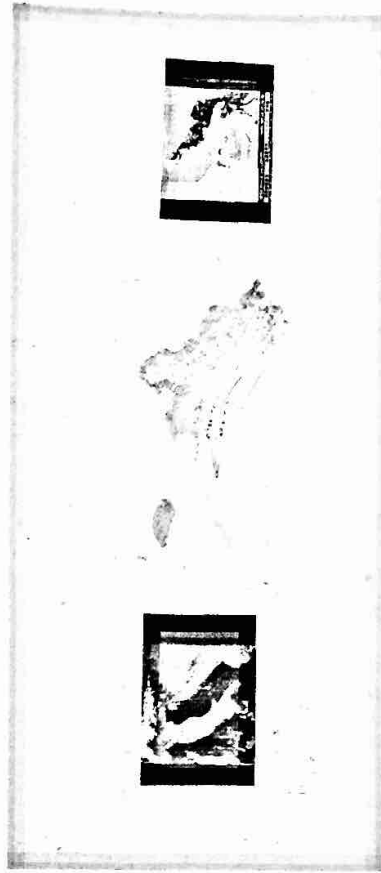
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4



9



8



4. It is not clear how the MITI could proceed systematically with an ocean biological industry, or systematic seaweed harvesting for fuel and raw feedstock, without adopting the ocean basin mapping already developed and advocated by Ocean Earth.
5. Ocean Earth intends to help introduce MITI initiatives in seaweed power to certain areas, together with a comprehensive architectural program based on the seaweed program.
6. Focus is now on Tivat Bay, Montenegro. A venture there could be set within the framework of the Italian pan-Mediterranean policies, with a partnership of companies from Italy and Yugoslavia together with Ocean Earth. How, amidst this, might the MITI be involved, and benefit?

PARALLEL PROJECTS

1991

The parallel-project practice, as we discovered recently, is also employed by the foreign-aid ministry of Japan for parts of the underdeveloped world.

Our reasoning for the parallel-project way of doing things is manifold:

- continuous comparison and contrasting keeps one attentive to changes in both
- a certain competition between the two regions develops, so pushing progress in both
- all the lessons and experience gained in one project immediately become useful in a second project, and further evaluation can lead to rapid steps forward in discoveries for both
- if there is political blockage in one, there can be progress in the other, with consequent pressure on dissolution of the blockage.

Other parallel-project plans envisioned by Ocean Earth include:

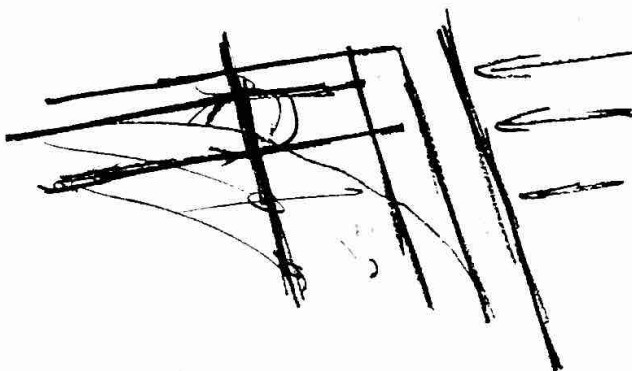
- northern Brittany - southern Brittany (now in practice)
- Persian Gulf - Gulf of California (similar ecological crisis)
- Mongolia - Great Basin (interior Asian and American steppe)
- Athens Bay - Tokyo Bay
- Adriatic lagoons - Black Sea lagoons
- Megalopolis: Boswash - SanSan - Tokyo-Osaka

AL/LA SLOPE

1991

The chief geological fact about "Los Angeles" - viz., the LA Basin - and "Albania" - viz., the Adriatic coast from Korfu to Dubrovnik and Vis - is that both are slopes towards the sea. Both are slopes on one direction only, with a bend to the west as one progresses north. Both are rather steep. In addressing these two regions, we address questions of SLOPE.

This structure of this slope, for both sites, appears thus:



What does it mean, kinesthetically and therefore architecturally, to live on a slope? How does it feel? What does it do to a personality? We all know from books like Architecture Without Architects and various German attempts at Terrassenhauser, and of course the image of small hilltop-clustered Greek or Italian villages, let alone the fantasy of Moshe Safdie's Habitat, that life on a slope is very desirable. The reasons why are, as Tom Wolfe would say of San Francisco, is that even the slums have a view. Even the slums have sunlight, air and a sense of place. All this is readily grasped in the concavity of Greater Los Angeles. It can also be sensed in the basin around Lake Scutari, held jointly by Montenegro and Albania. This geographical sensation, this genre of siting, we wish to exploit.

OBSERVATION OF LA BASINS

1991

The vital decisions for Los Angeles, which directly affect the physical survival of Los Angeles, include:

- whether to build giant bird-attraction marsh works in the San Joaquin Valley west of Sacramento;
- where to build spiral-ramp river sops among the tributaries of the Colorado River, to increase the inflow available to the Colorado Aqueduct;
- how intensely to plant kelp farms off the coast, given their production of high-pressure zones that reduce rain;
- whether and how much to work with the Snake - far north - before it would feed into the Columbia;
- over which freeways straddle structures can be built without breaking up air circulation throughout the downtown network (Century City, Downtown, Long Beach).

All these can be answered with time-sequenced satellite imagery.

The main questions are hydrological and metabolic, and the areas covered are all the basins from which waters feeding the LA slope are drawn.

1. LA slope, including the Los Angeles River and San Diego.
2. Great Basin, including Owens Lake and other reservoirs, now dry.
3. Colorado River Basin, the entire Gulf of California Basin.
4. California Current north, including the Central Valley.
5. Oregon / Alaska Current.

WATER REGIONS OF LOS ANGELES

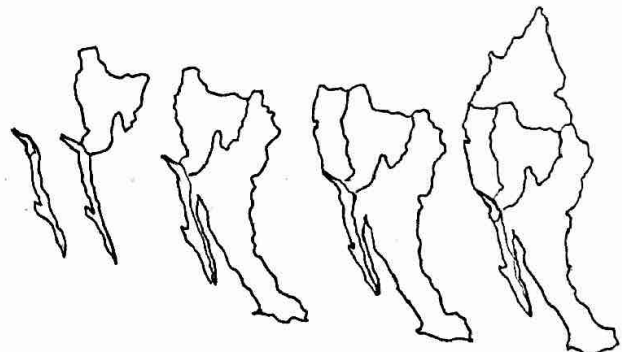
Slope

with Great Basin

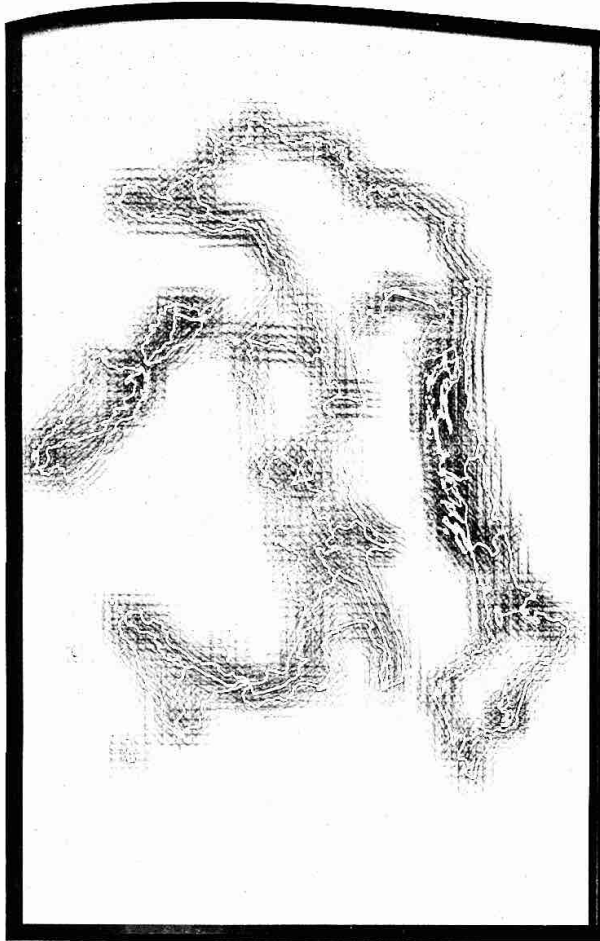
with Gulf of California

with California Current

with Alaska Current as well?



10



11

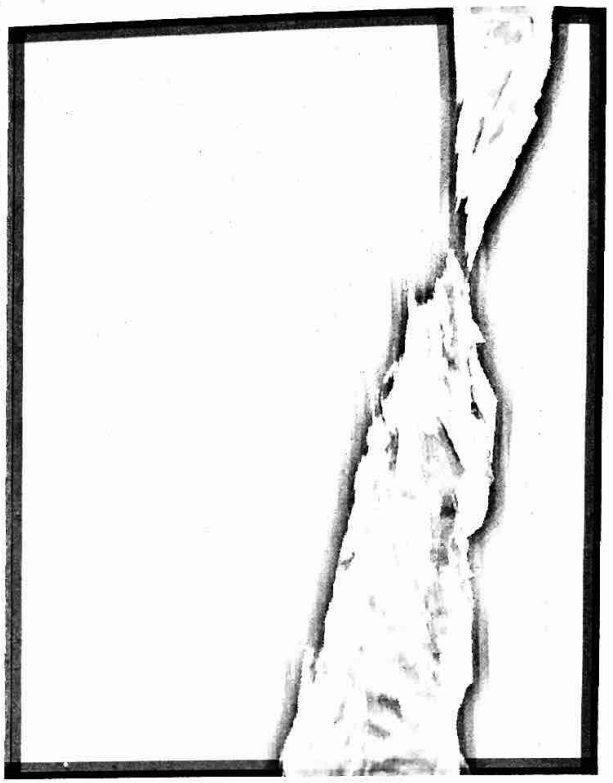


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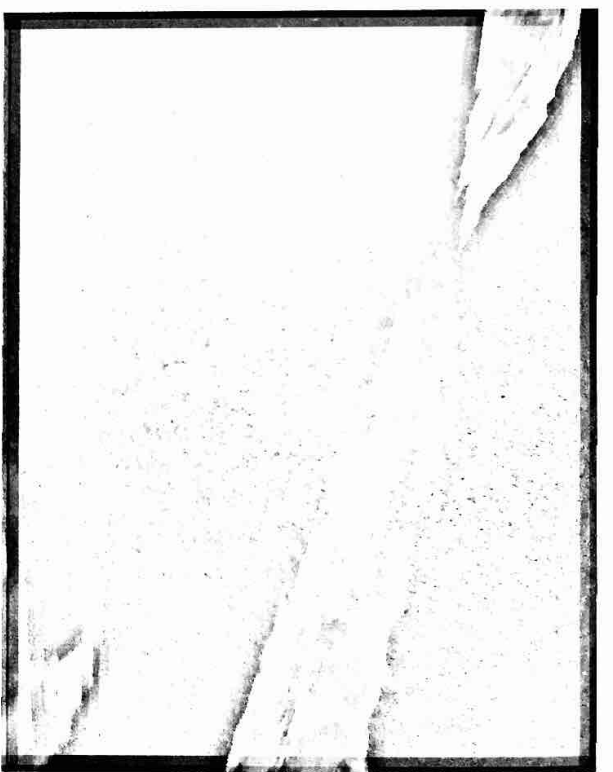


- 10 Satellite Hydrology Monitoring Chart for Ocean Hydrology Basins of the Italian Region.
- 11 Mediterranean basin. The subsets of this large unit, the basins of respective seas, appear in the right rear of Image 12. They are: Western Mediterranean (Ligurian/Tyrrhenian), Adriatic, African Sahara (Libyan Basin), Nile, Levant, Aegean.
- 12 "Basin As A Unity", from Site Simulator Show at American Fine Arts, Inc. 1991. Collection of Barbara and Howard Morse. In this version of the Adriatic all the endoeric, or inward-draining, basins have been removed, even though they apparently release water to the sea by underground flows. The basins can be seperately managed.

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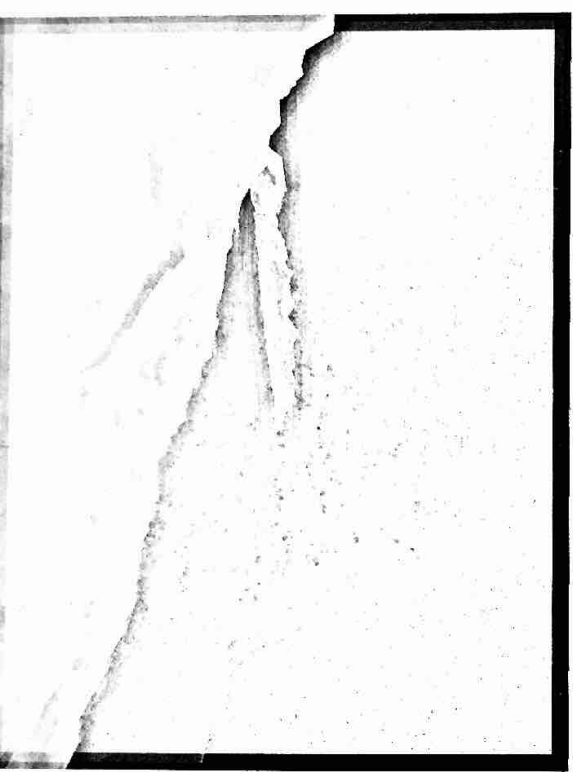
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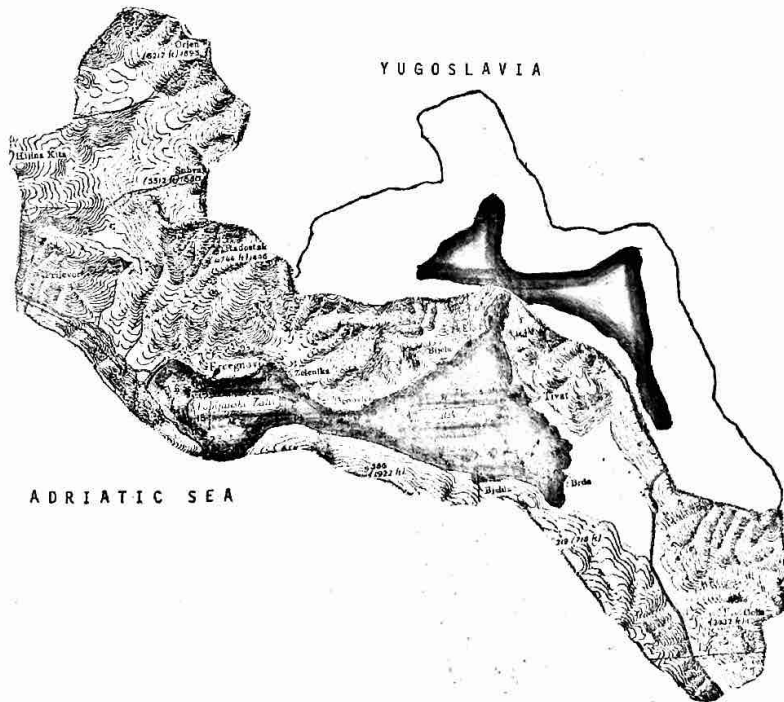
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13-16 Three dimensional site simulation studies by architect George Chaikin, based on digital topographic data combined with an adjusted-floating-data Landsat TM (30 meter resolution) scene of Tivat Bay, Montenegro, further to an Ocean Earth contract proposal for these entire enclosed bay. As scientists and architects in France and Italy have reasoned to us: the site is a land-sea microcosm.



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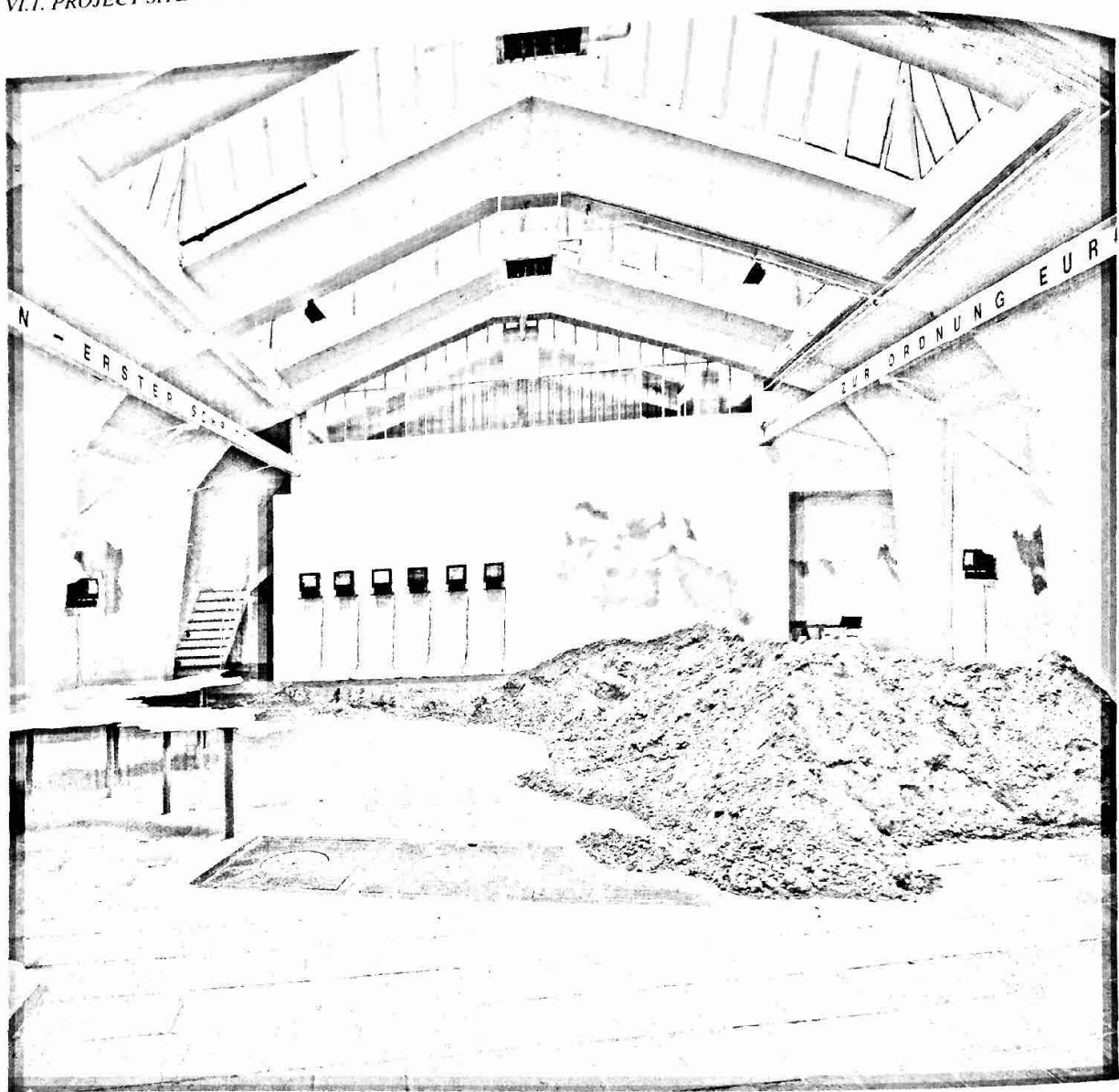


First contract site of OCEAN EARTH

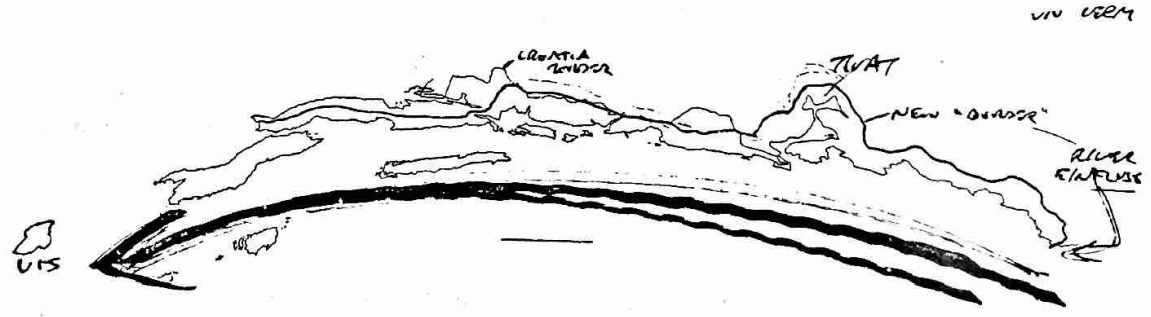
17 Satellite data (Landsat) of Tivat Bay, 1991.

18 In relief, the basin of Tivat Bay, area for Site Simulator 1991. In outline, the remainder of the fjord complex, Boka Kotorska (Kotor Bay), now the subject of planning for postwar development.

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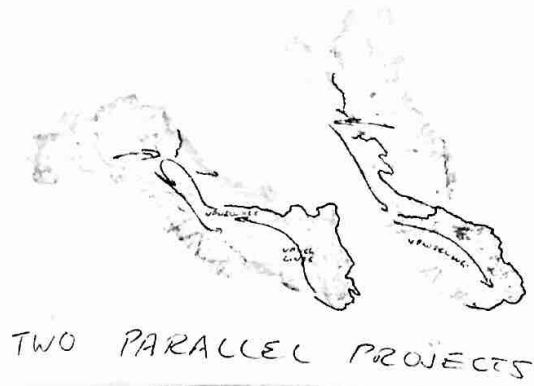
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19 "Means To Wealth", with focus on Albania and the Adriatic, as well as daily observation of the North Sea. Installation shot, Gallery Tanja Grunert, Cologne 1992.

20 If a project in Tivat Bay succeeds, it can be extended readily throughout the coast sloping into the entrance to the Adriatic: from Albania through to Vis. Remarkably, this coast is narrow. It has little influx of river waters. It can be controlled and monitored easily. The system is little more than a throughstream from Albania, which - as we have suggested - can quite easily be administered to avoid pollution. The outcome is an ocean current which is relatively uncontaminated, relatively coherent and highly accessible to the people residing there. Thus we would hope to extend.

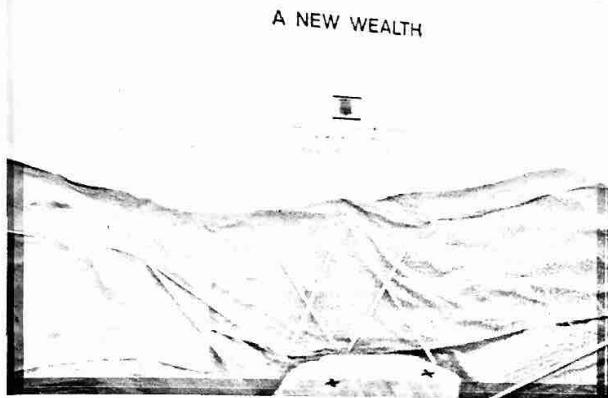
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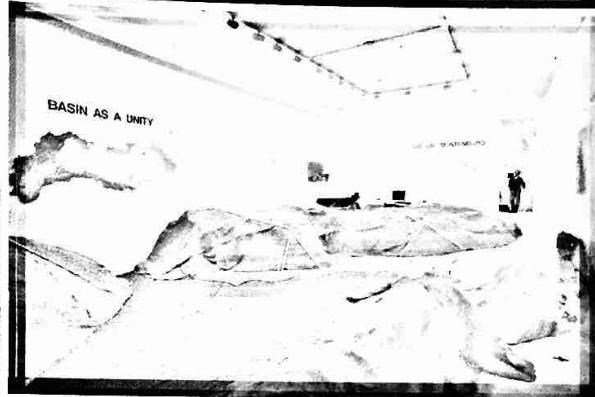
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- 21 "Two Parallel Projects", 1991. Parallel of the Adriatic Entrance and Southern California, then of the entire Adriatic and entire California Coast. A critical question is whether *Macrocyctis* algae native to California could suitably grow in the Adriatic. Temperature and oceanic conditions are parallel, at least down by the Entrance and eastern coast.
- 22 Dalmatian coast under scrutiny of Landsat, part of Ocean Earth analysis of coastal ecology with Landsat data, also presented with "Site Simulator" for Tivat Bay. Data from June 1991. Photo courtesy Esther Schipper, January 1992.
- 23-24 Scenes from 1:1000 scale "Site Simulator" for Tivat Bay, to induce construction throughout the Bay, with simulation of infrastructure along substrate of hills. Works and project for Tivat Bay altogether, Collection Barbara and Howard Morse.
- 25 Housing, which Kevin Gannon and Peter Fend were invited to consider afresh.
- 26 Cultural and religious presence of three religions, affording an ecumenical approach to development. A Yugoslav architect proposed construction, through Ocean Earth, of a "House of Four Religions" (including Judaism). In this frame appears two (different faith) monasteries. The site has been known for its relatively stable mixture of different ethnic groups.

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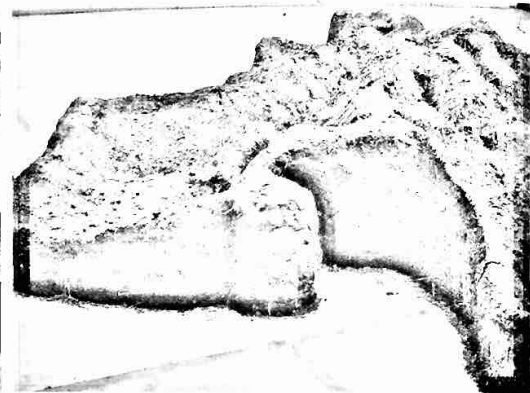
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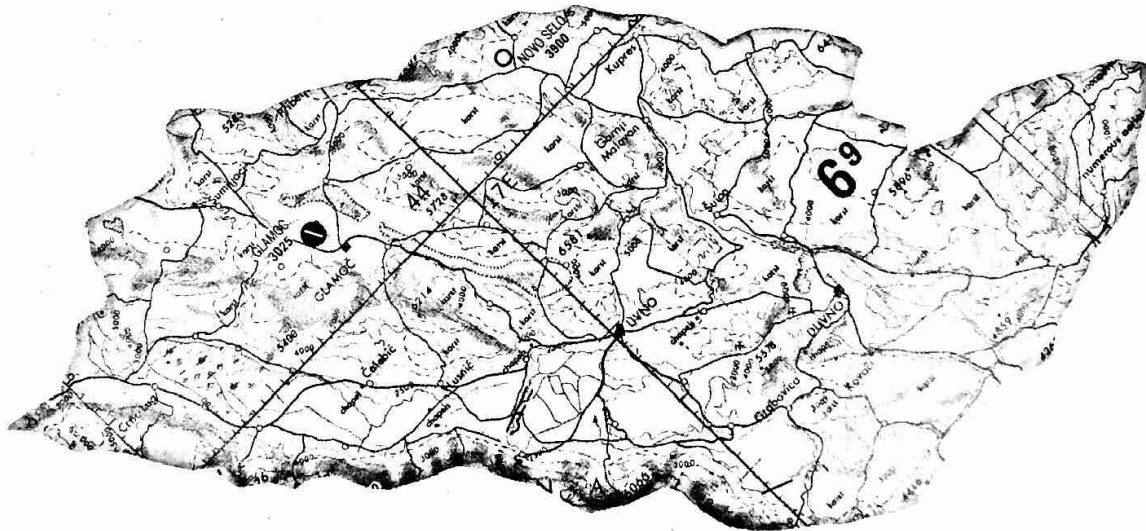
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- 27 Salt marshes and pans, which we anticipated changing with spiral structures.
- 28 Algae fields, which could be richer.
- 29 The structure, exaggerated, of the Albania or Adriatic entrance. Note the concavity of the Kosovo Basin: this is remarkable. It is quite rare to have a relative lowland nonetheless drain over a high mountain range to the sea on the other side. This means that there has been some violent blockage. Scientists in Trieste have told us that probably there are large fossil-fuel deposits there... which may explain the current geopolitical focus on the region. Installation shot of "Ocean Earth Enters Graz", Neue Galerie am Landesmuseum Joanneum, Graz 1993.
- 30 Detail of the Kosovo Basin as it drains to the Adriatic.
- 31 Interior basin, of Grabovica. This is one of at least a half-dozen inward-draining saltwater basins in Yugoslavia. Each basin could be treated as a unit for comprehensive ecological development, effecting the logic in "Great Western Saltworks". In only one other country does such a basin occur in Europe; in Italy the basin of Fucino.

ADMINISTRATION OF THE ADRIATIC.

Architecture obtained from recent art, fulfilling the maxims of Alberti for clean air and water, yields an integrated materials program for all of a region sloping into a Sea.

Giant quantities of biomass accumulating in the Sea, when harvested and fermented according to paradigms from conceptual art, produce enough clean-burning gas to replace all present mineral fuels, fossil or nuclear. Regrowth and exhaust cycles occur within months; there is no net change in the atmosphere. No Greenhouse Effect, no smog, no acid rain, no consequent deforestation or alpine-soil loss – all meeting the demands of scientists, convening in Venice and London during the recent Biennale, to cut fossil fuel emissions 60% “now, or else.”

The entire system is televised from Switzerland. There, panoptic bioproductivity readings received every six hours are integrated with an evolving data base from less frequent but more specific satellite overflights. French data from Toulouse, US and Japanese data from Fucino, baseline Soviet high-resolution data from Munich, all flown in by the new Swedish JAS supersonic fighter to central processing (Bern/Zurich/Geneva) or to research centers conducting specific projects (e.g., Udine, re agricultural runoff, or Venice, re congestions of green algae for harvest in lagoons, or Zagreb, for sea circulation), allow timely production of video-recorded, multi-spectral, multi-sensor, multi-temporal reports – ready for TV release from the point of raw (“clean”) feed, Geneva, and subsequent commercial broadcast, Milan.

Backing up the system is a new Swiss military (i.e., territorial protective) policy. The chief threat to the country is recognized to be airborne pollution, causing destruction of the forests; surveillance of sources requires (as Swiss law now mandates) going beyond borders. A Space Force is conceived, combining aggressive surveillance with public exposure, for all of Europe – in liaison with ground stations in Sweden and Norway. The JAS, highly maneuverable and low-cost, conducts on-command reconnaissance and, where welcome, pinpoint wilderness site bombing or nutrient-canister air-drops – for ecological revitalization. All imagery are real-time processed according to visual-field studies of Sharrits and Lewitt.

Offshore, the accumulation of eutrophic algae has long been a “problem”: it cannot be harvested fast enough. With a reduction in upland use of fertilizers, then introduction of larger species of algae, with metabolisms more conducive to fish, the nutrients are taken up by larger fronds, in deeper water, for better access. Circular rigs holding the fronds, since rotatable, reduce storm damage. Movable holdfast rings, based on concepts from Acconci and Oppenheim, allow for weekly harvests – automatically, or in labor-rich countries, by divers – with no reduction in rates of solar energy conversion. Not only is gas obtained; also, fine chemicals and, given their correlation with the larger sea plants, an abundance of fish. A concentrated soil industry forms, in open seas.

Onshore, fermentation systems produce biogas without a net addition of carbon load to the atmosphere. These are joined with reverse systems for production of micro-cellular organisms – known in Italy as bioproteins – from mixed gas outflows of combusted urban wastes. The organisms are supplied chiefly to fertility zones throughout the Basin, singled out by satellites as reduced-activity marshes or estuaries, for uptake through the food chain into nutrient transfer systems of migratory animals. Haacke identified this as Live Random Airborne Systems. Consequences of buildup extend beyond the Adria-

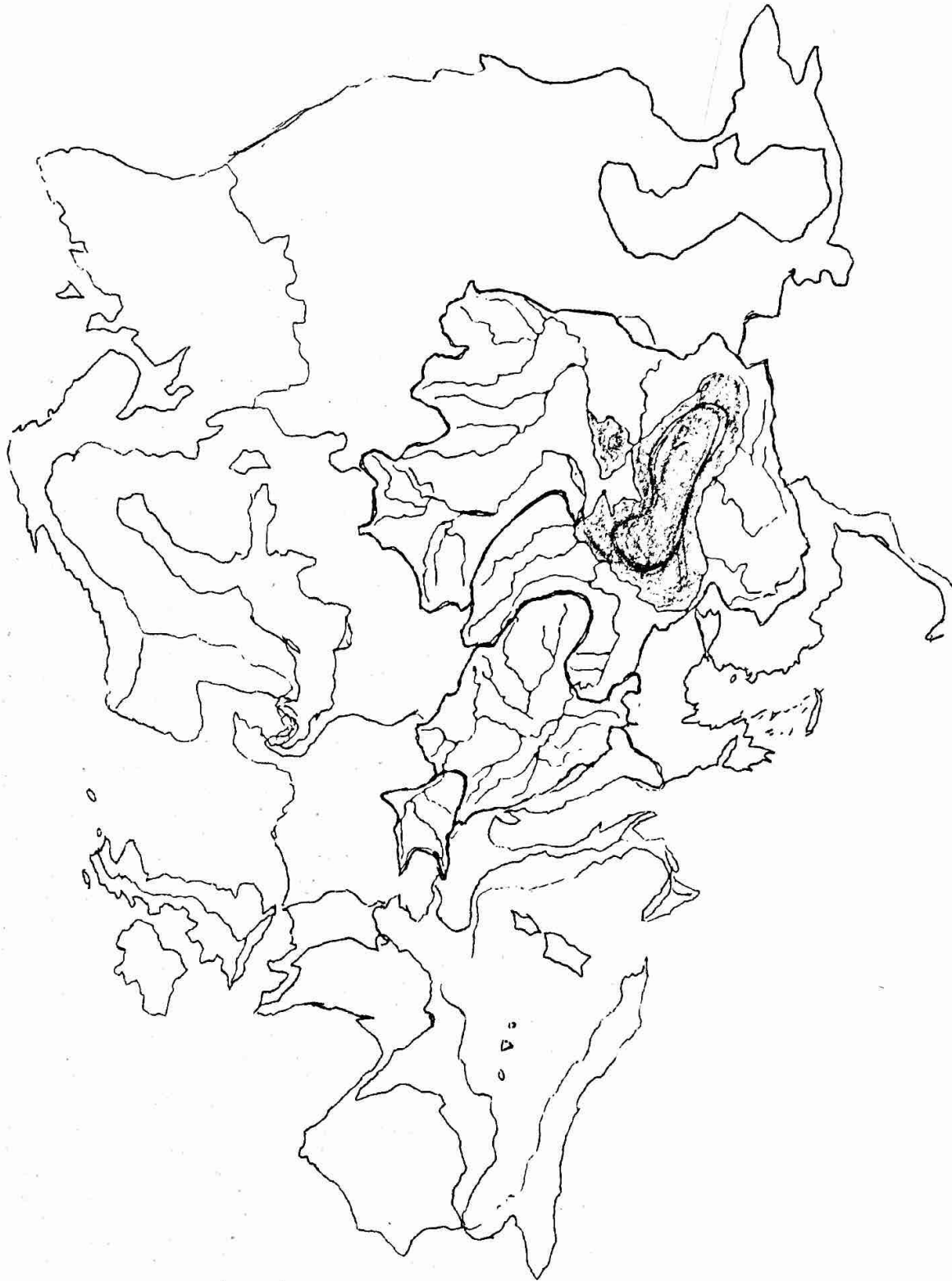
tic, linking it up as part of Europe with Africa. The governing paradigm for biochemical engineering is Joseph Beuys’ Fat Corner, which mandates that all life-assimilable materials downgrade to and upgrade from a hydrocarbon phase.

Upland territories revert to what a young Venetian woman demanded recently: a return to the ancient role in human society of “caccia”, of savage life on savage land, in concurrence with, and social hunting or fishing upon, higher species. The habitat is returned to pre-agricultural vitality. Harvestable yields per hectare per year increase. The military “campaign” is re-defined. Further to requests made by governments of Algeria, Iraq and Iran, we show with procedures from Arte Povera how the integrity of territory can be secured with systematic surveillance and predation upon wild species in no-man’s lands. The bulk of farmed land, until now directed to inefficient and anti-ecological feeding of domesticated animals, reverts to the wild. Those in the military can do as “savages” did: get the game. Marshlands, linked with each other along migratory paths, become factories of bioproductivity; as seen by aerial sensors, they are vibrant color fields, the prime regional indicators of wealth: habitat regains its one-time vigor. Land-use patterns of domestic agriculture, a prime cause of recent climate and ocean decline, greatly reduce in area. We start in the lagoons near Venice.

Current metropoli, notably Milan, appear as sores on the evapotranspirative fabric. Delivery of gas and rawstuff from the sea, joined with marsh expansion and micro-organic feeding, all within a transport system that generates no pollution, instead accelerating plant growth, fosters construction of entirely new infrastructure. Highways, when organized together with the new ocean-output lines, chiefly gas, form a capital-generating spine. The megastructural linear cities first conceived by Futurists, and most popularized in the 60s, become both ecologically and economically feasible as air rights above transport routes, made verdant by ‘emissions’ from biogas engines, effect a low-cost, rapid-traffic response to sprawl. “Strip development” evolves into mega-skeletal development, affording a proliferation of “architecture without architects” using a “raw loft” as substrate-for containers, tents, graffiti, plug-in fixtures and modules. “Buildings” are superseded by armatures. Sometimes they course over terrain; often, more efficient, they are wedged into the hills, above the flats, like ancient cave settlements. In this Basin, three corridors intensify along three slopes near flats: Trieste/Venice/Verona/Brescia/Milan; Rimini/Bologna/Turin; along both coasts. With lightweight canopies supporting vegetation over the gas-conveying frames, cities become oxygen-rich forests, more concise, less interfering with the movements of animals in their prairie or marsh habitat.

Integrated soil administration, exhibited to the public by daily satellite imagery, is financed by taxation not on income which requires that people make work – but on the consumption of primary bioproductivity. The satellites report on productivity; year-to-comparisons follow; both the administration and the public can see how the infrastructure and harvesting systems, with their costs, are drawing upon or increasing the Basin’s biological strength. Taxation can be set as a price for consumption of a primary index resource, possibly just the biomass yield from the soil concentrated in the Sea. Public finance thus promotes efforts towards energy self-reliance (e.g., direct solar or hydrogen), conservation and architectural innovation.

Appeared in Flash Art, Nov/Dec. 1990, “True Stories.” Led directly to contract talks in four Yugoslav republics, 1991. Historical liquidity now centers attention on Istria.



32 In the full peninsula that is Europe, extending from Gibraltar to the Urals, the Black Sea Basin appears as it is: the largest basin in Europe, both physically and – as important – demographically. This enclosed and endangered ecological unit houses 160 million people. We display here possibly useful subdivisions: Danube Basin to just beyond Vienna; Danube Basin to just beyond Belgrade; Western Black Sea basin, receiving several times more runoff than any other part of Europe, demarcating just beyond Odessa; then, at last, the entire Black Sea Basin, enclosed at Istanbul, ultimately a subset of the Mediterranean.

VI.2. PROJECT SITE: BLACK SEA

OCEAN BASIN MODELLING AND
MONITORING PART Ia: BLACK SEA

1989

[Excerpt from paper filed at "Towards the 21st Century: Global Monitoring and Assessments" conference, Venice, Italy, 1989.]

BLACK SEA BASIN

The best known episode of satellite observation probably was Chernobyl. Aside from, of course, being subject to state pressures and errors of rushed release, public exposure of the Chernobyl disaster was neither sustained nor systematic, and fundamental consequences of the disaster, let alone knowledgeable deliberations on what to do about it, have not been recognized.

When one situates the site within the context of the Pripjat River, which feeds into the Dnieper, and in turn arrives among the saltwaters of the Black Sea, one asks: what are the effects downstream? And when one keeps track of the changes occurring at the site from before the disaster through the year following, the River becomes a central question. It appears from the visual evidence that the affected reactor lay directly along the center-line, the axis, of a meandering river, directly in the middle of whatever might be the greatest pressure of muds and waters from upstream. Simple charting of the river with a map, and of the meander breadth with the famous Landsat imagery, shows this. [Image 14]

More revelations follow. The well-known black streak running southwest of the affected reactor is not attributable to smoke, as common public analysis reported, but is in the site itself, and is precisely perpendicular to the axis of the river, which impacts first and most directly on the affected reactor, rather than the other three reactors of the Chernobyl complex. During six months after the disaster, very large constructions of concrete were built upstream and downstream from the affected reactor, for about 30 km along the axis of the river. Further efforts were made to divert the Pripjat completely around the reactor complex and the excavation just downstream, apparently to prevent gravity-borne pressure, most acute during spring floods, upon the reactor site, which in turn is weakened and made prone to shifting by the cavity of the reservoir. The entire four-reactor complex was built on an artificial landfill, not on solid ground, in violation of conventional rules about architectural siting. About a month after the disaster, Landsat data revealed upon analysis a large discoloration, apparently due to applications of a petroleum-based material to keep waters that might be seeping up from reaching the surface (and only partly, perhaps, as alleged, to keep rainwaters from percolating down through the contaminants to the ground water). The discoloration spreads in an arc immediately upstream from the landfill and its four reactors, as if to block any further seepage tending to loosen the landfill from its site. Thermal-band studies of the reservoir show that its circulation of hot waters from the reactor caused a substantially higher temperature in the separated part of the reservoir immediately downstream, so that the bottom of the warmer side would tend to ooze and slide more than the bottom farther away. The largest new concrete constructions plugged in since the accident, including one nearly 200

meters long, lie immediately downstream from the two cavities that were excavated to hold water, and they follow a line upstream and downstream from the affected reactor.

All this suggests that sections of the landfill could settle, shift and separate. With the movement of muds and groundwaters, let alone the tendencies of the surface meander to leave its constructed track, particularly against a relatively unstable and weak cavity of the reservoir just downstream, soils and rocks placed between bracing piers set perpendicular to the course of the river, as is normal, could settle. Groundwaters could then seep to the surface, further shifting could occur, and the pipe fittings supplying the cool water required both for turbines and for stabilizing the reactor temperatures would not work properly. Visual evidence of the alleged "smoke", actually an anomaly on site perpendicular to the river course, lies directly at the affected reactor. We may conjecture that waters were rising precisely there; plumbing into the reactor, precisely there, would not be secure.

The maladjustments of water supply explain what authorities have told us: that for weeks before the disaster the reactor was over-heating. The structural difficulties set the stage for what happened next: a sudden cutoff in the cooling-water, steam-water balance, leading the reactor to overheat and explode. It appears that the "fault" for Chernobyl, although perhaps immediately including hurried and desperate attempts by the allegedly guilty "workers on site" to shut down the reactor, was more fundamentally the decision of central planners and architects to build four reactors in the center of a riverbed of a meandering, marshy river – out of the way – so that a large cavity could be dug out just downstream to allow for recyclable supplies of steam water. Architects know that unstable foundations, such as that of the Chernobyl reactors, are likely to settle and shift. This would disrupt the pipelines supplying water to the reactors. It is well understood in the architecture trade that landfills atop river beds are unstable, particularly if accompanied by lengthy diversions of the surface river, as here at Chernobyl, to induce a natural meander tendency to turn back from the diversion towards the river axis, beneath the landfill. Even if a surface river can be contained, there remains yet the subterranean river flow.

We conduct this inquiry less to discover who did what than to help identify what, if anything, is to be done. According to news reports, the reactor will be "live" for about 100 years, and the concrete now encasing it is expected to be solid, unbroken, for about 50 years. This raises questions about what to do around 2035. Also, given that the spring floods of the Pripjat River seem to have already caused some dislocations at the Chernobyl landfill, what prevents further floods, with ensuing oozeings of mud, from starting to break up that concrete encasement and the nearly-floating structures around it? A question arises: is the Pripjat being safely and permanently channeled away from the reactor site, such that under no circumstances, under no springtime or meander conditions, would it suddenly shift again and undermine the landfill? A still larger river diversion, outside the river bed altogether, may be in order.

Given our basin approach, we ask about the impact on the entire Black Sea, both through the Dnieper stream itself and

Black Sea Under Attack by Pollution, Destroying Its Fisheries and Resorts

Continued From Page 1

Black Sea countries — Bulgaria, Romania, the Soviet Union and Turkey. Newly published surveys show that every town, industry and river along its shores uses this land-trapped water as dump and sewer.

More than 50 rivers and streams deliver waste from a catchment area of 160 million people. The four largest are the Danube, the Don, the Dnieper and the Dniester. They arrive here after sweeping through a region now recognized as one of the most polluted in the world.

Scientists say that every year these rivers carry many tons of toxic materials — oil, lead, phosphorus, nitrates, chromium, cadmium and others.

Fallout From Chernobyl

In spring, when the melting snow washes the land, the river waters from Chernobyl, especially the Dniester, carry

Communism's collapse permits new study.

radioactive fallout from the 1986 nuclear accident at Chernobyl.

"I know of no other inland sea under such pressure," said Ivanislav Konov, director of the Soviet Institute for Biology of the Southern Seas at Sebastopol. "This is much more degraded than the Baltic."

Biologists like Mr. Konov who have spent much of their lives exploring the Black Sea say they are shocked and surprised by the collapse of its fisheries and other extraordinary changes in its ecosystems.

At Varna, a small community of summer houses and fishermen on the Bulgarian coast, Atanas Stefanov remem-

bers the time that he and his father hunted dolphins and seals to sell the fat and the skins.

"Our biggest year, we shot 1,024 dolphins," said Mr. Stefanov, who has been going to sea for 35 of his 68 years. "That was 1947. Everybody did it. Of course it's forbidden now."

Only little fish now.

For much of their lives, these fishermen have caught three-foot-long, cavity-laden sturgeon and loads of fat horse mackerel. "Today we get these little things," Mr. Stefanov lamented, showing a pot full of small scud.

Aboard the Bulgarian research vessel Akademik Hinko Kisarov said that the crew still spots dolphins, but that the other mammals, the seals, have disappeared altogether. And like creatures in a science-fiction tale, more jellyfish are getting bigger and bigger. "They are now appearing at 30 pounds or more," he said.

Yakov Zaitsev, a Soviet biologist based in Sevastopol, argues that the sturgeon were finished by overfishing. The total catch, he said, dropped from more than a thousand tons per year in 1950 to less than 10 tons two years ago. Worse than that, he said, is the 25 commercial fish species abundant in 1970, he said, today only five are left in commercial quantities.

Mr. Zaitsev says a proliferation of jellyfish has caused part of the problem because they eat the eggs and the larvae of other fish. A new arrival is a plague of ribbon jellyfish, a recent invader that found on the Atlantic coast of North America and probably arrived here in huge waves.

Anchovy Fleets Paralyzed

Whatever the cause of the changes, they are far-reaching. Some two million people live directly or indirectly off fisheries. On Turkey's 700-mile Black Sea coast, fishermen have been hit hardest, and anchovy fleets are paralyzed at Trabzon, Sinop, Samsun and other ports. The Ankara Government says that between 1987 and 1988, the Turkish Black Sea catch dropped all most 95 percent, from 340,000 tons to less than 15,000 tons, and it has declared a moratorium on anchovy fish.

"Nobody really knows why all this is happening," said Umut Uluata, an oceanographer at the Turkish Institute of Marine Sciences. "It may be a combination of overfishing, pollution, climate change and shifts in the food chain."

Geologists say the greatest change in these waters happened some 3,000 years ago, when the Black Sea was still a fresh-water lake but the sea level rose and the Mediterranean spilled through the Bosphorus.

As salt water rushed in, geologists believe, it killed the life adapted to fresh water, and this produced the mass of hydrogen sulfide, which remains trapped in the deep waters beneath the thin surface lid of oxygen.

Nine-Tenths Lifeless

Only the top 100 yards or so is oxygen-bearing water, and more than nine-tenths has such high levels of hydrogen sulfide that it is lifeless.

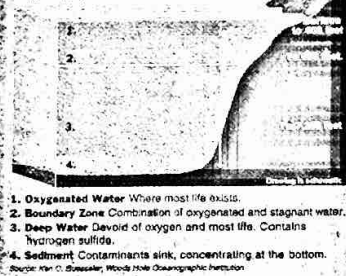
"It's really a geological freak," said David Aubrey, a senior scientist at the Woods Hole Oceanographic Institution in Massachusetts, which organized the first large international Black Sea con-



The Black Sea, once boundless source of dolphin skins, caviar and fish, is gradually falling victim to pollution. Hinko Kisarov, aboard the Bulgarian research vessel Akademik, said that the crew still spots dolphins, but that the other mammals, the seals, have disappeared altogether.

