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JEAN JARRY
INGENIEUR ESE

.. associate of
De Lauze

CENTRE NATIONAL DE LA RECHERCHE SCIENTIFIQUE
LABORATOIRE DU BATHYSCAPHE

13 - MARSEILLE - 1
1 RUE FORTIA

TEL. 33-60-11

December 27, 1965

Dear Tap:

Thanks ever so much for your letter of December 22nd. I had not realized that Andre Galerne was interested with you in the Oceanic Foundation.

Should I get back there, I will come by and we can have a visit about the future. We are extremely interested in doing more in this broad area of oceanography, particularly as it applies to off-shore drilling methods.

I expect that I will be going to Australia sometime in January or February.

I hope you all had a marvelous Christmas out there. Mother and Dad came down here and so did Johnny, and so we had a fine time.

Best regards, and I'll look forward to talking with you furhter about the material you sent me.

Yours very truly,

George H. W. Bush

GB:as

Mr. Taylor A. Pryor
The Oceanic Foundation

Makapuu Point, Waimanalo
Oahu, Hawaii 96795

THE OCEANIC FOUNDATION

THE OCEANIC INSTITUTE — December 22, 1965 — SEA LIFE PARK

Mr. George H. W. Bush
Chairman of the Board
Zapata Off-Shore Company
1701 Houston Club Building
Houston 2, Texas

Dear Poppy:

I was sorry to miss you at the Park the other day but glad that we could talk for awhile. Glad to hear that you are returning in January.

I have heard exciting reports about your company and the nature of your operation and its pace. Andre Galerne, among others, has described yours as the most progressive off-shore operation.

I have spent the last 20 months planning and promoting the Oceanic Institute which now has a Basic Science Division under contruction and an Ocean Engineering Division being formed. The great asset of this Ocean Engineering Division is its access to an experimental man-in-the-sea range which drops to a thousand foot depth within three miles of the shore and a deep sea range which continues down to 18,000 feet within 70 miles. We believe we have the ideal situation to experimentally develop new off-shore techniques, especially sea living equipment and techniques for any kind of under-sea operation. Galerne and I believe that we can significantly reduce off-shore operational costs while adding much greater mobility to such operations.

We are assembling a group of companies, each of which can make a technical contribution to our objectives while simultaneously gaining from them. If we could review these plans together, we might be able to see how this program could support your own.

Enclosed is some material which describes part of the program. Best wishes for the season and the new year.

Aloha,

Taylor A. Pryor

TAP:kk
Encls.

MAKAPUU POINT · WAIMANALO · OAHU · HAWAII 96795 · PHONE: 257-933

See Life Park Photos.

Pryor, living chamber behind him, gets note from above via porpoise mail.

Undersea Tests Resume With Porpoise Assistant

With a trained porpoise as a helper, scientists from the Oceanic Institute were back at work yesterday in an underwater living chamber off Rabbit Island after a year's delay.

Taylor A. (Tap) Pryor, developer of Sea Life Park and the Oceanic Institute, said the new chamber has been greatly improved over the one used in 1964 which gave his scientists trouble.

It was put into operation Thursday, and Pryor and diver Harold Jewell spent Friday night there, emerging after breakfast yesterday.

Dr. Robert Marvit ran medical checks on Pryor and Jewell before and after their descent.

"His opinion was that a night down there is good for you," Pryor said. "It eases tension."

The chamber is submerged on the ocean floor at 30 feet between Makapuu and Rabbit Island. It is 9 feet long and 5 feet in diameter and is held down by four 3-ton anchors.

Pryor said heavy duty surface equipment on a 60-foot tug boat is being used to supply air to the chamber. In the 1964 test, abandoned after nine hours, air compressors and support equipment was too "light weight" to do the job, Pryor said.

The chamber will be in near-constant use by two divers during the next year, Pryor said. It is the forerunner of two larger undersea living chambers the Oceanic Institute plans to sink in 1966 for oceanographic research.

Pryor said observations from the chamber Friday night indicate more life in Hawaiian waters than suspected.

"It's a wonderland down there—10 times more beautiful at night," Pryor said.

One surprise was the large amount of plankton—microscopic particles of sea life which scientists say can be turned into food for humans and previously believed scarce in the ocean around Hawaii.

Helping the divers in their undersea living experiment is Keiki, Sea Life Park's most famous trained porpoise. He carries messages, tools and instruments from the support tug to the chamber.

"He's performing marvelously," Pryor said. "A couple of years ago we were pretty skeptical about using animals as helpers, but not any more."

Keiki gives this diver a lift from the depths.

Honolulu Star-Bulletin
Saturday, Sept. 18, 1965

A billion a year in oceanics

By A. A. SMYSER
Managing Editor, the Star-Bulletin

THERE'S A MAN who thinks he sees a $1 billion-a-year new industry in Hawaii's future.

That's more dollars than Hawaii now gets from sugar, pineapple, tourism and military spending combined.

The ebb and flow of sources of Hawaii's wealth has been one of the major characteristics of its history.

A century ago, the community turned on whaling, now a dead industry. Before that it was sandalwood, soon lumbered to death.

Then came sugar and pineapple—both now considered near their maximum growth potential.

Then came the mighty military dollar—the most bountiful dollar source of all, but one that creates uneasiness since it sooner or later should taper off.

Tourism is today the principal growth element in the economy, and the end is not in sight, but neither is it yet the equal of military spending.

IF TAYLOR A. PRYOR is right Hawaii has a chance for even bigger things in oceanics.

Pryor is young enough (34) to be dismissed as a dreamer, but successful enough, determined enough and equipped with the kind of background to be taken seriously.

It was only because of his singlemindedness that Sea Life Park exists today and this $2 million venture has reached the break-even point in two years.

It also puts an automatic 10 percent of its gross into a non-profit parent, the Oceanic Foundation. This should mean an endowment of more than $4 million for the Foundation in the next 20 years.

"DON'T SAY that I'm predicting a $1 billion oceanics industry for Hawaii," Pryor said this week, "but say that Hawaii can reasonably hope for a $1 billion oceanics industry if it goes after it aggressively."

Some people say, he notes, that Cleveland could have been the hub of the auto industry, but it muffed its chance. Detroit became the auto capital.

Pryor sees Hawaii as capable of playing the role in oceanics that either Cape Kennedy or Houston plays in the Space progam.

He thinks a $500 million-a-year level in expenditures here is within reach in the next 10 years, and $1 billion a year over a longer pull.

FOLLOW ALONG with his reasoning:

The world below the surface of the oceans is more unknown and more alien to man today than Outer Space.

America today is spending $5 billion a year on Space research.

Present spending on the other alien environment — the underocean — is small, but there are evidences that interest is growing.

A 1964 publication of the National Acacemy of Sciences and the National Research Council attempted to assess the benefits from oceanographic research.

It came up with the estimate that $165 million a year, not counting funds for national defense, could bring savings of $3 billion a year plus added annual production worth almost as much.

ation, ocean shipping, long-range weather forecasting, sewage disposal, international cooperation, oceanography for defense.

It studies costs and potential benefits in each category, and identifies oceanography as a challenge with the very real hope of a big pay-off for those who partake.

IN PRACTICAL elaboration on this, the report cites the possibilities of big savings from routing ships to avoid storms, from developing reliable long-range weather forecasts that could predict storms and droughts, from designing ship hulls that would speed voyages, from increasing the world's food supply by tapping the ocean's protein, from mining the rich ocean beds of manganese and phosphate, or of adding to U.S. oil reserves by learning to tap offshore deposits.

These are all in addition to the tremendous military potential of the deep ocean and of being first in mastery of its offensive and defensive possibilities.

Pryor thinks the vehicles can be designed now by which men can move routinely back and forth to 18,000 feet to work, test, study and experiment. He has a sketch of a glass bubble, motor - propelled sled, which could simply "drive" along the downhill ocean floor off Waimanalo to 18,000 feet and then back again with no surface support system.

It would use fuel cells like those in Gemini 5, and the comparability of many Space and oceanic problems is one reason Pryor wants an aerospace firm to be part of any local undertaking.

HE AND LOCKHEED have in common an oceanics adviser—Andre Galerne—who agrees with Pryor that Hawaii is one of the ideal places in the world for oceanic research.

Pryor quotes George T. Scharffenberger, senior vice-president of Litton Industries, as saying: "Within 10 years, the annual oceanographic market will be about $5 billion, approximately the current annual budget of the National Aeronautics and Space Administration.

Pryor adds his own estimate that as the Cape Kennedy or Houston of the oceanographic program, Hawaii could claim from 10 to 20 percent of this—or from $500 million to $1 billion a year.

WHY HAWAII?.

Simply because Hawaii is the best place in the United States to base such a program, Pryor says—"if these islands weren't here, someone would have to build them."