A Sea Starved for Oxygen

Pollution and algae bloom caused by toxic runoff from nearby mountains are choking off the oxygen supply in the Black Sea.



ference in October in Varna. "If you put a piece of metal in deep enough, it will come out black. If you turned the Black Sea over, it would smell of rotten eggs."

"In this fragile setting," Dr. Aubrey added, "man has now created an environmental catastrophe."

The mass of hydrogen sulfide and methane is sealed off by the lid of oxygenated water. Scientists say that if the sea "turned over" because of an earthquake or a chemical upheaval — something that they call unlikely but possible — the escaping gases could kill people on the shore.

Sea Receives Less Water

Modern change began 30 years ago with the frantic industrialization along the rivers in Eastern Europe that brought toxic chemicals, detergents and fertilizers. Soviet dams and irrigation projects have diverted so much river water that by Soviet estimates, the Black Sea is today receiving almost one-fifth less fresh water and becoming more salty.

Some scientists believe that the poisonous hydrogen sulfide is seeping up, reducing the oxygen layer and thus causing fish kills. But others blame the detergents and fertilizers.

In the estuary of the Danube, a 70-mile-wide wetland of channels, lakes and swamps, the algae blooms have browned widely in the 1980's.

"By the end of the summer, much of the delta is covered in spume," said Mircea Staras, a Romanian biologist who lives in Tulcea, close to the mouth of the Danube. "When the algae die, everything else is killed," said Mr. Staras. "It's a very important spawning ground for sturgeon, for carp, for pike. We lost all the big fish."

"An Unexpected Bonus"

Radioactive fallout from Chernobyl is being monitored by scientists. They say the signals given off by particles like caesium 137 and strontium are traceable and therefore allow monitors to see how pollutants behave, how long they stay on the surface, how fast or-

ganisms take them up and how the Black Sea mixes and circulates.

It's an unexpected bonus," said Germana Pobjarkova, a Soviet monitor. "The fallout is a problem in the Dnieper water because it is used for irrigation but it is not a health hazard in the Black Sea."

As awareness of the degradation grows, hopes of reversing it are rising up against the reality that the Black Sea countries do not have the

The water is losing oxygen and the ability to purge itself.

means or the political will to change their practices in the short run.

"Even if we stopped all the pollution as if by magic," Mr. Zaitsev said, "it would be impossible to go back to the 1950's. Nature has its own laws."

Cleaning up many areas would cost a fortune. The large and handsome bay at Burgas, Bulgaria, was a popular beach resort until two decades ago when chemical plants were built on its shores. Today the bay is off-limits to bathers, and water and air here look equally greasy and opaque with contaminants.

A new legal framework will be a quantum leap, said Lawrence Mee, of the United Nations Environmental Program. It made a tremendous difference in cutting back pollution in the Baltic Sea, it showed us that the law can work.

Farther south, near Chernomorsk, researchers have found hot spots of uranium radiation along the inlets and beaches that they believe was spilled by a nearby mine. Local guesthouse owners, though, have repeatedly taken down signs warning people to keep away due to radioactivity. They say the signs ruined their business.

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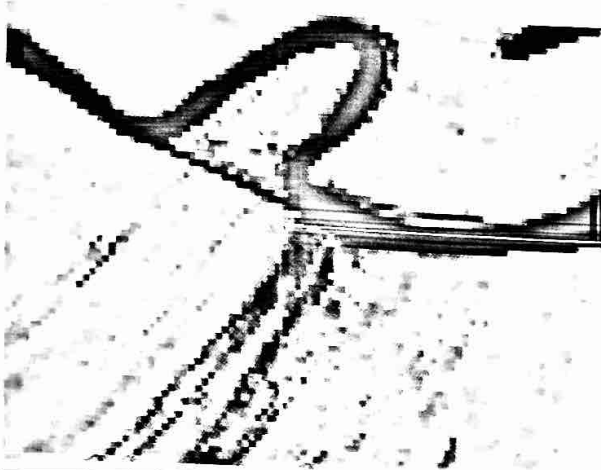
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33. "Black Sea under Attack by Pollution, destroying its Fisheries and Resorts"; 1991, in: the New York Times International, Sunday, November 24, 1991. Since this article, a Black Sea treaty organization has been formed, including all the countries surrounding the Sea, but not including such "land-based sources of pollution" (to use a UN Environment Program phrase) as Austria or Bavaria, and including, entirely outside both the Black Sea and immediately-adjacent Aegean, the Adriatic country Albania. Scientific attention to the Sea and its unique ecology is growing.

34-41 The data analyses from which a videotape was produced, and from which in turn these stills were taken (an image of an image, as derived in turn from at least three channels of digital data for each image as produced), revealed — these relatively unknown facts about the Mouth of the Danube. A great deal of construction has been conducted on the river: here, we see a new canal being built, at least for navigation, to bypass a meander; elsewhere, the straightaways are long, leaving the oxbows cut off. The river shoots out into the Black Sea like a gun. This may in part result from the high flood, hence high volume of through-flow, which had started a few weeks before upstream, during the September 1991 flooding in Austria and Bavaria. Turbidity studies show a dramatic arc, forced into being by the powerful counter-clockwise circulation of waters in the Black Sea, by now with momentum from the inflows of the Don, Dnieper and Dniester. The outflow has been turned 90 degrees to become part of an ocean river. Alluvia apparently are deposited in banks, each aligned with the arc of the southward bearing stream. Behind the sandbanks, behind the alluvial accretions, enough still water can sit. There, appearing as white patches, are fields of algae, probably, given their formation and what we know of the Black Sea, green algae such as *Ulva lactuca*. This algae is unfavorable to fish and stable ocean ecology. They proliferate also in the lagoons near the Po. Observation still closer up, down to the scale of pixels (30 meters), allows for precise inventory and harvesting of the eutrophicating vegetation — for ocean industry.

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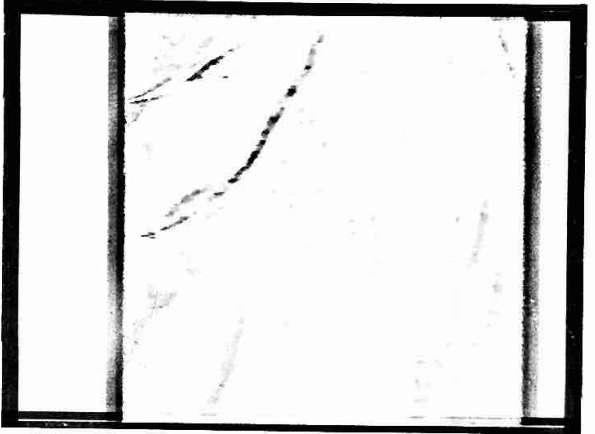
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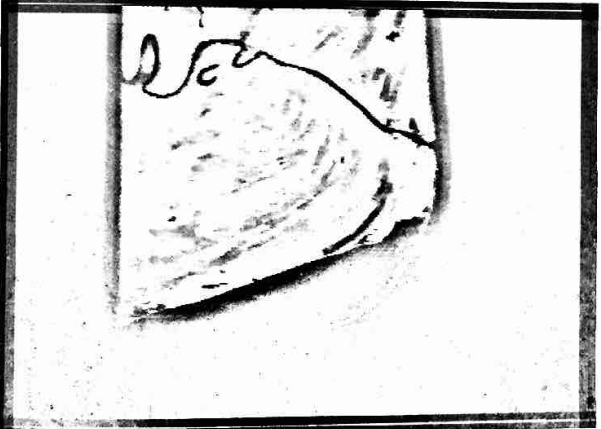
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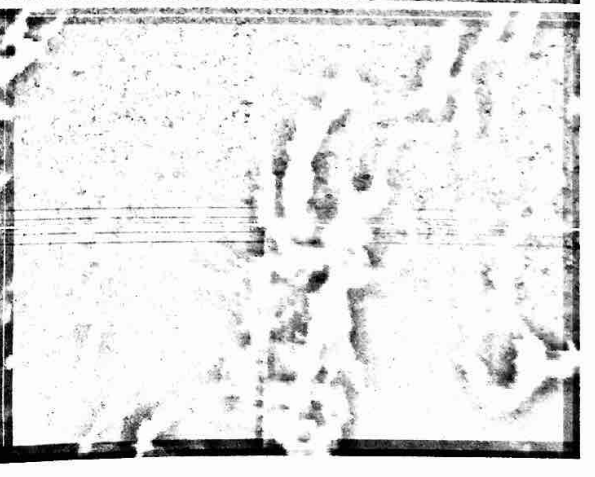
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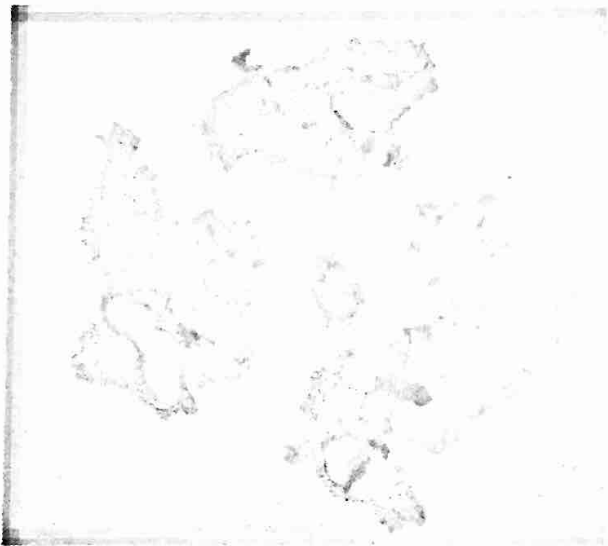
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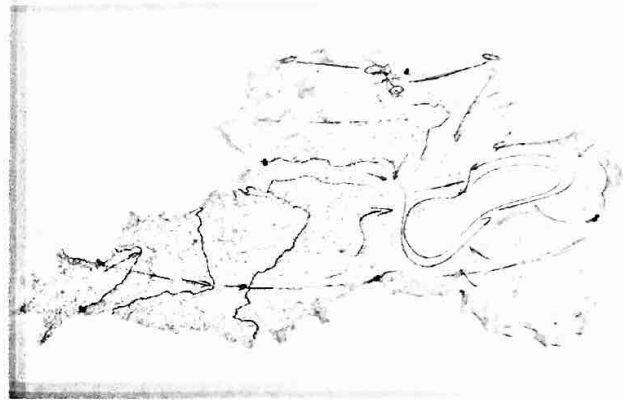
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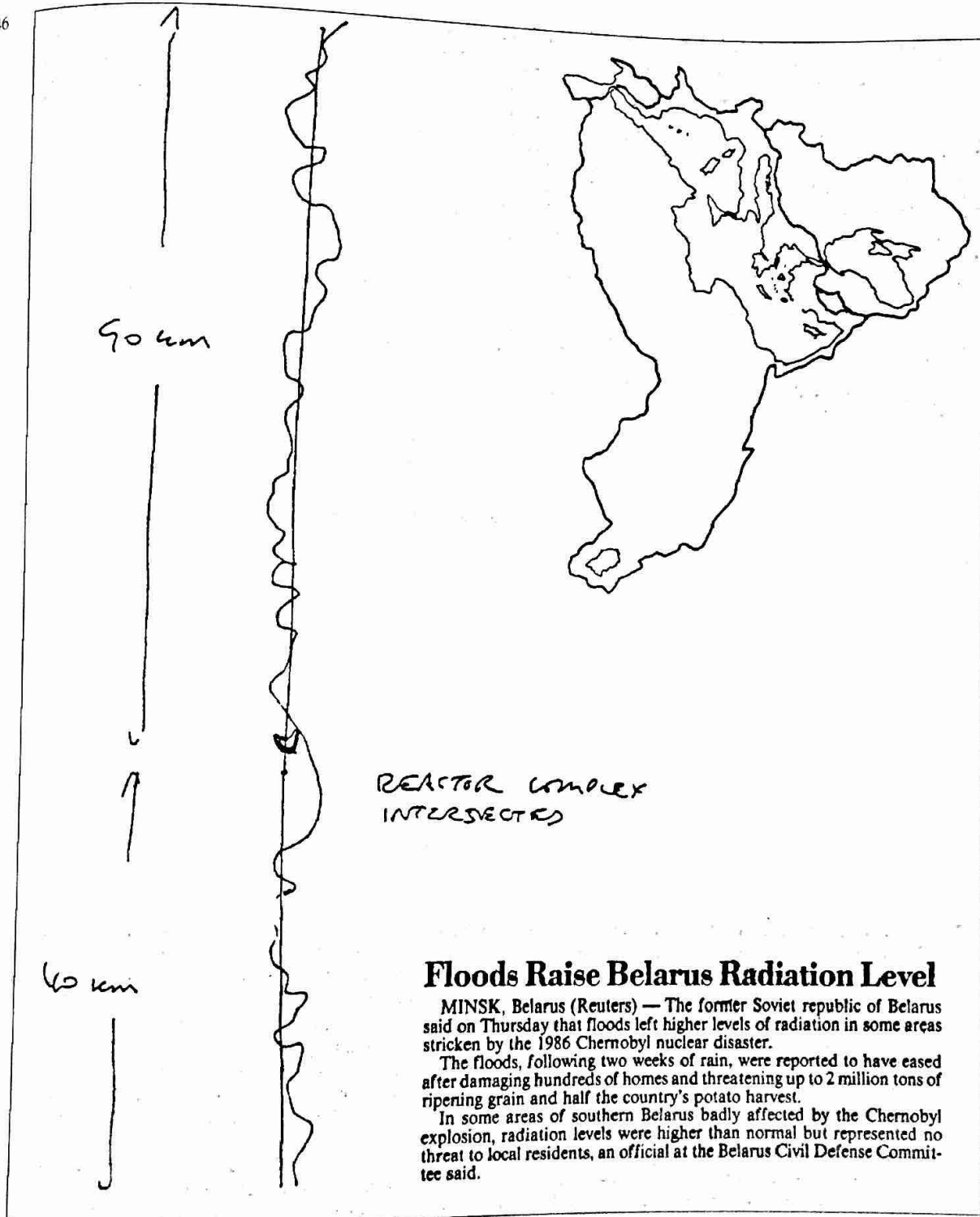
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42-44 A central question, relative to the shift in the karst and glacial deposits near "Stalingrad", is whether to let the Oberdon flow through to the Black Sea or the Caspian Sea. That is, whether to have the Oberdon flow instead, as its direction suggests, into the Caspian. There appears to be an advantage in such a change. The Caspian would become less saline, the Black Sea would become relatively more saline, and danger of excessive evaporation in the Caspian shore would diminish. The catastrophe at Chernobyl may provide an incentive for such a change. According to marine biologists at the nuclear biology research facilities in Monaco, it seems plausible that an increase in salinity in the Black Sea would help reduce the danger posed by nuclear contamination from the Chernobyl site. The piece, which is accompanied by some images from Chernobyl, shows a conceivable strategy for pollution management in response, for the Baltic Sea, the Caspian Sea, the Black Sea, and – as a variable – the Oberdon, which can be split off from the Black Sea basin and added to the Caspian.

45 The resulting Black Sea Basin image, with markings also showing subsets of hydrology and of human activity recently (i.e., war). The Ocean Earth proposition regarding war and migration is that human beings, as animals, are more governed by laws of biology in the context of saltwater basins than they might wish to believe. Note that the limits of the basin conform with many of the historical limits of expansion, for example, in the last World War.

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46 Oceano-hydrological implications of Chernobyl. The drawing, made in 1986 from a detailed analysis of the thalweg (middle channel) of the Pripyat, led to inquiries, starting with the 15 May 1986 issue of *Die Weltwoche*, into long-term physical cause-effect relations at the site. A long-term impact, as discussed with experts from Monaco for nuclear contamination of the oceans, could be throughout not just the Black Sea but also the Mediterranean: above right appears the entombment of the oceans, which could grow worse in the coming decades, appears in the *International Herald Tribune* of August 13th 1993.

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through accumulated effects on other rivers collecting airborne contaminants and draining into the Sea. A scientist at Oak Ridge National Laboratory told us that the saltwater impact is not clear, but that the saltwater marshes receiving contaminated freshwaters would probably function as "a large trap for radioactive material". Does that mean that the trap becomes contaminated, or that, as a scientist at the International Laboratory for Marine Radioactivity in Monaco told us, it becomes a means for somewhat detoxifying the radioactive material? According to the Monaco scientist, saltwaters apparently tend to absorb radionuclides and reduce their danger. This suggestion may be worth testing against the findings of the WHO team that rushed off to the Turkish coast of the Black Sea to test the saltwaters for radioactivity, and by the Monaco scientist's own report that "the fish and birds", the higher species at the top of the food chain in the Sea, are "in bad shape."

But if the Monaco source is correct, then a suitable respon-

se to the Chernobyl disaster would be to relatively increase the salinity of the Black Sea, which is now quite brackish. Given basin modelling, a means to this end becomes evident: cut a channel through the deposit of karst left from recent glaciers which blocks the upper portion of the Don River, flowing southeast, from flowing into the Volga. With that channel built, the upper Don River Basin would be fed, apparently as once before in recent geological history, into the Caspian Sea, making the Caspian Sea, understood by us to be oversaline, more stable, and making the Black Sea, perhaps in need of greater radionuclide-trapping saltwaters, more saline – and more likely to survive what may be an ongoing contamination from upstream.

[As this goes to press, Dr. Horstmann has confirmed the soundness of a scheme to feed more freshwaters into the Caspian, and less into the Black Sea – for reasons, among others, of reducing stratification in the Black Sea.]

OCEAN EARTH ENTERS GRAZ

1993

An Ocean Earth exhibition in Graz is directed not towards showing everything in mind, not towards suggesting every architectural possibility (the city is pleasant enough as it is), but for promoting one industrial change which is possible, necessary and easy to understand.

The promotion of a biogas industry in the Black Sea by converting the automotive industry to gas and by building, in the mountains, river stability systems based on meander and marsh dynamics rather than dams.

The central images for the exhibition, all directed towards reasonable public persuasion, none addressing any of the still-sensitive issues of the Balkans or Austria, would be these:

- satellite imaging of the mouth of the Danube and its immense bioproductivity impact on the Black Sea
- a satellite-data based scenario of harvesting of algae in the Black Sea
- a model of the rig for harvesting of algae in the Black Sea, complete with drawings showing the manner of harvesting and the use of submarines (in effect, a proposal for developing a Black Sea submarine fleet, for economic and not military ends)
- basin plans, i.e., regional catchments, for the Danube

up to Linz
up to Wien
up to Vukovar
up to Belgrade
up to the mouth of the Donau

- basin plans, i.e., ocean catchments, for the entire Black Sea, in several scales, with indications of sites for action
- basin plans for the Graz catchment
- siting and construction plans for meanders to stabilize river flows in the mountains without causing the problems of dams
- design specifications for a Gas Van, based on technology now being developed in France, Russia and Iran
- statement on implications for hinterland, notably in fostering wild animal industry
- design of a commemorative structure for a gas industry to be built in Graz
- if possible, some display of the existing state-of-the-art studies on air pollution and regional planning for Graz proper as conducted with satellite data by scientists in Graz – indicating the readiness of Ocean Earth to cooperate with already-present experts.

- 47 Graz is high up. It belongs to the Alpine range which sends into the Danube most of its volume. Hence it is part of the largest contributor of fresh water to the Black Sea. Control of water results from healthy terrain. This entails stable river flow, without excess runoff, plenty of marshes and sops, large-scale diffusion of migratory animals converging on such marshes and sops: altogether, conditions not often produced by dams. Hence, for the Graz region and the Black Sea generally, we propose construction of convex-disc river control systems, rather than dams, especially high up.
- 48 Graz basin locally: the valley of the Mur, to the border. This could be a pollution-management district.
- 49 As in a mountain valley so in the Black Sea Basin, there are successive levels of elevation. One level, the Mitteldonau, extends from the Eisentor at the Yugoslav-Bulgarian border to just before Vienna. One might call this the Mitteldonau. This includes Graz, and distinguishes Graz and its region, extending to just beyond Belgrade, from Vienna and its region, extending upland beyond the Tauern Mountains towards Munich and Ulm. One might call that the Oberdonau. Here are manageable sub-units within the greater management and resource possibilities of Europe's largest basin, that of the Black Sea. For the Neue Galerie, it is proposed to produce satellite imagery cut-out in basin outline of the Mitteldonau basin.

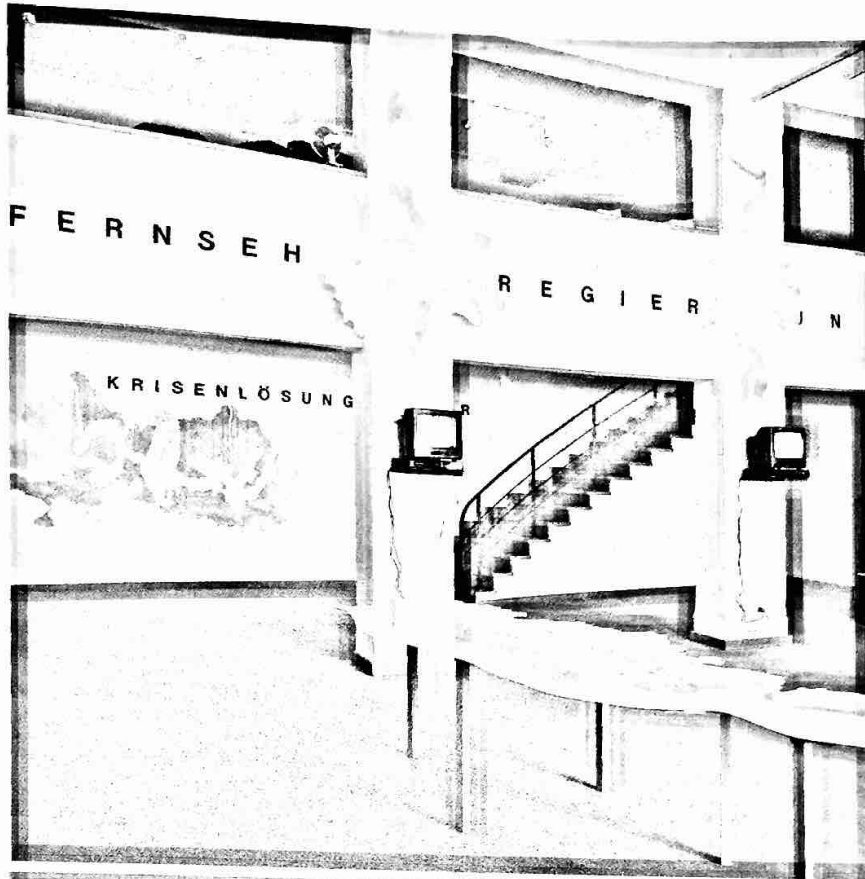
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50-51 Installation shot of "Europa" (Augenhalle), view upon new basin flags for Europe.
Installation shot of "Europa" (Augenhalle), at K-Raum Daxer, München, 1991.



52-53 Installation shot of "Europa" (Augenhalle/Krisenlösungskammer) at K-Raum Daxer, München, 1991.
Installation shot of "Europa" (Augenhalle) at K-Raum Daxer, München, 1991.

VI.3. PROJECT SITE: NORTH SEA / BALTIC SEA

LONG TERM CONSIDERATIONS FOR THE RUHRGEBIET

1981

As there have been conversations with research scientists at Ruhrgas GmbH, who say there is a future within one generation with biogas from, say, North Sea; we proceeded to develop a comprehensive energy-provision and megastructure plan for the Ruhr Basin, centering on Duisburg.

Duisburg and Ruhr policies

- Shift to gas production.
- End coal mining.
- Develop all-gas economy.

Generate electricity, largely for steel arc furnaces, or generate also gases and ecologically-active fertilizers, in massive waste conversion plants that handle wastes of much of the Rheinland as well as the Ruhr.

Build animal-rich marshes at the juncture of the Ruhr and the Rhein, and harvest the marsh grasses to achieve maximum filtering of excess sediments, nutrients and pollutants.

Using structural steel and cable produced in the Ruhr, build those megastructures and office/housing modules which can easily be altered and can very little interfere with the riverine ecosystem.

Increase the steel fabrication industry and build prototype elements of an industrialized, all-steel architecture.

Duisburg and Ruhr progress

End of most air and water pollution, which is caused by combustion and mere presence of oil and coal.

End of remaining water pollution resulting from outfalls of wastes into the Rhine and its tributaries.

End of air pollution resulting from usual incomplete combustion of usual waste incineration plants.

Restoration of biological productivity and biochemical stability in the Rhine and, to some degree, the North Sea.

Buildup of wild animal and plant numbers for eventual harvest to yield superior foods, superior fibers, gases and plastics.

Increase in markets, especially for engineered products, of the steel industry.

Increase in desirable, sunny and airy structures throughout the Niederrhein and northern Europe, starting in Duisburg.

With rapid progress in coal gasification, it is likely that gas from coal will soon be twice as economic as it is now, when it generally costs three times as much as coal per Btu. Shell, Exxon and BP are constructing major coal gasification projects in the Niederrhein and Rhine Estuary. So it is conceivable that coal gas from, say, U.S. coal, would cost only slightly more than natural gas costs now from North Sea fields. The net cost of the coal gas would be less than that of coal: gas can be shipped easily and cheaply, with hardly any price increment for greater distances; gas burns cleanly, reducing maintenance costs and depreciation rates on machinery and bur-

ners; gas does not pollute, so worker morale and health increase, raising economic efficiency; gas allows for smoother, more continuous industrial processes; gas does not require expensive environmental controls, controls which even now the U.S. steel industry says makes the steel business unprofitable. Gas has so many economic advantages that the higher cost per Btu of natural gas or coal gas is not enough to make such gas, even coal gas, more expensive altogether than even imported U.S. coal.

Gasification of the steel industry in the Ruhr will obviously change the industrial landscape. There will be no more coal mines, no more coal barges, no more coal trains, far fewer trains altogether. There will, of course, be far less air and water pollution. Gas pipelines and processing stations will proliferate. And with such heavy industrial use of gas, it is not hard to have a secondary, lesser distribution of gas among offices, homes and light industry. Petrochemical plants based on low-molecular weight hydrocarbons, notably ethanol, can proliferate.

OCEAN BASIN MODELLING AND MONITORING 1989 PART Ib: NORTH SEA / BALTIC SEA

The existence of giant blooms of algae in the seas of Europe is well known. The attribution of those blooms to excessive fertilizer and pollutant runoff from sites far upstream is also well known. What might the public, or even the scientific community, practically gain from seeing satellite imagery showing how such blooms spread and grow? Describing our experience with monitoring of the North Sea microalgae bloom in Spring 1988, which wiped out millions of fish and likely contributed to the immune-system breakdowns of sea mammals, we cite several economic and political opportunities.

In our processing of May 1988 AVHRR data to yield a rather standard brightness-temperature reading, which of course does not "show algae" but only shows that a surface is relatively and anomalously warmer, we – along with a collaborating oceanographer, Dr. Ulrich Horstmann, of the University of Kiel – concluded that waters in the eastern end of the North Sea had very rapidly become 6-8 degrees C warmer than nearby waters, including waters in the shallower Baltic Sea, without an evident relation to water depth or turbidity, with a speed and over an area which corresponded with the known spread of the "killer algae" bloom.

In response to arguments that one could not prove that the anomalously warmer waters indicated the algae bloom, and knowing that enough ground truth evidence might not exist to furnish a "proof", we affirmed that: (1) something is abnormally warm in a portion of the North Sea; (2) the spread within 24 hours from May 15 to May 16 was enormous, conforming with accounts of a near omnipresent spread of "toxins" and death; (3) the relatively warmer waters spread not according to currents or winds, but as an amoebic mass, with a notable exception: (4) such relatively-warm patches of water periodically appear, with one notable exception: (5) such relatively-warm patches of water periodically appear in full-scene AVHRR imagery as drifting along the North Sea current, from where the Thames and Rhine wash towards each other along the Dutch and German coasts to form a larger agglomeration of warmer waters off the mouth of the Elbe.



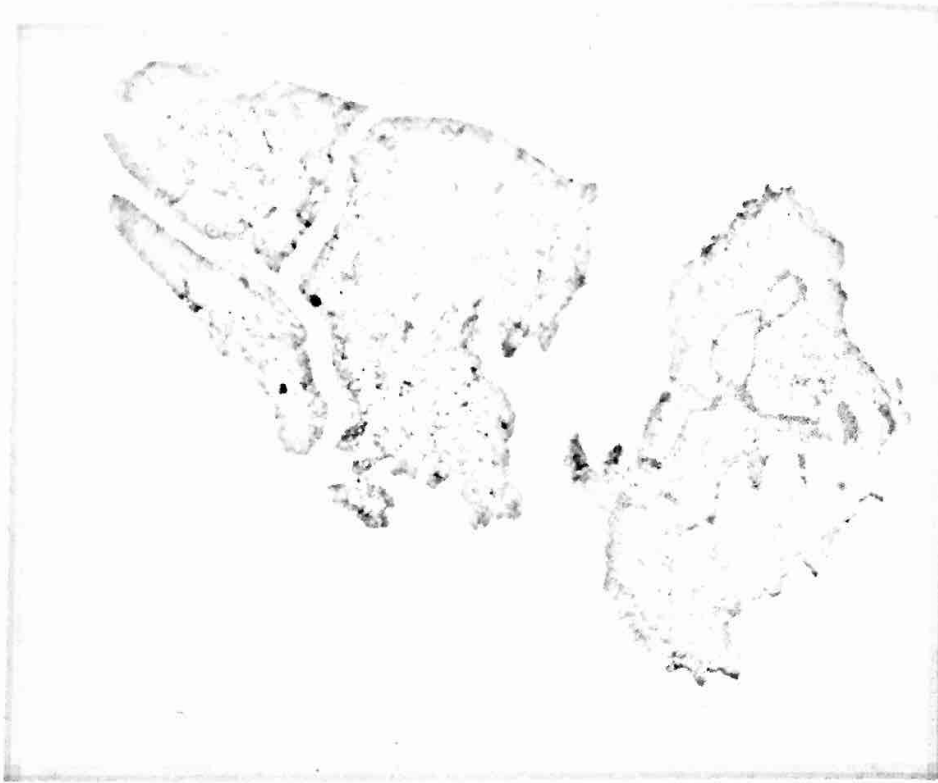
54-56 Raw imagery from AVHRR of the North Sea, May 1988

57-58 Processed imagery from AVHRR of the North Sea, 15-16 May 1988, showing the change in a 24-hour span, an explosion of the algae bloom from the small point where it began. Anholt, to nearly all the waters surrounding Denmark. The green in the water indicates the increased temperature of the sea-surface, about 6-8 degrees warmer than normal. Compare, by contrast, the relatively cooler water of the Baltic.

59 The evident distinction between the North Sea as oceanic system and the Baltic as system helps divide then two watersheds more precisely, at Helsingfor, the narrowest point between Denmark and Sweden.

60 A long-term solution to the abnormalities in the North Sea comes from restoration of normal nutrient outflows from the rivers. In the Rhine,, probably the largest single influence of excess nutrients and contaminants, one can construct marshes and sops for controlling confluence before The Netherlands, of the Ruhr joining the Rhine (its volume is as much as that of all major North Sea rivers combined). The urban pattern changes accordingly. Duisburg Project, 1980.

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- 61 When the Gulfstream arrives at Europe, it splits three ways, one to the north and the Barents Sea, one to the south and the Iberian Current, and one into the North Sea and Baltic Sea. This reception area is a very large estuary. We can subdivide it into the Irish Sea Basin and English Channel Basin, comprising together a primary reception, and from Calais-Dover on the North Sea Basin, with a transition point amidst the Belt of Denmark into a further oceanographic unit, the Baltic Sea Basin. Ocean Earth, on reviewing numerous satellite images, has decided that most of the Kattegat, between Sweden and Denmark north of Helsingor, is oceanographically part of the North Sea.
- 62 Sequence of images of the North Sea Basin showing various hydrological subsets in which Ocean Earth has been or is soon to be involved: Ijselmeer, Niederrhein, Rhine and Ijselmeer, the Elbe, the Weser, Elbe and Ems, converging on Helgoland and shooting the NorthSea stream northwards, the entire circulation of that North Sea Stream. The Rhine is by far the largest influence.

There, a new stream of pollutants arrives from Hamburg and the Eastern Bloc, and the agglomeration includes points 10 degrees warmer than surrounding seas. We have observed these problems at laboratories near Hamburg; they resemble what we have seen off the coast of New York. Apparently the waste stream induces a series of chemical reactions anomalous to the processes of the ocean. And the locus of those reactions acquires an identity, a cohesion, of its own. Like a billiard ball impacted by a steamy exudation from the Elbe, the agglomeration, now enlarged, spins off to the north – reeling towards the westernmost coasts of Norway.

We understand from Dr. Alfonso Liquori of the International Centre for Theoretical Biology that the agglomeration probably begins to induce quite dangerous biochemical reactions – not of bacteria, but of archaebacteria. The “toxic” qualities result not from the algae per se. Indeed, one is not satellite monitoring a phenomenon of algae per se. One is satellite viewing, in the anomalous spread of heated waters, a phenomenon – toxic to all oxygen-breathing organisms in the area – of archaebacterial digestion. Could such events occur in the atmosphere, which we breathe? According to Dr. Liquori, perhaps. There is a danger. And, as the imagery shows, if the dreaded event occurs, a biochemical reaction spreads rapidly, and entire populations of organisms perish, suddenly.

The question of “toxic algae” had left scientists perplexed at the time. How could microalgae in themselves kill fish? Or be poisonous? The satellite imagery suggests how. It suggests that a very pronounced increase in temperature could occur, and could expand explosively, such as not indeed to be attributable to algae per se, but to be attributable to a biochemical event. The agglomeration we have spoken off, having been contained within the North Sea by a strong Gulfstream Current sweeping along the Norwegian Coast to form a Norwegian Current, then drifts – as appears in the May 15-16 sequence – into the relatively quiet necks of the Skagerrak and Kattegat.

That is, visual evidence from a peak algae bloom period shows an occasional agglomeration of warmer waters, heated up (we presume, from coincidental evidence) by biological activity, moving along the current like a ball from one river mouth to another, finally falling back into a corner of the sea, away from strong currents, where various marine populations boom. This corresponds with what is known about circulation within the North Sea. And it explains how waters of, say, the Danish and Norwegian coasts that have normally been so fecund could now be so plagued.

As Dr. Horstmann acknowledged, the visual evidence from May 1988 suggested that the algae blooms there then were intrinsic to one body of water, the North Sea. The waters south of

the Kattegat, inside the Baltic proper, were virtually unaffected by whatever ravaged the North Sea, as if the disease were confined to one ocean body. This contradicted a common view, published for example by the Royal Swedish Academy of Sciences, that the Baltic Sea basin, including all the lands draining into the Baltic, like Poland and Finland, would somehow include the Kattegat. Popular talk about the algae blooms affecting both the North Sea and Baltic Sea resulted from a misdefinition of the Baltic Sea: we showed the Kattegat, with its contiguous anomaly of warm waters also infested with toxic algae, to be part of circulation within the North Sea, not the Baltic. Meantime, separately, again with AVHRR data, Dr. Horstmann studies pollution plumes entering and affecting the Baltic, notably from rivers like the Vistula.

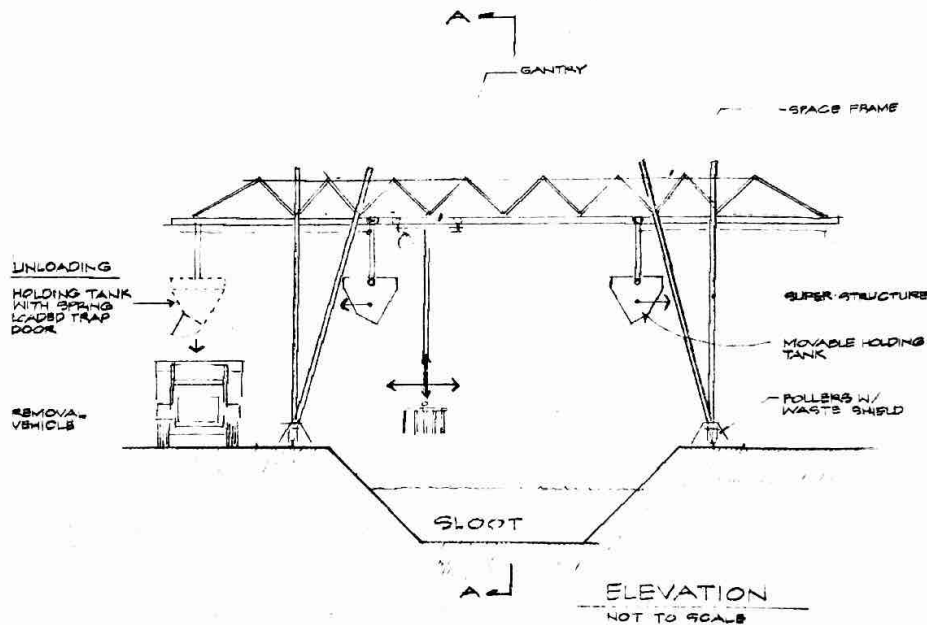
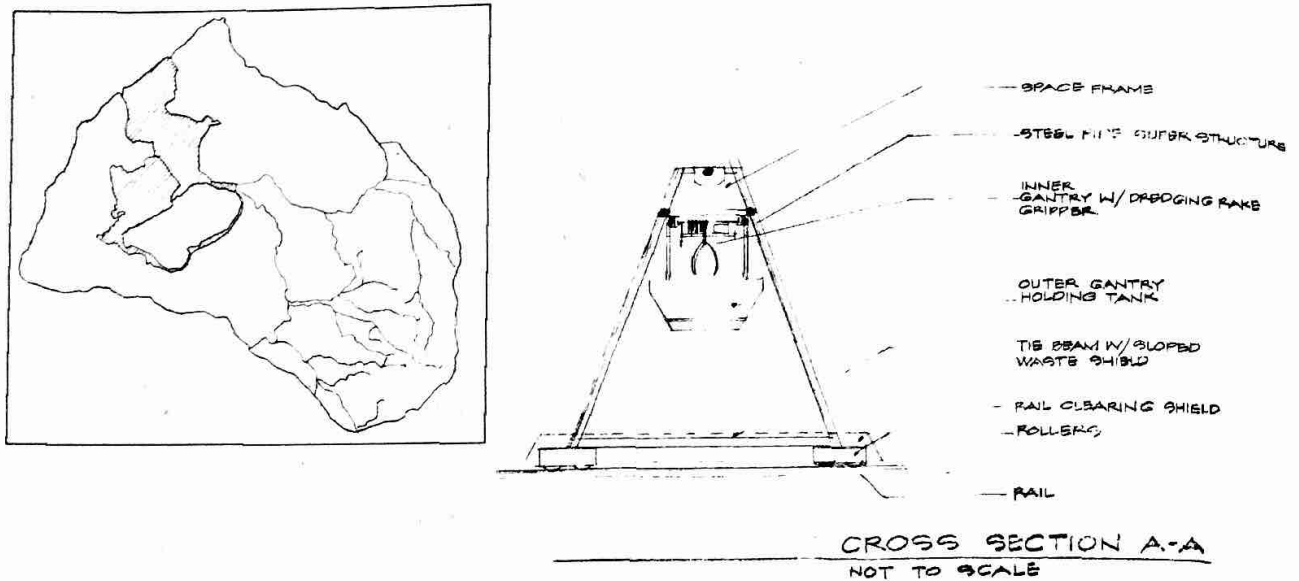
Questions about the “cause” of algae blooms in the North Sea, like those now occurring the Adriatic, can be met with one image: of the ocean basin chart for each respective Sea. The cause of ecological instability or plague in the North Sea proper is, physically, all the terrain, with all the attendant human activities thereon, sloping and draining into that Sea. The cause notwithstanding some far-transported acidic rain, is human activity within that catchment. The solution to that cause, of course, is corrective human activity within that catchment.

To effect a solution, we propose systematic coordination of all teledetection and other pollution monitoring within each ocean basin, e.g., within the entire territory comprising the North Sea Basin and, separately but with some relation, the Baltic Sea Basin. This requires building a sort of electronic news gathering and distribution network, not unlike present-day national television or agricultural reporting operations, but centered within its ocean catchment rather than any one nation state. An ecological news organization, similar in its trans-national condition to the new pan-national media companies like Sky Channel or CNN, could be run as “North Sea TV,” with a market territory extending from Switzerland, now seeking to end acid rain depletion of its forests, to northern Czechoslovakia and East Germany, now primary contributors to Elbe pollution, and on Scotland and Norway, now seeking ways of regularly monitoring and preventing further destabilizations in the marine populations.

A second, more aggressive step towards solution, soon to be tested on site by Ocean Earth, is formation of an extensive and storm-survivable series of offshore rigs, or other infrastructure, to achieve a program of continuous harvest of macroalgae in the sea, rather than microalgae, so that ocean vegetation can become an economic resource, including an abundant source of non-polluting methane gas and fine industrial chemicals, before it becomes an ecological liability.



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63 Wateroogster Project, Weerselo, The Netherlands, 1991. Asked to develop a timely project for the community of Weerselo. Ocean Earth proposed a new kind of agricultural harvesting instrument, for harvesting excess freshwater algae or plants in the canals and sloughs. The analysis ran thus:

I. Problem

1. No. 1 problem in region is agricultural waste.
2. No. 1 manifestation is in the water, as runoff.
3. The runoff leads to eutrophication.
4. Probably, given accumulation and backup, the water reaches a certain state of biochemical deterioration. Normal multispecies processes of nutrient circulation end.
5. As in a hose so in canals, the flow clogs, stops, cannot flush out.

II. Need

1. Clearing out eutrophicated waters, removing excess biological matter, before it enters main watercourses, but not too high up in the dendritic pattern.
2. Converting what is taken out into an economic resource.
3. Removing water from whatever is taken out, and letting that return clean to the stream.

Drawings and co-analysis are by architect Kevin Gannon. The project is pending. It is designated for the entire IJsselmeer Basin (top left).

The German city probably best positioned to start an entirely new phase in primary production, chiefly of energy, is also the German city now famous for an economic stress leading to civil unrest, Rostock.

In this role, it is similar to other industrial coastal cities in Europe, such as Calais.

Ocean Earth has developed a 25-part program for development of an ocean industry which, according to some scientific projections, could supplant the present mineral extraction industries (fossil hydrocarbons and uranium) with a sustainable, chiefly biological base.

First testing of the program is expected to begin near Rochefort, on the western coast of France.

Once tests yield positive results, the lessons can be applied to any coastal city, such as Rostock in Baltic Germany, with these features:

- an established shipbuilding infrastructure and tradition
- a motivated and trained workforce in marine engineering and construction
- relatively low labor costs, to allow for relatively low-tech startup in development
- a strong demand, even necessity, for a new source of energy, allowing no further dependence on fossil fuels, either for environmental or political reasons

- a public recognition in the region of a need to develop biologically-sustainable industry within the ocean catchment of that region.

In the case of Rostock, there is a city which is rightly proud of its shipyards and shipbuilding traditions, a city with trained people anxious to work hard without demanding high wages, a city within a Baltic Basin which is conscious of its dependence on imported oil, whether from Russia or the Middle East, or on nearby low-grade coal, chiefly from Poland, all of which has terrible consequences for the entire Basin.

The new major hydrocarbon presence in the area is Elf, from France.

This company seeks to cooperate with the Institut français de pétrole in development of new biomass industries to eventually supplant fossil fuel sources of energy. Ocean Earth works within this framework of research and development in this offshore harvesting and fermentation test site near Rochefort. Ocean Earth believes that soon it will be able to extend what it develops to the East, for example in Rostock.

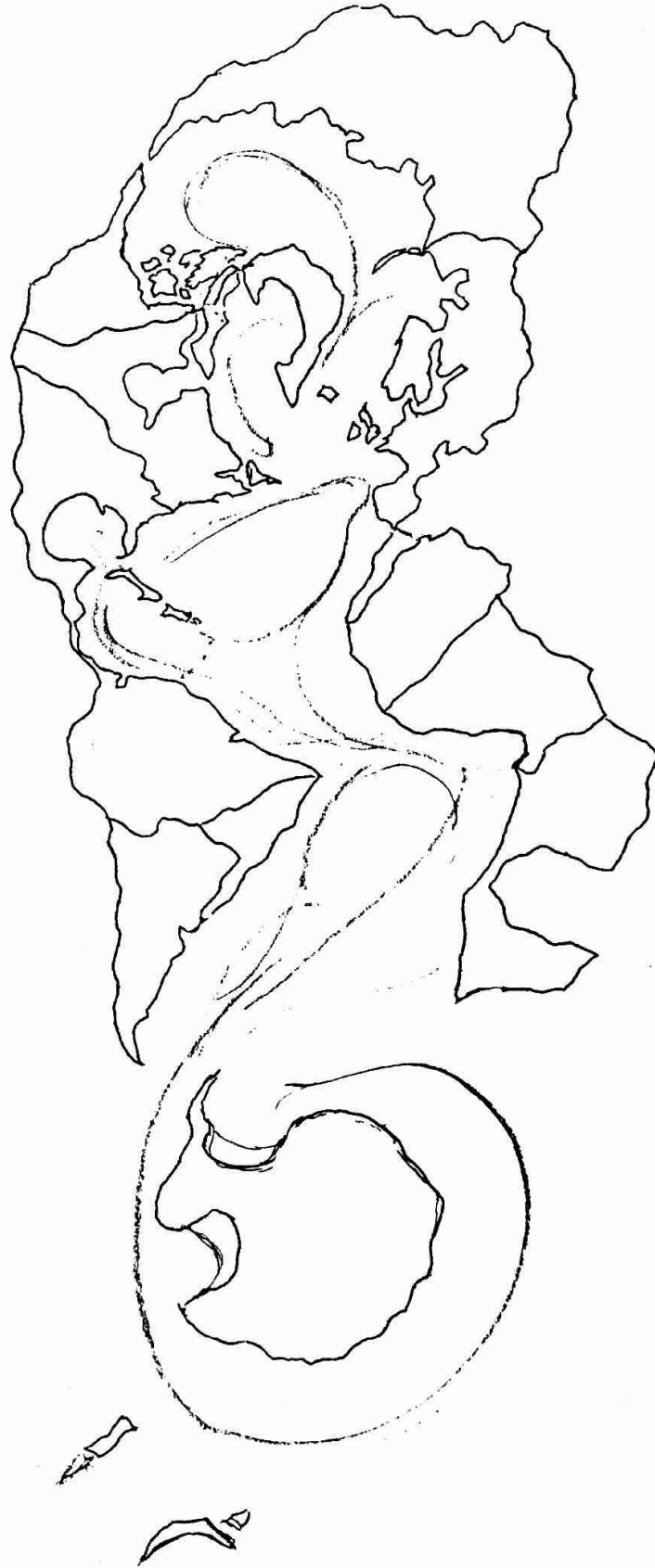
The Reichtum to be achieved, the wealth to be assured, could – with proper management of the home Sea, the Baltic – be immense, and sure.

11. November 1992

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64 The western, most-saline part of the Baltic Basin. There is considerable exchange here with waters in the Kattegat and North Sea. To the east, particularly with influx from the Vistula, the Baltic becomes too fresh to support large crops of marine algae. A project of ocean industry with marine algae specific to Rostock would be centered here – and into the North Sea. The area now is subject to various satellite-observation projects of Ocean Earth, in collaboration with scientists in Denmark and in Kiel, incorporating, for example, efforts at early-warning tracking of algal blooms.



65 The entire Atlantic Ocean, with its insloping lands, produces a transpolar circulation between the Arctic and Antarctic. Waters spinning around the Antarctic break off towards South Africa and Argentina, bearing north. They eventually arrive in the circulation around the North Pole, from where, spinning back, they plunge deep below to resurface in the Waddell in the Caribbean. There are many subcycles, such as the North Atlantic Gulfstream cycle. As emphasized to Ocean Earth water pump.