Hawaii lies in the middle of the world's biggest ocean.

It offers clear, warm waters year-round and relative freedom from storms.

PUT ANOTHER WAY, it offers "routine access to great depths," a phrase Pryor is prone to repeat as he points out that the U.S. East and West Coasts are handicapped by murky, cold waters and several hundred miles of continental shelf between them and the greatest ocean depths.

For a permanent operations base, Pryor sees no place better for the U.S. than Hawaii.

"This is a matter of man learning how to work and operate in an alien environment," he says, "and Hawaii

no bigger than would be allowed on the submarine. Others argued for an initial plant of unlimited size.

Rickover argued it was important to face the critical problems of size from the outset, prevailed, and cut several years off the development time of the nuclear sub.

Similarly, says Pryor, oceanographers should face from the beginning the problems of the 18,000-foot depths that prevail in most of the world's oceans.

PRYOR'S Oceanic Foundation is now bidding for its own small initial role in oceanics.

Its research programs with porpoises are already well-known. Its combined government and private industry contracts for 1965 have passed the half-million dollar mark.

Pryor now is trying to get a minimum of five major companies to contribute $20,000 each for a cooperative undersea research effort off the Sea Life Park complex that will build manned underwater stations down to a depth of 600 feet.

This is the continental shelf depth —a level which is now the target of many preliminary research programs in other areas.

HAWAII, Pryor points out, has the added advantage of having these depths "within arm's reach" as well as being close to the greater 18,000-foot depths.

For his continental shelf project he has three firms pretty well committed and five more interested, for a total of eight. They span the areas of electronics, chemicals and gas, aerospace, steel, aluminum, petroleum, mining and food.

His concept is that each firm will have the right to withdraw after the first participation if it is not encouraged by the results, but he hopes that this will prove to be the critical mass from which far more ambitious programs will spring.

NOWHERE ELSE, he points out, is an effort being made to bring industry together for cooperative work of this type.

Yet the industries he enumerates all have a potential role in oceanics and many of the basic techniques are things they would use in common.

Pryor would place instruments under the sea and check instruments ashore at the Oceanics Foundation adjoining Sea Life Park.

The two systems would work together and check each other. Men would move routinely from lab to sea and back again.

IF JACQUES-YVES COUSTEAU'S undersea village in the Red Sea ran into trouble, he had to go back to France for parts. Pryor's men will need to go no farther than Honolulu Iron Works or Kapalama Shipyard.

The naval facility at Pearl Harbor, the growing strength of the University of Hawaii, and the commercial know-how of Hawaii's big firms will all be on tap.

Electronics removes communication with the mainland or worldwide facilities from the problem area.

WILL HAWAII realize this potential?

Pryor is sure it can.

He is sure it can help speed up the national break-through into oceanics if it is aggressive in busi-

Ocean Engineering Division

The Oceanic Institute Makapuu Point, Oahu

The Ocean Engineering Division of the Oceanic Institute is presently being formed. The idea is to create a field station in the mid-Pacific where a consortium of companies, each representing a different American industry, can share certain onshore and offshore facilities. By working in consortium, with administrative and operational support from the Institute, these companies will obtain routine access to the sea at low cost.

Three unusual marine conditions are available in Hawaii. These are a capacity for low-cost, onshore simulation of the marine environment; an experimental continental shelf or man-in-the-sea range immediate to the shore with ideal conditions (exceptionally warm, clear water); and great depths up to 18,000 feet within 70 miles of these shores. The facilities to be shared in the Ocean Engineering Division are being designed to make the greatest possible use of these advantages with the least possible investment.

In addition to these field station facilities, which are unavailable elsewhere in the world, the Ocean Engineering Division will provide highly qualified operational and administrative support for the limited number of selected companies being invited to utilize this situation. This support will allow efficient oceanic research and development by companies with only a limited investment of their own staff time by utilizing the Oceanic Institute's support. Ocean projects can be carried out by only a relatively few engineering or scientific staff members.

In order to define precisely the objectives, the facilities, the organization, the procedures, and the funding of this concept, the Oceanic Foundation has contracted with Planning Research Corporation of Los Angeles to study the needs of the participating companies, the national oceanic market, the assets of the location, and the organizational details of the Ocean Engineering Division of the Institute. Four companies, including Air Reduction, ITT, Lockheed, and Ryan Aeronautical are presently underwriting the PRC Study. Each company is contemplating participation with a greater investment during the next three years. Air Reduction, for example, is finding a market for life-support systems and undersea welding previously unsuspected. Lockheed sees payoffs in connection with their Seaquest, guidance, and bio-oceanic programs, ITT in underwater communications and ASW, and Ryan with underwater drones. All are finding mutual benefit in working together. To date no steel or aluminum producer has joined the group.

The participating companies are finding that the Institute's submarine chambers, the onshore simulators, and the supporting shops, piers, and vessels of the Ocean Engineering Division will allow them great strides towards leadership in their particular oceanic interests during the next few years. They are finding that R&D investment in the Institute will accomplish far more for them during these years than they can alone because of the mutual support gained from the other members of the consortium and from the support being provided on their behalf by the non-profit Oceanic Institute.

Similarly, the Institute itself is finding great strenth in associating with such a consortium. The technological resources of such companies have not been available previously to oceanographic institutions on such a basis. The concept of the Institute allows operation by commercial and academic interests side by side, where both can be encouraged in their own objectives and to some extent funded by defense and other government interests.

The concept of the Engineering Division will accelerate achievements in the sea which were until recently considered a decade away. Undersea living at depths of a thousand feet; working dives to 1,500 or 2,000 feet; manned travel to great distances on the bottom of all oceans; new forms of offshore mining equipment; petroleum production on the bottom anywhere on any continental shelf; new sensory devices to monitor the entire ocean; new detection apparatus, and a vast variety of submersibles, diving tools, and undersea living devices have become possibilities of the near future.

In 1965, the National Academy of Science demonstrated that a hundred and fifty million dollar investment in the sea would return six billion dollars to the economy within 15 years. This one figure demonstrates the opportunity and potential payoff in ocean R&D investment today. The companies participating in the

PRC Study are investing $20,000 each this year to appraise that opportunity. If the results demonstrate the feasibility of further investment, this consortium of companies will by June 1966 have spearheaded the national drive seaward and will have established for themselves a competitive lead in the greatest and most productive enterprise ever undertaken by man.

Taylor A. Pryor
President
The Oceanic Foundation

December 8, 1965

Excerpt from "Governor's Conference on Oceanography & Astronautics
State of Hawaii, September 29 to October 2, 1965
Lihue, Kauai, Hawaii"

THE OCEANIC FOUNDATION

The Oceanic Foundation is a private non-profit organization devoted to the promotion of human progress in the sea. It was founded five years ago by State Senator Taylor Pryor and ranks among Hawaii's leading attractions for ocean-oriented industry. It is, as well, a major center for public education about the sea and a fast-growing center for basic marine research. These three facets of the Foundation are reflected in the organization of the Foundation itself.

The public education function is served by Sea Life Park, a public display of Hawaiian marine life and ocean science. The industry function is served by the Oceanic Association, which through contributions from several major companies provides unique facilities for technology in and below the deep central Pacific. Finally, research is served by The Oceanic Institute, which maintains a small select staff of scientists whose work relates to Institute aims. It also provides facilities and operational support for a variety of research workers from around the world. Each of these divisions will be described in greater detail in the pages that follow.

The Oceanic Foundation and its satellite organizations are located on a 118-acre site at Makapuu Point, Oahu, Hawaii. This location is only a few minutes from related organizations on Oahu such as Pearl Harbor Naval Base, the U. S. Bureau of Commercial Fisheries, the University of Hawaii, the Bishop Museum, and a variety of industries and suppliers. The site occupies a gently sloping lava fan situated at the base of an abrupt 1,000 foot lava cliff, and faces the sea across coral sand beaches and rocky lava headlands. Offshore a short distance at the edge of a fringing coral reef are Black and Rabbit Islands; beyond them the sea floor drops off rapidly into the deep sea. Eighty miles directly offshore the bottom reaches the abyssal depth of 18,000 feet. Thus the site has the advantages of quiet and isolation from the city and easy access to shallow and deep water. This site is divided into three major sections. Approximately 20 acres are devoted to Sea Life Park. A small central section encompassing 10 acres is devoted to Foundation Headquarters and central administration facilities for both Sea Life Park and The Oceanic Institute. Also located there are training facilities for marine animals and shop facilities. The remaining land is devoted to the Oceanic Institute and the Oceanic Association.