VI.4. PROJECT SITE: ATLANTIC OCEAN

BRASILOPOLIS

Brazil is often associated with the jungle, specifically, with the most important jungle on Earth, the Amazon Basin. But this is only one of two halves of Brazil. The other half, farther south, drains not into the Amazon and the North Atlantic Ocean, but drains into the South Atlantic Ocean. Oceanographically, it belongs to the Southern Hemisphere, not the Northern.

We focus our attention on these Southern Hemisphere basins of Brazil, including all land draining into the Brazil Current and, via the Rio Parana and Plate, into the Argentine Current, because they include most of the people of Brazil, most of the industrial and agricultural development, most of the concrete development and architectural questions.

In a sense, what occurs in the southern half of Brazil is more critical to the future of the planet, for here is a settled environment with a still-undetermined development policy, and a great need for sustainable wealth, which – if successfully achieved – could become a model for development throughout the world. The global tendency is for giant cities, or at least for giant agglomerations of cities called megalopoli. These agglomerations will become the megaconsumers of the resources of the earth. How to consume, from what resources, where, with what schedule of return, bears directly on the question of how vital regions like the rainforest will be pressed upon, or not. We aim to find ways of developing the populated South of Brazil so that a minimum of damaging pressure would be placed on the irreplaceable wild resources of the be-jungled North of Brazil. We aim, as Ocean Earth, to especially find ways of placing pressure on a readily-replenished Ocean, rather than a readily-depleted Jungle, so that any human economy anywhere today, urbanized as it is, not only does not injure but might even be able to enhance the ecological cycles of the Earth. The challenge in Brazil, as in virtually all the world, is to achieve cities and a supporting hinterland which supports no diminution in the fecundity and variety of wild species in Nature, including the Rainforest. Hence our focus on the cities.

Regarding ecological stability, most of the issues and alternatives are well known. What is not known is how or where to build cities and the supporting infrastructure, or hinterland. A good knowledge can only come from practice. We intend now to set up the architectural parameters for such a practice, yielding – we expect – a means for reducing pressure on vital regions like the rainforest, especially for extraction of mineral fuels, and shifting instead to a wealth base in the Sea.

The No. 1 economic resource of Brazil may well not lie in the Amazon, or even in the grasslands to the south, but in the Sea.

Given the concentration of population in the South, and given the vital role of the Equatorial Current to the North in the circulation of weather and rains throughout the Northern Atlantic Basin, including the Great Plains of North America and Europe, we focus – for Brazil as Development Model – on the Currents of the South Atlantic. Specifically, we focus on the continued extending from the Cape of Good Hope in Africa past Windhoek and the Congo then over to Recife, flowing south towards the mouth of the Rio Plate. We con-

sider a catchment including Johannesburg, Angola, Zaire and most of the population centers of South America, including two of the top ten cities in the world. Sao Paulo (No. 2) and Rio De Janeiro (No. 6).

Along the Brazilian coast, or just inward, a linear infrastructure does not appear. Remarkably, and perhaps regrettably, no “megalopolis” Boswash or Tokyo-Osaka appears. Rather, each city forms its own region. In part this results from the mountains, but chiefly it seems to result from the tradition of diffusion of power in Brazil into the hands of municipalities or regions, rather than the central State. Only when there was a military junta in power, or when there would be a national program of centralized energy production, as of breeder-produced plutonium, would there be a genuine federal power in Brazil. Otherwise, there are city-regions.

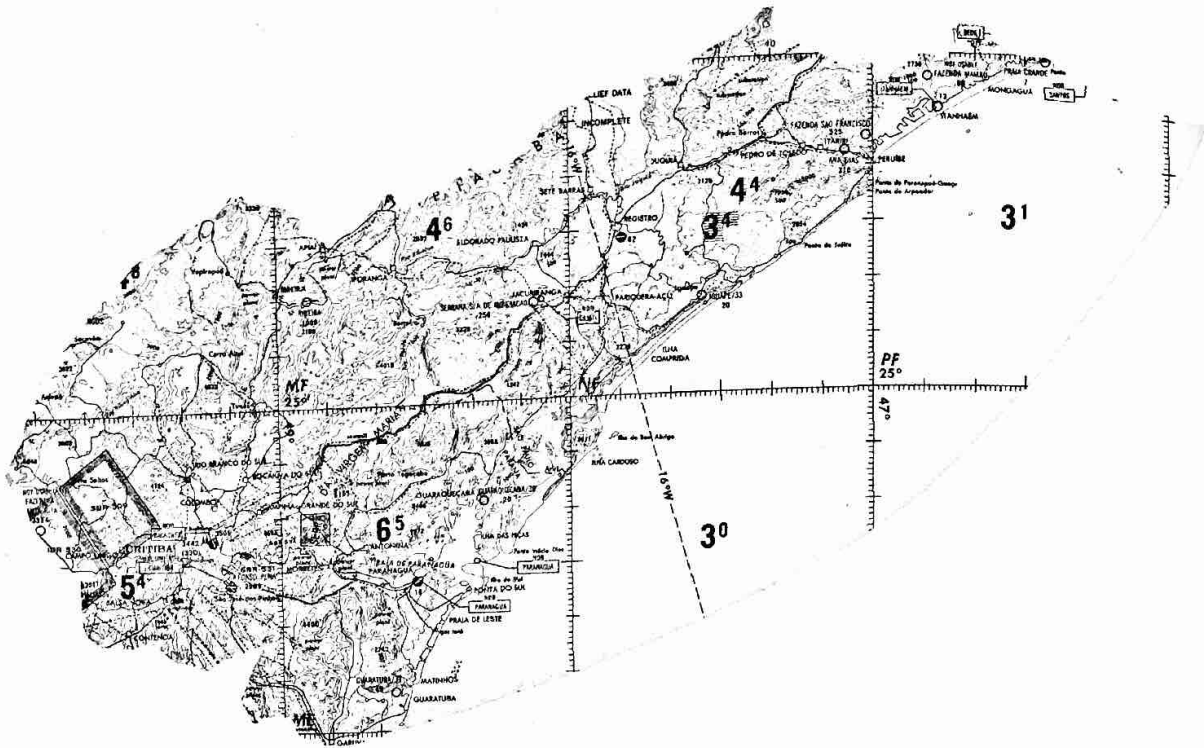
The challenge in Brazil, according to our colleague Thor Nogueira Erickson, a Brazilian national studying political science at Yale, will be to what extent the respective greater cities, such as Belem, Belo Horizonte and of course Rio and Sao Paulo, can achieve autonomous power. The federal system, after all, becomes ever more corrupt and unable. Its national pension program, for example, has collapsed. What will follow is either a sharp crackdown, possibly by the military, of central authorities, or – more benign and possibly more practical – the formation of strong city-regions.

This conforms already with the tendency towards smaller political units, correlative with the proliferation of communications technology, and with a plain need, now most evident in the Third World, for controlling the phenomenal growth of mega-cities. One deals less with countries towards solving ecological or planning questions than with the actual consumers of natural resources and occupiers of habitat: cities.

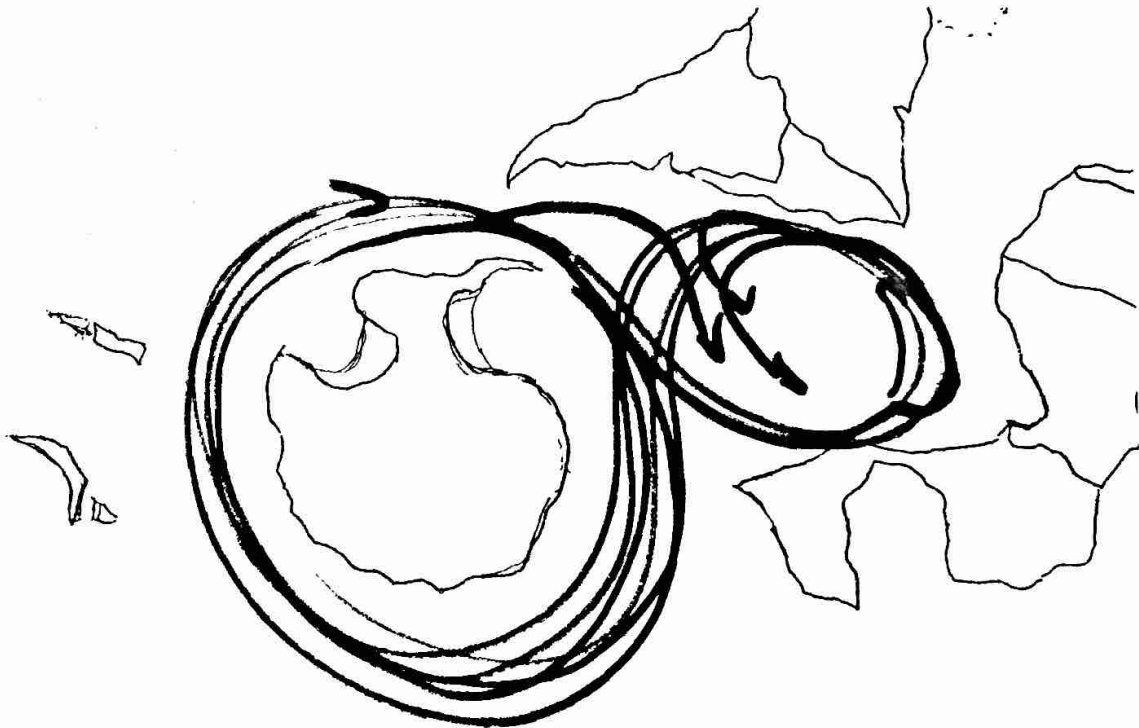
OCEAN EARTH PROJECT

- In Curitiba, Ocean Earth, along with other firms, develops a scenario for a large biogas industry offshore, and for an infrastructure that deliver the gas throughout the regional state of Paranagua.
- As a means to public finance, with property tax and depletion tax assessments, and as a means to enforcement of laws both to prevent abuses of the environment and to assure sustainable development, develop a satellite monitoring service for the entire Paranagua coastal region and its immediate resource consumer. In line with practices developed at the Satellite Meteorology Service in France through the Ministry of Culture work with an AVHRR ground station in Brazil to develop as well an up-to-6-times-daily multispectral monitoring service for the Brazil Current and the Serra do Mar.
- Develop a scenario – physically-feasible if not politically – for infrastructure, including Slope City and Linear City Structures, along both sides of the Serra do Mar. Correlate this with the gas distribution system best developed which could ensue from a very sizable biogas/algae industry offshore.
- Show Scientific Knowledge at work with the paradigms from Recent Art to achieve along the entirety of populated Brazil an ecologically-invigorating architecture.

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- 66 Ocean current directly utilizable by Curitiba, at lower left, just beyond the mountain ridge separating the Brazil Current from the Argentine Current basins. The current here, part of the Brazil Current, extends from Santos, the port of São Paulo to the Bay of Paranaguá, a large bay suited for initial testing of the giant algae structures. The bay serves Curitiba.
- 67 The source of waters flowing past the urbanized, southern part of Brazil is the Southern Ocean, circulating around Antarctica and then around the South Atlantic. The upwelling phenomena along the coast yields the legendary fertility.

- Focus on Curitiba because (1) the city is famous for its successful planning and stable economy, (2) the mayor is a professional urban planner with a UN position, (3) the city is sending its own delegation to Eco 92, (4) we have connections through professional associations with the mayor and with the city, as well as with Sao Paulo, (5) it is expected that lessons from Curitiba will be put to use shortly in Rio de Janeiro.

The overall context of the project will be the Southern Atlantic Basin, starting with the divide of the Angulhas and Benguela Currents at the Cape of Good Hope in South Africa, then continuing along the African coast to Gabon, then flowing past Brazil and receiving the outflow of the No. 2 and 3 rivers of Brazil, the Parana-Plate and the San Francisco. Implications for the Argentine Current will be suggested but will not be directly addressed.

We may also wish to exhibit our model of the Equatorial Current Basin, which includes the Amazon Basin but also coastal Brazil southeast to Recife, to underscore that while we work on the Southern Hemisphere drainage of Brazil, there remains - as a very different problem of surveillance and management - the Northern Hemisphere drainage.

We expect also with the contrast to make clear that while there is a jungle in Brazil which must be well assured, there is also a need to build a workable set of cities in Brazil - or "concrete jungles" - that by their metabolism will not interfere with, or make enormous demands on, ecosystems like that of the jungle. That is, we adumbrate a set of cities that do not rely on mineral fuels, which must be extracted from sites, and which leave wastes behind, and that also do not require large hydroelectric or sugar plantation projects, which also devastate the jungle and its impact on world water cycles. This model of urban development, or human habitation on the Planet, would be called Brasilopolis.

AMAZON IMPACT ON THE CARIBBEAN 1982

[This document was prepared at the request of Dr. Noel Brown, Director of the North American Office of the United Nations Environment Program. He asked if we might have a better concept for an atlas of the Caribbean Sea from what had already been commissioned and produced. The map produced (Image 36) led to further meetings with UN officials, and eventually to the overtures to the UN regarding the Gulf, starting in 1985.]

THESIS

As a regional sea, the Wider Caribbean Region is substantially influenced by the outflow of the Amazon River. An Action Plan for the region could reasonably include the entire South American drainage into the Southern Equatorial Current, including the Amazon, for that Current supplies nearly all the waters and nutrients entering the Caribbean Sea. Since the Gulf of Mexico has been included in the Wider Caribbean Region, and since waters and nutrients entering the Gulf come directly from the Caribbean or from rivers such as the Rio Grande and Mississippi, which themselves are supplied by precipitation from cloud masses generated over the Equatorial Current and Caribbean-Gulf, it seems reasonable to include in the Wider Caribbean Region the lands draining into the Southern Equatorial Current, the Caribbean and the Gulf of Mexico. Since, further, virtually all waters entering the Caribbean-Gulf exit at the Straits of Florida and hug the U.S. coast up to Cape Hatteras, we may include in an Action

Plan for the Region that near-land portion of the Gulfstream.

Inasmuch as the Mediterranean Action Plan has been amended to include a Protocol for the Protection of the Mediterranean Sea Against Pollution from Land-Bases Sources, we propose that a similar protocol for the Wider Caribbean Region be based on our ocean-basin maps of the Region. These maps, including the comprehensive Amazon Impact, or Caribbean Continuum, account for all the land-based sources of runoff and pollutants into the Caribbean Region as it is now charted by the UN Environment Program. The comprehensive ocean-basin map sets forth the entire territory suited for environmental monitoring, including satellite observation, by the Caribbean Regional Seas Program.

Altogether:

The Amazon Basin is a prime source of nutrients, waters and evapotranspiration for the entire Caribbean Region, affecting not only the ocean waters proper but also the precipitation and drainage cycles of the Great Plains.

The waters proceeding northwest from Fortaleza through the Caribbean to the Straits of Florida or Cape Hatteras, and all the freshwater influx into them, comprise a regional sea.

SUPPORTING ARGUMENT

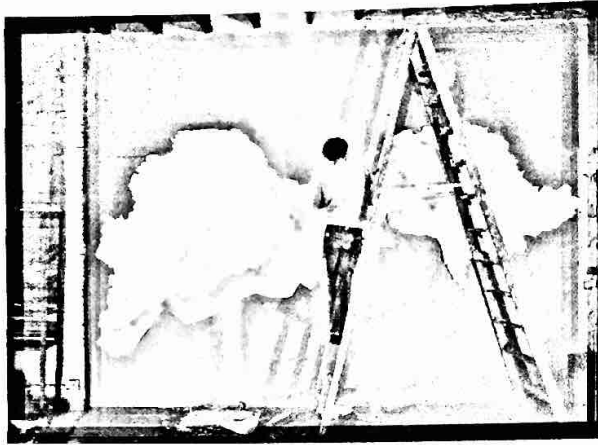
If, as oceanographers say, the Amazon releases nearly 25% of the entire freshwater outflow of the world, and if that release enters the ocean current that proceeds en masse through the Caribbean Sea to the Straits of Florida, then a plan for the Caribbean should incorporate the Amazon.

Unlike the Mediterranean, the Caribbean is not a closed sea. It is not even an unenclosed sea, a relatively open sea, with sizeable internal circulation: it is not like the North Sea. It is more like a river - an ocean river proceeding along the northeast coast of South America, streaming into the Caribbean, Cayman and Gulf of Mexico basins, and staying close to the U.S. east coast up to Cape Hatteras. 31 million cubic meters per second of ocean water flow into the Caribbean Sea proper, almost entirely as the Southern Equatorial-Guayana Current, and 32 million cubic meters per second flow out through the Florida Straits. The Caribbean is a transit system. A regional seas program for the Caribbean could include the beginning and end of that transit system as it flows close to land and is influenced by waters from the land. The largest and most important influx of waters from the land occurs at the mouth of the Amazon. Subsequent drainage of waters from the land into this ocean river, as at the mouth of the Mississippi, result primarily from weather patterns set in motion at the Amazon.

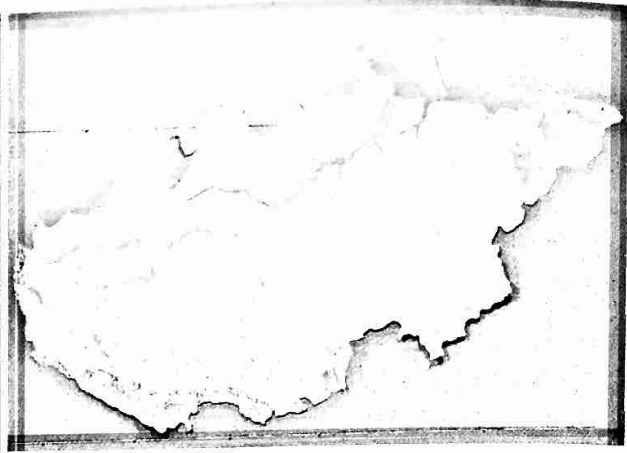
A review of the proceedings of the Symposium on Investigation and Resources of the Caribbean Sea and Adjacent Regions (FAO), along with research findings by oceanographers and satellite-data analysts at Lamont Doherty Geological Observatory, NASA, the U.S. Geological Survey and Grumman Aerospace Corporation, reveals these observations.

1. The Caribbean, unlike the Mediterranean for example, receives massive inflows of nutrients (e.g., phosphates) and organic matter from an ocean current - the Southern Equatorial Current. The organic matter apparently comes from as far away as a current flowing into the Southern Equatorial Current, the Benguela Current.
2. The surface of the Caribbean is relatively fresh, again unlike the Mediterranean, and this "anomalously fresh water" comes from an "intertropical convergence zone." That convergence zone directly receives the large 100-

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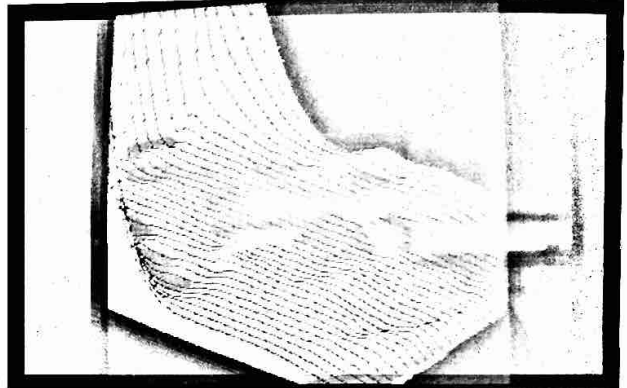
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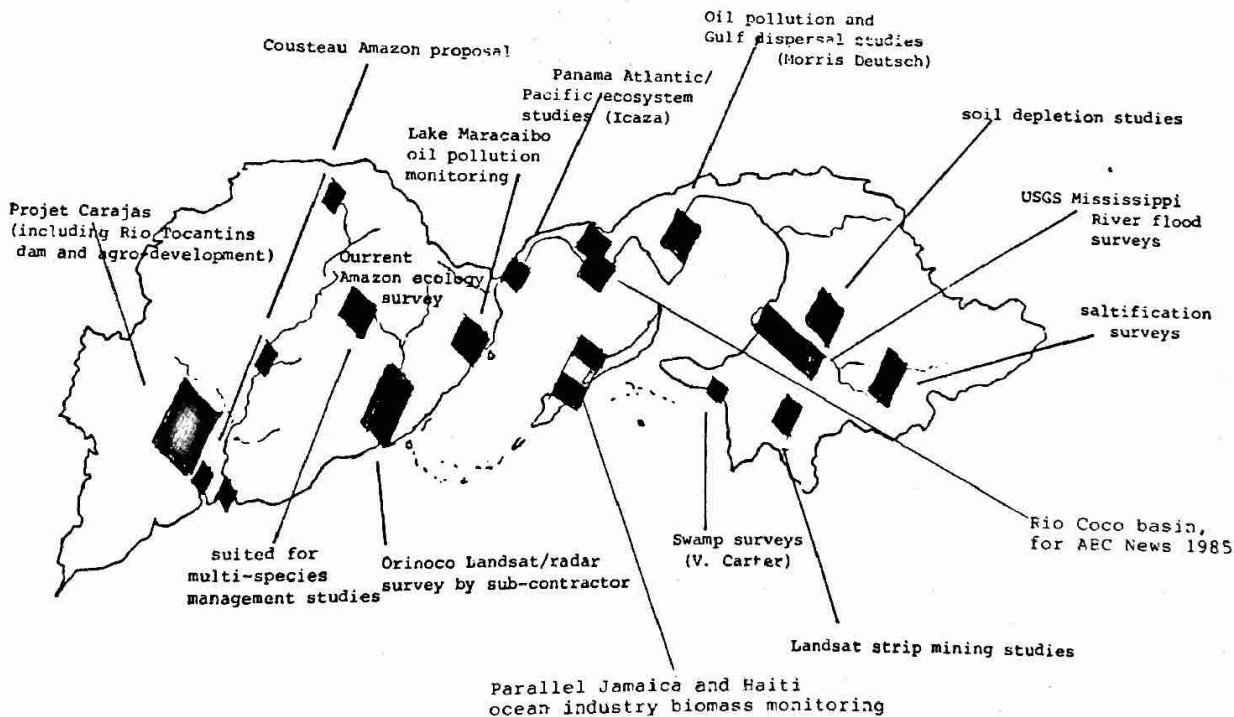
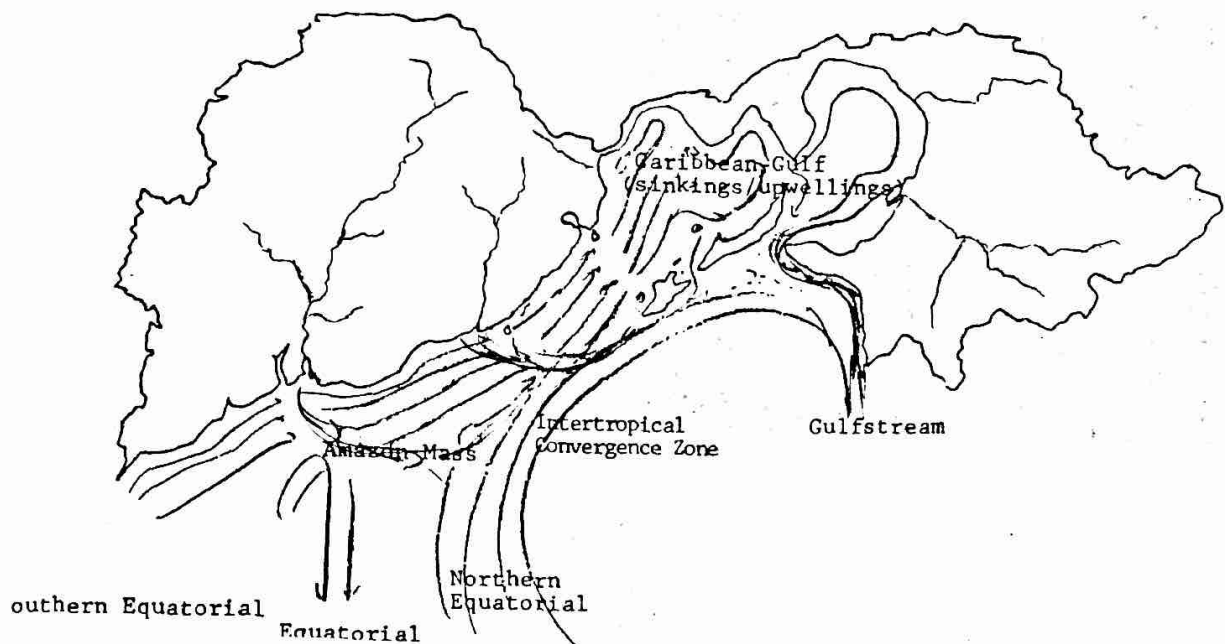
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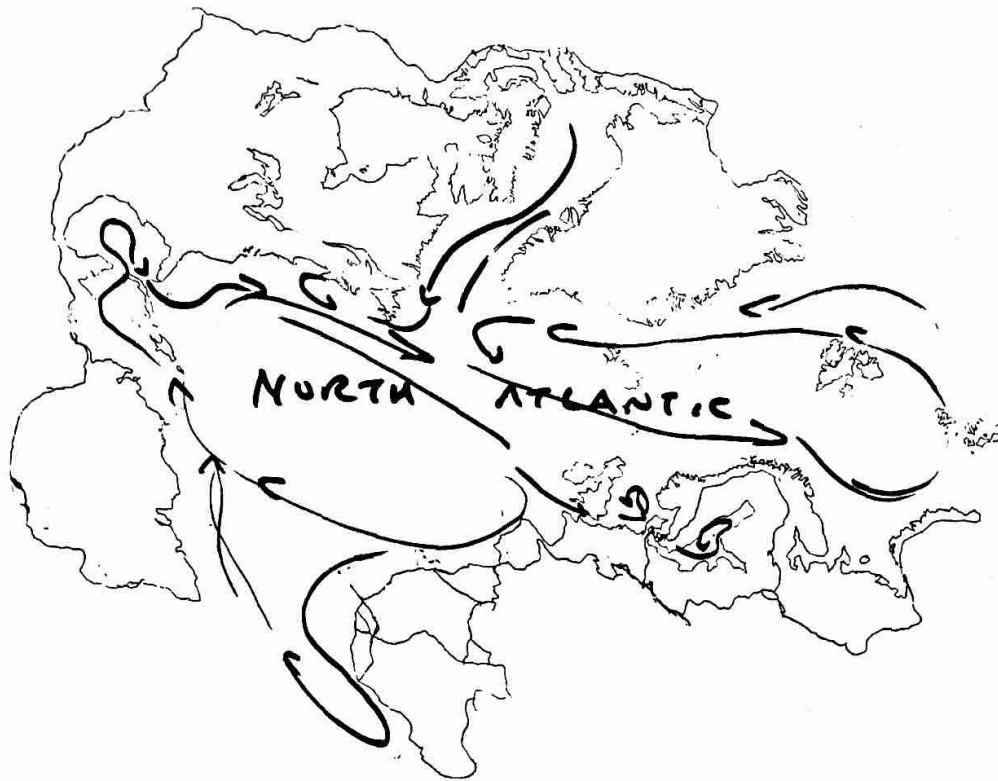


- 68 The Caribbean continuum, from the Amazon to the Gulf of Mexico, charts the flow of clouds from one basin to the next, more northern basin.
- 69 The Amazon Basin has been enlarged conceptually by Ocean Earth to include the entire slope of terrain draining into the Equatorial Current up to the outlet of the Amazon itself.
- 70 The Haiti project is situated within the Cayman Sea Basin, part of a continuum extending from the Amazon to Cape Hatteras. Here are three elements of that continuum: the Caribbean Basin proper, the Cayman, and the Gulf of Mexico. If one observes the Cayman/Caribbean divide, one notices that the Rio Coco along the current Nicaragua-Honduras frontier drains into the Cayman Sea, and therefore can be apportioned to the north. Most of the water vapor entering this area comes from the Amazon, as shown dramatically in a film produced through Ocean Earth for the Cousteau Society in 1983.
- 71 Modeling of the basin, as done here with computer facilities at Woods Hole Oceanographic Institution, shows that the main source of water and nutrients, the main source of runoff altogether, is in the mountains, outside Brazil. Thus, one could say that the Amazon is more a non-Brazilian basin than a Brazilian one.
- 72 The slope of the Brazil Current, however, is almost entirely Brazilian.
- 73 The slope of the Argentina Current, although mostly including territory of Argentina, receives its chief human influence from cities and farmlands in Brazil, and its chief natural influence from the Ross Sea Icecap in Antarctica. The propeller form of the entire Argentina Current basin, with its in-spin of waters from Antarctic, creates a foundation for a much more expansive charting of the homologous regions of the Southern Hemisphere. From the viewpoint of macroalgae industry, regions such as this will probably be much more productive in the global market than regions in, say, Europe.

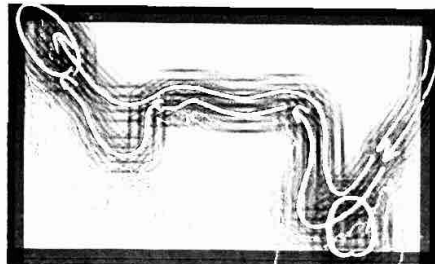


- 74 At the intertropical convergence zone, a 100-mile diameter Amazon freshwater body mixes and collides with waters of the Southern Equatorial Current and the Northern Equatorial Current. Some equatorial waters are kicked back, in part probably caused by the Amazon outflowing mass of freshwater, and form an Equatorial Counter-Current, leading to rainfall and circulation throughout the Gulf of Guinea. All Caribbean waters enter south of Cuba, mostly south of the Greater Antilles. All waters leave at the Florida Straits and follow the coastline closely to Cape Hatteras, forming the Gulfstream.
- 75 Inland surveys of environmental changes possibly effecting the regional sea. Imagery from these sites could be image-processed for videotaping and could be telecast, within or not within the basin and regional seas context, to inform the general public.

- mile diameter bodies of fresh water which regularly break away from the Amazon sill. It seems that this anomalously fresh water off Brazil comes from the Amazon. The Amazon releases 175,000 cubic meters per second of fresh water. The surface waters flowing past the Amazon towards the Caribbean proceed at 10 million cubic meters per second; the Amazon could significantly reduce their salinity. At the same time, of course, it could add phosphates, other nutrient minerals and organic matter.
3. The Caribbean intermediate and deep waters come from the Antarctic, not the North Atlantic. These Antarctic waters are cold enough and massive enough to prevent the intrusion of North Atlantic cold waters into the Caribbean beyond the Virgin Island and Windward Passages. They help keep the North Atlantic Current, surface or deep, out of the Caribbean; they help force that Current to make a U-turn and form a main trunk of the Gulfstream. By the time this water mass reaches the Florida Straits, it is only 0.1% fresher than Western Atlantic water, and upon exit at Cape Hatteras onto the trans-Atlantic Gulfstream, all traces of Antarctic origin have disappeared. The Caribbean, as a solar-heated mixing site, assimilates large quantities of Antarctic water into Atlantic water. The magnitude or global importance of this assimilation is unknown. It seems that the Caribbean plays a major role in the trans-polar circulation.
 4. The Caribbean may result geologically from the erosion by relatively rapid-flowing freshwater ocean currents. The fresh surface waters and fresh deep waters move at rates faster than normal for the world ocean. Geologically, the Southern Equatorial Current presses on a series of concavities: in succession, the Amazon Basin, the Orinoco Basin, and then – breaking through – the Caribbean, Cayman and Gulf of Mexico Basins. Freshwaters spilling out of the first basin strike a relatively saline, heated Equatorial sea body. Deep below, Antarctic deep waters bear the current along despite the Equatorial equipoise. Upon impact of fresh Amazon waters, the surface waters pick up momentum and establish a broad front of relatively light, rapid-moving water. The body of water presses west and finally breaks through at the Antilles Arch, gouging through the entire Caribbean and Cayman basins, mixing in sinks and upwellings, slowing down and spreading nutrients. In the Gulf of Mexico, the currents disperse and dump more nutrients and more sediments. The land draining into the Gulf of Mexico – the Great Plains – was once such a dumping ground. One might suppose that the nutrients of the Plains were dumped after being borne along from the Equator and the Amazon.
 5. The impact of the Amazon outflow on weather and current patterns in the Caribbean varies with the size and force of that outflow. It varies with the rainy or dry season. The freshwater masses ejected from the mouth of the Amazon have greater or lesser size, greater or lesser velocity and spin, and these variations affect the degree to which equatorial waters are turned back towards North Africa and the Gulf of Guinea in the Equatorial Counter-Current. The amount of turnaround directly affects the amount of rainfall in West Africa, particularly the Gulf of Guinea (Niger River) Basin. It conversely relates to the breadth and strength of the Equatorial Current heading towards the Caribbean, which now includes a large freshwater gyre spinning north.
 6. Most hurricanes, and many cloud masses develop in the region where the Amazon freshwater mass tends to go.
- According to Lamont Doherty physical oceanographers, cloud formation above the 100-mile diameter freshwater mass ejected from the Amazon develops into hurricanes during hurricane season. Given this satellite-observed relation, given the high rates of evapotranspiration above the Amazon water mass, and given the commonly-known fact that most U.S. precipitation east of the Rockies involves warm, moisture-laden air from the Gulf, it seems likely that most of the rain and snow of the central and (given westerlies) eastern United States, is the condensation of water originally precipitated, evapotranspired and run-off in the Amazon Basin. Rainfall in the Great Plains, like rainfall in West Africa, relates closely to seasonal cycles of the Amazon. Runoff from the Mississippi may be a direct consequence, involving the same water molecules, as runoff from the Amazon.
7. The upwellings and sinkings throughout the Caribbean notably along the southern coast of Cuba and Hispanola, result from interactions among Antarctic deep waters, Sub-Antarctic intermediate waters, and the relatively fresh surface waters laden with nutrients from the Amazon and Orinoco rivers. These upwellings and sinkings could be economically exploited for very much higher yields of food, fiber and energy, e.g., in Jamaica.
 8. Changes in the weather and current patterns of the Caribbean affect the direction, force and evapotranspiration rates of the Gulfstream. Europe is affected in turn. The Gulfstream can bear north and sweep broadly into the North Sea-Baltic Sea estuary, or it can lack force and volume, bear south, and be pulled into the Iberian and Canary currents. Whether Gulfstream moisture enters northern Europe or sweeps by Europe along the Bay of Biscay and Iberia, eventually returning to the intertropical convergence zone as the Northern Equatorial Current, may be a result of seasonal changes in Amazon outflow. It may also, therefore, be a result of man-made changes in Amazon outflow.
- Once Amazon Basin projects such as these are well underway, we should have a sense of how to efficiently and accurately monitor upstream, inland ecosystems to at least identify major land-based sources of degradation offshore. We could apply the methods we develop to other regions within the basins draining into the Caribbean region. We could image-process in a standard way the satellite/radar data of the Orinoco already thoroughly developed by one of our sub-contractors. We could apply our developing methods to agricultural and hydrological Landsat studies prepared at Texas A. & M. and Purdue University. Throughout, our contribution would be to correlate upland events with offshore consequences, and to develop an ongoing, probably videocast system of converting digital data into a rather simple variety of environmental readings. The basin maps we have prepared – for the entire world as well as the Caribbean region – would serve as contextual frames for upland/ocean impact studies. We would not propose monitoring or surveying entire basins as we have mapped them. We propose rather working within the context of the basin maps to concentrate monitoring efforts on the regions within those basins which seem most subject to adverse change, and most likely therefore to adversely change the biological health of their regional seas.
- The basin plans help delineate the extent of protocols for protection of regional seas against adverse effects of land-based actions. They have been reviewed by oceanographers at Lamont Doherty Geological Observatory, who referred them next to similar but less-painstaking basin mappers at the Hydrometeorological Institute of Leningrad.

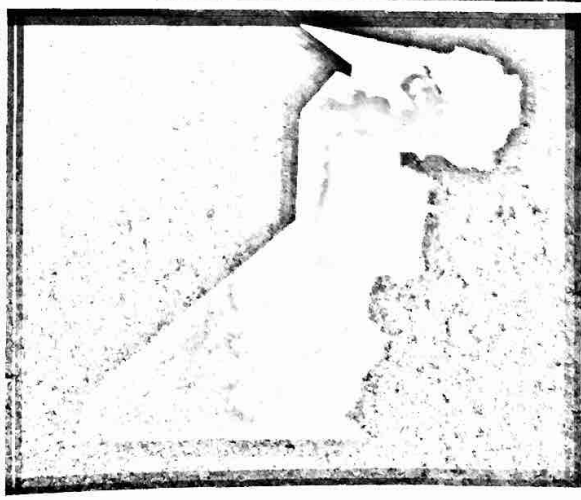
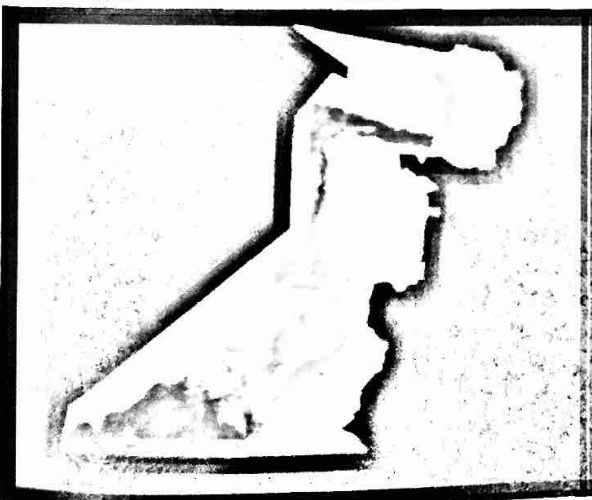


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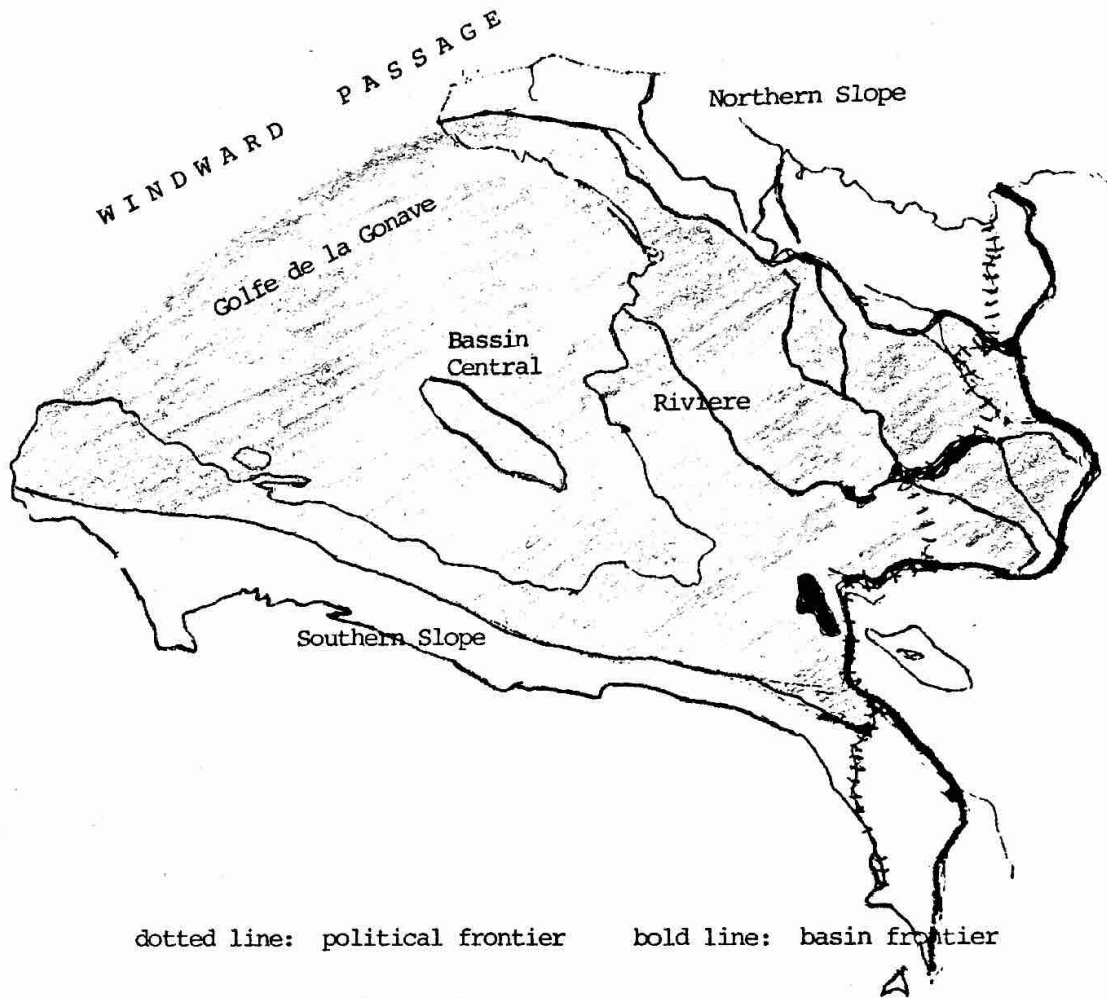
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76 North Atlantic circulation, showing importance of Amazon as a fount of waters, and of Greenland as a controlling force on the Gulfstream. This projection was prepared for the Louisiana Museum, Denmark regarding Atlantic development.

77-79 The current arriving in the Caribbean from the Amazon sweeps along the North American Gulfstream coast thus, forming a trajectory eastwards. The stream is contained by cold runoff from Greenland and the mass of circulation back westwards to the south. That westward return, which flows either back to America or south to the Gulf of Guinea in Africa, occurs off the coast of France, Spain and Morocco. One could say that most of this flow, the Iberian Current, never reaches Europe.

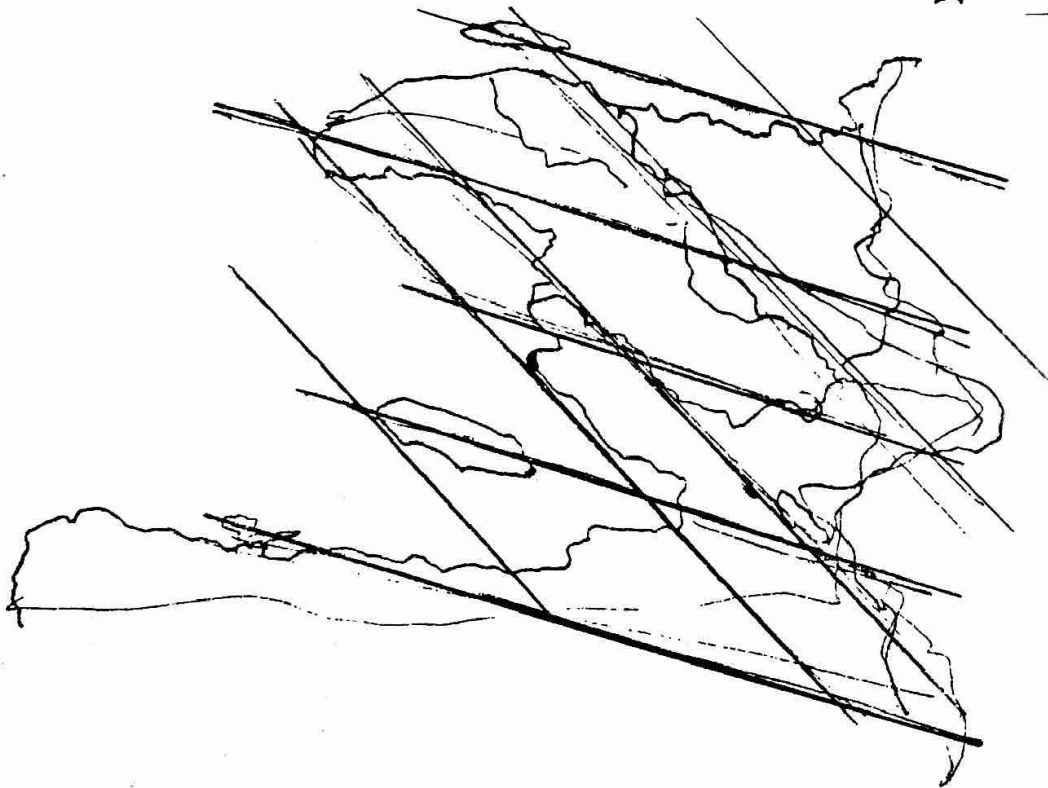
80-81 Co-copyright Ocean Earth-Meteo France production of AVHRR imagery showing sea-surface temperature for the Iberian Current. Data from four different frames have been re-assembled in this frame. Separate algorithmic functions would be applied to the now-masked area, covering the lands which drain into the Current. Output, destined for daily TV, is in video.

82



dotted line: political frontier bold line: basin frontier

83



82 Haiti and windward passage as a microcosm of the Amazon and Equatorial current. Site for comprehensive surveys and on-slope upland architectural development.

83 Schematic of ridgelines of Haiti towards a sensibility of the genus loci.

When the basin plans are combined with relatively standard mappings of ocean currents and regional seas, new cartographic versions of the planet result. Continents appear less as "continent", or contained, than as the collisions and agglomerations of shards of earth's crust. If the earth were perfectly smooth, every shard would be submerged. But the crust is irregular, and while some shards lie below water others tilt up and rise above it. These upheaved pieces of earth's crust, draining their soils and waters to salt lakes or ocean seas, can be respectively considered as ocean-basins or saltwater-basins. And each of them, when mapped and made into a context or frame for environmental monitoring, can be identified as contributing to the health or disease of their respective saltwaters.

OCEAN-EARTH MONITORING OF HAITI 1989 FOR ECONOMIC DEVELOPMENT

Haiti is the least developed country in the Western Hemisphere.

It is also one of the most densely populated countries in the Hemisphere, at the same time with a very low urban/rural ratio.

It has very little infrastructural development, with virtually no sewerage, few roads, and so little electricity that 2/3rds of electrical power comes from a single modest dam; rather than from near-unaffordable import fossil fuels.

Haiti is a tropical forest country, much like, say, Costa Rica or Brazil. But it has more severe problems than elsewhere, with immediate population pressures on its forests. The country is rapidly being denuded. This leads to soil loss and ecological decline, with attendant increase in disease and scarcity.

Most of Haiti's surface drains into a single large bay. The country forms a large bowl, with one side opening onto an ocean current, and with the outsides of the bowl – north and south – sloping in short, steep pitches to waters feeding the same single current. Both the inside and outsides of the bowl, except for the backside, sloping into a foreign country and separate sea, feed waters and soils – and pollutants or runoff – into one stream, called the Windward Passage. This stream is the main influx of waters from the North Atlantic into a larger stream from the Amazon, bearing waters from the South Atlantic and Antarctic along the coast of northeast South America into the Caribbean. There, in a transition zone from the Caribbean Basin towards the Gulf of Mexico, and on to the Gulfstream, waters from the North Atlantic, from the Amazon and Orinoco, from the South Atlantic and from the Antarctic, all mix in a vast array of upwellings and downwellings. Haiti slopes into one of the key gateways for waters into this mixing. Oceanographically, it can play a vital role.

Haiti is a microcosm of a world problem: achieving sustainable economic development of tropical forests within ocean catchments, with an altogether formative impact on world ocean-air circulation. The Amazon is a much larger example of this problem.

A successful path for development in Haiti as a tropical-forest drainage system feeding into the main ocean current along the trans-polar corridor, the main engine of world weather circulation, could lead the way to success in much larger and more vital regions, such as the Amazon.

Given recent legal theory about semi-enclosed bays, one can include in Haiti's territory – its sovereign jurisdiction – all of its large bay, the Golfe de la Gonave, as well as all waters within the conventional 12-mile limit. As a result, more than half the territory of Haiti is "ocean", the lesser half being "earth". The political jurisdiction, the entity for econo-

mic development and commonwealth, includes more ocean than earth – and has virtually all that earth sloping into that ocean as a single oceanographically-important current, the Windward Passage. An end-point is Jamaica.

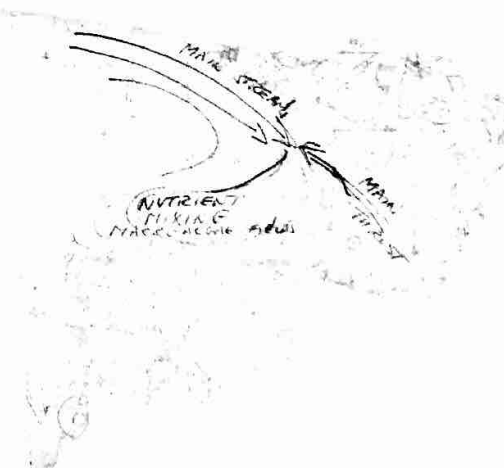
Monitoring of Haiti can thus be monitoring of an ocean-earth continuum, in which the resources of the contiguous sea are included as part of any inventory for the entire country. For Haiti, where most of the soil has drained from the hills down to the rivers, then the sea, economic potential suddenly expands – severalfold.

A key basin in the continuum from the Amazon to the Gulfstream is the Cayman Sea. We focus attention on a plantation on the south slope of Haiti, drainage into the Windward Passage from within the Cayman Sea, itself a definable property with a single owner, a well-documented history of construction, and a comprehensive saltwater basin form.

This site will be monitored, assessed, inventoried and modelled for responsive construction and development – or even de-development – so that it becomes far more supportive of human biological and aesthetic needs than now occurs throughout much of the tropics, now being rapidly denuded and turned to wasteland. The site will be assessed not only as sloping surface-terrain but also as the coastal waters immediately offshore, for both the ocean and earth comprise a total soil base, chemical-exchange system, and – at end – economic resource.

A similar basin-monitoring and modelling project has been started in the Bacino Torbido in Italy. Collaboration is underway with world-experienced architects to greatly advance the methodology of on-site planning, towards achieving specific constructions and alterations in the physical fabric of the area inhabited.

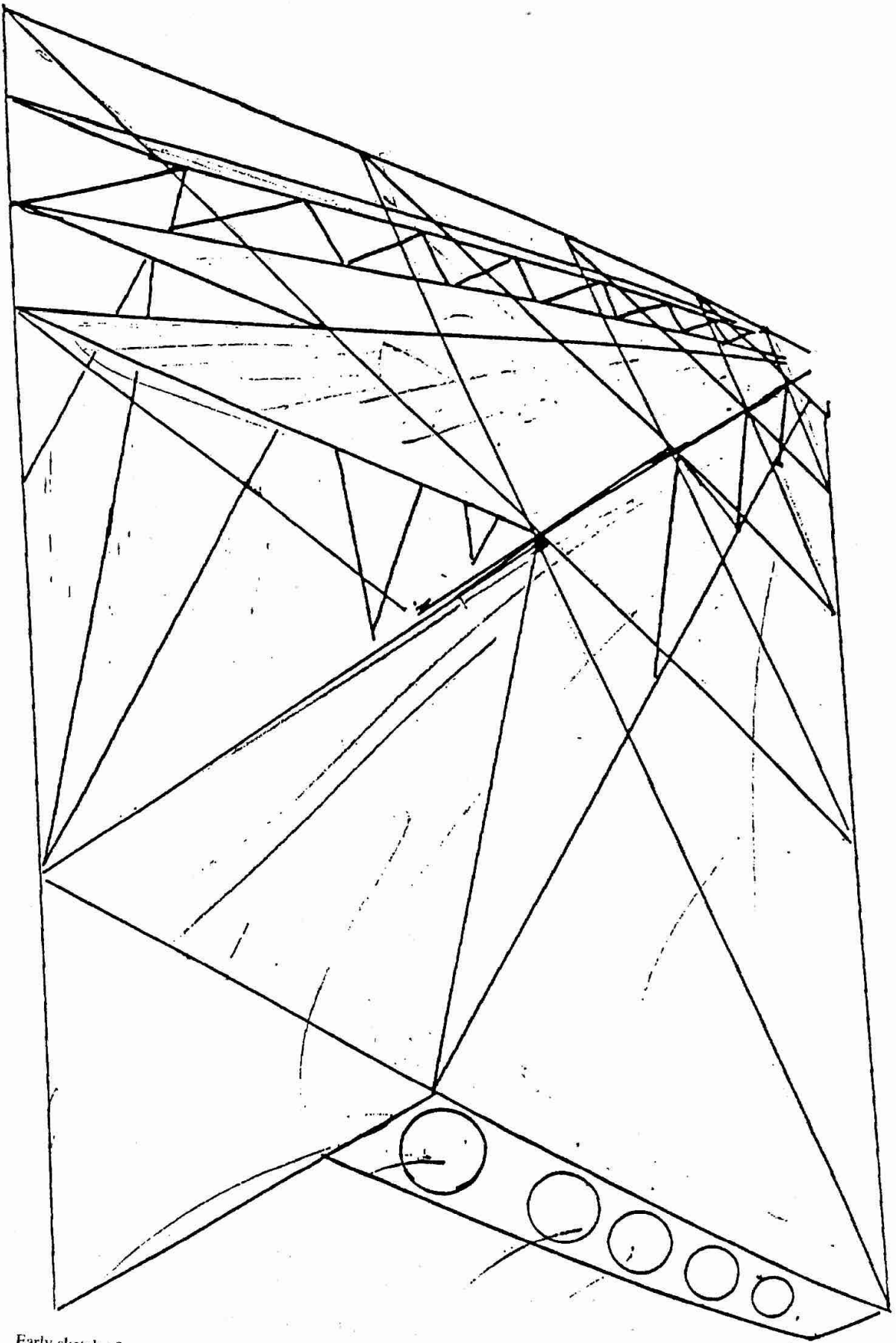
SUMMARY FOR ATLANTIC FRANCE 1993



- 84 From the text. The project for the Charentes is effectively a continuation of the "Projet de Développement Industriel Oceanique de la France Atlantique." After analysing the situation oceanographically, it appears that the basin of the Charente is not significant, but rather that of the Garonne. More, the main nutrient mixing from the rivers of France, including the Loire, the Charente and the Garonne, occurs well offshore. For macroalgae production, it occurs so far offshore and downstream from the river outlets as to approach the coast of northern Spain and Portugal.

CITY BILD

Consumer Products



1 Early sketch of megastructure concept for support of various "loft" levels, with outlying infrastructure, all above the flatlands, either set into hills or cantilevered, as in Firth of Forth bridge, above flats. Principle: 60-120 diamond formation. Based on work in final stage of career, never started, of Gordon Matta-Clark, 1978-79.

VII. CITY BILD

URBAN STRUCTURES AND CONSUMER GOODS

INTRODUCTION

The editor of Architecture d'Aujourd'hui said, at the beginning of Ocean Earth, that it had developed the first practicable and economically feasible program of what had come to be known as megastructure architecture.

By that he was talking about the preceding chapters of this book.

It had seemed vital to deal first with the supply and recycling aspects of the city, the material conditions of ongoing metabolism, and to only second deal with the structural emplaced on site. Since the first could provide the financing for the second, it seemed that overall there was an economically-feasible program. Nearly all other programs had failed.

How much original there might be in the designs that follow is not clear. A number of structural engineers have reviewed the work and found it to be executable and interesting – interesting at least in that to build one would have to find legal authority under codes for bridges or civil engineering rather than for conventional buildings. The chief block to progress in this area appears not to be technical, or even aesthetic (of taste), but legal. Building codes are in the way. This conforms with company experience, in many fields. What is possible, or even feasible, is blocked by the regulatory or administrative environment. The question now, as for any venture in architecture, is finding the conducive sites.

The actual product of the company – the consumer goods assembly – is the city.

So far, two invitations have been extended to work on the construction of new cities in Eastern Europe. This conforms with our experience, for example, in Yugoslavia, where frontier conditions seem to be most suitable to frontier structures. Our caveat here is that, unlike with the end of the last major war in Europe: do not rebuild along the old lines, for that will only perpetuate the old patterns of human settlement and conflict. Rather, let the cities destroyed remain destroyed, and proceed entirely new in the region as ecosystem. Terrain shall be considered raw, with a chance to build entirely new consumer products, entirely new products for consumption by the business and residential class, which interfere as little as possible with the material supporting, the "Variety Theater" of wild animals and plants.

THE NEXT GENERATION IN CITIES

1933

You have heard of the stealth fighter. And the stealth bomber. Now, we introduce

The Stealth City.

By this we mean a City that you can't see, except close up.

That leaves no trace.

No fumes or heat.

Nothing to sense.

No ruins, even.

A City that works itself into the countryside as material supporting, such that all the communicative and intense social functions of the city are fulfilled, but that as little or the alteration in the fabric of nature occurs.

The architecture of this city is not strange.

it is no more strange than the sculptural and architectural probes of artists from the 60s and 70s, artists such as

Michael Asher

Robert Irwin

Gordon Matta-Clark

Dennis Oppenheim

Vito Acconi

Michael Heizer

Richard Serra

Robert Smithson

And if this seems strange, consider what human nature is. consider how the humans first and for long survived on this planet. they did not survive on this planet by building huge towers and bastles which anyone could see and which inevitably with time would consume entire hinterlands, leaving behind a waste.

They survived by blending in with the terrain, by camouflage, by guerilla techniques, by deception, by stealth. Humanbeings first made a living on this planet by stealth.

They still can.

We start with

the stealth city.

BIG GAME OVERRUNS BIG CITY



MASSIVE TIDE OF ANIMAL BODIES RUSHES TOWARDS BIG CITY. ARTISTS RESPOND. According to biologists who have studied other such massive migrations, including migrations ending in massive die-offs, the animals approaching the big city--ungulates here--are trying to reclaim ancient homelands. The city, biologists say, is sensed to be illegitimate and monopolistic. It denies other animals their space. It smothers crucial marshes and feeding grounds. It layers over with concrete and buildings any mating grounds. It lowers the water table, denying underground animals their chance to live. It cuts off paths of migration, even for insects and birds. It greatly reduces the variety of animals needed for ecological stability. Like most cities, it damages ecological processes for hundreds of miles around. And like nearly all cities nowadays, it poisons everything. The city is now being threatened with destruction. Biologists have no clear concept of how to respond. The emergency is being met by the persons in society who make a profession of mediating relations between humans as animals and other animals--the animal magicians, the artists.

REPLICATION OF THE BODY

1979-85

[This essay was originally prepared as an article for *Flash Art* on architectural principles derived from specific conceptual artists. It was later generalized. The "architect" refers to such conceptual artists if they were instead producing architecture. It is supposed, in response to Warhol's remark that architecture was the only artistic field "left" unchanged, that conceptual art is the germinal new architecture.]

The body is the first enclosure. The first architectural construction. It is mostly water. For its metabolism and growth, it uses water – as an architectural catalyst. Not as a catalyst for construction only, but for chemical and therefore gravitational equilibrium.

Through time, gravity presses down, through the body. Through time, gravity drills the body into the ground. It bends the three-dimensional grid of pure space into a downtwisted warp. It cuts short a jumper's leap and slows a runner's stride. It reduces space to a malleable entity, to a reducible element. Trapped by gravity, the body spins its waters and their vital salts in whirling gyres. Subdued by gravity, the body's spin of waters gradually slows. The architectural catalyst becomes unavailable: fibers and walls reduce to heaps dry.

Architecture erects a reprieve from the forces bearing down. It rises from desires to travel, to break away and go higher, even to float. It rises from the same urges that send humans into outer space beyond gravity, if possible beyond time.

The architect constructs large-scale replications of the body. Not the body in stasis but in motion. Yet architects have long tried to objectify the body; to set it on a pedestal and derive from external appearance, including anatomy, the principles of Ideal Proportion. They spoke of human scale and symmetrical facades and Golden Sections. Their imitations of body aspect, instead of body action, scarcely invited those who approach or enter – with their bodies – to dance, or to lie, or to run.

Enclosures for a self that moves and feels amid gravity's field ensue from internally-induced actions and internally-felt sensations. They ensue from experience of the body as subject. The architect begins work by making his or her self an exploratory surface, a surface releasing sensation of how it feels to be formed. He or she will spiral within a closed system and will carry that spiral out to any scale of participation in space. The physiology, the closed system, could carry itself out to exhaustion in pushups, or a run, or any other engagement with gravity.

Boundaries are determined by limits of exertion. They cannot be set by plans. To find the boundaries, the architect makes a spanning of a site, bridging with body actions or tensions two distant points of a perimeter, and afterwards affirming that spanning with an installation of materials, sounds or lights. Structure performs what the body first enacts. A design follows from a list of the desired sensations – largely kinesthetic, but also visual, haptic, olfactory, audible. A plan might generate a building, as Le Corbusier pronounced, but first there must be the list. There must be a list of what is required. Without that the building becomes another classicist form.

We no longer need the vocabularies of post and beam, of pediment and foundation. A roof is what shields the body from sun and rain. A floor is what absorbs the body's steps. A wall is what limits access or exit. A forest canopy can be a roof, a skin can be a floor, a cascade be a wall.

A structure need not stand on the ground. We do not stand, like stones. We balance, falling this way and that, catching ourselves before too far. Instead of standing, upon poles, a building can be suspended or cantilevered, extending over a vast. When merely stood up, on the ground, a building mats down an active surface of animals and plants, making a cut in growth. Most buildings so squat, so press down upon a field. They make elaborate indentations with root-like foundations, and their heavy superstructures bar easy removals. Perhaps the solidity is reassuring. But "less is more" applies not only with details but also with foundations and mass. Mies Van Der Rohe would make a building look good with less, but would not make one work with less. He maintained the stack-on-flat sensibility of classical form.

A cut in the ground leaves an enclosed pocket, with only a roof to be built. A bridge instantly makes floors, walls and roof yet spans over rather than bears down on a site. A bridge with tensile spans could support a multiplicity of lightweight modules among foliage. With sails or nets to break the wind, the chief lateral load on structures, the bridge skeleton can carry more with less than normal buildings. Were not such buildings over-reactions, over-exertions in response to fear of no strong shelter? As children, we sought less to build stockades upright, like the "forts" you buy in stores, than to get below ground level or build a platform among trees.

Site need not be fixed. Each site holds inherent structures, each implies a plan. Ready to constantly shift locations, the architect expects not to build a determined house but to exploit the fragments of existing external situations.

Energy used to make objects can be used to locate them.

A hillside dugout already has walls. Plants spreading over an abandoned brick wall already form an air conditioner and windbreak. Traversing the globe, the architect builds into whatever site seems enticing. The aesthetic lies not with some edifice, with some monument, but with the capacity to shift from one site to another, and adapt. Architecture ceases to be transfixed.

Its materials and structures are modeled less from plants than from animals. And not animals as they look, but as they function. The most efficient architecture appears in explicitly artificial animals like airplanes (birds), ships (fish) and cars (horses). Le Corbusier said that architecture should be modeled on airplanes, ships and cars – but he meant in appearance, in form, more than in metabolism and muscular action. He overlooked the fact that airplanes, ships and cars are moving. They are burning calories and changing wind-flow and churning up waters. The graceful lines of ships and cars celebrated by Le Corbusier are there for a reason: to facilitate movement. Although buildings might not themselves move, might themselves not have an elaborate array of moving parts (except, of course, in the air conditioning and interior transport systems), they are supposed to facilitate movement. And they are themselves supposed to move, to have moving parts, whenever that assures economy of structure. Radical cantilevers can extend far, lightweight, with adjustable counter weights. Plug-in modules can be shifted most easily with cranes, on tracks, incorporated in the structure. Wind load and earthquake load would diminish in effect with elastic membranes or sails spreading tensions among compressive members.

Efficient structures can mimic the flexing helices of muscle, the stretching tendons, the pivoting joints, the connecting bones, the fluting fins, the elastic skins – all being held up by the same burning of fuel, the same torsioning of fibers, the same inflation of skins with water and air, and the

same pumpings through vessels. A building could be designed the same way as the body. It could be buoyed up by tensile cables slung from pneumatic envelopes. For even in stasis, an animal – unlike a plant – cannot stand or sit without continual stretchings and inflations. A skeleton collapses under its own weight, let alone that of the flesh and blood in a body: it stands erect and defies gravity only by continuous chemical actions, continuous flexing of muscles and movement of fibers, only by inflating and suspending of volumes. You cannot just stand there like a statue. We are not stone. Pneumatic action and elastic motions help bear up the weight. Falling this way and that, then catching one's self, the body is able to be upright. By flexing and not compressing, by stretching and then releasing, by breathing and then exhaling, the body organizes internal forces for bridging of voids, including the void it fills up. Architecture, most efficient, is in motion.

The architect yearns more for bridgings of space than for apparent definitions with columns and lids. One tries to be in two places at once, so defying the limits of body-space and so making an outstretch, an imminent fall. Yves Klein's leap was an architectural act. How he landed was the architectural result. What if he had caught a tree branch and made himself into a bridge?

Then architecture would work. Then a roof would work. Shortly after Klein's leap, the sculptor Dennis Oppenheim proved this. As with running or other motions, he breaks away from one stability, one position, and lets himself fall forward only to catch himself. He falls and then catches himself with a motion. He reaches out to the other side of a gulf and holds out until collapse.

Structures under tension become normal. Such structures have been developed by Frei Otto, Thomas Herzog and a host of other pioneers back to El Lissitzky (Sky Hook), but they have been classified as "tensile" or "pneumatic", as in a class by themselves. No thorough-going vocabulary about architecture had been developed to incorporate them among the buildings and spaces we daily experience. There are buildings we live in, and there are these experiments or novelties. The new vocabulary arises if we start with the physiology rather than anatomy, with the body in motion rather than as statue, with process rather than form – with movement. The Futurists made first words: *fotodinamisme*, the city builds, always under construction, words in freedom. Now, architecturally, we say: the tent replaces pediment, the floor replaces pedestal, the walls aslant and shifted replace the regular planting of columns.

In physiological experience, there are no buildings. There are greater or lesser enclosures. What has been called "buildings" are integrated within larger spaces. With the physiological language, originating from conceptual and Futurist art, originating from actions by Beuys, Acconci, Nauman and Schneemann, we conceive not of buildings but of physical experiences in built space. Megastructural thinking ensues.

Buildings integrate within larger structures, with components being moved about, as by muscles, and with counterweights and counter-vailing forces being exerted in a mesh of vectors to maintain equipoise. The street as straightline corridor with upstanding single structures showing facades goes the way of the ghost town, the Hollywood movie set. Each building there is constructed for an appearance, a front, and each, being self-consumed, is overbuilt. Each is overconstructed in its apparent independence. Instead, there would be interlocking of structural parts, whirled up in helices, spirals and other efficient forms. A community can hold itself together as a structural unit. It need neither spread as grid nor sprawl as suburb. The highway and railroad did not spread out cities and destroy their

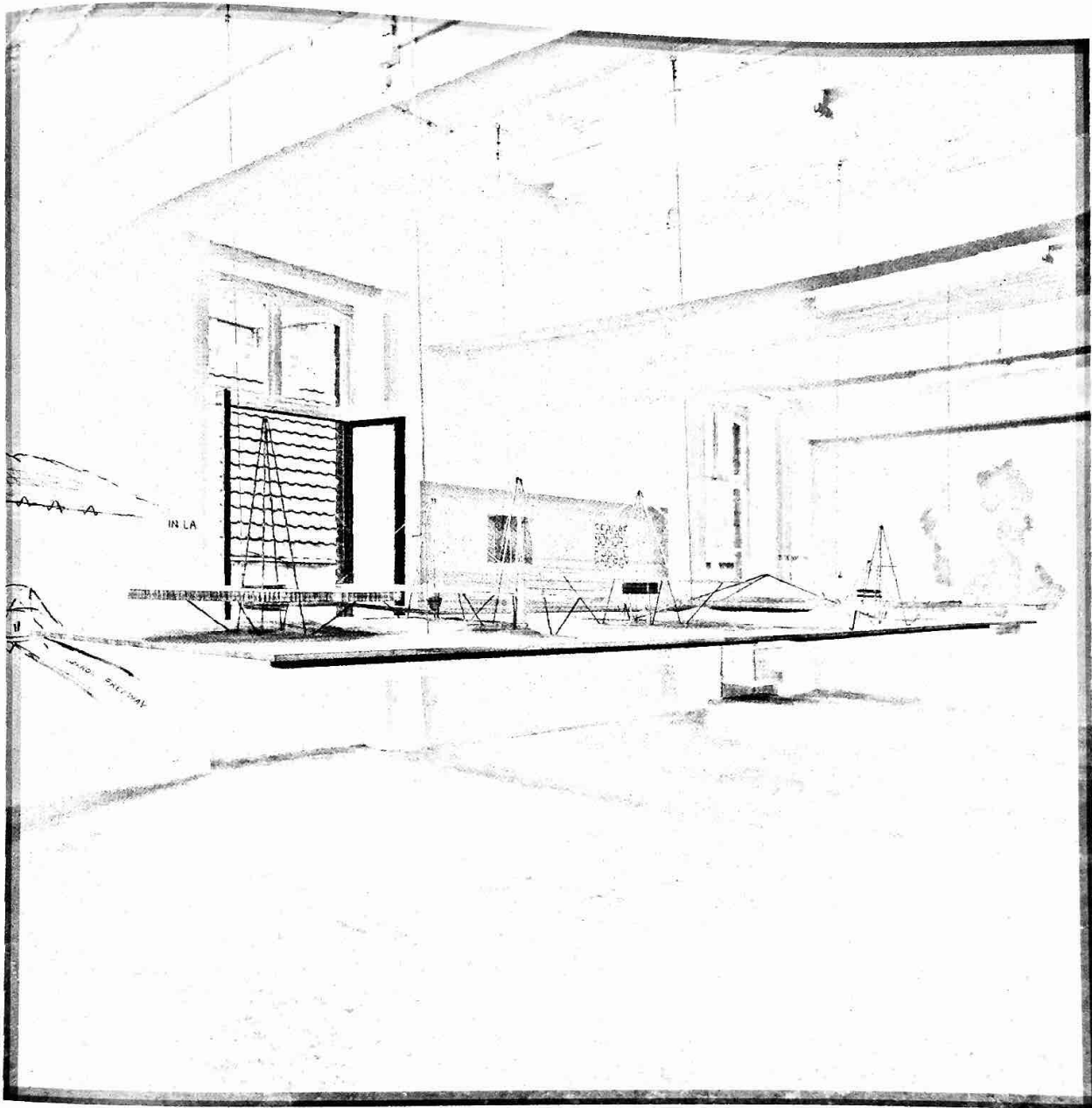
intensity: rather, the insistence that each house or building be its own thing, distinct, with attendant yards. If cities were truly organized around highways and rapid transit, including airports and docks, the layout would economize. The layout would conform with movement of residents and goods. A circulatory system ensues, as in a body, and it is concise. Towards ways out from the blocks burning in the South Bronx, the architect builds an aerial megastructure, like the elevated train paths, attracting graffiti – and activity – in clusters above the trees. Towards a way out from the embastioned palazzi on Park Avenue, the architect replaces the twin adamant rows of inhospitable energy, the stout walls, with suspension bridges bearing lights, footpaths and hovering sites from which to encamp a few containers with garden.

As Oppenheim builds a house, it's a "platform for viewing." It's a place for surveying the surrounding conditions, for setting up an assault practice course before entrance outside, for organizing what comes through. Walls function less to bear a load than to organize a field of information. The home, like the city, is a matrix of reports. It is a node of connections between words, goods and pictures. It is not a repository, not an enclave, but an intersection of vectors – vectors of information, which are condensed and integrated into programs for action. The king might have his castle, the peasant his hovel, the priest his retreat, but we are beyond that era. Now the home is a place from which to see, to hear, to sense.

Information can be received visually, as would occur in megastructure frameworks with components up high among latticework. More likely, it arrives through media. In advertisements and James Bond fantasies appears what the people want: a room with a view, and mostly a view upon multiple monitors, with multiple soundtracks, and multiple "interactive" options. Architecture will organize around media, not media around architecture. The room becomes an arena for the mind, an expanded replication of the neurosensory system, a theater with viewing stands surrounded by image-laden screens. The New York Stock Exchange is an example. All the papers strewn on the floor, the signals and numbers appearing on the screens, the transfer of messages, occur within a floor configuration that embodies a web of components interacting in a continental-US configuration. The site could be transferred elsewhere, to the top of a building perhaps. But the site functions as an information nexus, with walls and movements defined by displays and connections. So, with media, each residence and office comes to be.

The city, in turn, becomes a network. It ceases to be a unit. It ceases to have walls. It lies open to invasions of information and travelers. It begins at airports and highways, less so downtown by the river. The architect regards a city first as its schemes of circulation. For the measure of space is not distance but access. And the measure of intensity is not density of population but importance of convergent information. The Empire State Building, like many skyscrapers, is not important. It attempts to be grand, but it's separated from information. The scope and importance of information, the reach of understanding, makes a building more or less intense, and more or less effective within the web of ideas and facts that is the City.

As ecological systems, cities contain predators and prey. They set up intersecting paths for costly encounters. They set up markets. Where markets occur, there are crowds. Where crowds, lures and traps, collisions and losses. The architect locates the intersections. He studies the movement of crowds and rigs up snaring structures to absorb their energies. She, or he, builds a network of energies and persons that mimics the wilderness.



3 The city floats,
the city rises,
the city builds.

To realize the fantasy in the Futurist Boccioni's *The City Builds*, one must abandon all thought of the city as it used to be and one must begin with the feelings of the body.

Hence the phrase „Städte als Körper“.

Hence the installation at the Galerie Esther Schipper in 1990, which, like its successor effort (with more artists) at Galerie Anne De Villepoix in Paris, with a collaborative thinking and action about circumforming the body, about building a Raum for the body in which to move, with both a man and a woman, both sexes, engaged.

Abandoned is the notion of the Master Architect.

Abandoned, the attempt at Planning.

Abandoned, the assignment of a would-be Patriarch, appropriately decreed, who would attempt to subordinate the city fathers to a certain (mini) new world order.

This exhibition was produced by Peter Fend ((man) and Heather Jansen (woman), for a balanced approach to structural invention for habitat). The window was kept open to allow a view on the source of supply leaving the air and water – first conditions for the city – in good condition: the ocean energy rig.

ABOVE THE FLATS: SLOPE

1991

It is well known how to build on flat ground.

It is also well known that ecological processes usually suffer from building on flat ground, and that cities built thus destroy first their sites and then themselves.

There is plenty of human history to prove this.

One does not need much history, but just a little observation, to see that the agglomerations called cities do not have long rates of survival.

One might say that the city is, from a long-term standpoint, expendable. But it becomes harder to say that the site as well, given the toxic concentrations taking place there (as in many other urban or even outlying areas), is expendable.

A first task is a practical integration of already-proven technologies to effect a thorough recycling of nearly all materials. This assures clean water.

A second task is the industrial development of completely non-polluting and non-degrading energy sources. This can help assure clean air.

A third task, part also of the general task of assuring clean air and water, and essential as well to assuring a decent view, a good prospect, is locating whatever might be a city off the flat ground. Off the ground.

We do not mean cities that hover. We do not mean cities far removed from human commerce. We do not mean cities out in space or under water. We mean cities set upon hills, either natural or made.

Ideally, the water table can stay where it was. The wild animals and plants can proliferate as they have. Whatever steam of evapotranspiration rises from marshes and forests will not be diminished. The city reclines above.

It sets into slopes above.

It will not occupy flat ground.

Pioneering architects in the past century have been trying to get to this point. There is nothing new in this ambition. Witness the pilotis, the Constructivist balloons and ridges, the stilts of Archigram, the everlasting romance of Terrassenhäuser. Recall, further, those world's fair homes of the future, invariably set up above terrain, simply resting there for awhile, like a landed space vehicle. And recall, demiurgically, the first cave dwellings; or the cliff dwellings at Mesa Verde: in any case, they were above the valley, nestled into a hill or cliff, aloof from the dangers of wild animals... and plants. Some urge, even if just in a tree-house or in the needle skyscrapers now so popular for the New York rich, is to not settle on the ground.

Even if one builds on level with the ground, the urge is to then go below, and to build a hill over the house. Recall the primary hovel effort, with a shelter set into a pile, made by Smithsonian at Kent State.

Remarkable is the fact that no systematic and rigorous program of building, backed up by industrial production of components and standardization of specifications, has been directed for buildings off the ground, leaving the ground open, set into slopes.

In every case, the tilt, the slope, the angle, the declivity, the subordination of material to gravity, is central to the construction.

From this we hope to realize an architecture of declivity, or slope, or descent and ascent, as opposed to erection. From this we hope to realize an architecture based on equipoise, hence on col-lapse.

Thus, at last, comes an alternative to the ziggurat.

Or its successor the high-profile office tower.

HUMAN ARCHITECTURE

1980

(From a draft for corporate outline, with distinction from land or wilderness architecture, or non-human, architecture. This can be sharply distinguished from efforts, albeit distinguished and respected, by Frei Otto, who sought form in a soap bubble, and is more aligned with the animal physiology studies of architects like Le Ricolais, or the bioengineering school.)

Human architecture: Thorough imitation of the body on large scale. We enter structures that function like our bodies, with the requirement that all structures be away from or above marshlands, flatlands and deep forest. Structures set either into hills or up on counter-balanced pilotis. We return to the trees or the caves among hills, like those before the Neolithic.

Spine. Structures achieve uplift mainly with cantilevers, in counterbalanced beams from central fulcra, by cables and by a ball-like foundation that mimics the human foot. Buildings function as humans do, with forces in one direction counterpoised against forces in an opposite direction. Cables and adjustable counter-weights behave in tension much like muscles and tendons. The spine reaches out to encompass arms, legs, limbs--the platforms on which loads (offices and resident lofts, open to on-site invention) are placed. Each platform contains utility outlets which can serve also as control points for public finance. Taxation can be based chiefly on consumption, with consequent incentives for rationalization of construction within the supporting megastructure frame: burden, or load, behaves similarly with the spine.

Circulatory System. Transport system of moving sidewalks and freightways set on aqueducts of water or heavier-than-air gas, which, being pumped, function like the blood circulation system. How else does one move but by such pumping?

Pneumatic System. Wind load modified and reduced, for local circulation of air (including plants' oxygen), by canopies and rigid-sail windscreens, commonly held aloft by low-grade heat, or exhaust gases, from city machines and pumps.

Cells. Transportable containers, which can be bought or sold much like the fixtures, or part of fixtures, in present loft tenancies. Can be suited for special functions like sleep (negative pressure chamber) or intense thought (video-computer-multimedia chamber). Suited for spines' up-borne platforms, or for any hillside used as spine, or backbone, as plug-ins.

Cities are usually disastrous to ecology. By imitating the body as it functions, we can possibly make the city become like ourselves as we evolved over tens of thousands of years prior to cities: when we were not disastrous to ecology. For starters: do not make a mound, or heap, but make pathways for standing and running around -- as cities, as selves.

SLOPE

1991

The chief problem with cities, according to polls, is (1) circulation and (2) pollution.

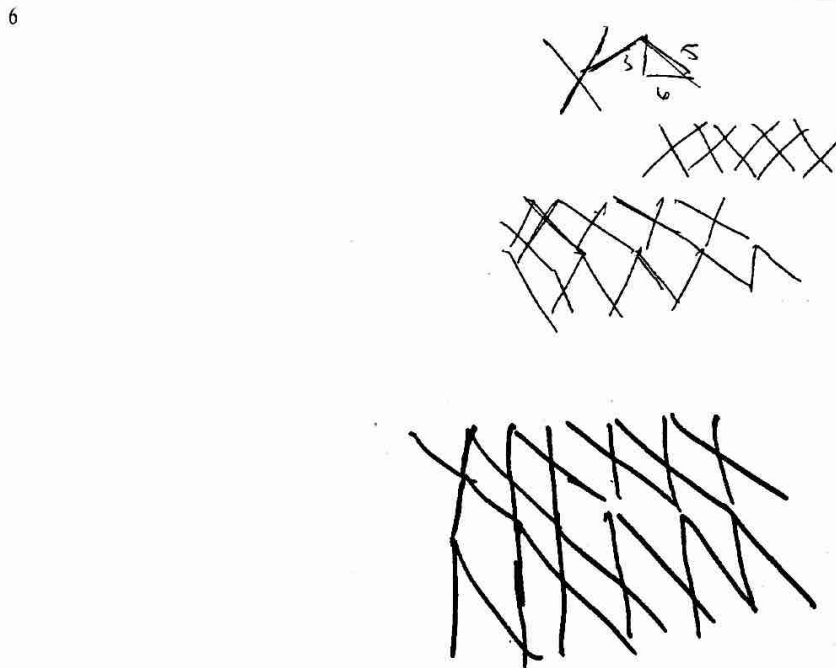
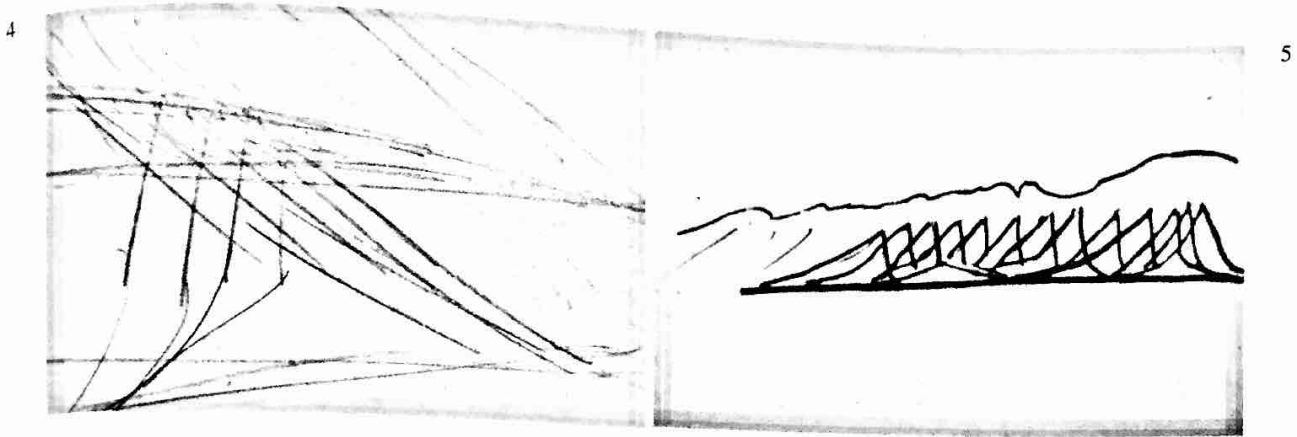
This conforms with the purpose of cities: to accelerate and intensify circulation, without causing an unacceptable level of pollution. You want to be able to get around and see a wide variety of people, or have a sheltered situation for a very specific subset of people, without having too much of a mess.

We propose the use of concepts and structural practices from recent art to solve the problem.

EXCERPT FROM "AL/LA SLOPE"

1991

What does it mean, kinestetically and therefore architecturally to live on a slope?



SLOPE STRUCTURE

1991

We draw upon the work of such artists as Dennis Oppenheim, who cut wedges into hillsides as a prime sculptural act, Richard Serra, who studied the poising of great weights at steep gradients and in countering-off, and Michael Heizer, who with "Complex" brought the sloped structure up off the cut in the ground, to make something to look upon rather than to look through a window to.

A paradise in America, never occupied by US citizens, is the Mesa Verde cliff housing set in desert mountains in the Southwest.

Ever since, there has been a longing for an... accommodation, even a compromise, something between a house as its own height, a bungalow tucked away (or, nestled) into the hills, and an apartment (ideally, a penthouse) set above most everyone else. An objective has been a place from which to view.

The solution to date has been the skyscraper (an Ameri-

can invention allowing every executive the sensation of being on top, and now a necessity for any city pretending to be American), the concomitant high-rise apartment tower, and the split-level house (for the sensation of hugging the contours of the land).

We would propose now to go further.

Rather than try to climb the z axis, or – alternately – deny it, one works on a gradient in relation to it. One builds not on flat planes, not in vertical columns, but at angles, set into slopes.

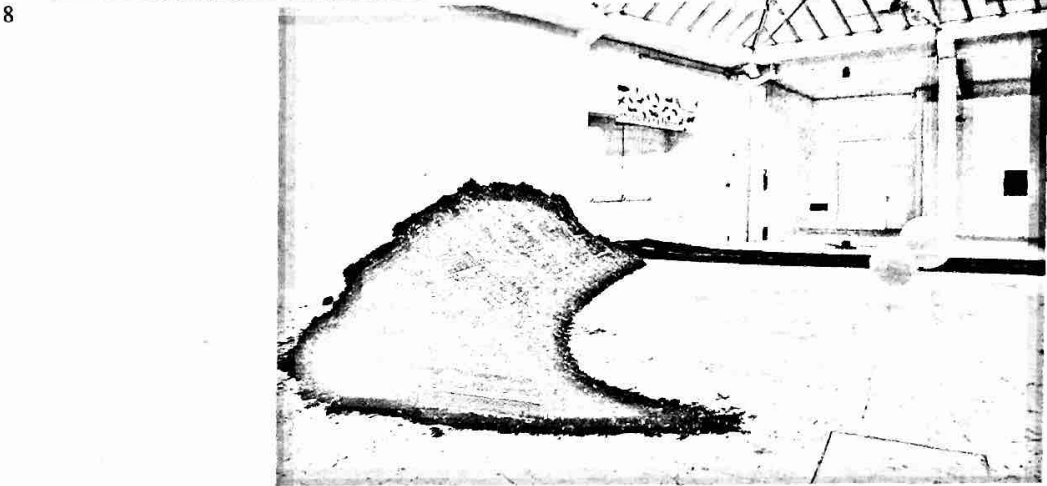
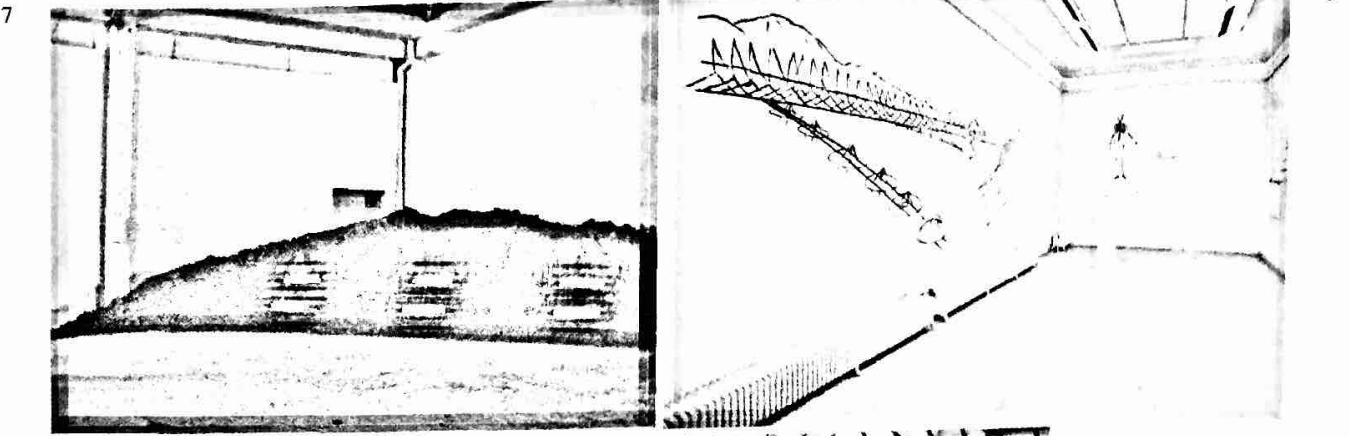
This is thought to be tough. It is thought to be expensive. Given costs of construction, that may always be true, although with containerport and conveyor-escalator technologies there may be great savings. But when considering long-term costs, and the overall question of efficient circulation essential to the city, it appears that construction upon hills may in fact work. Why rise straight up when the earth can rise, often at angle, as well?

All the following drawings were produced between 1978 and 1980, except where indicated.

4 Basic scheme for setting into a slope.

5 Infrastructure servicing this scheme.

6 Concept for bias-cut 60-120 degree diagonal grid structures climbing slope. See also Tivat project (Image 10 in the Adriatic chapter, Images 23+24) and elevation diagram for megastructure and slope (Image 39). The objective is greater efficiency of vertical and horizontal movement.



- 7-8 The realization of the first „Slope Structures“ is being handled by attorney-collector Howard Morse with his wife, also an attorney, Barbara Morse. Photos from CCC Tours indicate the concept of a slope city. Something set into the hills, using the slope as a supporting element, as a substrate.
- 9 Installation at Künstlerhaus Graz, showing the starting point for thinking (how to move beyond the body, with a reification of the body into built or secondary form, as in corsetting), then on the pedestal and on the far right the standing figure as counterbalanced and breathing, or atmospheric, which allows for an upright position of otherwise collapsing elements, and finally a scenario of a city derived from these physiological facts, situated – in this case – in Montenegro.
- 10 Site Simulator, Tivat Bay, Montenegro
 Urban schemes, infrastructure set into the slopes, with grid system for supply to the Los Angeles Basin, with slope structures built against topography as evaluated by computer processing of satellite data together with terrain elevation data. The person on the computer is George Chaikin, a professor of architecture and computer sciences holding positions at Princeton University, Cooper Union and the School of Visual Arts.

How does it feel? What does it do to a personality? We address questions of Slope.

We all know from books like *Architecture Without Architects* and various German flatland attempts at Terrassenhäuser (an architectural genre), and of course the image of small hilltop-clustered Greek or Italian villages, that life on a slope is very desirable.

We focus on why, and on how to make sure that given a site that slopes one can accommodate many, many people with as many of the advantages of slope as possible, without the disadvantages.

The advantages are: access to sunlight, air and a vista; of the built structures, a variety of volumes.

The disadvantages are: difficulty of access to site, both for building materials and in daily traffic.

The disadvantages may account; for why the slope is usually abbreviated and turned into a series of skyscrapers on flat land.

Now, equipped with modern engineering technology, such as containerization, light-rail and high-speed escalators, we seek ways of getting beyond the skyscraper and flat-land, back to slopes.

SLOPE MEGASTRUCTURE

1991

Extreme counterbalance techniques make it possible to offset the uprearing loft levels to the left against the heavier, outward extended office/store levels to the right. Originally the design was set into a hillside, but theoretically it could be set on floating caisson feet and set couring above terrain. In such a case, however, it may well be more sound to set one such sloping structure back to back with another, parallel one. They need not prop each other up: they are separately balanced. But a modest juncture at the apex could increase the assurance of stability.

Megastructure carries aqueduct and other roadways at the center.

The various loft levels accommodate any number of arrangements of airfreight containers, with positioning subject only to the overall counterbalance equation.

THE AMPHITHEATRE AS PRIMARY FORM

1991

There are several basic architectural forms:

the erectheum, an upright structure

the pantheon, or domed structure

the amphitheatre, or coliseum, as concavity

We are here concerned with the third form, the concave form, the amphitheatre.

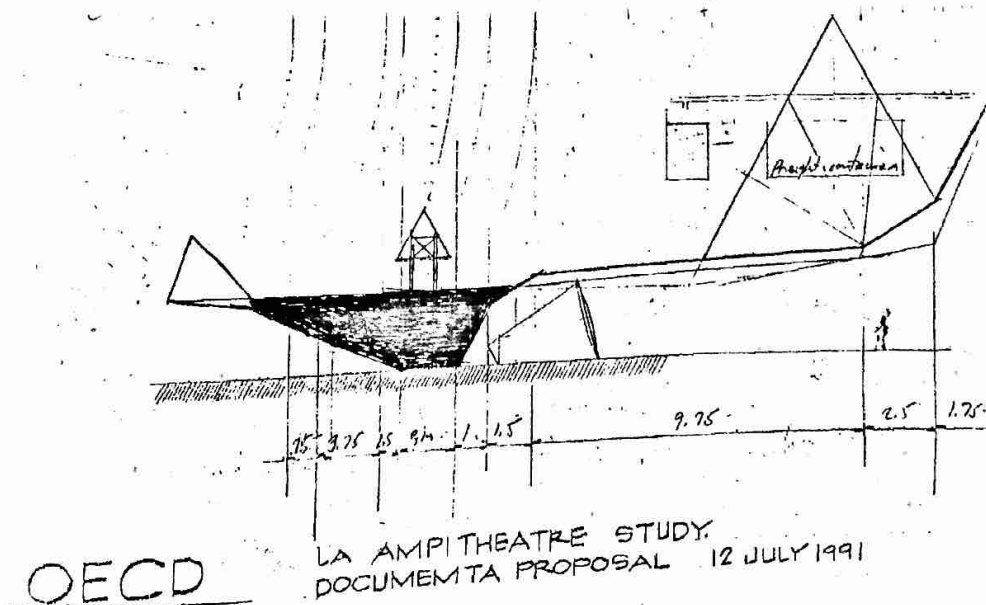
We propose that although some have sought to build entire cities based on the erectheum (witness Manhattan and its imitation Frankfurt) one might do better building cities based on the idea of coliseum, or amphitheatre, based on the idea of slopes bearing downward to a common pool. This makes it easier, for example, to allow people there to see. Otherwise, as in Manhattan, they end up in a forest of erected structures, a concrete jungle.

It is ironic that while most people in nature live in an amphitheatre situation, on a slope or shore, or among cliffs up high, most theories of building have focused on the erectheum and pantheon as forms. We may recall, for example, how one has been likened to studies in male assertion, the upright cock, and the other has been likened to a search for female shelter, the bulbous breast. What might be the anthroposexual reference for the amphitheatre?

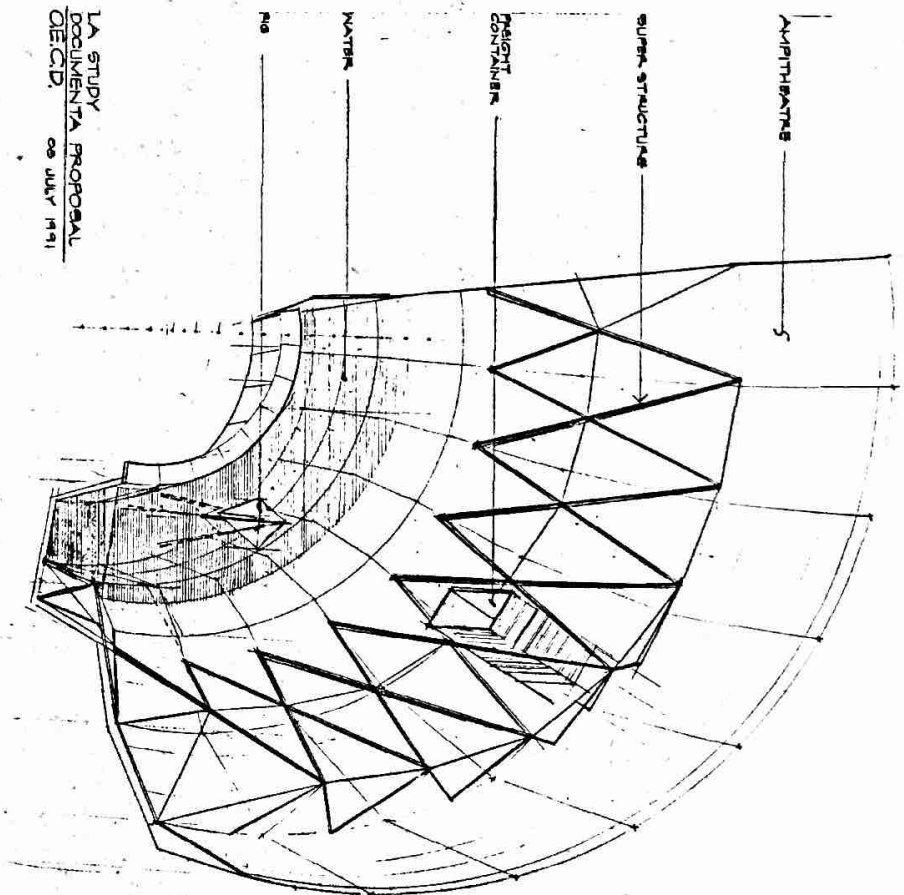
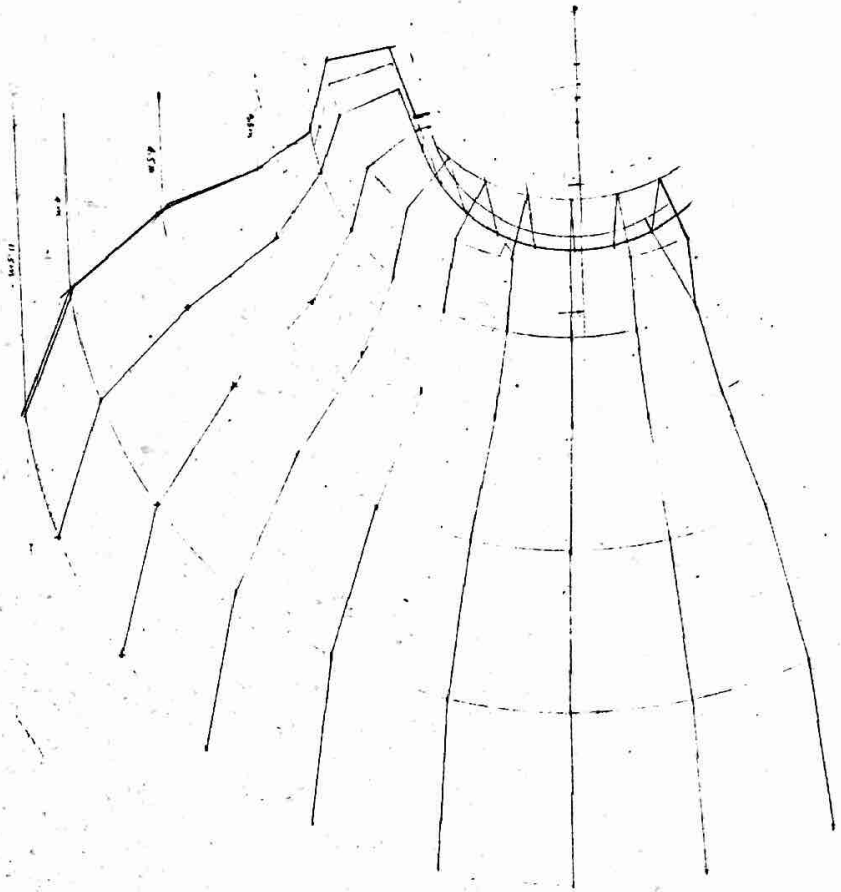
We propose, neither one nor the other but both. The amphitheatre is the arena in which both sexes meet, in which there is neither assertion nor protection alone, but a commonality. If it should have a correlative in the human body, it is the seat, the hips, the butt. Into this both sexes can fall in, allowing community.