The Oceanic Foundation is unique in that the terms of its long term lease from the State of Hawaii (which runs to the year 2026) require that it endow itself through the establishment of a public display; this display (Sea Life Park)returns to the Oceanic Foundation 12 per cent of its gross revenue to be used for the purposes of promoting marine progress. Thus, though Sea Life Park is a commercially-operated concern, a substantial portion of its revenue goes for the support of marine science. The authenticity and educational content of Sea Life Park are controlled by the Foundation, and to those who have seen it there is no question that it represents the finest and most authentic presentation of its kind. Public acceptance has been exceptional and returns are expected to exceed projections in years to come. Present returns project more than four million dollars revenue to the Oceanic Foundation in the coming 20 years.

Many additions to Sea Life Park are planned including a display of current marine technology, an underwater television theatre, and a presentation of the life of the Great Barrier Reef.

The Oceanic Institute began operation two years ago and has expanded rapidly. It has supported a diverse group of research workers from several universities. A scientific contribution series has been established with several papers published or in press to its credit. The nucleus of a fine oceanographic library has been built. Its first building has been completed and ground has been broken on a two-story laboratory scheduled for completion by January 1, 1966. Detailed plans for other facilities have been prepared. The permanent staff has been started with four well known scientists. Several Associated Staff members from across the nation have been selected and a supporting technical and clerical staff has been brought together. Much of the early scientific work of the Institute has been oriented toward capabilities inherent in the operation of Sea Life Park--namely research on large marine animals. This emphasis is expected to change as the facilities of the Institute grow and more diverse workers can be supported. Those directing the Institute are convinced that it should always cater to a relatively small number of carefully screened workers at any one time, whose projects are especially applicable to the objectives and capabilities of the Institute. Further, exceptional support will be supplied for these selected visitors in order that they may use their time as productively as possible.

As a sampling of these initial activities the following programs might be mentioned: Studies on handling trained porpoises in the open sea were carried out by Professor K. S. Norris of the University of California at Los Angeles with the Office of Naval Research support and resulted in the development of trained porpoises as adjuncts to the activity of divers and researchers beneath the sea. Such trained animals have since allowed open-ocean studies of diving physiology, echolocation (animal sonar) and locomotion. In this latter category should be mentioned the studies of Thomas Lang of U. S. Navy Ordnance Test Stations, Pasadena, a hydrodynamicist who has shown that certain species of porpoises do indeed exceed their design characteristics as we know them, by swimming several knots faster than calculations will allow. This Navy sponsored work is still continuing.

A comprehensive 10 year program of brackish water pond culture research has begun under Rockefeller Foundation support. Project director is James Ellis, who operated the University of Washington experimental hatchery prior to coming to the Oceanic Institute. He is establishing a field lab and experimental pond site on Molokai Island and assembling a staff at Makapuu Point in an attempt to add materially to the world's protein resources through this unique program.

Gregory Bateson, internationally known social anthropologist and authority on the pathology of communication, has carried out detailed studies of the social communication of a captive porpoise school, in part using directional underwater hearing devices in collaboration with Dr. Wayne Batteau of Tufts University.

Dr. Malcolm Gordon of UCLA has carried out studies of the metabolism of deep sea fishes. In this unique and interesting work Dr. Gordon was able to work with living deep sea fishes off the Kona Coast of the Island of Hawaii by working at night in the remarkably calm water near shore where vertically migrating bathypelagic fishes come to the surface at night. This experimental resource of living deep sea fishes is nearly unique to Hawaii.

Dr. Emerson Hibbard, working in collaboration with Dr. Roger Sperry of California Institute of Technology, has carried out nerve regeneration studies using a wide variety of marine fishes.

In all 25 projects have been sponsored in the first two years, as much as facilities would allow.

The Institute occupies a tree-covered slope overlooking the sea and the offshore islands. On lower ground, screened from the road, space has been allocated for a series of large experimental tanks for instrument development and calibration, hydrodynamic studies, fouling studies and various marine biological programs. Preliminary design has been carried out for a large pressure chamber buried in the lava cliff where submersible components can be tested and other pressure work carried out.

Approximately one third of the research area has been allocated to the Oceanic Association for the development of industrial and governmental laboratories, and for support facilities for the offshore operation.

The activities of the Oceanic Association began with the lowering of Oceanic I in the summer of 1964. This was a simple two-man underwater laboratory designed as the first step toward sophisticated permanent underwater laboratories to follow. Oceanic I was moored and manned in 30 feet of water, the world's fourth such structure. It will be reactivated this fall for further preliminary studies. Meanwhile detailed design and costing for Oceanic II was carried out, in collaboration with Lockheed Missiles and Space Corp., Sunnyvale, California. This modular laboratory is designed for inexpensive construction, easy handling and installation, and applicability for a wide variety of research efforts under the sea at 50 feet to 600 feet of depth.