Although some dancers have told people that the center of human power is in the diaphragm, just below the breast-bone, we tend to locate that center more in the seat, astraddle the hips. From here, after all, comes the capacity to rise up, to leap and drive forward, to swing. How about architecture built thus?

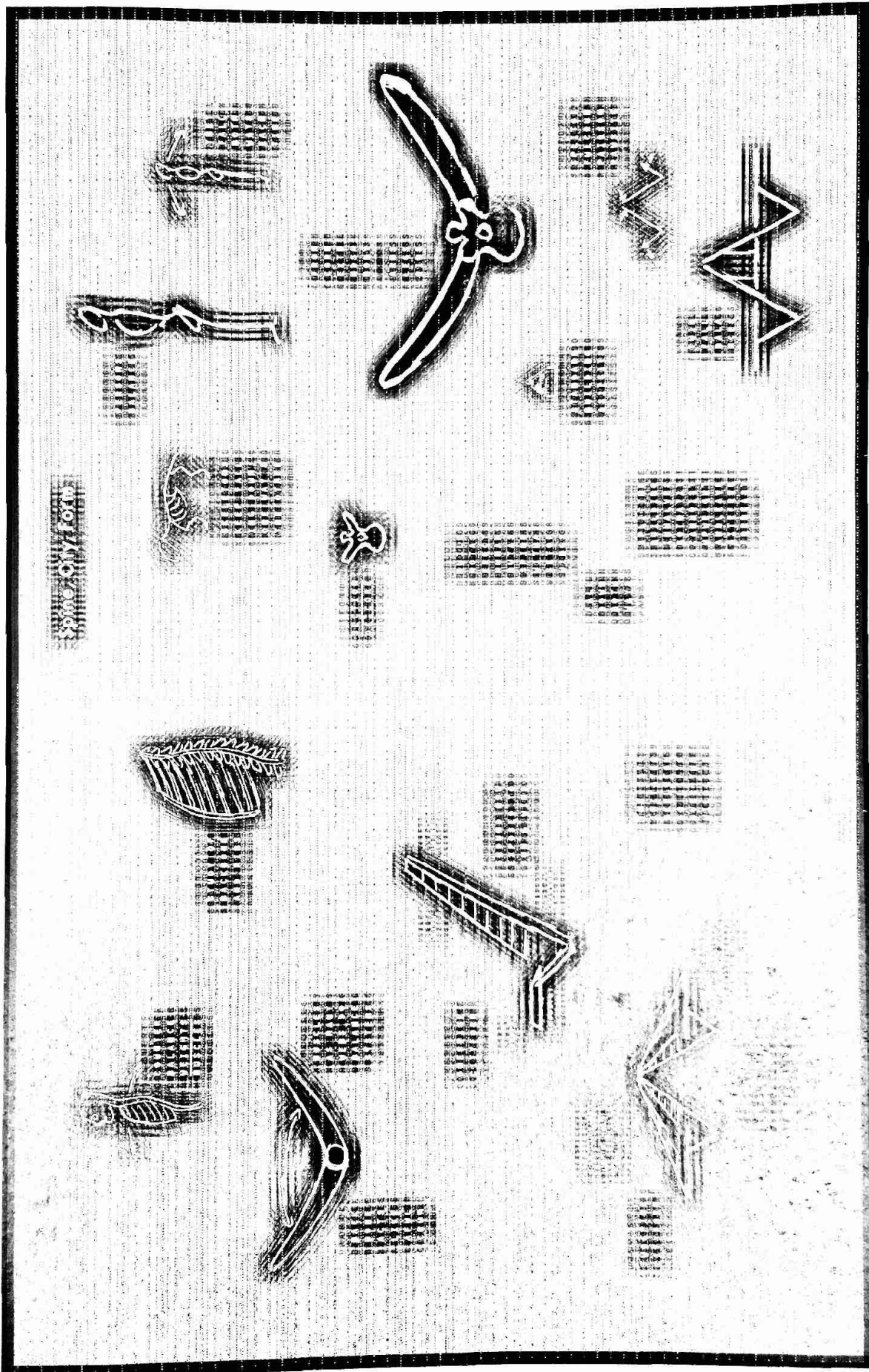
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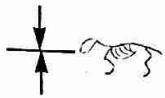
11 Section drawing executed by architect Kevin Gannon at Ocean Earth studio shortly before trip to Montenegro, after which the concept was expanded into the AL/LA Project, 1991. Due to the war this project was interrupted, and it was deemed by the company to be suitable for the context of Documenta IX.



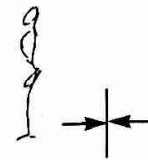
12 Isometric renderings of LA Amphitheatre Study, by Kevin Gannon, 1991. The structure models both the geology of the LA Basin (parallel with the Adriatic Entrance slope) and a conceivable system for steel-structure embedding into slopes to afford lofts with utilities and raw space for translocatable fixtures (i.e., containers). The counterweight in this case is the part of the geological slab – the slope is pressed down by the mass of ocean water, in which a sea rig would float.



13 Film of body and architecture, from ZONE Inc. The original produced in 1969 was hand-written.

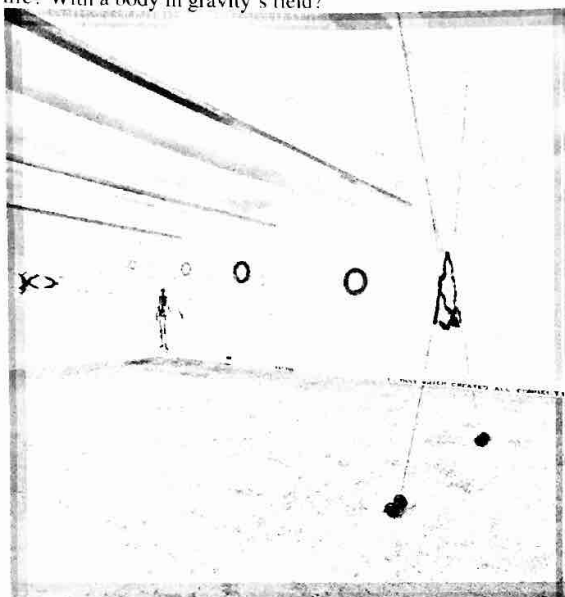


STRETCHING OR STANDING

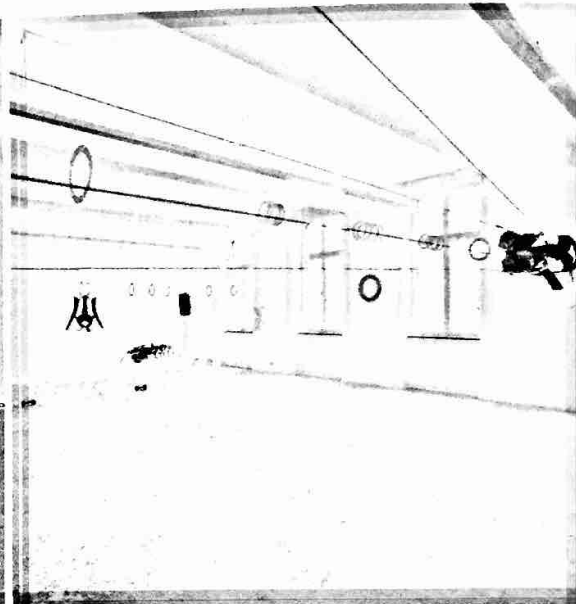


Knowing our selves, we take what seems to be the two body actions: fall/run/leap or stand/walk/balance: Extending forward, on all fours or in air (running), or maintaining balance in one point (for us, walking). What else is there to do with a self in this life? With a body in gravity's field?

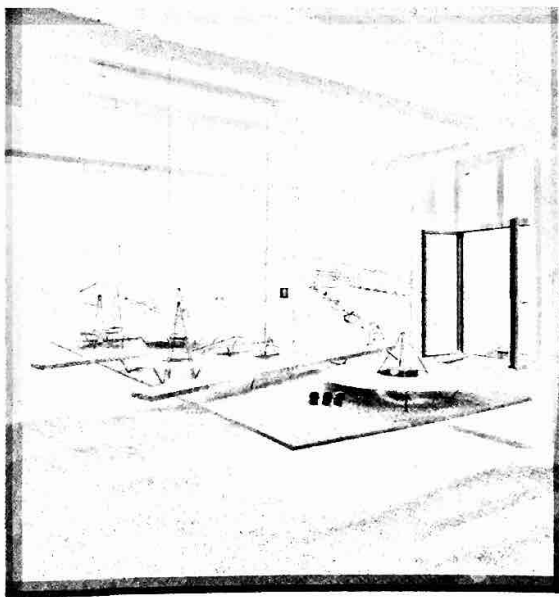
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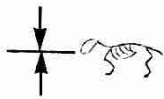


„Städte als Körper“ Gallery Esther Schipper, Cologne 1990
Aspects of body engineering, stretch and rigid body ware, conducted by Heather Jansen.
Buildings and bridging structures, spropoused by Peter Fend.

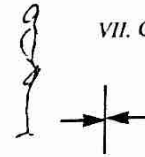
14-15 STRETCHING/RUNNING. Bridging structures, or flying structures further to elastic jump suit. The paradigm was the dog, or the act of leaping into a swimming-pool.

16-17 STANDING/WALKING. Counterbalance structures, further to the rigidifying corset, with tensible fibers helping to stabilize what is otherwise in equipoise of countervailing weights.

It is not inconceivable that further research will be conducted with various investigators into structuring around the body, and consequent capacity to extend either horizontally (leaping, jumping, running) or vertically (standing, walking).



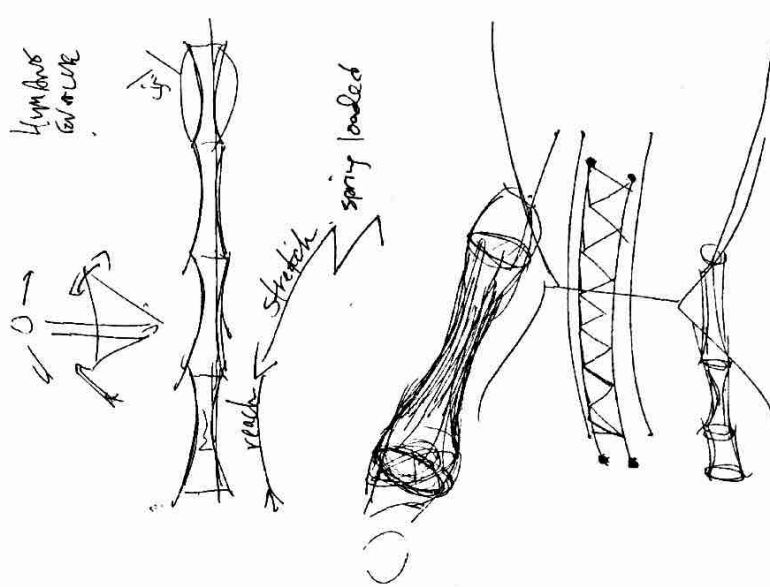
STRETCHING OR STANDING



VII. CITY BILD

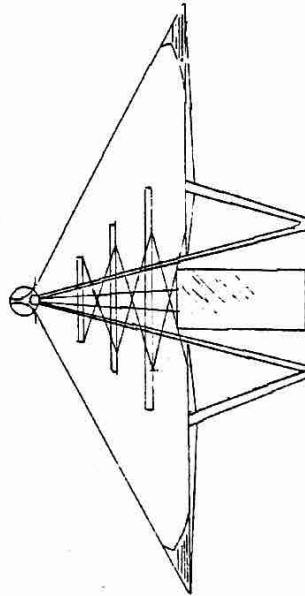
Extending forward, on all fours, or in air (leaping or running), or maintaining balance on one point (for us humans, walking). In both cases, stability is achieved by a combination of vectors, counter-vailing, coupled with inflation. Why not with structures?

18



19

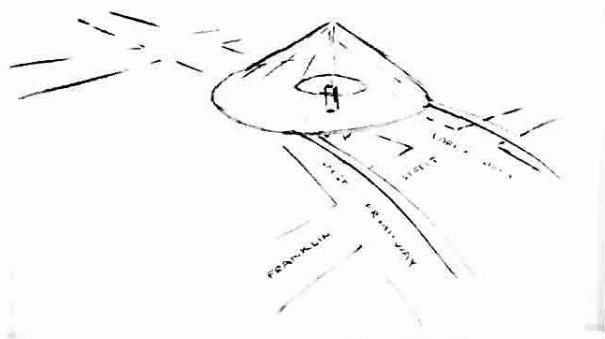
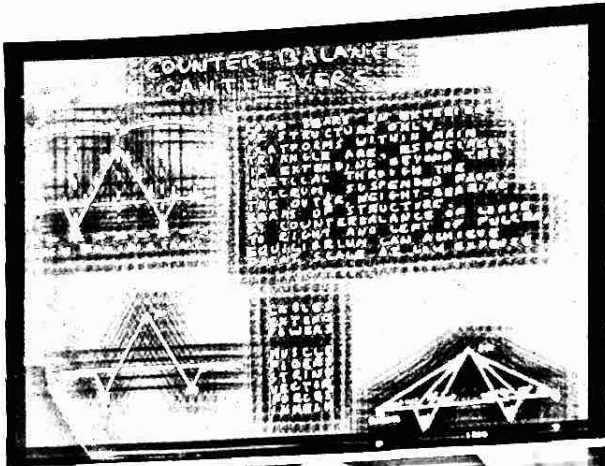
BODY-LIKE BUILDINGS FALL DOWN



CONCEPTS FALLING OF BODY-LIKE BUILDING LEAD TO CONSTANT STANDING UP AGAINST GRAVITY. BUTTERFLY BUILDING IS A GOOD EXAMPLE OF THIS SYMMETRICAL BUILDING, WITH BOTH SIDES FALLING OUT IN EQUILIBRIUM, ACHIEVING EASY ELEVATION AND STABILITY. THE COUNTERWEIGHTING BECOMES COMPLEX, AS IN ARCHITECTURE, WITH SKIN AND FIBER SLIPPING.

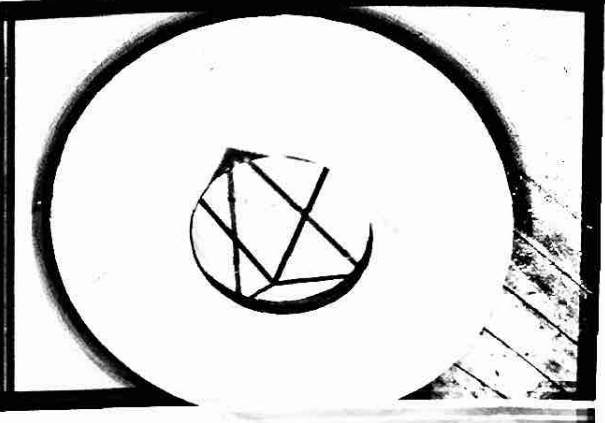
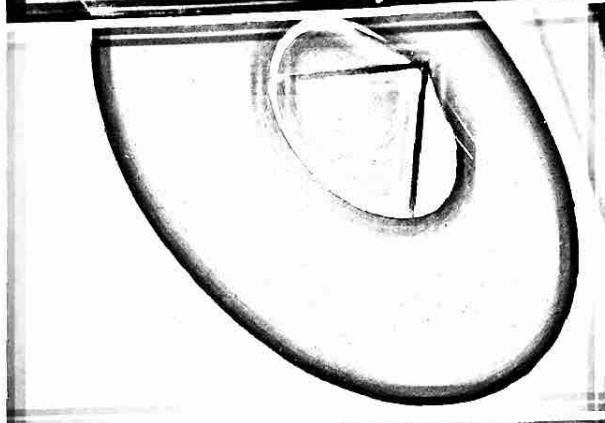
18-19 Documents from the first formation of concepts for structures based on constricting/standing/walking or stretching/leaping/running. Top, drawings by Heather Jansen for a compression-ring web structure extending across a gravity field, taut, with a fit dog designated as the model, 1990. Below, a poster for an architecture show in NY in 1981, in which Peter Fend followed through on a response to the TWU sculpture by Richard Serra at the small square between Varick, Franklin and West Broadway in Tribeca, NY City. Fend proposed to lift the TWU sculpture, making it a counterweight against a series of decks for a giant, hovering-saucer Mudd Club. Steve Mass, who liked the idea, was unable however to find the city permission or funding to realize it. The design combines concepts from Matta-Clark's "Splitting", which would poise parts of a building in counter-position, falling away from each other, with his balloon-suspended canopy concept (borrowed from Leonidov's "Sky Hook"). Architectural engineer Giuseppe de Campoli, author of authoritative texts on engineering, says both concepts of standing or stretching are sound, and that the structures are efficient and eminently buildable. But they would need to be registered as bridges, not as buildings, in order to meet legal codes. Thus, altogether, City Bild attempts to establish an architecture of process, of actions as constant and ongoing as maintaining good bearing, alive.

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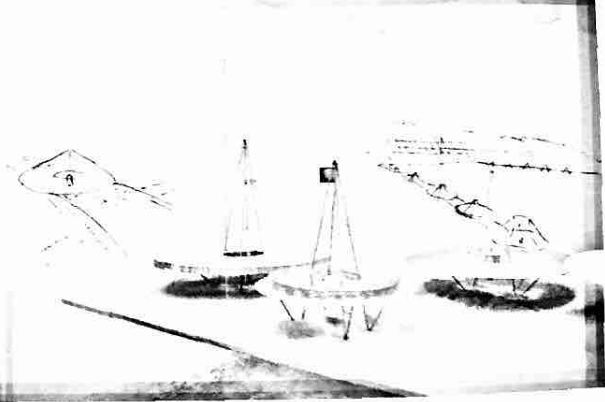
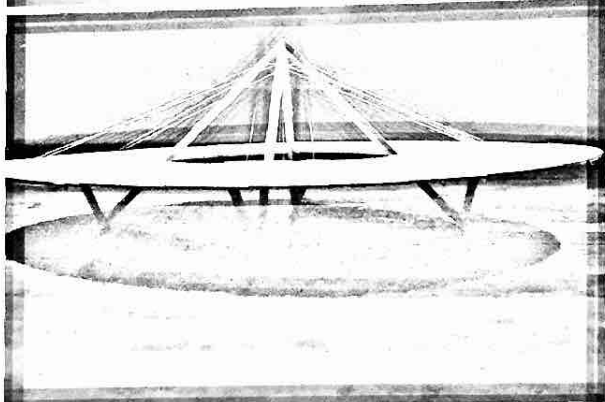
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Centered Counterweight Structures

20 Counter-Balance Cantilevers explanation.

21 Implications for a building, hovering above a convergence of streets. Mirror panels on the underside could allow enough light to reflect in the space below to allow trees, bushes and grass to grow – beneath the building's floors. The reflected illumination from glass-walled buildings that lights up, for example, Park Avenue, could be used to produce a literal (non-concrete) "jungle", the *pilotis* practice pioneered by Le Corbusier and SOM is taken further, along lines suggested by Ocean Earth founding shareholder Andrea Callard. The site shown here is well-known for its succession of installations, including various vegetation plantings and – as we use for our counterweight building – the massive grouping of steel plates, called "TWU", by Richard Serra. An intention is the lightweight, airy architecture of Alan Saret.

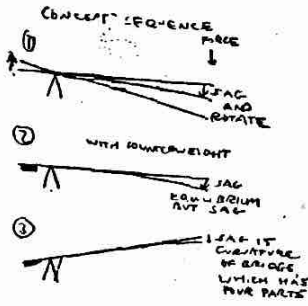
22-24 Counterweight disc building, which being in a state of collapse and counterpoise, with adjustable outerweights, can be more resistant to wind load or earthquakes, or other lateral forces, than implanted buildings or post-and-beam construction.

25 Scenarios of urban construction with vocabulary developed by City Bild. The counterweight, the bascule structure of disc and linear strip structures, the hovering off the ground, leaving it open. Galerie Esther Schipper, *Cities as Bodies*, Städte als Körper, 1990.

26

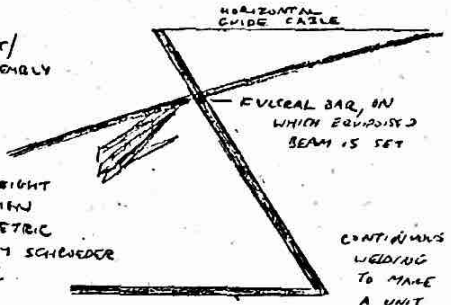
CONCEPT

IF AN OUTWARD-EXTENDED ARM IS COUNTERWEIGHTED AND TILTED UP, IT CAN ACHIEVE GREATER DISTANCE WITH THE SAME STRUCTURAL STRENGTH. A SERIES OF COUNTERWEIGHTED ARMS, STABILIZED BY CABLES, CAN SPAN A BROAD ARC.

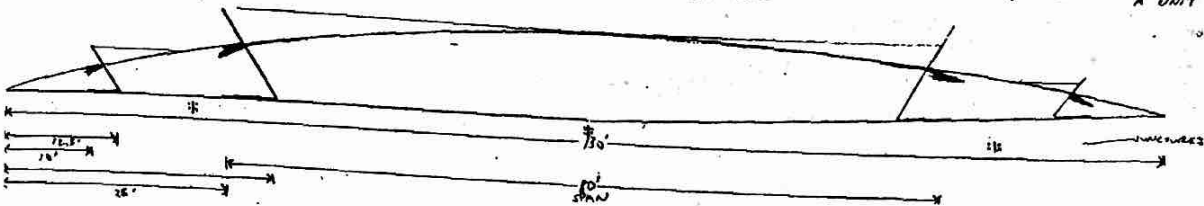


COUNTERWEIGHT/ PROJECTION ASSEMBLY ELEVATION

COUNTERWEIGHT AND DESIGN OF GEOMETRIC ARRAY BY SCHROEDER STRUCTURE BY FOND

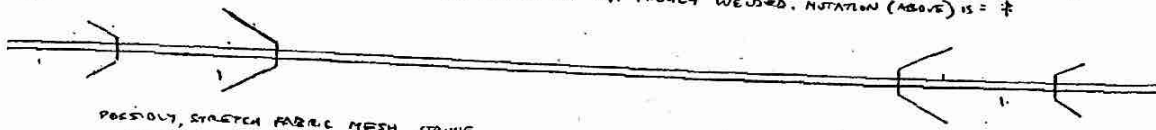


ELEVATION



STRUCTURE HAS FOUR COUNTERWEIGHT-NEM SECTIONS, WHICH ARE LOOSELY JOINED BUT NOT FULLY WELDED. NOTATION (ABOVE) IS =

PLAN

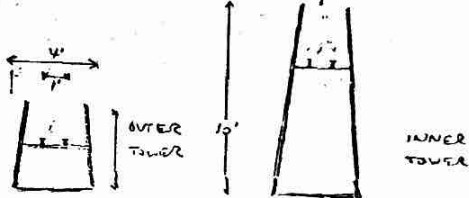


POSSIBLY, STRETCH FABRIC MESH STRUNG TIGHT BETWEEN TWIN I-BEAMS

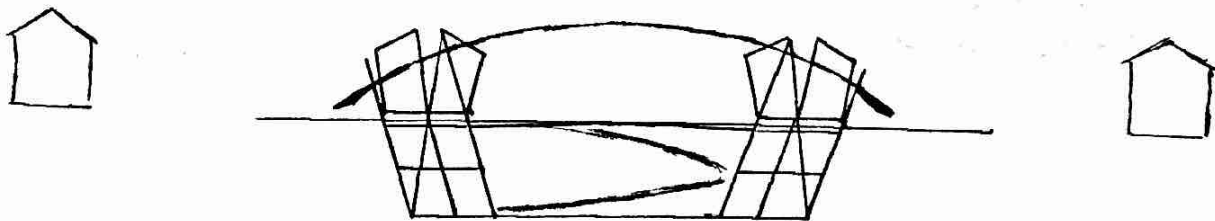
RENDERING



TOWER ELEVATIONS



27



Outlying Counterweight Structures

- 26 Sag Hover. Collaboration with sculptor Frank Schroeder to use his works as outlying counterweights against fulcrum which elevate much longer members, in lateral pair, to bridge a long span. The dead-load of the steel effects a sag, which becomes a stable low arc. Tensile cables from the fulcrum towers, also straddle structures, do not suspend the structure but rather prevent movement, against wind load or lateral load. Reviewed with architectural engineers, found to be efficient. 1981.
- 27 Enter/Leave. Concept proposed on invitation for admissions-alumni office of Carleton College, Minnesota. Objective: to build a sizable office and reception area inobtrusively in a single-family house residential area adjacent to the campus. Solution: place most offices below, in a giant ring intersecting two existing houses. Split the houses and hoist the halves on giant steel tent stakes which support at one end two outlying counter-weights and at the other a lightweight canopy overarching the entire space. Most offices and the main reception are in the light-well below. A retractable bascule footbridge connects the two houses directly, through the lightwell. This was noted as the "intriguing avant-garde design concept", 1991.

STÄDTE ALS KÖRPER
PROPOSITIONS

1990

[Statement for City Bild exhibition at Galerie Esther Schipper, Köln, September, 1990. The projectors, under a three-year contract with Ocean Erth, wee Heather Jansen and Peter Fend. A subsequent business structuring goes on now. The subsequent exhibition, by a team of French artists, utilized most of this installation under the title "Once Upon a Time in City Bild."]

You can build structures based on principles of the body. Investigation into this possibility requires both men and women. One cannot realize architecture with paradigms from only one sex.

The body is delimited by its skin, itself stretched taut by muscles and tendons. This is in turn delimited by clothes. The act of clothing is the first architectural act.

From the clothing on out we proceed with the formation of kinesthetic experience in space. Extension from the body in space, achieving architecture, proceeds through the act of adding skin, enclosing self.

We are not licensed to practice architecture [others with the firm are], but the architectural profession is not licensed – not enabled by law – to produce an architecture generated from desires of the body. It is not able to produce an architecture which manifests how the body wants to work – how it stands, how it jumps or runs, how it moves.

We generate from our primary investigations a new, and possibly disallowed, methodology of building. The situation is exploratory. Without an established body of knowledge or practice. We enter uncharted terrain.

Underlying all this is the drive for Marinettis "Futurist Body Madness". We seek to build membranes, then force and equilibrium fields, which enhance the sensations, even the abilities, of the body. We work with forces taut, forces loose and extendible, forces continuing the kinesthetic dynamics of the assemblage of tendons, muscles, nerves and tissue around an ever-collapsing skeleton, not as static structure able to stand, that is the body.

Städte als Körper is a Forschungsprojekt. It arises from efforts throughout the century to build a new vocabulary of construction. Nothing yet is being achieved in real building. But as mandated by the 1980 corporate charter of Ocean Earth Construction and Development Corporation, all is directed toward real building, of entire cities, drawing upon ideas of Futurism, Constructivism, and the Megastructural Fantasies of Metabolism and Post-Metabolism in recent decades. A clean break is made away from Modernism, along with attendant Post-Modernism, or other historicist references. A clean break is made, further, from objectifying the Building, and of regarding the Building, the Edifice, as a Work of Art, or perhaps less. Design.

Although there is much precedent here, and although there have been many influences, including most pronouncedly research for projects of Gordon Matta-Clark, based in turn of projects of the Constructivist Leonidov, as conducted in that eminently alterable fantasy-city, Los Angeles, we take our cue for this research from questions posed in 1989 by Ocean Earth founding-shareholder Eve Vaterlaus.

The need for changes becomes evident from the condition of present cities. Despite the maxim of Leon Batista Alberti that architects must first assure that cities have clean air and water, not one industrial city today, given the use of polluting fuels and toxic wastes, can claim to be well built. The fuel base at least must be totally changed. And with this, as the

editor of *Architecture d'Aujourd'hui* remarked of Ocean Earth, an economically practicable plan emerges for building of infrastructure that ecologically works.

LOAD BEARING STRUCTURES

1992

All structures take advantage of human physiology as immanent in close urban quarters: low-grade heat and movable liquids are treated as an inflating or lifting element; taut cables are used less to suspend than to stabilize against lateral loads, as skin or tendons can; slats rigidify tensile fabric, as skeletal members can, without necessarily bearing full load; loads, such as floors and containers, are counterweighted against each other, at angles; cables lace together, taut, as with a corset, for variable internal cohesion. The ultimate paradigms, in which structures fall into each other or splay out in counter-weight against each other, are couples in either wrestling or love. Rather than build complete single structures, we build assemblies of incomplete structures.

- Centered counterweight circular bascule bridge.
- Hot air inflated column with rigid vertical slats for stability.
- Hot air balloon suspended canopy, with airfoils to counter wind load.
- Bascule bridge with multiple counterweighted sections with sag on the mid-section effecting a low arch, stabilized against wind load by suspension cables.
- Compression ring stabilized tensile cable bridge.
- Diamond-angle girder system set at a slope.
- Compression-pump propulsion of aqueducts bearing continuous-loop belts as platforms for live load.
- Counterweight set against suspension cable for arching canopy.

FROM "ENVISIONED STRUCTURES"

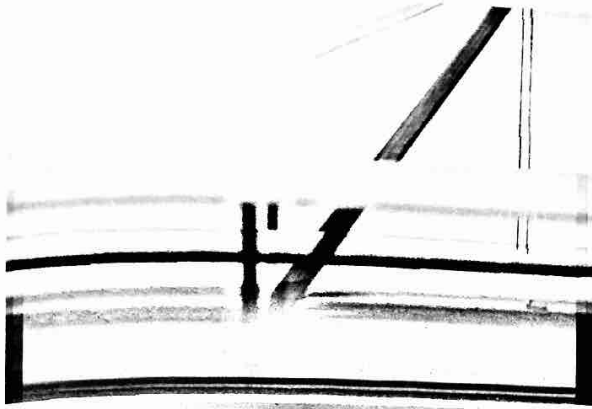
1991

An architectural consequence of work by Richard Serra, Richard Nonas, Tony Smith, etc. is the formation of bridging structures based on pitched or sloped beams and walls stabilized by other counter-poised weights. The structure stands because its parts work against each other in col-lapse. This manifests how the body actually stands, in equipoise of falling weights, and it leads the way for integrating advanced structural engineering and architecture, in treating the structure legally not as a building but as a bridge. We propose first using the building as a multi-media club, with various levels and bars, possibly with a center for media review, and with the center counterweight less being a sculpture than a wrap-around theatre. Very little ground space is required: one takes advantage of air rights for economy – and a view.

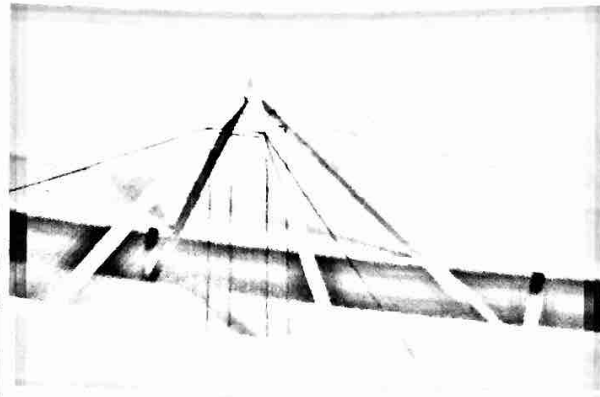
Rather than have architecture imitate Nature, or imitate structures in Nature, we have architecture imitate the Body. Not the body as form, but the body as physiology, as process, as metabolism. We participate in architecture as we participate in the body. A body does not stand up like a pillar. It does not stand up dead.

Rather, it balances. It counterbalances. It equipooises. And it breathes. It swells. It inflates. It responds to this or that movement with counter-movements. If truly fatigued, it finds a hollow into which to nestle, perhaps a cave, a place between rocks. It certainly does not make a huge heap and try to stand on it, and it certainly doesn't seek out a life in the granary. But this is what happens with all the architecture derived from classical temples, in turn from granaries.

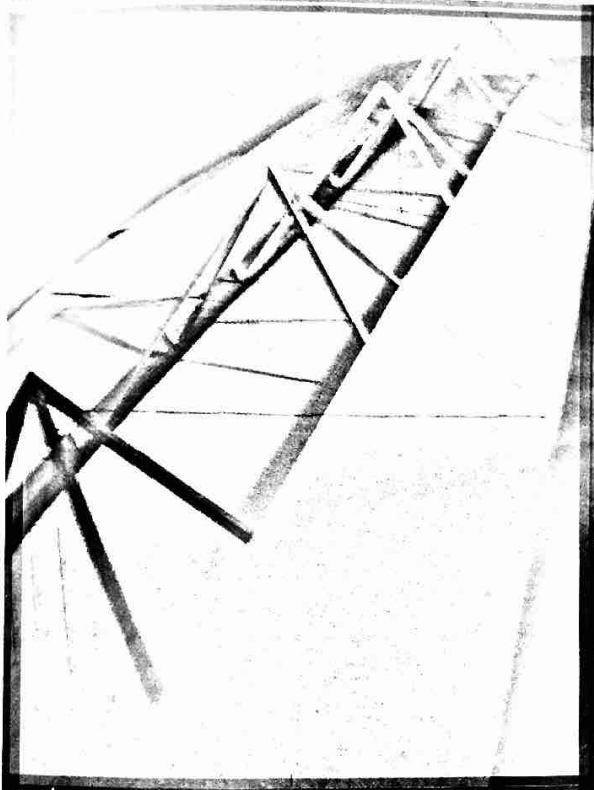
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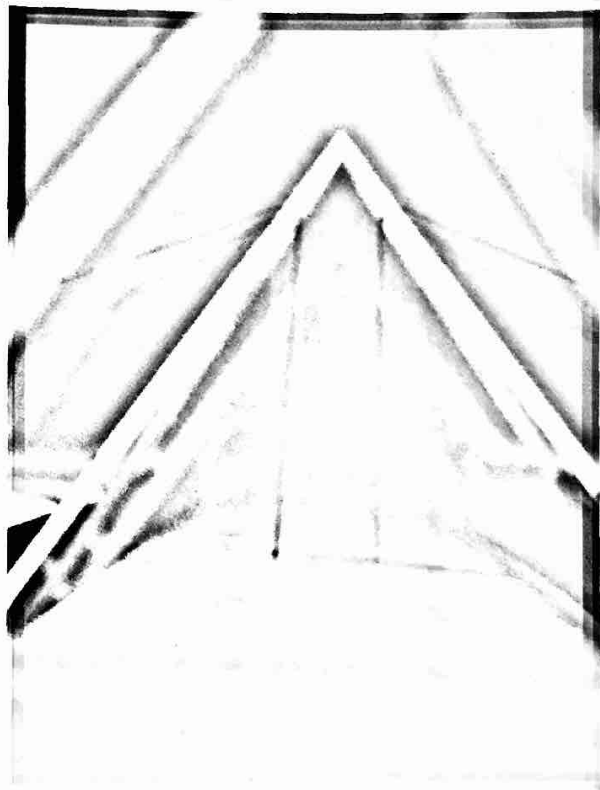
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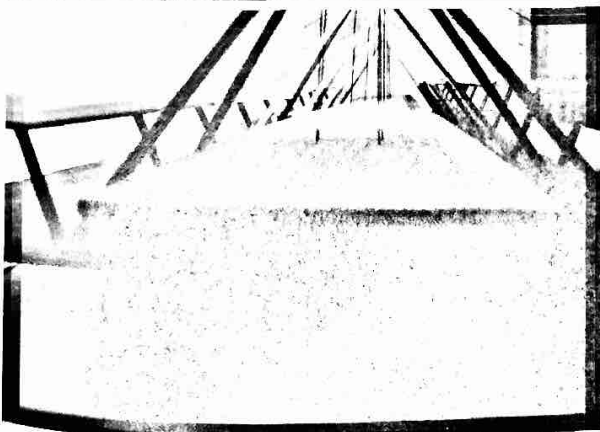
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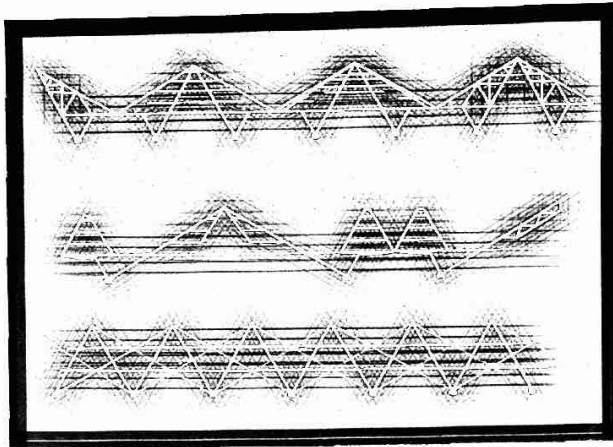


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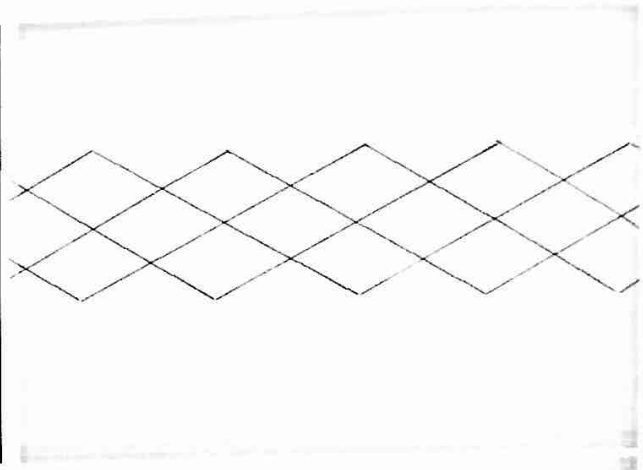


28-33 The same principles of counterweight being continued along linear strips, along the lines, for example, of urban infrastructure. We continue what is evident in containerport terminals, but we allow the respective cranes to col-lapse into each other, then be offset by opposing, outridged weights, such that the equipoise can continue along tracks for a great distance, 1979.

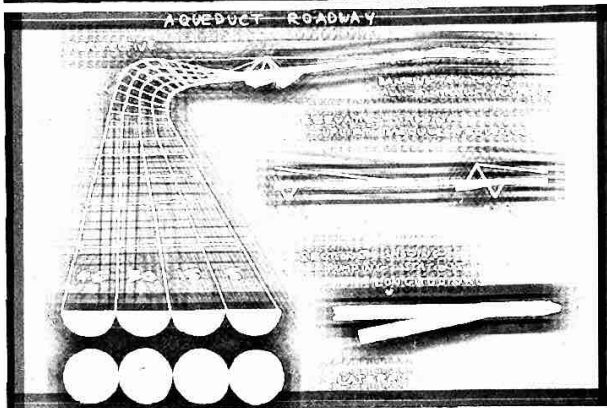
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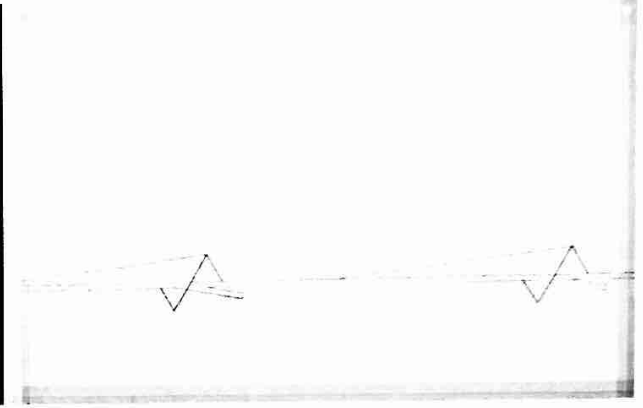
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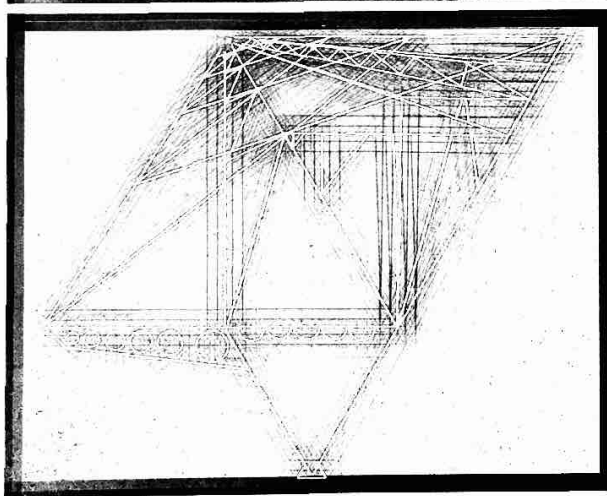
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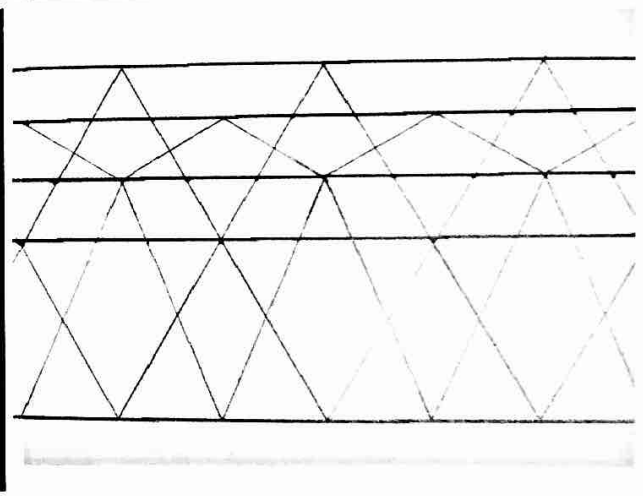
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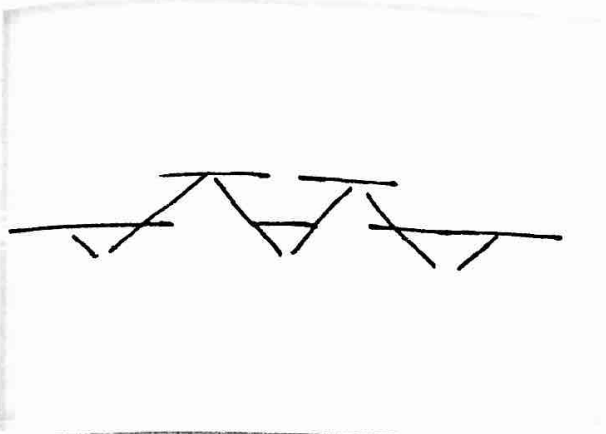
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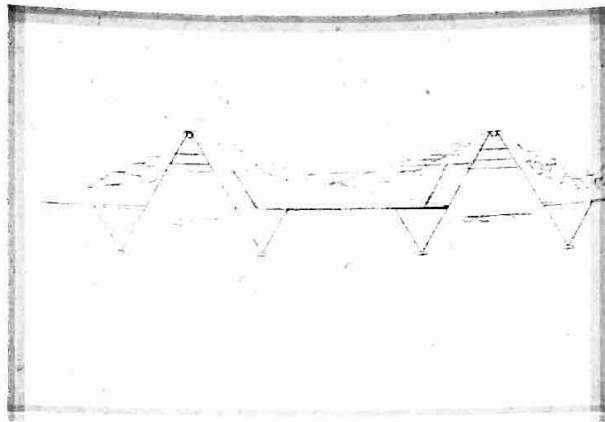
Megasrtuctural Vocabulary

- 34 Elevation of various modalities of counterweight and bridging.
- 35 Diamond-formation of the bridging, plan.
- 36 A lightweight transport system, with aqueducts supporting continuous floating elements, as if continuous boat strips, for minimum live load and therefore minimum structural requirements Aqueduct Roadway, in a series of bascule extensions.
- 37 Elevation of the basic structural scheme for this bridging system supporting the aqueduct.
- 38 Section of multi-tiered slope structure, here set on half of a poised bridging system, such that the entire V-foundation is counterweighted and poised, with relatively modest pressure therefore against a counterpart slope structure, facing in the opposite direction. Balloons and sails could further stabilize the structure, by locking various lateral loads. One works with several points of securing, much as in rock-climbing.
- 39 Elevation of same, showing scheme of structure.

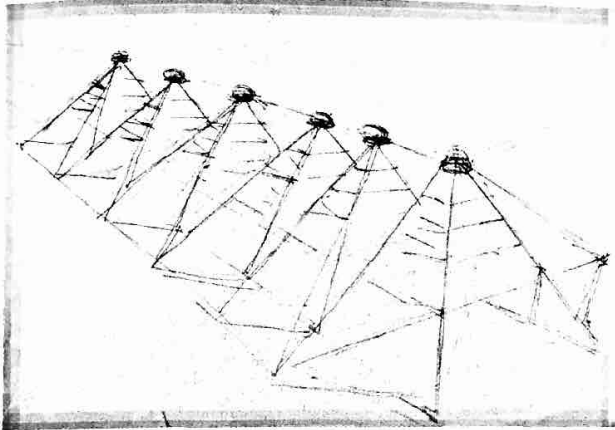
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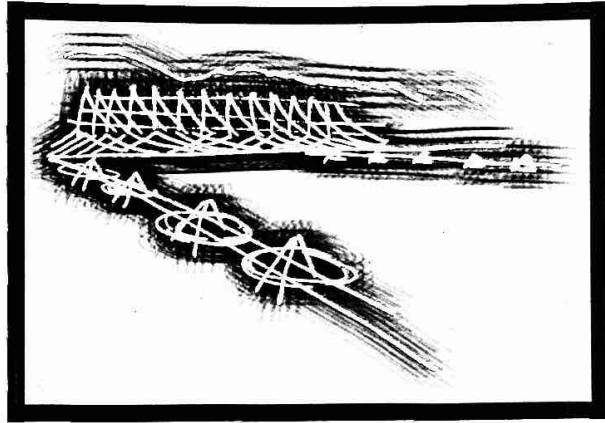
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- 40 Basic concept of splitting (as in Matta-Clark's Splitting) with counterweight elements splayed out.
- 41 Perspective view, at center are suspension of canopies by balloons.
- 42 Implications for a megastructure, with section revealing the technology of a cantilever bridge.
- 43 Basic concept of the city, off the flats, up in the hills.

TWIN TRAC CITY

1979

Four counterbalanced structures linked together by cablework, much of it suspended by hot-air balloons receiving collected heat of the site and occasionally bolstered fueled pipes.

Cross-section of a linear city. Airfreight modules could be cantilevered from the bridgeposts or, as here, can be suspended from rigging.

These structures can be inverted to make basins and bowls, can be set into existing slopes, can be raised to immense heights, can be emptied and can be filled. This could well course over the large railroad yards or soon-emptied docks.

ARCHITECTURE IS MEGASTRUCTURE

1980

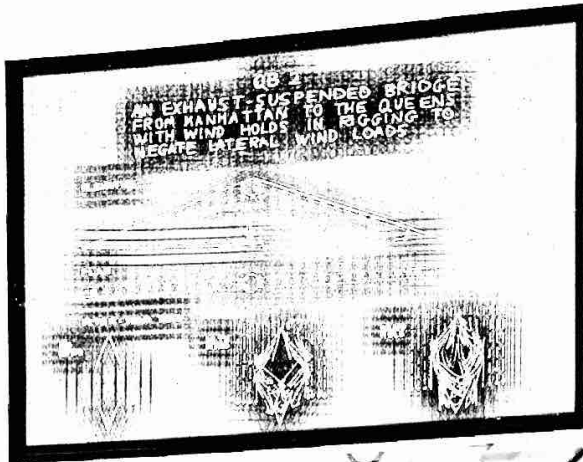
In the 60s emerged a notion of "megastructural architecture." The notion rose from plans for large complexes incorporating many uses with various functions, that is, for comprehensive planning of entire office and residential areas within single structural schemes. One of the first megastructures, single architects said, was the cliff dwellings at Mesa Verde. Another

early megastructure was Grand Central Station. More recent megastructures included Habitat in Montreal, the Centre Pompidou in Paris, the George Washington Bridge approaches on Manhattan, that is, any building project incorporating highways, railroads, a multitude of business and residence spaces. Or, more bluntly, any truly designed neighborhood.

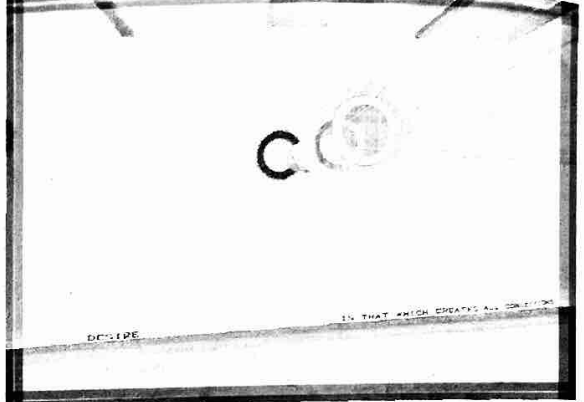
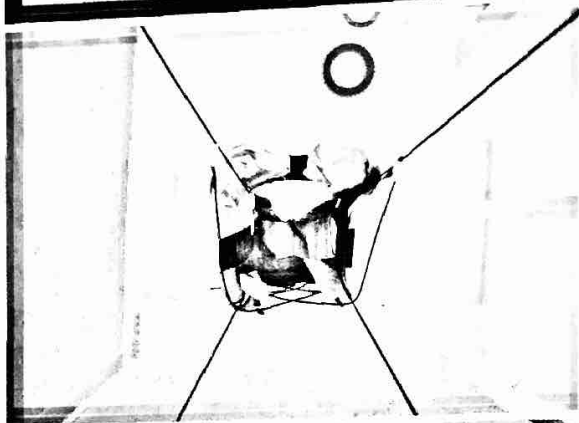
The word "megastructure" was not necessary. It may even have been pernicious. It implied some departure from "human scale," as if the area being designed would be any smaller if not planned coherently. It rested on a foundation, sentimental at best, that architecture still had to do with buildings, single structures, as distinguished from streets, groupings of buildings (e.g., Rockefeller Center), utilities and railroads or vegetation. From Leon Battista Alberti on through Aldo Rossi, we have been reminded, that architecture has not to do with buildings but with cities, and that the architects – more than anyone else – are responsible for the physical well-being of cities.

Organization of the built environment, i.e., architecture, is "megastructural" if it is thorough.

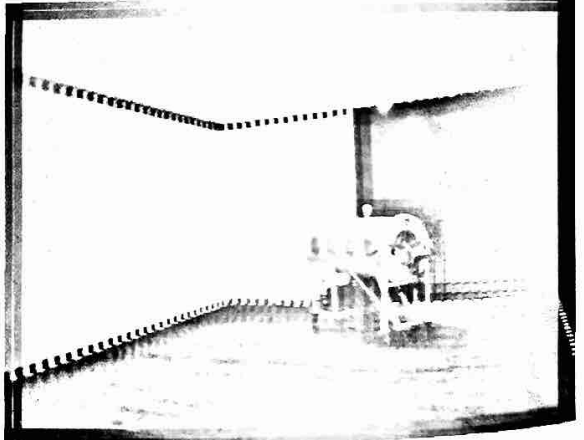
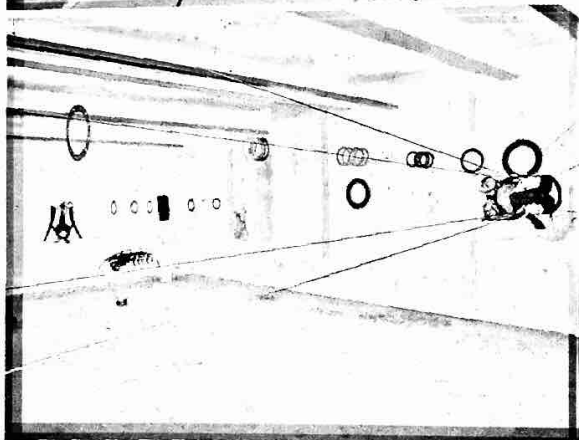
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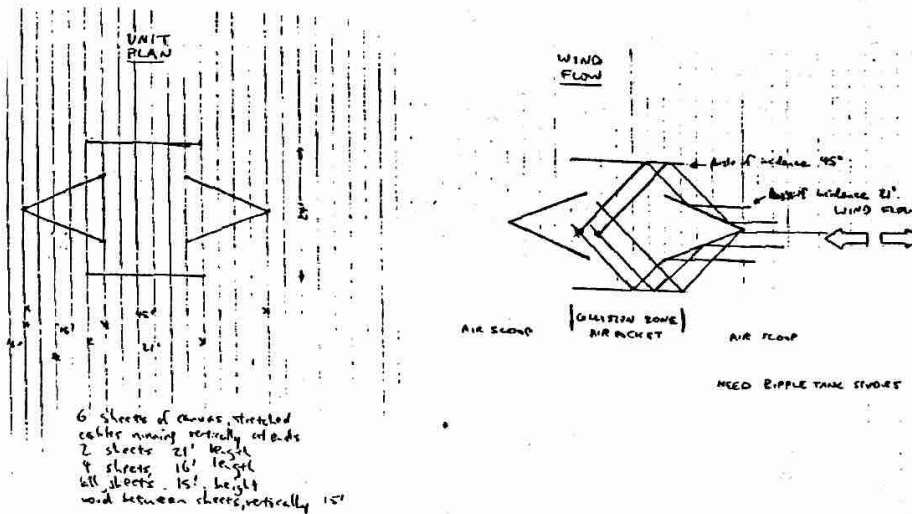
44 Balloon suspension system, here for a footbridge, but more often to support vegetation canopies over the city elements, using converged low-grade heat (i.e., exhaust from air conditioning or heating, or just the heat of the built-up space itself) to support the canopies. This particular program is based on research for Gordon Matta-Clark in the last several months of his life. He had wanted to break clear from the deconstruction, or reorganization, projects to a program of construction, the named – after the original source of the concept, Leonidov – Sky Hook.

45-48 As standing structures deal with counterweight and cohesion of tensile forces, the bridging structures across spans can deal with stretching of fibers of tensile elements. The standing figure as tightened horizontally is a foundation for upright and megastructural forms. The leaping figure as tightened vertically is a foundation for extending and bridge megastructural forms. Questions of relations to human clothing, either in rigidifying corset structures or in elastic stretch structures, were undertaken for this exhibition under contract with sculptor Heather Jansen. Galerie Esther Schipper, Cities as bodies, Städte als Körper, 1990.

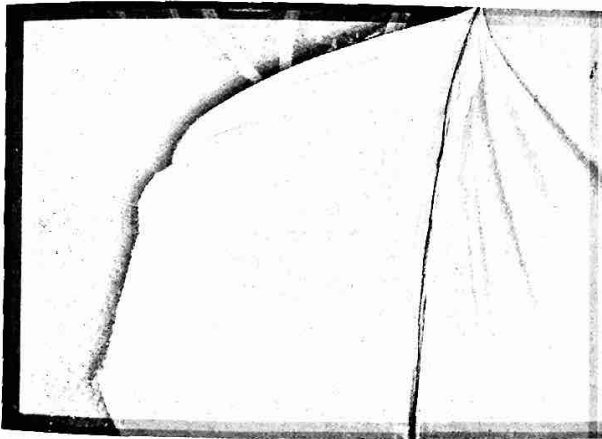
49 A more radical inquiry into the relation of the body to space is conducted with the Iron Lung. First exhibited at Galerie Peter Nadin, 1979, this inquiry has gradually been continued with medical scientists: it is now established that elasticization of the immediate space around the body can indeed suspend a great deal of muscular activity involved in, for example, respiration, and can indeed mechanize or automate functions of rest; whether this could induce a mechanization or acceleration of functions of sleep (much as cars do for walking) is not yet known. The objective, in any case, is to use technologies which modify the relation of the body to its immediate space, much as belts or elastic suits would do, and to extend the logic out into constructed habitat.

Working with atmosphere as elastic "stuff" – towards lighter weight suspension of structures, using air as a suspending media

50



51



52

50 Technical study for lateral stabilization using wind load, with air foils to make inflated air pockets.

51-52 As the structures are balanced and lightweight, wind load should be reduced as much as feasible. Hence the use of stretch fabric for scrims and tents. Rather than use rigid tensile elements bound taut by cables, we allow the fabric itself to be elastic. Investigations were started here in the courtyard of a Bronx school. They have been continued, with elaborate sculptural mobility, by Eve Vaterlaus, a founding shareholder. She has also raised the idea, starting in 1984, that the structuring of elasticity with corsetry can become a foundation for architectural, i.e., space modifying action. The premise, established at the Iron Lung project in the Peter Nadin Gallery in 1979, is that space is not a void; rather, it is a gas, an elastic and motile substance in itself.

MOVE

1985

The body is the basis. It moves. Its greater or lesser freedom to move, and desire to move, derives from the environment, including its air, its vistas, its scale of view. Organization of movement results from an organization of the environment, starting from clothing and extending into political space.

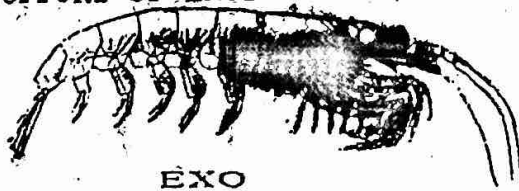
Participation in the body is the foundation. Dance, broadly defined, is central. We dance. We look to dancers. We run. We look to runners. How they breathe, how they navigate, how they move - these determine the space that we order. If,

for example, the air is so polluted that running becomes difficult or dangerous, then movement is inhibited and the space is out of order. We may say, indeed, that breathing is the first movement, and any unnatural inhibition of breathing (as in pollution, as in closed quarters) is to be stopped. We look to architects to assume responsibility for stopping such inhibition. We look to them to assure an environment in which we can breathe fully, as in nature. If one builds a city based on processes and metabolisms of the body, one faces the prospect of building - and living within - an physically-arousing city, even a sexy city.

ATTENTION PETER FEND
 IDEAS IN SUPPORT OF EXOSKELETAL EXO-WEAR



Heather Jansen
 1990



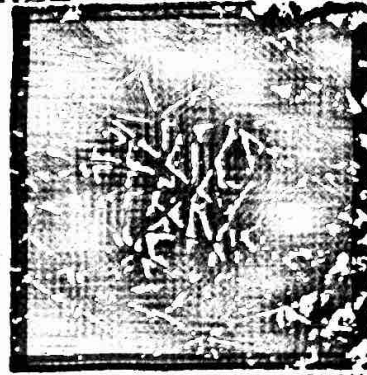
EXO

The world is not a vacuum with a few scattered coordinates on a plane. But a continuum of primordial energy that functions dynamically. This outer wear is meant to enhance this awareness.

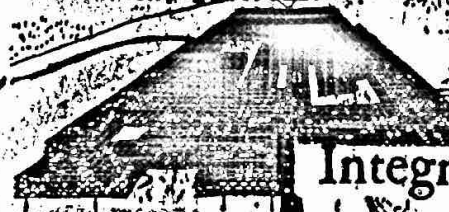
DESIRE IS THAT WHICH CREATES ALL CONNECTIONS

Sensation is a function of a limiting membrane that separates the living system from the surrounding ocean of energy fields. Through this membrane the living body communicates with all other systems. It is no accident that the sensory nerves from the ectoderm, the outer germinal layer, the gastrula

ENDO

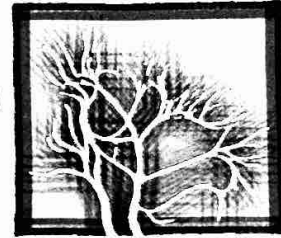
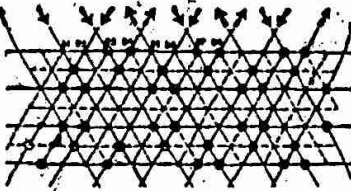


SURFACE OF HUMAN SKIN



Integrative mechanisms

In relation to architecture: a movable form of a nature as opposed to confinement, i.e. concrete. Following Le Ricolais' example of the Trihex (1968). A territorial assemblage of coexistence and succession. Combining distributional advantages of the hexagon with the straight line advantages of connected triangles.



FUNCTIONS

EXPANSION --- CONTRACTION
 PLEASURE --- UNPLEASURE



NATOMY OF A SYNAPSE

The Rhizome is the organic equivalent to the Trihex. The Rhizome is a root system and is not amenable to any structural or generative model. People are Rhizomes, strangers to a central axis. One's psychic multiples extend on a plane. The line of flight is infinite within such a structure. Like nerve fibers to increase one's territory.

1. System of attire that can cover any human activity.
2. Reference to corset, yet evolved to be completely elastic.
3. Quilted seams bring focus to erogenous zones, evoking sensuality, but with confidence in representation.
4. Barrier between living body and outer world, but characteristics of silk actually enhances flow of energy fields. Creates a sense of well-being.
5. Variables between strength and vulnerability are possible via removeable shoulder pieces and arm sleeves. Adaptable for different temperatures as well.
6. Piece is utterly Sexy.

FROM "COURSES OF ARCHITECTURE" 1990

Clothing more or less contains, more or less constricts movement, more or less inspires one or another set of thoughts and actions. It directly affects one's experience of larger surroundings, such as buildings and mountainscapes. It is architecture on the microclimatological level. And at its most elaborate stage of development, it is structural engineering with intent to both excite and deceive.

To relegate clothing to the category of "fashion" is to neglect its kinesthetic and psychosexual functions. Every art form has its fashions; art and music have fashions and trends and popular movements as much as clothing. If we are to treat clothing as material for art, then we shall practice the mental habits, the disciplines of thought, in architecture.

PROJECT OF INTEREST WITH VATERLAUS, 1993
JANSEN AND VIEILLE

[Prepared for City Bild/Body Wear exhibition at Galerie Anne de Villepoix, Paris, Feb. 1993]

F.L. Wright's Taliesin East was so exciting with the first trip there because it fit so well.

There was a pleasant engagement of the body with the sometimes confined, sometimes more open space.

How Wright achieved this engagement of the body within the space remains a mystery.

Has there been any literature, even by Wright, discussing this architectural power?

All there seems to be, rather, is much harangue about principles, and humanity, and proportion, none of which approximate what is experienced by the body. But it has seemed, in a study of aesthetics, that the architectural aesthetic - unlike that of more cognitive arts like painting - is a kinesthetic aesthetic. It is an aesthetic of movement.

EXO WEAR: CONCEPT

Description of works prepared by Heather Jansen at CITY BILD, Galerie Esther Schipper, September 1990

Referring simultaneously to corset's and armor, the original cloth pieces defy the structural confinement of either.

The corset's sign of compression and restriction are reversed by the use of "midergummi" (all-stretch elastic), while the armor references are reserved by the use of two layers of silk layered over cotton filling. Formally reduced demarcations of muscle structure and genitals are quilted into the soft materi-

Not in "fashion", which implies following or leading a crowd, but in architecture, in organizing an immediate environment and social display for an individual - in physical space.

We may entitle this essay, "Clothing is architecture," meaning that it is a kind of architecture. But making that point becomes tendentious when one considers the full panoply of clothing. An architecture treatise need not be cluttered with discussions about all details of construction and all manner of buildings. Rather, it concentrates on a few models. It concentrates on the quintessential experiences and structures. If in a treatise on buildings we discuss temples, both religious and corporate, so with clothing we discuss the most engineered, most significant, most dramatic and most emotionally communicative of garb.

Anything which modifies the movement of the body is an architectural phenomenon.

Recalling the work of Vaterlaus, we are struck by her facility in organizing and moving materials which are to be apprehended by the body and are somehow resistant to the body. We recall her astonishing ease of working with stretch fabric, pulling it across large spaces in meshes and webs, and we recall the physical excitation resulting from the formation of surfaces with greater or lesser resistance, greater or lesser rigidification of elasticity.

We engage in efforts to create a rigidification of elasticity throughout space, hence a kinesthetic and erotic charging of the space.

One can start with research in clothing. For if one would say that one occupies a space, one occupies first a space of clothing. One applies a clothing, a second skin, and then directs the movements and the fluids within the site. The body is a first site: if one constructs well on the land, one commences with the inhabitation of the body.

als, providing not actual protection against modern (or ancient) weaponry, but a psychological and representational shield against existing values of passivity, commodification and sexuality projected onto the bodies of women.

The thing feels incredibly great on while allowing all directions of movement. It makes you want more - in selfpossession of body and will.

Instead of arriving at a closed construction of theoretical claims. I hope that the work arrives at an open space. Asking what it means to have a body, resisting gravity-bound interpretations. Here, refer to *A Body Without Organs*, by Deleuze & Guattari.

What started in 1990 as a simple contract with Heather Jansen has expanded into a number of business probes by several people. Ocean Earth itself seeks no direct role in the clothing business, or in whatever might be a venture or ventures called "Body Ware" or "Exo Wear". But it intends to continue the procedure of controlling all ideas from such ventures as they may be applicable to innovations in architecture, and specifically to the invention of new forms of what Ocean Earth is legally chartered to produce: architectural components. Such components could include tents,

stretch structures, windfoils, scrims, containers and other fixtures, along with of course the larger-scale components of hinterland development, like offshore rigs, satellite monitoring programs, large earthworks and river-control or estuarine projects, with commensurate hardware. The objective, overall, is to derive from kinesthetic logic, the logic of the body moving in earth's surface, a line of industrial projects and services effecting an extension of this logic out upon that surface. This was a mandate from Earth Art and Body Art.

ROOMS

The second tier of architectural industrialization by Ocean Earth, after the first tier of Exo Wear or Body Ware, is the condensed, pre-fitted and transportable room.

Much of the inspiration here comes from a genre pioneered by artists since the 60s: the conversion of raw industrial space into lofts, each with a given body of "fixtures" to become habitable. A raw loft could have pre-formed rooms or components, each with fixtures, so that the fixtures could be transported throughout the space and outside the space to another loft.

The lightweight tensile fabric membranes researched by Eve Vaterlaus, along with gas-exhaust uplift first conceived by Leonidov and furthered by Gordon Matta-Clark just before his death, could be coupled with the assembling of various fixtures to allow for remarkably lightweight loft construction. The objective, at end, beneath various lightweight canopies, is a city with interchangeable modules functioning much like a containerport terminal or a large airfreight house.

Architect Kevin Gannon, first introduced to Ocean Earth at Yale, concentrates his design attention on

- containers, of various sizes and mutability all suitable for consumer purchase
- light-rail systems for moving containers from loft to loft, or from neighborhood to neighborhood
- extension of gantry and bridge structures in containerports throughout an urban infrastructure, to erase the distinction between "meuble" and "immeuble".

Gannon and Fend are working out a common industrial design based on their different drawings of containers with removable or changeable walls, removable roofs, and various input segments, such as NEWS ROOM electronic news-comparison equipment.

AIRFREIGHT CONTAINERS

1981

Airfreight containers, the big ones, measure 10' high, 10' wide and 20' long, and as steel/aluminium boxes designed for transport by forklift, tractor-trailer, railroad, wide-body aircraft and container-ship, they constitute a virtually indestructible space.

Containers now cost over \$ 10,000. For a permanent space, that cost is prohibitive: sheet rock and other standard construction materials, along with labor, cost less. But if one expects to transfer all the contents of that space to another location several times within, say, a ten-year span, and if one expects that those contents can be accommodated in essentially the same spatial dimensions or a combination of such 10'x10'x20' dimensions, then the cost becomes economic. For each move, the container saves the cost of new construction or new improved-space rent or purchase, and its in toto transfer, while apparently expensive, saves the accumulated costs - in time and money - of packing, moving, un-packing and re-arranging the contents of a given space. It is well-known that a home or office relocation suspends or slows down business as usual and costs much more than even the payment for moving companies.

THE CONTAINER: COLLABORATIVE PROJECT 1981

The Times Square Show established the appropriation of entire spaces, of an entire assembly of spaces that is a building, as an activity for not just one but many artists. Pieces were not simply hung and installations were not simply made: the entire walls, floors and ceilings of the building were engulfed by artistic actions. Murals were made, rooms became ocelot-skin caves, staircases became mazes, urinals became fountains, mirrors were painted on with forest leaves.

The show also initiated the first Collaborative Projects store: artists sold low-cost multiples, to the benefit of themselves, the general public and Colab.

The Real Estate Show addressed the conditions of life in its neighborhood, the Lower East Side. The current architecture and urbanism was challenged, criticized and superseded with alternatives. A common aesthetic question was the problem of the room as part of apartment block - of residential space as an allotment of cells within stacks.

Hans Haacke said this could only happen in rich neighborhoods. Is that so?

NYLA - A FLIGHT STATE 1981
INSTEAD OF NATION-STATES... FLIGHT STATES

In view of the recent international air controllers' action, it seemed appropriate to abandon the nation state and start an airline.

There's a lot of traffic between New York and Los Angeles ("NY" and "LA").

This traffic, plus the two cities, could create a greater physical fact called "NYLA".

There's a lot of people who would like to maintain lofts in both NY and LA.

There's an airfreight-container airfreight-container industry which the Japanese are converting into a modular-housing industry, and this could lead to having all the fixtures, and all the intense work areas of a loft, be containerized.

There's a need among many people to own their workspaces and fixtures as movable goods rather than as fixed, irreplaceable installations.

The industrial potential and cultural sanction exists: for construction of loft fixtures and other modular units, as containers suited for airfreight traffic as well as for high-technology space-frame loft buildings.

Vito Acconci likes the idea, and has acted on it in the last year. Many of his cohorts in art, in film, in business effect the idea in their life as "bicoastals". Will the airlines like the idea?

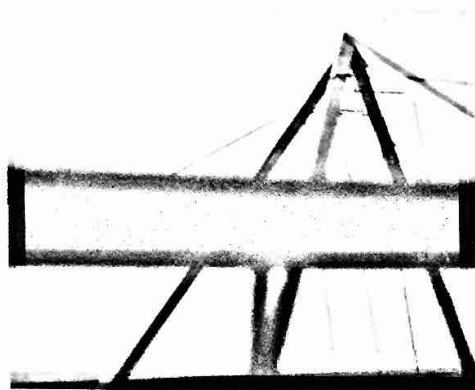
Of course they would, especially after they figure out special coast-to-coast airfreight-container rates.

PROSPECTUS

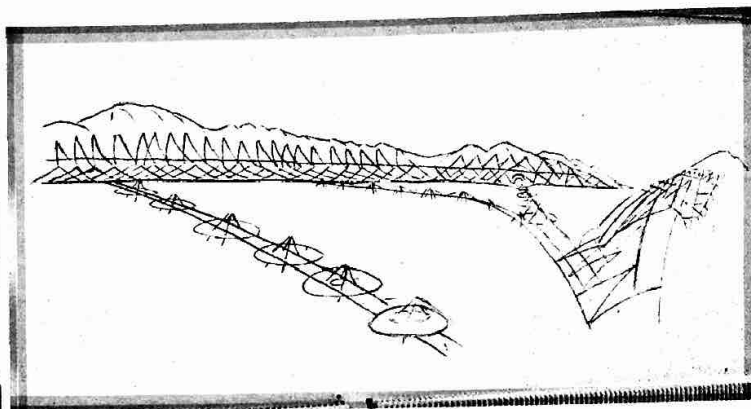
The main project underway now is formation of an Efficient Industrial System (EIS). We research and prepare to install on a site, preferably a relatively sheltered and undeveloped bay, a comprehensive industrial program for a community of, say, 50,000 people. This includes: periodic satellite monitoring, algae production to yield methane as the primary fuel, along with other materials, wastes conversion to yield keratinaceous proteins for uptake by higher species, infrastructure and lofts set into mountain slopes for most efficient transport in diamond grid. First contracts—with us assuming responsibility for surveillance, modeling and infrastructure siting.

Port cities are especially suited to pioneering the practice of integrating urban infrastructure, in turn supporting offices and housing, with today's intermodal transport technology. Most of what we propose starts with common port engineering. Then we track two gantry crane lines in parallel and poise them against each other, in counter-poise, by adding infrastructure—i.e., walkways, roadways, pipelines and outlets—at both sides of the respective tilted cranes, to bear much greater load. At the apex, ideally, load is near zero.

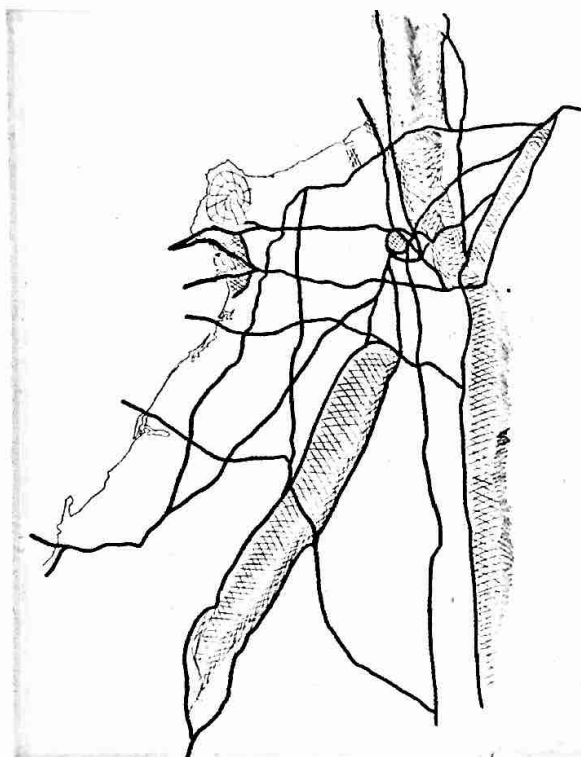
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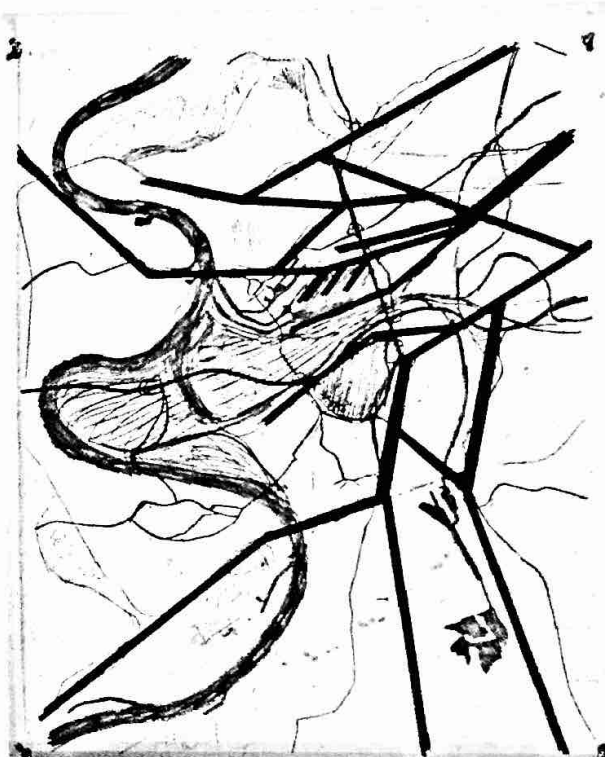
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- 54 Pedestrian view from walkway of multi-tiered counterweighted megastructure city. At the apex, as said, load is near zero. The source concept is "Splitting", by Matta-Clark, and the visual effect is much as in his cutting up of conventional structures. The aesthetic aim: to build on the experience of driving along Pasadena Freeway, with foliage and structures above as well as to the sides, for a flicker effect while moving. Biogas fuel would reduce noise and eliminate pollution, affording this almost movie-sprocket sensation. Air rights and bridge-construction regulations would permit construction.
- 55 Contract generated scenario, with slope structures and off-ground structures, for Tivat Bay, Montenegro, here exhibited in Neue Galerie at the Künstlerhaus Graz, 1993.
- 56 Consequent plan for, in this case, Los Angeles, structures set into hillsides, with highways becoming arteries for overbuilding; dense urban development as we know it from Manhattan is only in the center the Downtown.
- 57 Concomitant plan for Duisburg, in which city is removed from the ground except at the core (downtown and Altstadt), and then rests on pilotis along bridged infrastructure. Thus the marsh and wildlife conditions revert to prior fecundity.

CITIES

1989

A survey of 85 world cities is ongoing by Ocean Earth, with its own method of comparative density analysis, the cities grouped by basins as markets. The use of uniform-grade satellite data, from whatever source, allows for mathematically-precise comparisons through time and between sites.

The cities under scrutiny are the top 50 conurbations of the world. As the public knows by now, very rapid urbanization, more rapid than ever in history, has been a phenomenon of our time. Within the time span from 1950 to now, cities such as Sao Paulo, Mexico City, Tokyo and Cairo have grown so

fast that the size of the change alone is larger than the total population of the world's largest cities back in 1950. Not one city in Europe is among the top ten cities in the world. New York, once No. 1, is soon to be No. 6. And London, No. 2 in 1950, is slipping into No. 17—behind Los Angeles.

The largest degree of growth for any city in Europe is in Milan, expanding since 1950 by nearly 5 million. No. 2 in growth is Paris, followed by Madrid. But if any Europeans want to visit a nearby rapid-growth city, they should travel across the Mediterranean to Cairo, or across Arabia to Teheran. The world undergoes a revolution as we live.

NEWS ROOM

A JOINT VENTURE IN FORMATION

VIII. NEWS ROOM

T H I N K A S
T H O S E I N
P O W E R D O

NEWS ROOM

[News Room is a project in which Ocean Earth has participated. It started more or less within Collaborative Projects. Photographer Gregory Lehmann initiated the practice of NEWS ROOM, that being critical scrutiny of the mass media, prompted by the Iran-contra scandal: in formation now is a company, a bit like University Microfilms in its use of previously copyrighted public-domain material, called MEDIA SURVEY. Peter Fend of OCEAN EARTH had conceived the idea of a room, a space, in which to conduct such critical review; this arose largely from experience with the news rooms of TV and newspapers, which are not open to the public. Jarg Geismar of ATW, Around the World, developed ideas for a global network of NEWS ROOMS run by artists. George Chaikin, ever skeptical of mass media and ever engaged in computer graphics and image processing, offered to join the venture with a firm called GENERAL PICTURE. Recently, a major Western government has informed one of the participants that such study of "contradictions in the news media" is not to be done, and the head of another government's art funding organization has said that this activity is "out of bounds". Our experience with the last NEWS ROOM in Copenhagen in January, suggests that Western governments (at least) are serious about not wanting this activity to take place. Quite likely it will cease. It is not essential, after all, to the architectural program of Ocean Earth. And, as this writer has been told pointblank, it will not be safe to try doing it. These documents show our principled practice.]

MEDIA ARCHITECTURE

1980

As media sculpture has been the attempt of several artists to effect send-recv television relays, often by satellite, between parts of the globe, so media architecture is an attempt to effect functional relays between parts of the globe as there seems to be a market demand, a felt need, for direct point-to-point information transfer. Media architecture constructs television-relays which have not been constructed or are not possible within the present structure of nation-based electronic information dissemination. For a number of reasons, NBC did not telecast in the U.S. the 1980 Olympics; a media architect, discerning the obvious gap in signal connections, would negotiate and do the post-production for coverage by other parties and U.S. distribution through other channels, notably cable. For other, non-political reasons, largely resulting from the coherent mass-markets afforded by nation-states, there is little video communication between the world centers of innovation – between, say, Novosibirsk and Tokyo, or Sao Paulo and Mexico City, or Milan and Nairobi. A media architect would arrange a trans-national, inter-politain television transmission system between these centers of innovation. The markets would tend to be elite, not unlike today's art market. But it would also be more involved in corporate and political decision-making than is much of today's art market, which tends to be leisure class. The market would be far more numerous than today's art market, and it would be drawn not only to news programming of cosmopolitan character but also

to direct relay of video art, performance art and films by artists. The international decision-making class does not attend as much to these matters as they would like because they cannot afford the time and expense of visiting galleries and museums, of browsing through international bookstores, of consulting varied newspapers. But when such fare is present on a select television channel, notably cable, they can easily link up with compeers in equally-advanced cities around the world. Media architecture is premised on the recognition in File Under Architecture that a room can become an information node in which the telephone, radio and telephone act as "space conditioners" that are far more powerful than any of the existing walls.

EXCERPT FROM "SITE MONITORING FOR PLANNING"

1990

Since early 1988, Ocean Earth has been developing a procedure of geographical information display very different from that of conventional television. The procedure, made in conjunction with artists, computer scientists and architects from Germany and the United States, is called NEWS ROOM. The objective is to bring all the news, on many monitors, in one world situation room, much as occurs inside the news industry – but now for the public. Much information would be retrievable by computer, with large global and regional display formats, so that one is less concerned with "today's new events" than with reviewing the situation at any location at any time. This spatial rather than linear one-screen format of news monitoring brings the Ocean Earth discoveries into full, regular use – not possible in normal "news-story" TV.

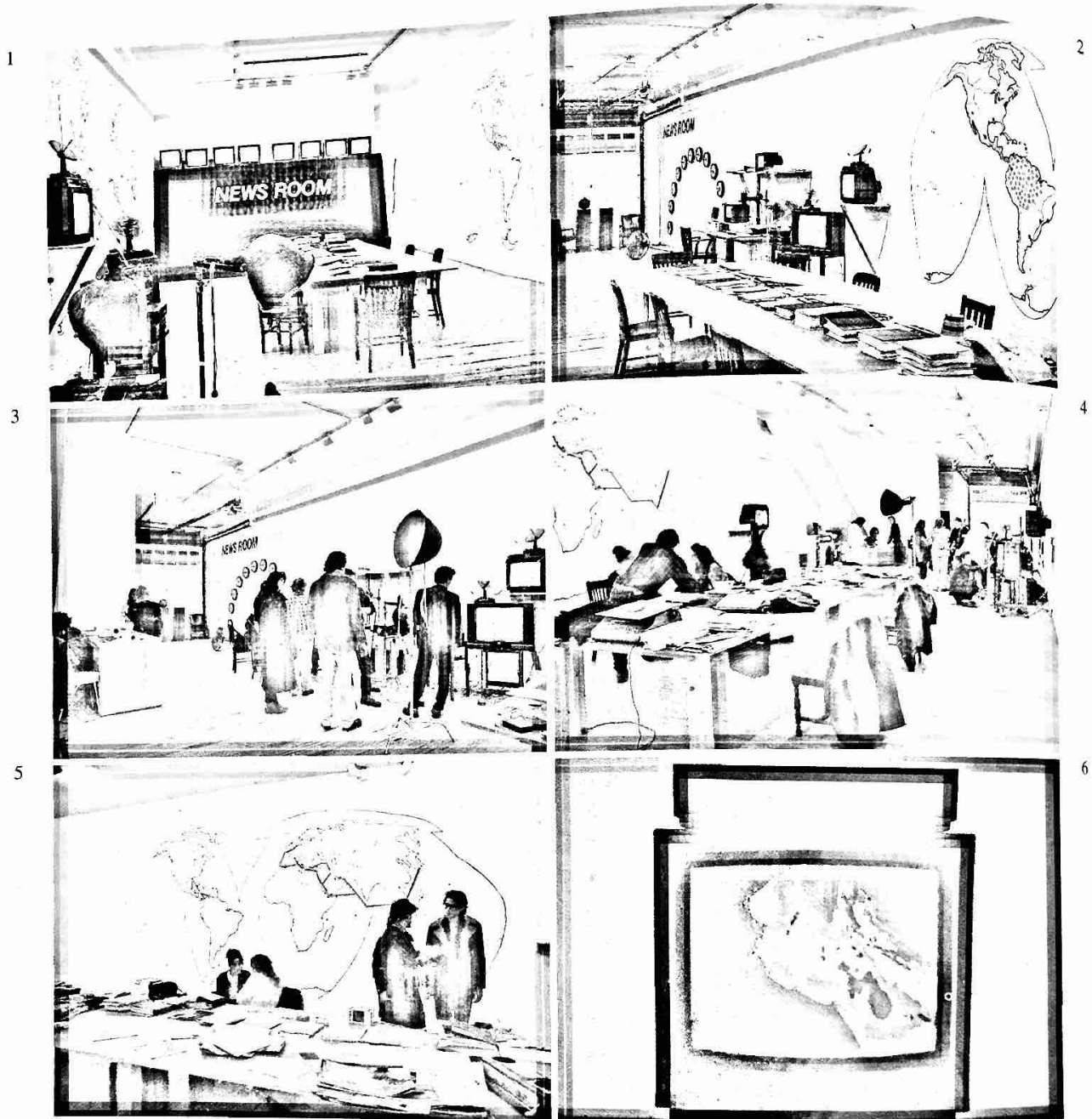
Information can be sold in this market place: of news sites and sensitive regions, for the general public; of biological resources, pollution and urban conditions, for specialists and professionals.

A first inter-city NEWS ROOM project was conducted in January 1990, with sites at a museum in Amsterdam and a gallery in New York. An excerpt from the statement follows:

If television is so important in Romania, but if any practical public review or discussion about television is illegal in the United States (or most other Western countries) due to copyright laws, what does that suggest about political freedom, or freedom of the press and speech, or simply that right of a citizen in the West to go to a library and review a number of articles from a wide range of sources?

The public need is plain to change the terms of access, for public review and analysis, to the news footage of TV.

Artists in New York and Amsterdam take upon themselves the right and obligation of assuring open discussion, backed with evidence, of what goes out over the TV as news. Hence the establishment of NEWS ROOM. Hence the operation of public-accessible sites, not unlike public libraries, where telecast information is recorded and ready for review, analysis and attack.



1-2 At American Fine Arts Company, January-February 1990, without people.

Reveals the basic ingredients of a NEWS ROOM:

the bank of monitors, for comparative news clip review
the logo

the work table with files and a chance to clip from different newspapers or videocopies of newscasts

the opposing wall maps, one of geopolitics and political geography, the other of ecology and physical problems

the clocks, here designed and arranged by Kirsten Mosher

the theme sculpture in the waiting room, a globe on a giant branding iron, designed by Kirsten Mosher with joint copyright in design of globe by Ocean Earth

the theme sculpture about geopolitics in the reception area, the "Mine and Yours" piece by Taro Suzuki

an overhead camera and computer terminal for digitization and review against additional data of the site

specific video recording and viewing capabilities with lights and chairs, a studio for visitors

colored tape, for application to the wall maps for continued updating of news events against the global maps

the news-wire service terminal

3-5 The site, with people: most people entering the gallery would not realize that it was a gallery. It wasn't.

6 At the Case d'Arte, in Milan, a sort of NEWS ROOM was set up in which videotapes were played showing the state of the sea. Perhaps most popular there was the videotape of the Adriatic. Television was normally showing the state of the region, as sea, for the people there. As daily service. Thus was the idea of Taro Suzuki realized... daily.

7 NEWS ROOM AMSTERDAM®:

Accumulating Evidence of a Hidden Struggle for Access to Tibet

During the last week of October 1992, a death notice repeatedly appeared in the International Herald Tribune claiming that We, the people of Tibet, are greatly indebted to the just deceased: Members of the German Parliament, Petra Kelly and Gert Bastian.

Evidently, at least according to those paying, the Tibetan Community in Switzerland, the Tibetan Youth Community, the Tibetan Women's Association, and others, the two pioneers of the Green Party in the German Parliament had had a lot to do with Tibet. They had made 'valuable contributions to (the) cause'. We presume this means Tibet's independence from China.

Precisely this cause was fiercely defended to us by a one-time art dealer and sometime professional colleague of Marina Abramovic, someone who also frequently visited Tibet, and with other places 'in transition' such as Thailand, and who last summer developed a plan to give NEWS ROOM a solid direction and base, in the Brussels' intelligence community. After asking testily 'Who are you working for?' (as if one must be working for some government), he declared that the 'liberation of Tibet' would be achieved within five years. That is: with sufficient covert assistance and timely military or other coercive action, the thirty years of Tibet's incorporation within China could come to an end. Artists such as Abramovic (or, at other times, Josef Beuys, Les Levine and Newton and Helen Harrison) could make themselves useful by doing the groundwork.

This person's business came to our attention when, after having been caught photocopying the contents of a NEWS ROOM briefcase at the Abramovic house, he proceeded to send correspondence and faxes regarding whatever might better become of NEWS ROOM under the label 'Stichting ARM'. One artist who was thinking of collaborating on NEWS ROOM, named Rob Scholte, began receiving:

- a letter to him at the alleged address of Stichting ARM referring to his alleged request for documents about the Serbian partition of Yugoslavia from the Serbian Academy of Sciences
- a proposal for a NEWS ROOM type newspaper for distribution parachute inside Yugoslavia to be called 'SNIPER'
- an assortment of newspaper articles about either Yugoslavia or AIDS, mostly incomplete, usually with references to ARM.

When people get this kind of mail, the security police might arrest them on suspicion. We discussed the matter with Rob Scholte. He decided to demand an explanation, and the return of private documents on a business proposition. The explanation eventually given, after several days silence, was that one does not study political science in Paris for nothing, and well, in his case, the service is for France.

Does this mean that France, like the United States and Great Britain, is working for the 'liberation' of Tibet?

Probably not entirely. Probably, in view of the French tradition of hedging bets, it seems more likely that one intelligence branch is working for the liberation of Tibet, while another is doing the opposite: chumming up to China.

However, in Germany, we have heard from high places, and as anyone can surmise from recent comments on human rights by Klaus Kinkel, the choice is China. It has become fashionable to say that, while Japan is great, China will be greater. China is the new friend to have, the country to know, the market for growth. Neither Germany nor China would appreciate the 'valuable contributions to our cause' advertised by the proclaimed 'people of Tibet'.

The full scope of all this becomes clear with an inventory of the estimated mineral resources of Tibet: up to 40% of the world's uranium, probably the largest reserves on earth, and large quantities of the rare precious metals platinum and titanium, for which until now the West has to rely mainly on South Africa. Aircraft or rockets cannot be built without the rare metals, and, according to economics ministers from Germany, France and China, a viable economic future, including a strong industrial export programme cannot be built without nuclear fuel. To sum up: Tibet appears to be, together with the Gulf and South Africa, the next World Prize.

And any country that hopes to get access to this Prize, can do without foreign policy-complications caused by such anti-nuclear politicians as Bastian or Kelly who think that a place like Tibet can be both 'liberated' and 'Green'.

Speaking from experience: shortly after the NEWS ROOM SARAJEVO proposition at ps 1 in New York in April, a key figure involved found herself being invited to stay at the house of, and occasionally (if she wanted to) share love with, a rugged young man who made a living out of climbing mountains in Tibet, carrying with him several million dollars worth of advanced photographic equipment. By August it became clear that the man was not so much a film-maker as a 'surveyor', the problem with his work being that, while inside Tibet, he must remain undetected. As was being indicated by e-mail correspondence from London, he should avoid certain places, should send postcards frequently as if he were a tourist, and should be prepared to endure severe hardship...

Suffice it to say that, for the governments in Washington and London, and probably also in Paris, Tibet could be a wonderful asset to the West, the chief problem being, however, that China might have a different idea about access for some Western countries (in view of its already evident support to Yugoslavia in defiance of Western policies) and might prefer to make the assets of Tibet available to others.

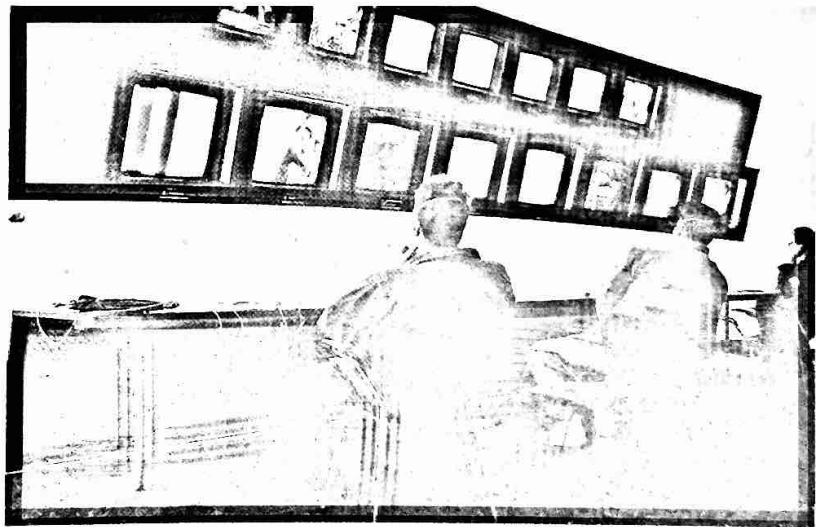
Only think of Germany's new friendship for China. And the visit to China of Akahito from Japan. Or the Chinese-Japanese climbing team which has just conquered a key peak in Tibet. A war from the past can be forgiven with a view to the needs of the future. Particularly when other countries — such as France or the us — make a habit of complaining about the violation of human rights.

Nowadays, to maintain a strong economic link, France and the United Kingdom supply Japan with enriched plutonium. Germany is not a part of this deal.

Moreover, quite suddenly relations with India have warmed up, and the us is conducting joint naval manoeuvres with them, France is sending weapons, and all the Western countries are celebrating the new capitalism. After all, those who want to gain access to a Tibet independent of China, will need an ally close by.

Once again, the alignments of the last world war re appear, and once again, the classic polarity of Eurasia core land mass versus outlying maritime powers re appears.

All this must be quite difficult for Marina Abramovic, who allegedly kicked Mr. ARM out of her Amsterdam house for his lack of sympathy for Serbia. Abramovic, who supports the Serbian cause, would therefore be sympathetic to China's geopolitical programme. At the same time, she has become a key proponent of Tibetan religion. Would she also be interested in helping to achieve a policy for Tibet in opposition to China's geopolitical programme? We might well invite her to present her views in the next issue of this column.



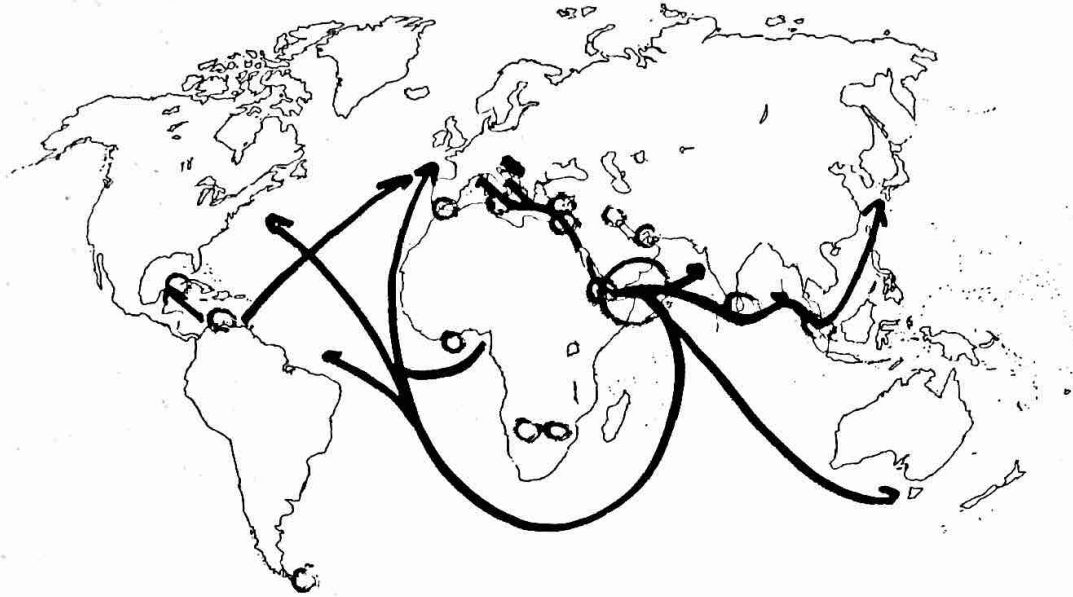
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7 Article from Mediamatic Nr. 7, 1992. At present, the only surviving element of the NEWS ROOM experience is the archive and computer base for a regular column to be published in Mediamatic, based in Amsterdam but released globally. The column, which has several authors and is therefore anonymous, is called, simply, "NEWS ROOM AMSTERDAM". This appears in every issue, raising serious issues of contradiction or abuse amongst the various nations' media.

8 Any NEWS ROOM can be different. There are no rules of what to show or edit. The only rule is that the logo and labeling be uniform, for „NEWS ROOM“ (two words) in Helvetica Italic Bold. The NEWS ROOM Amsterdam was more immersed in video viewing and video production than NEWS ROOM New York.

NEWS ROOM has been conducted since early 1990 in these cities, in each case involving persons from those cities: New York, Amsterdam, Cologne, Paris, Stockholm, Frankfurt, Copenhagen. An invitation was extended by the Collegium Artisticum in Amsterdam, Cologne, Paris, Stockholm, Frankfurt, Copenhagen. An invitation was extended by the Collegium Artisticum in Amsterdam, Cologne, Paris, Stockholm, Frankfurt, Copenhagen. An invitation was extended by the Collegium Artisticum in Amsterdam, Cologne, Paris, Stockholm, Frankfurt, Copenhagen. There is now an invitation from Sarajevo for a News Room there, in early 1992, but the war blocked it sooner than expected. There is now an invitation from Moscow. We are conscious, however, that government authorities, at least in the West, have specifically ask that it not be conducted — that is, that "apparent contradictions" in the news not be publicly examined. In retrospect, it seems the most successful NEWS ROOM project, concerning a particular reported event, was conducted at the Galerie Christian Nagel, Cologne.

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A PRIME REASON FOR WESTERN INTERVENTION IN SOMALIA AND IN YUGOSLAVIA, 1992.

Yugoslavia, marked in black, had until 1991 attempted to lead a restructuring of world access to primary resources, chiefly Oil and Gas. The peace conference it organized just before Desert Storm regarding the Gulf included countries with control over all the circled areas – that is, over most of the choke points for world oil & gas traffic. It became necessary to let Yugoslavia collapse. It has since become necessary to secure the now main exit for oil to the world from the Gulf, the Gulf of Aden. This region includes two close allies of Yugoslavia, Yemen and Djibouti, and another potential ally with major ex-Soviet bases, Somalia. Most of the military action for recent decades has been conducted in relation to these sea lanes choke points. No country anywhere, least of all the West (which with 15 % of the population consumes more than 50 % of the oil and gas), is engaged in providing anyone with “humanitarian aid.”

10

EUROPE IN QUESTION.

A standard NEWS ROOM practice is to correlate what is publicly reported with what is geographically real. There has been much talk since the last World War about creating a Europe “from the Atlantic to the Urals.” We of NEWS ROOM have simply traced such a Europe, extending along its peninsular length from Trafalgar, off Spain, through Moscow, in Russia, to the Urals (quite Napoleonic), and we have discovered that the now-named European Community does not even fill out a space behind a line drawn from, say, Copenhagen through Belgrade, less than halfway across the peninsula to the Urals. A similar map could be drawn, separating east and west, of an undecided United States in 1861.

11



11 The chief discovery at NEWS ROOM FRANKFURT, which appeared in a series of yet-uncontrolled news-wire clips on our Reuters terminal, was the (apparently unpublished) fact that Saudi Arabia led a complete shutdown of oil deliveries to Japan for a number of days in December 1990 in order to get the financial commitment it was demanding, for Desert Storm. Passers-by stopped in, normal people not solely the art-crowd.

Given that NEWS ROOM STOCKHOLM was visited by agents of Swedish intelligence even before the arrival of anyone from New York, and given the direct warning from the French Government, it seems that NEWS ROOM,

wherever it might be (including the illfated attempt at Sarajevo), is not an acceptable form of competition with the powers-that-be. This has helped to focus the question for Ocean Earth: What Is?

BEACH PARTY

ADVERTISING FOR THE PUBLIC

IX. BEACH PARTY

BEACH PARTY
DEUTSCHLAND

1992

WARUM NICHT

All the world knows that the Black Sea is on the verge of collapse. That the Baltic Sea is so polluted that disease and deformation become rampant among the newborn on its shores. And that the North Sea has less, not more, bioproductivity, with each year.

And everyone knows that the Black Sea, Baltic Sea and North Sea, like their southern counterpart the Mediterranean, have lasted much longer than any race or nation of humanity, let alone any sovereign state in Europe.

Yet now we face the possibility that, for a while at least, states like the united Germany or France, let alone the newly independent, 2.5 million strong Slovenia, or 4.5 million strong Croatia, could outlive the oceans into which they drain.

While Serbians and Croats kill each other over who gets what turf, and while the Pope wants to make sure that his flocks get ever larger, more numerous and more consolidated, presumably against whatever foreign and dangerous influence might befall them from those of Eastern faith, oceanographers have concluded that the ocean just downstream – which they all must by gravity's force share – is in danger of irreversible collapse, even of a chemical turnover that could, they warn wipe out human populations upland.

Perhaps this is no danger to the people in Bavaria or Austria, or even in Croatia and Serbia. But it sure would make a decent Ostpolitik hard to maintain if, in both the Ostsee and Schwarzes Meer, there was not much more Ost worth living in anyway.

All the world knows we all face an ecological cataclysm.

All the world knows that Europe's beaches are worse off than ever.

Every German knows that much of the frenzy for an "independent" Croatia (which, according to Bunte's "Geographie der Befreiung", would be absorbed into a revived Austro-Hungarian Monarchy anyway) is to assure a better access to some of the best remaining beach property in Europe.

Are there any safe beaches now on the Italian side of the Adriatic? Or, given what happened last spring, in the Italian and French Riviera? Or on the North Sea, or in the Baltic, or the Black Sea? Where else can you safely go during the summer except... Croatia? And perhaps also – and the Government is also rushing in there with investment – Albania? For now, Montenegro is somewhat off limits... But given what happens every summer, and given the ever-greater danger of pollution, threatening to choke all but the western coasts of Europe, it is hard not to think of Genscher's foreign policy as little more than making sure there's a place in the sun. Because the beaches back in the Heimat, we all know, have already gone to hell.

The problem with Germany's foreign policy – which, given its focus on places like Brazil, South Africa, Argentina and the Mediterranean, looks more like a Beach Policy – is that it's not strong and clear. It's not aggressive enough. It's not bold. Or direct. It's still trying to find a way out of the mistakes of the world wars, acting too often with stealth and staged events (why drag out the dirt?), rather than just out and

out declaring that what it tried to do in the past was not a mistake, but was wrongly understood. What was being tried in the past, with the occupation of remarkably pleasant places like St. Nazaire and Mykonos, was to create a Fortress Europe in which prime access to most of the beaches was preserved. It is time now to organize the territory in those events around what everyone covets most, delightful shores.

For what would have been called a German homeland only fifty years ago, we can propose, in the manner of Charlemagne, a three part split;

- Nordland: the North Sea Basin, including most of England, of course
- Ostland: as named before, the Ostsee (Baltic) Basin, including the Baltic republics, Poland, Sweden and even some of Russia
- Schwarzes Meer: the Black Sea Basin, including onetime Austro-Hungary, plus the Ukraine, Serbia Romania, Bulgaria and part of Turkey

The only apparent "sacrifice" is a forfeiture-by the North of most of Bavaria and part of Baden-Wurtemberg, leaving those parts to Austria, towards which they drain. But is this a "loss"? The running joke in the North is that the Bavarians are "halb Deutsch". So be it. Thus could Europe be divided, then organized, into physically-unified lands, each with a clear inventory of resources, including living resources, and a precise mandate for stopping pollution. For each land is a basin, a sink, a gravity-based body of land, with waters bearing materials all to one center. Possible to coherently survey. Possible to manage. Possible to efficiently tax.

Germany is the largest, most powerful state in Europe. It lies at the crossroads of most trade. Whatever it does will trigger a chain of events that ripple throughout Europe and shape Europe.

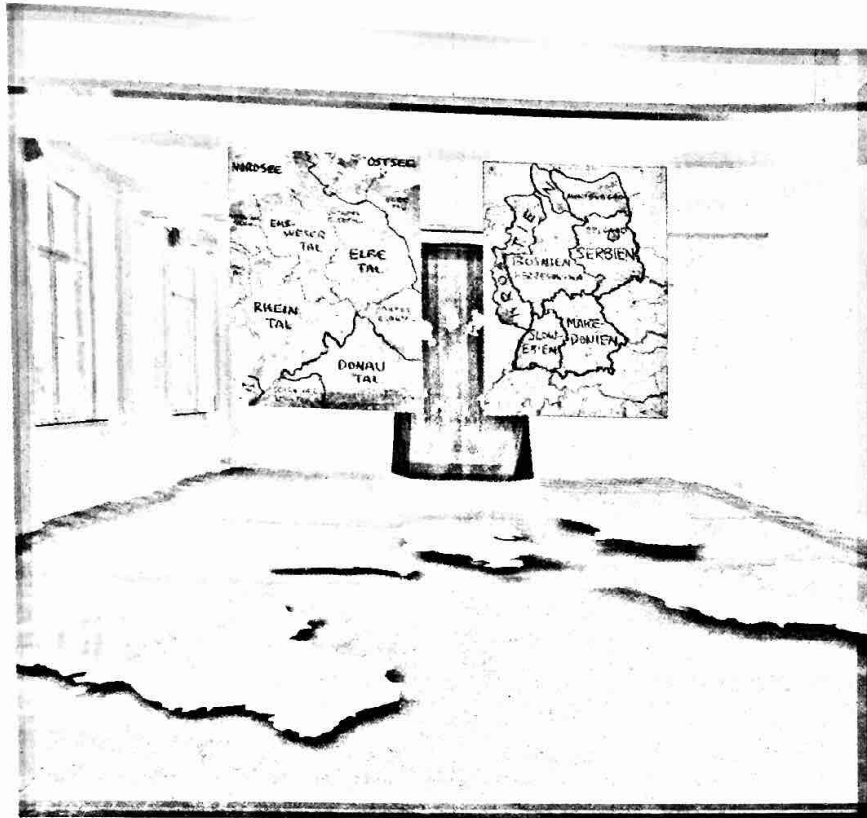
Europe has the most severe danger of oceanic collapse of any part of the world. The continent, with its large confined seas surrounding it on three sides, has gone to the brink. Germany can lead the way to bring it back.

There are those who say that only nuclear energy can assure a clean environment and bring us back from the brink. But everyone knows about Chernobyl, or countless other lesser accidents and near-misses, or simply the fact that human nature is not perfect, that nuclear energy must be perfect, and that even with perfection there remains the problem of deposition of wastes. And everyone knows that there are other sources of energy required, regardless, namely hydrocarbons. And scientists know that the most efficient source of such hydrocarbons, also required for steel let alone fuel, is ocean algae. How shall we build an algae industry – essential to any post-fossil-fuel society – if the oceans are mismanaged and near collapse?

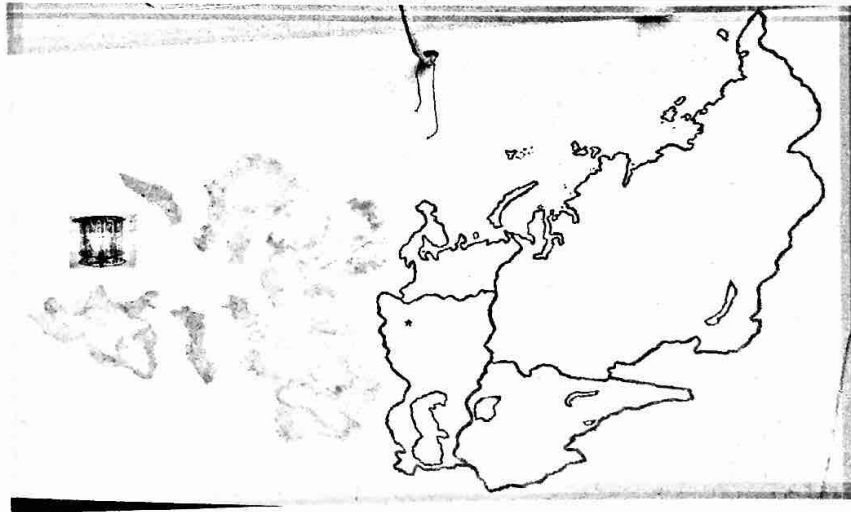
It is better to think of the entirety of Europe from the outset, to not exclude one part or include another, to not think of one part as free and another as... enslaved, to not get involved in partitions of East and West, and to deal with that entirety as a peninsula surrounded by seas, all now endangered, all potentially a foundation for future industry. As the proof of success would be in the beaches – are they healthy or not? – the "political" party advancing a total European program is named

BEACH PARTY

1



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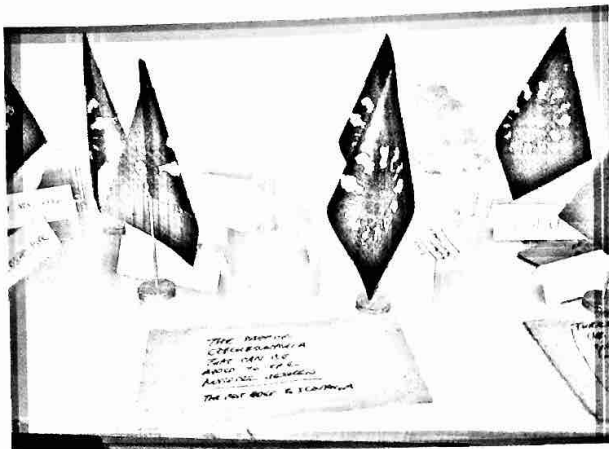


BEACH PARTY KÖLN

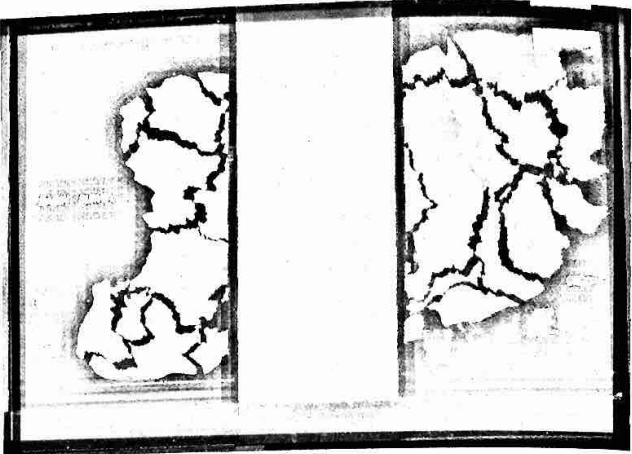
- 1 Galerie Esther Schipper, 1992.
Memorial to Germany, or Denkmal für Deutschland.
Including, on the floor, a Greater Germany of the Baltic, Black and North Sea/Irish Sea combined, in case anyone in Germany feels expansionist enough. This piece is copyrighted by Michael Trier with Beach Party. Then, further towards the flags and maps of Germany: the separate parts, English Channel, North Sea, Baltic Sea and Black Sea, all very large and quite imposing.
The paired maps of Germany are organized on one hand along the logic of the impending breakup of Yugoslavia, and on the other along the logic of the separate ocean basins. Take your pick.
Behind, for patriotic purposes, is a Beach Party flag of the European Community as finally fulfilled, from the Atlantic to the Urals, with – magic number – 13 “stars”. The flag was specially prepared for Documenta because otherwise no one would know where Kassel was. Behind the flag, appearing to visitors as a flicker, is a satellite video of Montenegro.
- 2 This is the installation during the Köln Show, 1990. While Russia was still Red, and while the question remained one of TSAR WARS (rather than Star Wars), we decided to show what Europe could do in response. Divide into basins, and then let the Russians do likewise, if more abstractly, in their respective Barents, Caspian, Arctic and Aral regions. Much of this is coming to pass now. We could reasonably speak of most of the Black Sea and Baltic Sea Basins being distinguishable (as in the separation of the Ukraine or Belarus) from the rest of the then-red Russian Empire.

IX. BEACH PARTY

3



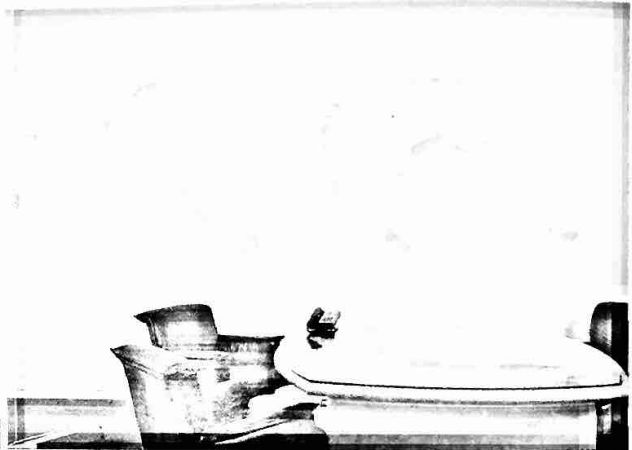
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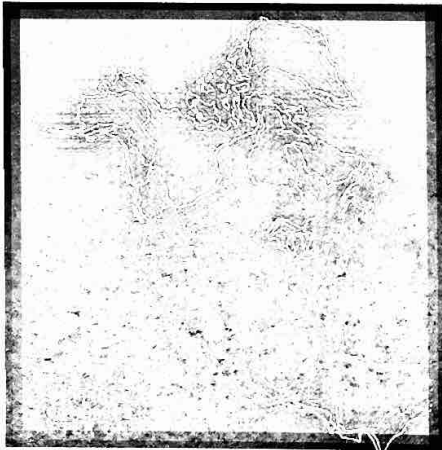
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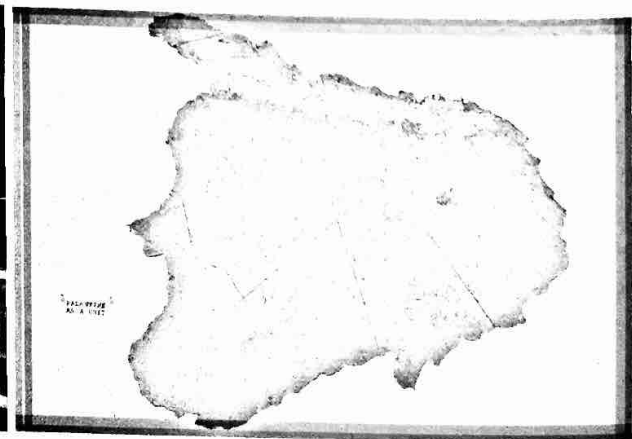
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A D V E R T I S I N G A

- 3 Beach Party Köln, Galerie Esther Schipper.
The conference table is for the 13 basins of Europe, assuming that the European "community" finally becomes European comprehensive of the continent "from the Atlantic to the Urals." 1992.
- 4 Europe and Africa, in basin survey, as promoted by the OECD, a somewhat misleading acronym for Ocean Earth. The acronym was displayed with considerable authority in the Chase Manhattan Plaza, such that many of the businesspeople passing by and witnessing this proposal for planetary organization believed that the source of the display was the Organization for Economic Cooperation and Development, a think tank based in Paris. 1982.

B E T T E R W A Y T O

- 5 A world space, as presented at the Gallery Peter Nadin in 1979. This was part of a multiplicity of interjections in the site, the last one being the identifying of the space, or the possessing of the space, by a confluence of four artists concerned with somewhat similar issues, Peter Nadin, Lawrence Weiner, Dan Graham and Louise Lawler. Mr. Nadin insisted that an organization of North America be made on the floor, as we were there inside of the continent, which made altogether for a double entrance, or double vision, of just how much of the site was being claimed by the artists, either the four-named, or a representative of Beach Party. 1979.
- 6 Middle East Conference Room. A favorite hangout for visitors to the Scott Hanson Gallery, NY, complete with large chairs, a conference table, telephones, and files, and – of course – the requisite maps. On the table, under glass, the ever important Gulf, Red Sea and Dead Sea (Palestine) basins, with a touch of Kurdistan. On the walls, all the other basins of the Islamic or Middle Eastern world. Here shown are the parallel basins of the Bay of Bengal and the Arabian Sea.

O B T A I N W E A L T H

- 7 Proposal for North America. Political Economies After Oil. In 1979, both presidential candidates from California (Brown and Reagan) happened to talk about a need for a new organization of the political economies of North America. Since then, there has been some diplomatic talk about a North American Free Trade Area. How organized but thus?
- 8 Sea of Japan and Sea of Okhotsk, which together could conceivably be apportioned to "Japan". Of course we add the Kuroshio and Oyashio Currents, the eastward parts of Japan, to allow for a view of the Rising Sun. 1983.

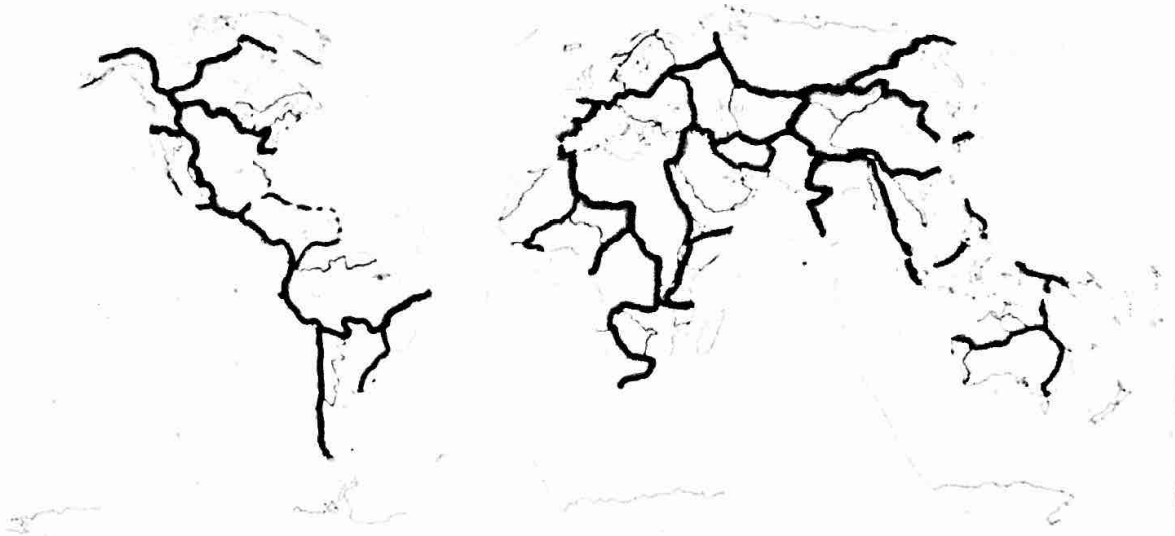
I F M O B I L D O E S

I T , S O C A N W E

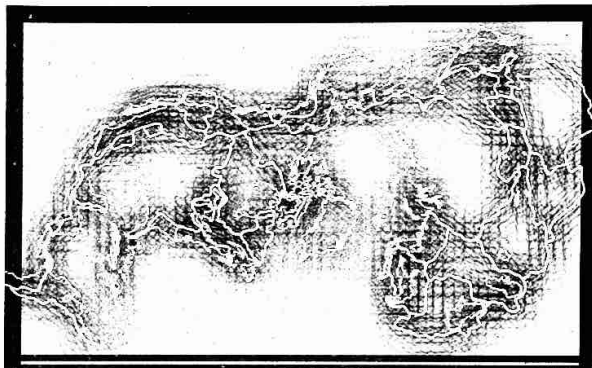
- 9 "Heimaten", a proposal for the Black Sea Basin. The poster was presented throughout the subways of Vienna, to imply that it would be okay to "revive" the empire, within an ecological and comprehensive framework, for the whole basin.
- 10 Palestine as a Unit. The Arts Editor of the Village Voice, after learning of this idea, overruled the Art Editor's selection of Beach Party for the 1980 (that far ago) choice of artist of the year. Three years later an Austrian diplomat arranged for the idea to be presented to a UN conference.

B E A C H P A R T Y

11



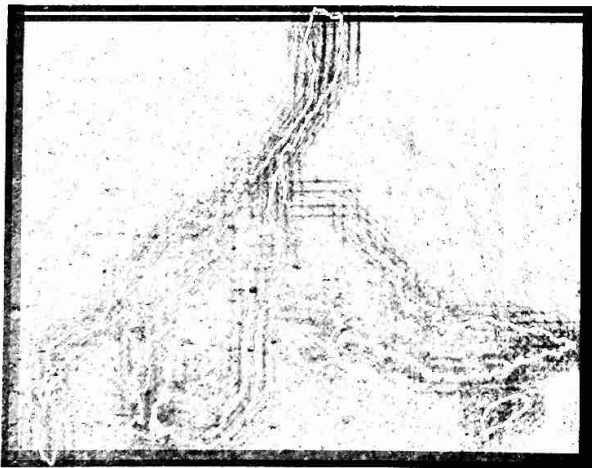
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- 11 World Basin Map, 1979. This led to discussions with then-Soviet (now-Russian) scientists – and to corrections.
- 12 Polar Projection, showing contiguity of arcs along the Pacific from one Equator to the other. Thus, for example, can the East Asian Archipelago be seen as an integrity.
- 13 Arctic Ocean divided into primary freshwater inflows. This constitutes a gyre which spins waters and sends them back deep below to the Antarctic – via the Atlantic. We learned about this from the Russians. (Image 65, p. 122).
- 14 South China Sea. At the southern end of the East Asian Arc. One ridgeline cuts through Dienbienphu and Khesanh.
- 15 Sea of Japan/Sea of Okhotsk. For planning purposes (regarding the “client”), the architect would include as well the outlying currents of Japan, to treat the entire set of concavities as one planning and production region.

SALTWATER BASINS
AS PLANNING UNITS

1989

For a number of centuries, the planning unit has been the x-y field. A given administrative area, such as a "country" for World Bank funding and sector reports, would be whatever was demarcated on a flat map.

We of Ocean Earth, conscious of work by Robert Smithson, would like to add the dimension of elevation and depth. We would like to make the "z" coordinate a part of planning, such that each unit is defined by the maximum values of z for a given minimal value of z, i.e., a salt water collecting pool. Each unit may then be seen as a salt bank, a salt collector, and therefore (given the source of terms like "salary") a repository of natural wealth.

SALTWATER BASINS AND
PRESENT NECESSITY

1989

If the scientists studying the Greenhouse Effect are correct, the human race in 1989 will add a 5 billion ton surplus of carbon to the Earth's atmosphere - all with dangerous effects.

According to these scientists, evidence of a planetary warming trend - already underway, as we know from recent summers - requires the immediate elimination of that 5 billion tons/year. Otherwise, higher forms of life on this planet face extinction.

As most scientists would agree, whether or not they fully endorse the Greenhouse Effect studies, combustion of fossil fuels adds about 6 billion tons of carbon to the Earth's atmosphere each year, and deforestation adds roughly 2 billion tons each year.

If the Greenhouse theory is correct (the charts indicate some distinct warming), at least two-thirds of fossil fuel consumption must be eliminated - not 'with deliberate speed', not 'as soon as possible', not 'over the next decade', but within the next several years. In effect, right away.

There is no doubt that fossil fuels are not good for the planet. They cause the bulk of air pollution, the bulk of coastal ocean pollution, the bulk of soil contamination. They serve as a rawstuff to which are combined a great range of toxic minerals. They are seen at best as a 'necessary evil' without which economies cannot function.

But given the sudden speed with which the forests of northern Europe and the US are dying out, due chiefly to pollution from fossil fuels, and given the sudden increase in near-permanent levels of air pollution among major cities, let alone a Greenhouse Effect which if genuine would destroy us all, one reaches the conclusion that the First and Material Cause - fossil fuel combustion - must cease immediately.

We have yet to see a statistically-supportable argument on how conditions necessary to human life can be sustained without a drastic reduction, by at least half, in combustion of fossil fuels.

Given the necessity, what is to be done?

We have proposed an organization of territory according to saltwater basins.

This has been denounced as politically dangerous, as fantastical, as unlikely, as naive.

Such denunciations may have weight, but before accepting them ask, what have those who denounce proposed for organizing human effort and human economy to shifting away from fossil fuels at least by half, right away, and ultimately altogether? Also, what more reasonable method, given current economic structures, might be adopted for achieving a two-thirds reduction?

There is much talk of dramatic changes in production of energy. A high-tech solution appears almost within reach. There's a fusion in a jar. There's hydrogen produced by electrolysis. There's a solar-cell industry placing collector panels on every building, every car, every factory, every sunny desert. There's superconductivity to assure easy diffusion of electric current, however produced.

Many of the technologies here cited already exist, to little avail. Why? Because any new technology, to become widespread, requires its own manufacturing, distribution, R&D, socio-economic structures, and the primary sector of the world economy, in virtually every country, is organized around mineral fuels. The entire world economy, and most of its geopolitical struggles, is organized around mineral fuels. Changing this cannot be done overnight. It cannot likely be done by 'revolution'. It can most certainly be achieved, if at all, by a process in biological evolution: adaptation.

Rather than get rid of the fossil systems, with their highly elaborate infrastructure and know-how, it is better to adapt those systems to deal with hydrocarbons - and chemical products generated from hydrocarbons - from a new, non-polluting source. This is available now.

The new source is the same source as of the fossil fuels: fermented or combusted wastes and vegetation. There need be very little change from the timely sources of hydrocarbons, which unlike those from mineral deposits, can contain no pollutants and can contribute nothing to global carbon imbalance, or global warming.

Although scientists will dispute among themselves about the best energy system, researchers at both of the U.S.'s two leading technical schools - MIT and Caltech - separately conclude that hydrocarbons from vegetation and wastes, collected chiefly in coastal waters, could meet much of the world economy's current hydrocarbon demand.

Of course there may be households and communities with solar panels and hydrogen gas from solar-driven electrolysis, and there may even be giant fusion programs, all yielding vast quantities of electricity in an all-electric economy streamlined with superconductors, but the colossal economic and social structures for such changes have not been formed, and meantime - within a few years - most reliance on fossil fuels must outright stop. It is easier now, and more responsive to the immediate emergency, to shift very substantially away from fossil hydrocarbons to fermented-income hydrocarbons, and to center such industry in precisely where the giant hydrocarbon companies are going next: coastal waters of salt seas.

The territory draining into each salt sea, into each relatively coherent body of saltwaters, becomes subject to resource inventory. It becomes subject to systematic surveying and planning. It becomes subject to large-area programs for collecting quantities of wastes and surplus vegetation, chiefly from soils accumulated downstream and offshore, very similar to what hydrocarbon companies have know-how to do now. And this territory of observation and collection appears little different from what the hydrocarbon companies already now define for exploration: the North Sea, the Caspian Sea, the Northern Slope, the Gulf, the Gulf of Mexico, Gulf of Guinea, the NY Bight, the Labrador Basin, the California Slope. What fossil fuel companies speak of today is what we can chart as saltwater basins, including in the inventory, as the source of all waters, soils and pollutants which might enter the saltwaters, all the land sloping into those waters. Simple.

Questions of politics can be met readily. Establishing a fusion energy program, or a global superconductor electricity grid, or even a large patent-protected solar-cell and electroly-

tic-hydrogen industry, would take more than the few years required for a drastic shift away from fossil fuels. But establishing comprehensive administrations for salt seas, to assure reduction in pollutants (chiefly from fossil fuels, anyway) and increases in bioproductive yield (if only for the evapotranspiration and oxygen they generate) can all be accomplished within legal frameworks of the United Nations Environment Program, notably its Regional Seas Program.

A body of law already exists. The body of law induces treaty organizations, or Regional Seas Programs, among the various governments of each respective Sea. Some of the treaty organizations are one of the few international entities with near-implacable enemies as active members. Consider the Persian Gulf Regional Sea Program, called the Kuwait Convention, in which Iran, Iraq and Saudi Arabia are all active. Or consider the Mediterranean Sea Program, in which both Israel and Libya advocate strong enforcement, out into the sea and extending up into what are called the "land-based sources" of inputs and pollutants. Scientists at the Italian state hydrocarbon company have linked up their remote sensing and survey program to the Mediterranean regional sea concept, in a project coordinated with the company's counsel. The hydrocarbon giants are already predisposed to looking at regional seas, or basins, as entire systems. One need but encourage the shift.

As for marketing: any hydrocarbon executive today, under harsh scrutiny for disasters like the Valdez spill, seeks a way to shift direction, or adjust the assets and operations, so that more such disasters – or all the talk about Greenhouse Effect, acid rain, and smog – can go away. These executives already have on hand a giant distribution setup, marine and geological engineers, specialists on the interface between organisms and hydrocarbons, including the hydrocarbons produced by fermentation, and recognized brand names. Consider: "Gulf", "Shell", "Elf Aquitaine", "Texas Company (Texaco)", "Aral", "Total", "Ente Nazionale Idrocarburi", "Chevron". Most of these names are not about "oil" or "fossil fuels", but about places, or seashores, or sea bodies, or, generically, hydrocarbons. Ad campaigns could easily be developed to justify any shift away from fossil fuels with phrases like, "There is nothing wrong with hydrocarbons. These are a foundation for all life. There is only something wrong with burning up long stored-up hydrocarbons, like fossil fuels. We have changed. We went to our namesake. We went to the Gulf..."

"As a Total System"... "Relying on basins as live shells,

rather than dead ones..." Or, most dramatically, given an ecological crisis there and long-known yearning for there: "Restoring the ecology of the Aral Sea, to yield biogas, the Aral Way."

Given the power of the international hydrocarbon companies, and given the growing recognition by the oil-producing countries that they must start now to shift away from reliance on depletable mineral deposits (with their own political, geological and ecological costs), it would not be inconceivable for those companies to adopt the legal framework of the Regional Seas Program of the UN Environment Program and establish a sort of bio-mineralogical jurisdiction over the waters and submerged seafloor of each regional sea. It would not be inconceivable, further, for those companies to start demanding enforcement of environmental laws over the 'land-based sources' of pollution upstream, surrounding each sea, so that their shift to biological harvest and production in the sea can proceed unhindered. A chief barrier to success in coastal production of biologically-generated hydrocarbons, after all, is pollution. To stop it, one need only line up economic interests that must prevent it to survive.

This suggestion of a viable future may seem rather drab and accomodating, lacking the drama of a fantasy with high-tech gadgets all run on strange new sources of electricity, all propelled with solar cells and superconductors and perhaps even tiny fusion-reactor jars.

But the suggestion is politically and industrially realistic. Many industries today require hydrocarbons regardless of energy source, including the steel industry, chemical industry, fertilizer industry, even much of the biologicals industry. Most cities and countries now are infrastructurally geared to handle hydrocarbons, as opposed to, say, hydrogen or direct solar, and simply cannot afford to rapidly retrofit. Countries now relying on fossil fuels for their income, such as Mexico, the Persian Gulf states, Nigeria, and Indonesia, cannot be persuaded to abandon fossil fuel extraction unless they can see a viable alternative path, suited to their current refining and shipping infrastructure and need for exports: most of these countries could rather quickly shift to a methane gas export industry, then to a non-fossil gas export industry based on coastal bioproductivity, without a permanent or chronic loss in revenue. Finally, there is a political recognition, a broad public demand, that fossil fuels must be phased out as soon as possible, without turmoil or abrupt shifts, and therefore without ancillary or extraneous shifts in all other aspects of life.

We advance saltwater basins as a realistic, concrete and recognizable paradigm for resource planning and development on this planet. When advocated in a balanced manner, they can meet all the urgent requirements of our time:

for a framework in which to monitor pollution and enforce existing pollution laws, regardless of what energy system might be adopted;

for a concentration of public attention on saving the chief source of oxygen on the planet, those regional seas and high seas;

for a shift in the hundred-year-old hydrocarbon industry, already well in place, away from fossil fuels towards the very biologically-obtained, non-polluting fuels which it has itself been researching;

for a beginning of exploitation of any regions soil base in its entirety, not just upland, where cropping and grazing pressures have become too severe, leading to deforestation, but also offshore, where most of the soil nutrients (never permanently lost) end up over the centuries.

War's Cost to the Gulf Region Put at \$676 Billion in '90-91

New York Times Service

RIYADH — Two years after the end of the Gulf War, a new report estimates that the conflict cost the region \$676 billion in 1990 and 1991, not counting vast damage to the environment and a continuing suppression of the rate of economic growth in the region.

The report, prepared by the Arab Monetary Fund in conjunction with two other Arab economic institutions, estimates that \$51 billion that would otherwise be invested in the region's economies

continues to be held in foreign accounts as a result of the war.

This flight of capital has abated in large oil-producing countries like Saudi Arabia, said the report, prepared in conjunction with the Arab Petroleum Exporting Countries Organization and the Arab Fund for Economic and Social Development.

The war's effects are felt most broadly in the loss of income for millions of Arab and Asian expatriate workers who were employed in Saudi Arabia, Kuwait, Iraq and elsewhere in the Gulf.

The International Herald Tribune, 26 April 1993

POST-SCRIPT EDITORIAL

Desert Storm, which brought us a New World Order, has been tallied to cost at least ... guess ...

Seven Hundred Billion Dollars.

Those who say that we are utopian or idealistic in pressing for industrial development or replacements for the fossil-fuel industry protected with Desert Storm are herewith asked if it would be utopian or idealistic to request an investment on this replacement industry, this replacement industry for a non-polluting and replenishable hydrocarbon fuel base,

seventy billion dollars

or, in line with the usual 1% dedicated to art projects in large public works efforts,

seven billion dollars,

or, in line with a percentage otherwise dedicated to foreign aid for impoverished countries

seven hundred million dollars

or, in line with our own budgets for what is possible within the scenarios outlined in the corporate charter at the founding in 1980

seventy million dollars

or, in line with what was offered to us by an investor as a reasonable start up capital for our (what the art press now calls grandiose ambitions but in the business world would be completely normal) program, of

seven million dollars.

What has occurred instead is that the US Department of Energy has published that various energy schemes like the ones in which we are interested, and for which a group called the Offices of Fend, Fitzgibbon, Holzer, Nadin, Prince & Winters was asked to collaborate, by scientists at major institutes and corporations, are "pipedreams".

This leaves us within a fait accompli that whatever shall be the energy destiny of the planet is to be dedicated exclusively by the same industrial interests which were protected, for the sum of Seven Hundred Billion Dollars, in Desert Storm.

INTERVIEW

“AS THE DOCTOR SAYS”

A ‘CORRECTIVE’ INTERVIEW

'CORRECTIVE' INTERVIEW

Peter Fend: I'd like to address the generally circulated views about what I'm up to. I have to be as simple as I can for what I might call a corrective interview. Corrective always to try if possible to give the public figure a chance.

Philip Pocock: Wouldn't that put you on the defensive. You remember General DeGaulle: "Never apologize. Never explain." But okay, let's try: Your company's name is?

Peter Fend: Ocean Earth Construction and Development Corporation.

PP: No irony intended with OECD?

PF: No, that was quite by accident. Or I should say by a certain kind of necessity in the sense that we had initially proposed a name but New York State had that name already in the register so we adjusted the name and it was done by this lawyer who wasn't expecting any possible concurrence with the organization based in Paris, so, voila, we had a name with an acronym that wasn't unique. We thought then, let's just continue.

PP: You must already have a dossier in covert agencies.

PF: Of course, sure. But I'm not really operating in that frame. Maybe I should get to the real program. We have here a book [*taking it from the shelf and looking through it*], *The History of Technology*, and we understand that there are real technological needs today. Very acutely there is a need for a change in the fuel base. We understand from scientists that sixty percent of the fossil fuel emissions need to be eliminated and pretty much right away. Now. So that is what the doctor tells the patient. The patient however, even after a huge conference in Rio de Janeiro about the world environment and about the patient's health, knowing that it's really bad, decides to do nothing. So it's rather amazing. Here you have a doctor telling the patient what to do and the patient, the world society, is unable to act and, yes, I feel it is necessary to act.

PP: Aren't emerging nations like India using such occasions to barter economic aid for environmental responsibility? The real issue there wasn't the environment but the leverage of the environment for economic gain. India reported that future emissions from its exploding car population alone will be big environmental trouble unless western powers provide the aid necessary for responsible growth.

PF: That may be. But as one who wants to have children who will live and live well, and as one who comes from a post-war generation as opposed to a pre-war generation, I'm aware that I have to make my world as they made their world and unfortunately they have a lot of power right now. They still have their property arrangements, which are mostly in the ground, i.e. oil fields, and there can be a lot of mouthing about the need to change the fuel base but there has been very little action. There are all these assets held by existing major oil companies and so on. So there is a necessity unfortunately of making some real change which will I'm afraid to say mean, like any kind of historical activity, involve a certain amount of cutting through of tissues, so to speak.

PP: Well now you get to the problem of how?

PF: My whole career is genuinely and fundamentally to figure out how. You might call that an art career in terms of art as manner, way.

PP: Do you think it's possible with art?

PF: When I say the word manner or way, it's opposed to *kunst* which means sort of ultimate, or very refined. I'm not really one who makes anything refined. Rather I'm one who tries to push forth an idea and present an image or a kind of psychological event to the public like here, here's our media. Bang. Here is a big pile of dirt. That is a place which should be *unabhängig*, independent.

PP: What is it that's stopping people from doing the obvious thing?

PF: Existing property arrangements, which in effect means existing concepts of wealth. And art helps to identify new concepts of wealth. That's why I say "art". Take the Renaissance. During the Renaissance there was a whole idea of pictorial space, of say a flying machine, drive shafts, and the Renaissance studies of perspective were directly tied in with the formation of the new technologies. The camera, the drive shaft, all that comes from Renaissance drawing. And what recently we've had in art in the form of earthworks, things like Walter de Maria's Lightning Field, we've had performances that sort of suggest the new paradigms in material organization like Joseph Beuys's Fat Corner pieces and we've had drawing by people like say Sol Lewitt, we've had video by Keith Sonnier, all of which, were they to be normal industrial technology, if you were to have lightning fields everywhere around the landscape, would obviously mean a very fundamental change in the use of land, the building and design of cities, in the notion of what to do with materials. The identification of the marsh as a valuable thing by people like Robert Smithson would entail very directly a greatly different approach to things like marsh clearing, marsh drainage.

PP: What do marshes do for the environment?

PF: They serve as the fertility zones of any given ecological region. That is to say, it is there that most of the nutrient and species interfacing goes on, most of the killing, most of the eating, most of the transfer of the nutrients, most of the breeding and so on. This is also an area where a lot of nutrients are transferred from say the Equator towards the North Pole on bird flyways, insect flyways. These are critical to adding micro-nutrients to environments and so on. *Guano* you know, deposits here and there. It's really like saying that we all know that a city will not function if the railroads, the railroad stations and the airlines and truck lines are shut down. I mean the city is there. There are foodstuffs and there are buildings. There is hardware, but the moment the transportation system shuts down very quickly the whole city begins to fall apart and that's a very interesting point that is not evident with Renaissance modes of thinking but rather more with systems modes of thinking, with what they call a systems mode, which means that, for example, even if only one percent or two percent of all the goods that are actually in a society are in circulation at a given moment, or even less, like .5 percent, something really small, the very cessation of movement causes a breakdown of the entire system. Quite

curious. And it has nothing to do with the quantity of material being moved. It has to do with the very nature of the movement. It's as if critical attitudes occur now and then. So all you do even though you are, suppose for a moment that you stop eating, your diminution of weight would actually be rather minor but your ability, your ability to function will shut down very, very fast. You simply need to have this ongoing supply of various things to metabolize and so on. And it's this fact which is not about quantity but rather what you might call circulation which is what makes an infrastructure work, and this point is fundamentally lost in things like farming.

It's not to say that farmers don't know it. But the case of farming is: I have a certain amount of land, I plough the land, put a crop in the land, put some fertilizer in and it's always in sort of quantities, outcomes, when what you really also must be aware of is the insect vectors, the bird vectors, the wild animal vectors going on in this area which in the long term are necessary to its vitality. Agriculture as we know tends, unless it's very healthy, tends to deteriorate. The Midwest of America is a good example.

PP: In the United States agricultural exports are third behind art and entertainment. And perhaps their attitude towards it also lags. Do you feel we're too far along to change effectively our methods of farming?

PF: Well that's why I'm a so-called *enfant terrible*.

PP: You have hope?

PF: Of course. I have no choice.

PP: But it is naive?

PF: Well they always say that I'm maybe naive. I have hope, but I think one has to be aware and ironically they are together. I'm aware of the fact that social change, or technological change or even industrial change, will involve shifting property relations, and it will involve, someone at some point some place having to say, I will not continue the old way of doing things, I will now start a new way of doing things.

PP: You're discussing the problem on a structural level here.

PF: I'm thinking about a certain area of the world.

PP: My point is that a structural change in society is only possible peacefully after a change happens in our internal structure, our consciousness, don't you think?

PF: Yes, but I'm afraid that that usually has to happen in something like a war.

PP: Something so drastic will have to happen?

PF: Well, yes, I'm afraid to say. Maybe to give you a good example, Los Angeles may be ready for some major change. First of all, there is the legal necessity, they already put that in law, but as we all know there has now been a great deal of now reluctance, hemming and hawing about we really can't afford to do this change.

PP: The technology though is there?

PF: But the property relations aren't. Technology may be around but people aren't, I mean how do you have property in oceans to achieve ocean energy which the people at Caltech say is important, scientists say is good, the books all say is good, Cousteau says is good. France *Soir* the newspaper has a cover story saying it's good to have oceans become the new source of energy. The Japanese Ministry for International

Trade and Industry has decided that this is the new future of energy, the ocean, algae. How do you get people to establish the new ideas of property?

PP: Exhibiting in galleries isn't going to do it. What percentage of your time is aimed at politicians and state assemblies and so on?

PF: I can say that most of my time is dedicated to scientists and policy-makers, especially now. What I've done in the past several years, we have to remember several things. We have been profoundly abused by State authorities. By saying abused I mean a real attempt has been made to convert the company Ocean Earth into a front, a cover for provision of satellite imagery to, you know, various governments, or let's just say covert activities, because after all, we've been a convenient source. The very first event was when we did the Falklands for the BBC and at the door arrives somebody from the British Admiralty and the US Navy saying, Your material will now be used to help the British Admiralty. And in terms of property it is illegal what they're doing but we're a convenient cover because it's private enterprise doing its activity, and we can be essentially commandeered for that effort. That kind of thing went on for a long time with various governments, whether it's Dutch or British or German. And they having committed these wrongs against us for their purposes, because we're a bit pioneering and have some hard information.

But I want to get to the point here, which is that having, shall we say, having had all these experiences, all these escapades, it's okay you know. All is fair in love and war. Certain things have been attempted. I'm not going to try to embarrass anybody especially. I've done quite a lot of depositing things at all over the place, all kind of countries, so you know you really can't do very much without having problems. And then the thing to do is to put on a happy face, keep on putting on a happy face and go into the world of Realpolitik with some people who have some clout.

PP: But how do you "get" there?

PF: Having had these exposes in terms of the Herald Tribune and other newspapers, and letting them know that you don't want to fool around with us, and having gotten around all those problems and having meantime in the art world, I was not in the art world a long time, I've been using ideas from art and not wanting to be in the art world, not exhibiting as such, having meantime made it a publicly recognized fact that there are all those basins, there's all this satellite monitoring, that the idea of satellite monitoring was to work within the basin framework and not to do espionage. I don't care about espionage. It's boring. And having established that we really have an ecological program, whether it's in the Persian Gulf area, we don't really have a war program. We don't care about these wars. They're boring in the end. But we really wanted to find a way of identifying new technologies that will help to restore the ecosystem, that will help to restore the marshes, for example. And that in effect, in administrative terms, as there is this change in property relations, we can introduce to the area a new property concept of, say, marshes, or a new property concept of art on site, like that of De Maria, Smithson, whatever, or satellite observations in the manner of Sonnier and Sharits, or new technologies basically which will have much more in harmony with the ecology or a new fuel base, for example.

PP: Well would you say that your program is art-inspired design and not the other way round?

PF: Of course it's design more than art. I'm not an artist. I never professed to be an artist. I keep on trying to tell people I'm not an artist. I always say I'm an architect. Everything I'm doing is architecture.

PP: Does modern architecture fail more often than not?

PF: Yes, absolutely. Because, and I can be very plausible here, and very rigorous in the old-fashioned sense, Leon Battista Alberti, I always quote him, in his *Four Books On Architecture*, a rather famous treatise, it's like Vitruvius's *Ten Books Of Architecture*, it's very classic, says that the essential question of architecture is the city, not just the house. That's why I take exception to the idea of Dwelling because we're really rather more interested in Community. I mean, I could get a dwelling in the middle of nowhere, but that's not architecture. That's just building a hut. Architecture is the task of building the streets.

PP: We call that urban planning.

PF: Okay. But let me get back to Alberti for a second. He says that the city is the subject and that the first task of the city and anybody making a city is to have clean air, clean water and a good view. That was his phrase, well in the old days that meant, don't build a city near a marsh because you had malaria, mal-aria, bad air, and don't build a city say such that the waste, if you dump waste and you have cow dung it's going to go into the city and cause dysentery or something.

PP: That sounds like an sales pitch for a graveyard: clean air, clean water and a good view.

PF: Well it's a bit boring, but unfortunately no major city in the world today has any of those things. Mexico City for example certainly does not have clean air or clean water.

PP: It appears so simple, what you're asking.

PF: Yeah, it's rock bottom. It's not as though I don't hammer this constantly over the head or hammer the nail. It's a very boring and standard thing. It could just be the slogan, right, good. The thing is that to do that means a change in the fuel base and to do that you need to have a really thorough waste recycling system for every city and to do that you need to have some organization and infrastructure in building such that you can have a great view, look upon a prospect, have a kind of horizon line thing, You're not in a cave or a sort of gully some place and you can, everybody can have a chance to sort of look upon something or other that's not unpleasant. So that last part is design, or you might call it visual aspects. The first two are more or less mechanical. How to do the plumbing basically and what kind of, who brings the firewood, what kind of firewood?

PP Aren't the mechanics though based on business?

PF: Well, it's based on property, yes.

PP: Okay, you want to conflate business with property. But business choices are based on parameters other than social well-being. Aren't we being naive to think otherwise? How do you change the decision-making structure to implement your ideas?

PF: That's why I have to get back to the question of, and I'm afraid to use the word, war. What I mean by that, when you have a change of property relations, and you have a new opportunity for new property relations, then you also have the

new technology which works for cities. That is to say, we know after the Civil War in America, with the success of the industrial North over the agricultural South, that there was a decision then to try to make cities services, an important term, and quite literally somebody developed an integrated city-service system called vertically-integrated oil companies. That person's name is John D. Rockefeller, and in 1867, two years after the ending of the Civil War, he began the first vertically-integrated oil company, which is the present-day model.

PP: What does vertically-integrated mean?

PF: It means that everything between the wellhead and the consumer is in one corporate package. All stages, exploration, drilling, refining, trucking, sale, the whole thing, packaging. And these are the largest industrial corporations of the world today. Shell, Exxon. These are also the foundation of every economy in the world today. They all have a vertically-integrated system, whether it's state-run or privately-held. And they're also responsible to some extent for the fossil-fuel problem today. I mean if we want to have a diminution as the scientists say, the doctor says, I'm going to quote the doctor for a moment as a metaphor, then we must have a diminution of sixty percent in fossil fuel utilization now, or else. The fact is these companies, which have all their assets and profits and careers and everything else stuck in their means of production, what are they going to do? They can't really. Not in any kind of timetable that's "now", they won't. It's not a matter of condemning them, it's just a matter of property. They have property which is no longer appropriate. So the only thing you can do is have a new form of property emerge some place or other where one will essentially be able to replace that which was of the integrated fossil-fuel companies, and I might say at the moment that the best place to do that is Yugoslavia, because Yugoslavia is I guess cut off from oil they say and Yugoslavia does have at least something of a coast, for example, and Yugoslavia does, did make an invitation to my company to work there, when there was a country there, when it was legally allowed.

PP: What would the fuel base there be replaced with?

PF: One of our points was direct solar and so on, we talked about that, everybody knows about those things.

PP: It takes fossil fuel to make those. Are they efficient enough?

PF: Well I'm arguing that you need to always have a hydrocarbon substrate. I mean you've got to make plastics, you have to drive a car, some kind of cars, you can't fly an airplane with solar panels, pretty hard. And although there are some people who think we can make hydrogen engines some day and we already know that that will be very dangerous. One little car crash and the whole town is dead. So I'm just suggesting that we would go with, well there are various scenarios, but in any event, as the MITI in Japan has determined also, the Ministry for International Trade and Industry, we should definitely be thinking that most of our hydrocarbons will come from seaweed. Why? Because this is the most productive vegetation on earth.

PP: Would the balance of things change in the ocean?

PF: Absolutely, These are very real facts. That's why you do satellite monitoring. You just do satellite monitoring on a continuous basis of the area, and by the way there are many areas of the ocean that already have too much algae. We

know that too and they are very damaged by that situation. So there's plenty of algae to be harvested. I mean, Venice is glutted with the material.

PP: What sort of exhaust is given when algae is burnt, or is it?

PF: Nothing. Carbon dioxide and water, water vapor. No problem. You're not burning algae, you're burning the methane that can be fermented from the algae. So you could have an ideal scenario, we're talking about systems where you have eighty percent methane yield from fermentation of the algae, and methane burns clean and it also has no Greenhouse Effect because it burns within the annual cycle. I mean, you harvest this, all the technology exists but nobody has property so to speak in the ocean the way they have properties, wells in the ground. If I get a concession for oil in Kuwait or something that's a lot of money for me.

PP: Is there any historical model you can think of to give some hope for change?

PF: I think it's always happened, that is to say after the Black Plague there was a major change in the land use and there was an introduction of crop rotation. And I can't be precise about this and that but I'm sure that with the invention of the reaper for example there were major changes in the planting of crops on land or in irrigation. Certainly the United States has had a rather epic phenomenon of very large changes in the land use very quickly. When you think of Indians hunting buffalos and suddenly it's the White Man raising cattle and growing wheat. So the fact is that there's a long history of this and I might say further that one very important pattern to recognize is that in history it only takes one really good model to make everything change, which is why I've decided to center on two major sites for activity.

One is the Los Angeles area and the other is the Yugoslavia area. First of all there's a parallel because they're both sort of like California. Second of all, there's an historical situation where they both have a necessity which has been publicly recognized. I mean we all know that Yugoslavia has changed. For sure. It will not be what it was. And we all know that California has to change. Because it's in the books. It's a law and people there are already mobilized to do that but now they're meeting resistance from oil companies. Well, working with both will create a kind of concurrence between the two to see who's going to change first, so let's try working in both areas. And to me what's -- now we're talking about politicians -- what's very exciting is that we know that the new prime minister of Yugoslavia is from the Los Angeles area, Milan Panic, so that, Gee, you know, you can kind of put your feet in two places at once, do something out in L.A., do something in Yugoslavia, and while they're talking about bombing Sarajevo or not bombing, I mean, who cares. I mean, why don't you accept a new energy system because you don't have any more oil anyway, you're cut off.

PP: Where can you get support for your ideas?

PF: The art world has first of all functioned over a period of time in allowing me to function in a relatively-sheltered situation away from the media because we were kicked out of the media pretty much for showing the Persian Gulf, things about Libya, things about SS-20 bases in Russia, things about Lebanon, making people look at the facts, so to speak, and I've been able to nurture this in the art world for a while and develop a profile.

PP: Now you need a lot of money?

PF: It is clear that one can only enact a change with capital, and also with permission to work on a site, I mean access to a site. Now this particular area in Montenegro for example that we were recommended to work in ("we" being an architect, another artist, myself, a computer scientist), recommended by a prominent biologist, is quite obviously a very good place to work in. It's a kind of microcosm of the ocean, very good, not polluted, an ideal testing site. There was an investment of hundreds of millions of dollars by British real estate people to build there and to build a kind of model community actually, and this was with the-then Yugoslav regime or Montenegro regime. Well of course that's all on hold or not disposable at this moment or maybe even reinvested in something else. The point is that there was an interest, that there are people who are interested in investing large sums of money to do something interesting, new, there. So a gallery in London, knowing this thinking all along and so on, having a good business-like manner, is prepared to, okay, act on my conversations with the foreign office in England, the foreign ministry, about this subject, about what we had and so on, what's going on because it would be very interesting obviously for the British government to foster a reallocation of its investments, investors in Montenegro, say, as a kind of a post-war Marshall Plan or whatever, or just a post-war business deal. And when you have a post-war condition you have a kind of a tabula rasa, a chance to start all over again and if the foreign ministry likes the package which is now being prepared for them, presented to them, then of course they would be willing to underwrite or allow for or encourage us to do it.

PP: Then your goals are synchronized?

PF: There's always if you will somewhat delicate matters. My degree of trust is dependent on the alignment of political interests, and let's just say that I'm aware of the fact that the British and the French for example would somehow like to have a position in eastern Europe.

PP: What practically are you hoping to achieve in Montenegro?

PF: Well we're really taking the same site we already had access to, about fifteen kilometers by twenty kilometers, a beautiful place, a bay. The British, they intend to build a city with a population of maybe fifty thousand people total. They've got about five or ten thousand people. You'd just take the town and maybe some slopes nearby and build in effect a kind of ski resort and, if you want to use that term condominiums, and the idea from my point of view is a relatively dense Mediterranean-style hillside community, modern building in terms of certainly very strongly-clustered structures with open spaces, certainly marshes. We're thinking about all of this. I don't believe in sprawl. I don't believe in having single family dwellings spread all over the place with winding little roads which are called Cherry Hill Lane.

PP: And how would they be energized?

PF: Exactly. We would produce bio-gas methane from the bay itself.

PP: And is that feasible?

PF: A number of people at the present time say Yes. Some of the scientists we consult with say Yes. And the main point is, and this is important, that it's feasible because there's the social will to do it, the community wants to do it, the

government authorizes it, Montenegro's new government has a constitution, we hear, that mandates it, it's called an "ecological constitution". They don't tell anybody this in the news. You know the news always says Montenegro may be expelled from the United Nations. Well maybe it's just as well because they can get on with the real business of making an autonomous ecologically-unified condition. And stop fooling around with these blabber talks like they're having in Rio de Janeiro in which nothing is done.

PP: How will they interact with other communities?

PF: Well we're only talking about energy self-sufficiency. We're not talking about trade.

PP: But what about gas for trucks to return elsewhere?

PF: This area's so isolated that it's virtually unapproachable, I'm not saying totally inapproachable, but it's very hard to get there. Sure everyone will fly in with the same old fuel and the same old pollution, if they want, but cars I think could be easily, a local market could be easily developed so that you don't have such a need for oil.

PP: Are you proposing England's Lord Sinclair's electric car?

PF: I'm talking about methane. I suppose you could have electric cars too. That's not against British investment too. I might say here that Los Angeles law mandates by, I think it's 1997, some time that year there must be a drastic diminution of fossil-fuel emissions. The engines and fuels will be just entirely different than at the present time. So the electric car is a normally understood scenario, but also why not have methane gas? The methane car is a scenario, with a biologically-derived methane as opposed to a natural-gas methane. So in an area like this where you have, and I must stress this, a fully-enclosed bay, you have, if you will, the community's own energy source so you have the gas so to speak and because that place has a social tradition and a very strong community tradition. This is in Montenegro after all. It's not where there are any problems with private land-property rights. That is to say we're in a common bay, a common, if you will, Commons. And because they have a war and everybody knows it's time for something new, Hey, let's do this thing new. We don't have any access to the Persian Gulf any more anyway so what the hell. And finally it's not very expensive.

Oh, and I should have finally pointed out, initially, initially the glitch, the reason for not proceeding with these schemes elsewhere in the world has been (a) Pollution, like how do you do this in a lagoon? there's so much pollution you can't even go in the water certainly, and (b), as serious, Storms, meaning that you're just beginning a new technology and you're just trying to figure out how to make rig stay in the water and have seaweed, and the last thing you want to do is have a hurricane come along and destroy your whole system, during a major gale, that's what crushed the efforts by Caltech in California because, you know, one good storm and all your scientific testing is gone. You haven't had time to even figure out how to do it and your test tube's all destroyed, so to speak. You have an open-systems laboratory.

PP: How can you solve that problem?

PF: Find a closed-systems laboratory. What's so great about this site is that it's a bay, it's a bay surrounded by very high mountains. It is a very quiet, and also it is a bay with very few rivers so it's not an estuarine system. It's a very narrow basin so to speak. You have just the mountains and

that's all. There's no major like-Mississippi River coming into here or something, no Po valley. You have a more or less microcosm of the sea. It is a pretty much normal saltwater body of water surrounded by mountains with no real chance for storms to get in there, sheltered, so you have a perfect microcosm, not polluted, of the high seas, and there's a normal coastline, but protected.

PP: Will scientists have to clone this topography as a precondition, sort of like Turrell's mountain project.

PF: Oh, James Turrell, and I'll put this on record, is rather unfortunately for everybody trying to repeat Robert Smithson or to do a rehash I should say of Robert Smithson and it's most unfortunate.

PP: I was referring to his mountain building project.

PF: He's being corny.

PP: It's all fine and dandy with Montenegro but what about elsewhere?

PF: I'm certain that we have to find a way to do this in the North Sea or the Labrador Current or the Arctic Ocean.

PP: Isn't it crucial to plan these future sites now or Montenegro will be just an ecological Disneyland, no?

PF: When you have a baby, you have a small playpen and have everything sheltered and protected and so on. Later on you go up to the real world. When you have a new technology you have a little small research site, well protected, it has very few variables, no big storms coming in, and then later on you can take it out to the real world. Ocean Earth Construction and Development Corporation is doing Ocean Earth and not just Montenegro.

PP: So there is a future studies arm?

PF: We intend to, I'm involved in science policy. But the difference between me and other people there is as one who has stuck his neck out, out of the shell and yes I did some report for Congress and yes we did get something in a couple of books, some regular press, you find out very quickly that even if you get yourself legitimized, the powers-that-be want to crush you because you threaten their interests, quite obviously.

PP: So how do you get around that?

PF: Well I say you go to areas where there's a tabula rasa. Obviously, Montenegro will be a tabula rasa.

PP: So war is a given precondition?

PF: War is a very effective condition for allowing new ideas to occur. It's like a forest fire. When you have a forest fire then you have a new soil and then you have new plants and animals and all that kind of stuff, a new situation, and I must say that when Klaus Kinkel, the foreign minister of Germany, a very unfortunate man, I'm sorry to say even a dangerous man, starts talking about how we need to put out fires, Sir, maybe you should start to think about after the fire and then allow something new to occur instead of trying to maintain the status quo, you know, Huh, and also you would maybe think a little about history as being a little like going through a rapids. Then maybe you have a few tumbles, a little bit dangerous, the white water, but you have to go through the rapids because you've got to go through the change, and that means, Mr. Kinkel, that your environmental minister, Mr. Töpfer, who was there in Rio de Janeiro didn't do anything

about that absolute requirement of the doctor who said we have to cut out fossil-fuels by sixty percent now or else. And so you can blather on about putting out forest fires here and there, putting out little fires like down there in Yugoslavia, but the fact is that you in Europe and we in the world must change that fuel base and you should take that situation in Yugoslavia and work with it creatively instead of trying to work with it like some kind of policeman.

PP: But politicians don't get elected by solving problems. They only get elected by exploiting them. The problem I believe is one of consciousness, not politics. That level only begs the real question. I think we need to affect a change in consciousness, not governments. It's attitudes and values...

PF: That's part of the reason for the artist. It's the problem of the artist to create permission. As Les Levine said, the artist is someone who creates permission. Until the artist comes along something is not possible, not allowed, not socially sanctioned. I mean, if I said I wanted to build a huge 'spiral jetty' and I was a businessman, that would be considered eccentric or weird but if suddenly some artist does it, it's sort of okay. If I decide to get all enthusiastic about aerial photography they might think I should be in the military but if the Futurists did it then it becomes culturally feasible. It becomes cool. Artists make things socially acceptable and they also make things not just permissible but hip, to use the term.

PP: That affects consciousness?

PF: Right. That's the function I try to achieve, although if I have some critics who want to objectify me as an enfant terrible or whatever, I say we more or less fail because my job is not to have them think about me. My job is to have them think about the possibility. My job is to help them re-think what's interesting in the world and forget about Peter Fend, whether or not he's an enfant terrible.

PP: What do you mean by possibility?

PF: The possibility that what we do today as art could be tomorrow a sort of reality. It could be real, everyday, standard. I am not interested in taking part in a professional world where all the ideas that are being conjured up, all the images and structures being produced, are meant to get no further in life than some auction market for antiques. I want to think that when I like a certain piece of art, making a certain fantasy or form in the world, that such could become a part of standard production, everyday, what we all live with as our Built World.

PP: Who are the members of Ocean Earth?

PF: The company?

PP: Ya, the founding members?

PF: The founding members. I have to say that all the founding members are frightened off. I mean nobody who was a founding member of the company is now involved with the company, not in any daily kind of practical way. Joan Waltemath hung in there, sometimes, and Bill Dolson found out what was going on against us, and Sante Scardillo did a lot of good work in our dealings with the UN and some foreign TV companies, like the Japanese, and throughout everything George Chaikin - who doesn't give a damn about people who might try to intimidate us - has been doing a lot of computer projects. But most of the people nonetheless got frightened off by the troubles. There have been big troubles. It was pretty rough. We'd like to think that's behind us in the

sense that I think that we've achieved a certain level of profile and also I think it's, I mean, we all must remember that as you get recognized, as you get somewhat, call it famous, well as you get noticed, it becomes harder to have you be crushed because it would cause a scandal and also, I might say, you enter the kind of bloodstream of consciousness or the stream of consciousness and then you find ways of sort of playing with that so that actually, well we won't bother with those like, well we'll just forget some of those people and plus let's get onto something more practical and in effect I think that we really need to restructure, rebuild. I would not, I don't think at this point, go back to the given, to the beginning.

PP: Does that mean starting over?

PF: Not quite. But I had always thought that Colleen Fitzgibbon, if she would take the responsibility, could be a better team-maker. I've been more of a ground-breaker. A breaker of barriers. So, it means building new structures of communication and connection. There was a time we were operating through Space Force, a fantasy label, and then we got involved in mass media, which made us real but drove almost all the artists away. I mean, who would want to hang out with the smoothies in corporate TV? We could better go back to production of our own, as with our last tape on the Gulf. The artists who could be called 'members' in being engaged as sovereign artists, showing work on their own, and also, working on projects contracted by the company, number about, at tops, a dozen. These members have all taken part in the TV shows, either for cable or for mass-media networks, in which Ocean Earth worked, chiefly with data from satellites. Taro Suzuuki was the conceiver of Space Force in 1979. Joan Waltemath and Eve Vaterlaus, who co-curated the 1977 Space Window show, were also founders. Co-copyright agreements were made with Paul Sharits and George Chaikin, the latter working on virtually all on-going projects. And there's a co-copyright agreement with Dennis Oppenheim, and on specific projects Kirsten Mosher and designer Sophie Vieille. We're working on more co-copyright structures, with architects and naval architects, so that the art marketing system can secure property for us in what otherwise is strictly an unprotected engineering piece. Media projects continue to be conducted on some occasions with founding shareholders, notably Colleen Fitzgibbon, and in recent years architect Kevin Gannon and sculptors Heather Jansen and Eve Vaterlaus have worked with the company on what you might call structural engineering, wit body-logic. But it must be acknowledged that from early on in the news media business the participation got drastically reduced. We hit a high point with Chernobyl, having 3 people in Paris, 5 in NY, 1 in DC, but then the tidal wave hit, of Official Pictures. It got harder and harder to go on. So it's important to get more into areas where we first wanted to be: in areas like vision research.

PP: Why not form a research institute?

PF: Ya, sure. We're getting some of those things together in France. We have two sites already and there's some real support. Actually, for all of my, I would say sense of dismay, or I would say ennui, boredom with much of what goes on in France, and for all my relative shall we say lack of engagement in, say the French art world, I am very impressed, very pleased by the fact that a government agency has cooperated with Ocean Earth on some work, that a museum is opening with a huge kind of space for permanent installation and archiving of everything we have ever done as a museum, not so much to show as to save, to safeguard, and

that members of the Assemblée Nationale have been very decent after a show there with Ocean Earth and that the head of one of the parties, Mr. Rocard, I believe his name is Rocard, anyway I hear that Mr. Rocard wants specifically to learn more about the company. So we actually have pretty good reception there in France.

PP: What about Canada?

PF: People have suggested Canada. It's really just a matter of time and money. You can't go everywhere. I'm pretty much in Europe because Europe is liquid. Europe is clearly in need for a new structures of partnership. New forms of exchange. Everybody knows that. Maastricht was rejected by Denmark, but that only says that people have to re-think Europe. It's not just a bueraucratic procedure. We also have a good thing going on with Denmark. There will be, I think, some real activity there with high-level politicians because we have all this satellite monitoring of Denmark showing the algae bloom problems, so we have a certain kind of reputation there as someone who really checked out the situation.

PP: What is an algae bloom?

PF: That's when the micro-algae usually explodes, greatly increases certain species, greatly increases the population and then usually some other kind of biological activity like the digestion of the algae by some kind of bacteria occurs in which a toxic condition in the water is bad for the fish, they all die and it's a kind of universal death. We're very frightened by the phenomenon which, as this picture shows, you're going to have a pan-oceanic experience, in this case all around Denmark, everything between Denmark and Sweden all over towards the German border and so on. The entire surface of the water will be covered with this problem within twenty-four hours, so that's an explosion.

PP: But what causes this explosion?

PF: Let's just say pollution. I think it's the only way to talk about it. There's a chemical imbalance occurring in the water due to too much something or other going in there, becomes unstable and some species get out of hand and then that gets to be devoured by a certain kind of bacteria. Or, really, archaeobacteria, a sort of ancient, gas-producing bacteria.

PP: How does one avert such an explosion?

PF: Well, obviously you try to get rid of pollution. I think that's the first thing. And you also try to have a steady observation of the whole situation generally so that when you begin to have accumulations of eutrophicated material, you harvest it as quickly as possible and anything sort of going into the water that's causing an overload, take that out. That's what we can do with satellites, by the way. You can do that right now. We can do that with potentially off-shore rigs so that we can have ocean management. That is why we did the basin mapping, because those are simply the districts within which you can have ocean management. Each basin map is simply of all the land draining into a given body of water, which in this case would be the North Sea.

PP: How do you define ocean management?

PF: It would be nothing more than a surrogation of the current oil industry. That is, the current oil industry also works with basins, also works with very large areas of territory, the Persian Gulf, the North Sea, oilfields, you know and works on a global basis and thinks geologically the same way, that is to say oil is wherever marine algae have collected and decomposed

and congealed and blablabla, so now there are a lot of what you might call dead systems, fossil systems or stored-up, and these are what the oil industry works with. It's like taking care of an old bank account some place, an inheritance, and we're wanting to work within current income systems.

PP: And how can you motivate them to adapt their current technology?

PF: You can't motivate them to adapt their current technology because, and I think this is the truth that we know from history, and there's actually quite an essay called *New Wealth and Old Wealth* [Beach Party 1988], you simply cannot get people who have old ideas about wealth and have old assets to change, because their wealth, their identity, their existence is all wrapped up in the old assets. We need to have a tabula rasa situation where people have nothing to lose and everything to gain by going with the new technology.

PP: That sounds like revolution?

PF: No I wouldn't call it revolution. I think it's the wrong word there because in Yugoslavia, Montenegro, you have a situation where I guess you can't get oil, I mean apparently.

PP: That's -

PF: ...That's a condition of war.

PP: A post-condition of war?

PF: Let's say you have a condition. Let's say, Albania. Albania's too poor to import oil. But there's some possibility that it has oil. Plenty. The question is, Who controls the oil in that part of the world - some Europeans, like people from BP and Shell, or other Europeans, like people from Belgrade? The same goes generally for what you might call the land bridge between Europe and the Middle East. Someday this bridge will open up. Who's going to control it?

PP: But Albania, that's even more remote, more a tabula rasa.

PF: That's what I want people to think. That there's not so much use being geopolitical about that part of the world when you've got in fact an economic tabula rasa, a clean slate, a chance to start things all over. For one, it's Natural. It has Ya, well, Albania has a great coast, fantastic coast. This area, running up from Greece past Albania and Montenegro to Dubrovnik, this is a Coast. And it has a lot of people who would rather participate in the land, in the nature, than be in a big city, people - I met a lot in Montenegro also - who you could supply with some scuba diving gear and could go out into the water and do all this ocean energy stuff we've talked about with their hands. You don't need special tech. You could be even to be corny. You could have the fermentation of the seaweed be done the same way they make wine, just press it with their feet. It's not impossible to create an energy industry from the ocean in Albania that would be almost entirely done by hand, in any event with low-grade technology, in every case right off the coast, available for people who would otherwise be trying to get on a boat to Italy. And actually that's the whole proposal that was presented at the gallery Tanja Grunert.

PP: That was a political show.

PF: It was a physical show. The only thing "political" would be the choice of labels. Someone from Belgrade didn't like the word "Albania" being stuck on the big object in the gallery, so there was a modification of the label. Same object.

PP: Why do you make objects?

PF: Because it is objects.

PP: Why do you put dirt in art galleries and cut maps and glue them to plexiglas?

PF: Well that's because those are the objects we've been dealing with. Those are *real things*.

PP: Do they support your activities?

PF: There's a certain amount of fund-raising involved when you sell the piece but I think rather more importantly if I might speak of it in a concrete, specific way, the fact is that the basin map for example, the one you buy, is a representational model of a wealth unit we're working with.

PP: What about museum shows, science museums, exploratoriums, even popular TV? Won't you reach more people than the 800 maximum that visit Tanja Grunert in a month?

PF: There have already been appearances on popular television, on network TV, even up to 45 minutes long, but some of these appearances resulted from having first shown in a gallery. There have also been presentations that have been made at scientific institutions with a nationwide broadcast, and at the United Nations Correspondents Association, in front of the world press, and at what could be called the community center – as opposed to museum – of country areas in Italy and Holland, but most of these were made possible through contacts first made in art.

All the communications at the UN started with a meeting with a corporate PR type at a gallery who happened to have a friend at the UN, and pretty soon you were in an office showing your stuff to these administrators. And then you go to their parties. Even mass-market TV is the same: you have to belong to, or be accepted by, a certain rather small crowd. So all the stuff that makes us look global actually comes from little connections or recognitions that are quite personal. Fact is, the volume and weight of our exposure outside the art world is greater than that inside, but if it hadn't been for what we did or produced inside the art world we wouldn't be producing for audiences outside. The art world itself does not see this very well, probably because most art is, just that, Art, and can stay in its corner and shut up.

PP: So can art places be important?

PF: The important thing about art places as opposed to science ones is a much higher prestige. I found this out during the 1990 Venice Biennale: there was also a major scientific conference going on then, which I went to as well. One had more "class". So I had to straddle different social groups.

PP: What group are you in?

PF: I'm in the art group. But as an architect.

PP: You mean?

PF: I mean I don't try to be in the science group. I even tell the scientists that. Everything I do to develop a practice of

architecture, one that is based on art but is informed by science. That is to say: Science is a body of knowledge. There are a lot of scientists doing This and That. The choice of what to work with in Science, what This or That to use, is determined by Art. For Art is about "way". Art is the "manner", to use the word "art" originally, with which you integrate or utilize something of knowledge to make, or build, a world that you like.

All this we well know from books like this. The History of Technology. There's a lot of possible technology, a lot of possible scenarios, and it was very well shown in the exhibition of Christian Philip Müller in Munich about old dreams or old fantasies that a lot of technology which I guess possible is not artistically or aesthetically pleasing, and therefore doesn't happen. If art's an aesthetic process, there's a lot of scientific knowledge with which we can make all kinds of compositions. There's always an aesthetic choice, in the end.

PP: Computers are popular then because of the microchip aesthetics?

PF: No, actually more interesting there, we have found out that the main computer industry is in mini-computers and macro-computers, portable computers, desktop computers, not in big huge gargantuan boxes, and von Neumann, who invented the computer, had to his death this big fantasy about having big huge boxes, because it was all very Fifties, and his aesthetics were not the same as the aesthetics of Apple or NEC. His idea of social structure was not the same. You know, he was seeing armies of secretaries, instead of you could have everybody being their own secretary. So in fact the aesthetics, and I also say, social customs has had much more power in determining the nature of the computer industry than the actual hardware and so on, the utilization, than pure science, because pure science could not have caused us to have one type of computer industry or another type of computer industry.

The same thing goes for something like dams. Now it is possibly, scientifically, to build a dam. There is, for example, right now, a project which I'm very alarmed by involving a Brazilian company and the ABB Deutschland to build a huge dam on the Karun River in Iran. Now I know about that river from our satellite work and I think from that that the dam will probably be very bad. But their aesthetic is, you know, macho big dam river hydroelectric water die and it gives them a certain sense of being tough guys, and the problem is of course very damaging to the river and to the water cycles in the Persian Gulf as a system, and I intend to prove that with satellite monitoring and other kind of work by scientists to show that that dam is a lousy idea. I think if I show that in an art world situation and maybe go on from that to show it to the prime minister of this or the foreign minister of that, it's going to be more effective than if I try to make an explication in a science museum. By the time I get finished making the explication, the implication is, well, that's somebody's science idea. So what.

Interview conducted 27 July 1992.

© Philip Pocock, Peter Fend, 1992.

BIOGRAPHY

1. EXHIBITIONS IN RELATION TO LATER OCEAN EARTH PROJECTS

„EARTH NET, AN ECONOMIC SYSTEM“

Baxter Art Museum, California Institute of Technology, 1978 (advised by patent attorneys to not publish or exhibit until after securing legal protections).

„IRON LUNG: A ROOM DEFINED BY ITS WALLS BUT BY A PUMP“

Peter Nadin Gallery, 1979. Basis for further research, now conducted at Hôpital Ephemère, Paris, 1992.

„WORLD SPACE“

Peter Nadin Gallery, 1980.

„PUBLIC POLICY, ARCHITECTURE PROPOSITIONS“

Exhibition curated by Fend, of artists seminal for new architecture, 1980.

„ITALIAN MILITARY STRATEGY“

Scenario installation, New York / New Wave, PS 1, 1981.

„BACINO TORBIDO“

On site river-ocean test projects, Museo Santa Barbara, Calabria, 1985.

„MIDDLE EAST CONFERENCE ROOM“

Scott Hanson Gallery, 1988. As part of a larger show of basins under the name „Peter Fend“.

Special guest, Kunststrai Amsterdam Art Fair, 1988.

„COMPLETION OF THE WAR“

American Fine Arts, New York, 1989. Featured on Morton Downey Show, a nationwide broadcast.

Basin plans for Corsica and the Mediterranean, at FRAC Corse and the Assemblée Nationale, Paris, 1991.

„TEORICI AMERICANO“

Ottaviano, Milan, 1991.

„IL FAUT CONSTRUIRE L' HACIENDA“

Slope City, giant mountain-set structure, CCC, Tours, 1992.

„ROOM SPIN“

Simulation of mounting a room on a centrifuge, with a view through paired windows to adjacent vanishing points. Galerie Roger Pailhas, Paris, 1992.

On-site analysis of the impact of the Amazon on the Atlantic Ocean as North-South polar corridor. Prospectively for Arte Amazonas, Rio de Janeiro, 1992.

Special guest, Nippon International Contemporary Art Fair, Yokohama. Invited to do more projects in Tokyo, Artlab session.

2. OCEAN EARTH CONSTRUCTION AND DEVELOPMENT CORPORATION

New York State Subchapter S corporation, founded 1980, with 15 shareholders, including Paul Sharits and Wolfgang Staehle, and copyright sharing agreements with, for example, Dennis Oppenheim, Paul Sharits, Heather Jansen and Kirsten Mosher.

Precursor: The Offices of Fend, Fitzgibbon, Holzer, Nadin, Prince & Winters, with exhibitions/consultations in New York, LA, London.

„ART OF THE STATE“

by SPACE FORCE, concept of Taro Suzuki. The Kitchen, New York, 1982.

„GLOBAL SURVEY“

Chase Manhattan Plaza, New York, 1982.

„FERNSEHREGIERUNG“

Kunst und Medien, Kunsthalle Berlin, 1984.

„OCEAN EARTH, SURVEILLANCE“

LACE, Los Angeles, 1987.

„COMPUTER IMAGES OF ARCHITECTURE“

sponsored by AIA, 1987.

„MILITARY IMPLICATIONS OF CIVIL SATELLITE MONITORING“

New York, Military Affairs Society, 1989.

„DEUTSCHE KUNST 1945-85“

Nationalgalerie Berlin, 1985.

Site surveys or basin modeling for mass media

Falklands	NBC, BBC	1982
Beirut	CBS	
Amazon Basin	Cousteau Society	1983
Bekaa Valley	NBC, ABC	
Chad-Libya	NBC, Paris Match	
Beirut seige	NBC	
Persian Gulf	CBS, French TV	1984
	ABC, German TV	1985
	New Scientist and many other publications and TV companies worldwide	
Nicaragua-Honduras	ABC	1985
Severomorsk	ABC, Norwegian TV	1984/85
SS-20 bases	CBS, Dutch TV, Sygma	1985
Sirte, Libya	ABC, RAI, Europeo, Bunte	1986
Chernobyl	ABC, Swiss TV, European Space Agency, numerous contracts (e.g. Bunte, Stern) blocked by State	
Persian Gulf SPOT	NHK, RAI, The Observer	1987
North Sea algae bloom	Denmark, Swiss press	1988
Adriatic Basin	architecture clients	1989

Nullification of rights to use civil satellite data without government censorship, as public domain material.

Attempt to bypass government blockage by filing Persian Gulf material directly with the UN negotiator (1985) followed by discovery of his abuses of role (1987) leading to international press releases and serious cover-up actions, revealing the full scope of UN corruption via BCCI and the extent of Iran-contra.

In the media projects, key persons involved have included founding shareholders Colen Fitzgibbon, Wolfgang Staehle and Joan Waltemath, erstwhile colleague Ingo Günther, Robert Horvitz, George Chaikin, Sante Scardillo, Peter Fend. The work of Günther shown at Documenta 8 may be correctly regarded as the invention, the art, the innovation, of Ocean Earth Construction and Development Corporation. Formally, despite erroneous publication by Documenta 8 and other outlets, Günther has renounced all rights to a New York credit or ownership of work product of the company obtained with data from the US or French space agencies. The company in New York has resisted a New York attempts by governments to seduce it into „Spionageverdacht“, and it has maintained a practice of exposing wrongdoing by governments when that might affect Ocean Earth or the civil satellite industry generally. It appears from experience that truth and legality in civil satellite monitoring directly depends on whether one is not affecting vital economic interests, particularly in fossil fuels and nuclear industry.

An authoritative summary appeared in a book on satellite monitoring published by the Oxford University Press, with media follow-through, for example, in a London Times article, „Landslip Was Factor in Chernobyl Blast, Expert Says“.

Ocean Earth photographs and text for certain sites are represented to the global mass media by Sygma Press and Sipa Press, Paris.

3. OCEAN EARTH Earthworks, regional development

„RUHRGEBIET“

Proposals for Duisburg, the Ruhr and the North Sea, Duisburg, in tandem with Beuys, Monnig, Messner, Haus-Rucker. 1980-81. Energy program endorsed by Ruhrgas research head.

„BODY“

Construction program for the Persian Gulf, as based on satellite observation 1972-87, American Fine Arts, Inc, New York, 1988. Based substantially on French satellite data contracted for but forcibly denied, leading to its acquisition instead in Sweden.

„DIE TOTENSTADT: CITY OF THE DEAD“

Galerie Tanja Grunert, Köln, 1990. Based on satellite studies chiefly by Fend and Günther.

„PROGETTO ADRIATICO“

Le Case D'Arte, Milan, 1991. Some satellite monitoring of the Adriatic Basin, a plan for comprehensive development.

„DIE TOTENSTADT II“

BBK, Munich, 1991. Kunstforum article.

„EUROPA“

Kunstraum Daxer, Munich, 1991. Very deeply supported by Johannes Daxer.

„SOUVENIR DE L'AVENIR“

With satellite observation of the entire Biscayan/Iberian Current, conducted in conjunction with scientists in Lannion and Nantes, under Paris administration. Foundation for further projects at FRAC institutes in western France. A pan-European program of surveillance within ocean basins is being developed, with French colleague Sophie Vieille.

„SITE SIMULATOR; TIVAT BAY; MONTENEGRO“

American Fine Arts, New York, 1991/92. With Kevin Gannon, licensed architect, and George Chaikin, architect and computer scientist-artist. Structuring of hills by Janet Nolen, architecture work by Jee Won Kim and Jelena Popovic.

„NOORDZEE“

De Floriade, satellite observation on daily basis, fed from Scotland to Princeton, then to Amsterdam for local feed to a monitor and computer in front of up to 3 million visitors — of the North Sea Basin.

„MEANS TO WEALTH - MITTEL ZUM WOHLSTAND“

With focus on Albania and the Adriatic, as well as daily observation of the North Sea. Galerie Tanja Grunert, Köln, 1992.

4. CITY BILD Urban structures, consumer goods

„RUHRGEBIET“ proposal, „DUISBURG ÖFFNET SICH“, 1981.

Using vocabulary from „End of LA“ performance, with megastructures, 1978.

Stretch fabric constructs, with Eve Vaterlaus, as installed in Forrest Avenue Maze, South Bronx, New York, 1981.

„STÄDTE ALS KÖRPER“

With Heather Jansen as exoware experimenter, Esther Schipper, 1990.

5. NEWS ROOM

A joint venture including Ocean Earth (Fend), Media Survey (Lehmann), General Picture (Chaikin), and ATW (Geismar)

In response to the evident control of mass media by governments, an attempt to regain democratic capacity by subjecting published media — including television — to comparative scrutiny.

The first News Room, labeled as such, was installed at the Times Square Show by Fend in 1980.

NEW YORK-AMSTERDAM, 1989-90

American Fine Arts-Museum Fodor preliminaries with Barbara Braathen Gallery and Montevideo, Amsterdam 1988

KÖLN, 1990

Re Neusel „Attentat“

Galerie Christian Nagel

FRANKFURT, 1990

Pavilion Ryszard Varisella in cooperation with Städelschule – Institut für Neue Medien

STOCKHOLM, 1999
Galerie Nordanstad-Skarstedt

SARAJEVO-NEW YORK, 1992
Collegium Artisticum, Sarajevo-PS 1, New York
With major contributions from NEWS ROOM
AMSTERDAM

PARIS, 1992
Galeries des Archives

COPENHAGEN, 1993
Globe artists' association

6. BEACH PARTY

An entertainment and adult-toy label for the ocean basin administration proposals of Fend, as promulgated not just by Fend but also — in different formats and voices — by Sophie Vieille, Euroflag SA, Air de Paris. These exhibitions have occurred.

BEACH PARTY CALIFORNIA
San Diego and San Francisco. In group show
„Corporate Crime“. Focus on Europe and
California. „German Future“

BEACH PARTY PARIS
Salle du Monde, Hôpital Ephémère, 1991

BEACH PARTY NEW YORK
American Fine Art, New York, 1991

BEACH PARTY ENGLAND
Riverside Studios, London, 1992
BEACH PARTY DEUTSCHLAND
Esther Schipper, Köln, 1992. In conjunction with the book
„Beach Party“.

BEACH PARTY WORD FLAGS
The flags of the world, presented as official at the Documenta, without ascription to Fend.

7. TV/FILM PRODUCTIONS

„Italy Wins World War III“, featured in Artforum „Artists' TV“, 1979.

„SPACE FORCE SERIES: I, II, III, IV, V“, Joan Waltemath, Taro Suzuki, Win Knowlton, Wolfgang Staehle, Eve Vaterlaus, Fend, produced with, inter alia, Colen Fitzgibbon, 1979-80.

„IRON LUNG: TOWARDS AN OTHER ARCHITECTURE“, with Robert Polidori, 1980.

„Moving a Border by Moving a River“, for UN, RAI, NHK, other clients.

Rabotnik TV series on Palme, Libya, Chernobyl, and other scandals, Amsterdam.

Co-wrote scripts, with emphasis on plot structures, with Eric Mitchell and Charlie Ahearn, New York.

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(excerpt):

(all texts released by Ocean Earth, except where mentioned)

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Many of the news media releases cited here, not themselves complete, have appeared in a far greater number of outlets downstream. An article first appearing in the New Scientist has appeared under contract later in The Australian, and not under contract in various Persian and Arabian language journals. Images consigned to Sipa Press or SYGMA have appeared, with credit to Ocean Earth, in journals worldwide. Images appearing on a major TV channel have been photographed by news agencies like Agence France Presse, to be then released in print as a news item in itself. Sales to certain Anglo-American TV companies have led to worldwide releases, appearing as standard stock footage, of agencies like WTN. Stories appearing in the International Herald Tribune re-appear, much condensed, in journals like Der Spiegel. Specialist journals like International Defense Review and Chancen run major articles, but in a way which we of Ocean Earth would rather not now emphasize. At the end of 1986, in a session sponsored by the US Congress, a news executive said that there were two new companies on the horizon of global news coverage: CNN, and Ocean Earth. The fate of one is well known. The fate of the other, although even now with similar potential, appears in this book – and can be surmised from the reactions that various states have had to such truly independent powers of sight. If we were to have been a CNN, a bibliography becomes superfluous. We endeavor to achieve that condition in this decade, even as we were blocked in the last.

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- „Traces from Lecture Piece“; 1977
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- „Artist Joseph Beuys of Germany ...“; 1980
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- „An Art History of Ocean Earth“; 1985
- „Art-Historical Necessity for Ventures such as Ocean Earth Construction and Development“; 1988
- „Permanent Retrospective“; 1990
- „Architecture as Consequence from Art whither Conceptual Art: Larger“; 1991
- „History of Recent Art and Architecture“; 1991
- „Ocean Earth“; 1991
- „Art Doesn't Do Its Job“; 1992
- „Building: Coalescent Integration of Art“; 1993

CITY BILD

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- „Architecture – Attempting to Deal with Death“; 1979
- „Balloon-suspended footpath and windscreen ...“; 1979
- „TV Mudd“; 1979
- „Twin Trac City“; 1979
- „Architecture is Megastructure“; 1980
- „Architecture Proposition – Public Policy“; 1980
- „Big Game Overruns Big City“; 1980
- „Counterweight Hovering Disc“; 1980
- „Airfreight Containers“; 1981

- „Body-Like Buildings Fall Down“; 1981
- „City-Bild Slides“; 1981
- „NYLA Flight States – Instead of Nation States ... Flight States“; 1981
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- „Ocean Earth Premises“; 1990
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- „Hacienda“; 1991
- „Rooms – The second tier of architectural industrialization“; 1991
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- „Slope – The chief problem with cities“; 1991
- „Slope Megastructure“; 1991
- „City Bild – East Asia“; 1992
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- „Load Bearing Structures“; 1992
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EARTH WORKS

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- „SEQUENCE – formation of red star feather in burning-reformation of phoenix bird“; 1977
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Lebanon	1982	CBS
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Bekaa Valley		NBC, ABC
Chad-Libya		NBC, Paris Match
Beirut seige		NBC
Persian Gulf	1984	CBS, Antenne 2
	1985	WDR, ABC
	1986	ABC, DRS, ITN
	1987	Swedish TV, ABC, NBC, NHK, RAI, BBC, CBS, CNN, NBC, ABC, NDR
Soviet military	1985	NOS, CBS
	1986	NRK, Swedish TV, Finnish TV, ABC, NBC, ITN, WTN, DRS
Libya military	1986	ABC (twice), RAI, WTN
Nicaragua	1985/86	ABC
Chernobyl	1986	ITN, ARD, ABC, TF1, RAI (twice), BBC, EBU, NBC, DRS (twice)

North Sea		Denish TV
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OCEAN EARTH was conceived as an instrument for implementing the goals of artistic movements with an affinity with the ideas of Joseph Beuys, Robert Smithson and Gordon Matta-Clark. With its projects OCEAN EARTH transcends art-immanent fields.

In intensive, cross-disciplinary collaboration with scientists and artists, who connect ecological imperatives with future-oriented technology, OCEAN EARTH has sought to develop wide-ranging concepts for improving man's environment from a global perspective. For the first time a survey of OCEAN EARTH's projects will be presented: new forms of energy based on the utilization of natural ocean resources, constant surveillance by satellite to ensure global peace and democracy, elimination of national boundaries, a geophysical way of viewing the world instead of a political one and new architectural programs for creating ecologically sound and human cities.

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Vincent J. Scully,
Sterling Professor of the History of Art,
Yale University

OCEAN EARTH wurde als Instrument gegründet, um die Ziele von künstlerischen Bewegungen, die mit den Ideen von Joseph Beuys, Robert Smithson und Gordon Matta-Clark verbunden sind, zu verwirklichen. OCEAN EARTH geht mit seinen Projekten weit über kunstimmanente Problemfelder hinaus. In intensiver, grenzüberschreitender Zusammenarbeit von Wissenschaftlern und Künstlern, die die Anforderungen der Ökologie mit zukunftsorientierter Technologie verbindet, beschäftigt sich OCEAN EARTH mit umfassenden Konzepten zur Verbesserung des Lebensraumes der Menschen aus einer globalen Perspektive.

Zum ersten Mal wird ein Überblick über die Projekte von OCEAN EARTH ermöglicht: neue Energieformen durch die Nutzung der natürlichen Meeresressourcen, ständige Satellitenbeobachtung zur Ermöglichung globalen Friedens und globaler Demokratie, Aufhebung nationaler Grenzen, statt einer politischen eine geophysikalische Betrachtungsweise der Erde, neue architektonische Programme für umwelt- und menschenfreundliche Städte.

In ortsspezifischen, genauen Projektstudien wird eine Welt entworfen, die funktioniert und die Mittel zum Wohlstand für alle gewährleistet.

„Ich war völlig überwältigt von Ihrer Arbeit... Darin betrachten Sie die Welt und deren Probleme auf eine für mich stimmige Art und Weise, die ich sowohl visuell als auch konzeptuell sehr spannend finde. Ich bin gerade dabei Ihr Material durchzuarbeiten und bin nach wie vor begeistert.“

Vincent J. Scully,
Sterling Professor der Kunstgeschichte,
Yale University

OKTAGON VERLAG