Association plans call for a range of undersea labs, monitored and supplied from shore facilities in the Oceanic Association grounds. Association members may use these laboratories on a participation basis.

Starting at the laboratory chain and extending beyond to nearby abyssal depths, plans call for a dynamic instrumented range to be constructed in which instruments can be tested and performance monitored by computor. This range will also allow a unique real-time analysis of various physical parameters in the sea. The 1,000 foot cliff-top behind the Foundation grounds allows line-of sight radiotelemetry where cables are not used.

Ground breaking for shore facilities and establishment of the first Oceanic II series underwater laboratories is planned for 1966.

In summary, The Oceanic Institute offers scientific, military and industrial organizations an unusual opportunity to carry out oceanographic research. Engineers and scientists working in Hawaii at the Institute will share research facilities which will include pressurized and unpressurized onshore simulators (oceanarium research tanks), an electronic data processing center and library, a design and instrumentation center, submarine laboratory series, and an off-shore environmental surveillance and submersible test range.

Where shared facilities are not desirable or necessary, participating corporations, institutions and individuals will be provided with sites for the construction of private administrative and laboratory quarters.

Substantial efficiencies are offered participating researchers in the joint use of the unusual sea-water supply system, its training tanks, collecting vessels, gear, cold storage facilities, maintenance shops, administrative offices, security patrol, and heliport--all of which are now in operation at Makapuu Point.

The Oceanic Foundation is a new and vigorous marine-oriented organization whose impact is certain to be great in future years as the nation and its industries turn increasingly to the sea. Those industries and individuals with ideas, imagination and energy will find it an exciting place to work.

Ocean
97

July 27, 1965

Dear Mr. Galerne,

I,personally, will not be in Houston on either August 11th or August 12th. I plan to leave on my vacation on August 8th; however, I am sure Mark Gardner and Russ Mosby will be here during that week and will be delighted to see you.

Let us know what your plans are going to be.

Best regards,

George H. W. Bush

Mr. A. Galerne, Pres.
International Underwater Contractors, Inc.
P. O. Box 82
College Point 56, New York

Copy to: Mr. Tom Devine

Bc: Mr. Mark Gardner
Mr. Russ Mosby
Mr. Robert Gow

I would appreciate your seeing this fellow and seeing what he has to offer. You may recall that he was the guy who got us in touch with Lockheed.

G.B.

I·U·C International Underwater Contractors, Inc.

TECHDIVER

July 21, 1965

RECEIVED
JUL 23 1965

Mr. George Bush, Chairman of the Board
Zapata Off Shore
1701 Houston Club Building
Houston, Texas

Dear Mr. Bush:

I just spoke with Mr. Thomas Devine regarding my stay in Houston during August 11 in the afternoon and August 12, all day, and I would very much like to take this opportunity to show an on-the-job film of underwater welding, underwater painting and underwater core drilling.

This filmis a color movie, 16 mm which runs about 15 minutes. Could you organize a meeting of interested members of your staff to enable the undersigned to make such a presentation on one of the above mentioned dates? During this period I will make a similar presentation to Texaco and since I do not have my exact time schedule, I would appreciate it if you could have these dates made available to me pending a more definite scheduling of my time.

Awaiting the pleasure to meet with you again, I remain,

Very truly yours,

IUC, Inc.

A. Galy

A. Galerne
President

cc Mr. Thomas Devine
AG:ns

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Ocean

June 24, 1965

Dear Mr. Allen,

Thanks very much for writing me on behalf of Dr. Henri Delauze in answer to my letter of June 4th.

I was glad to learn that Dr. Delauze will be in London in July and plans to meet with Pat Linton. I will ask Mr. Linton to be on the lookout for him.

Yours very truly,

George H. W. Bush

Mr. D. P. Allen, Pres.
Marine Science International, Inc.
P. O. Box 6406
San Diego, California
GB:as

Bc: Mr. P. M. Linton (with copy of Mr. Allen's letter)

Cable Address "MARSCINT" San Diego, California

Marine Science International Inc.
1357 Rosecrans Street
P.O. Box 6406 • San Diego, California, U.S.A.
Phone (Area Code 714) 224-3233

Ser. No. 604-665

Ros Mosby this is the guy Chuck Deal said to contact. GB

22 June 1965

RH Gow

Mr. George H.W. Bush
Chairman of the Board
Zapata Off-Shore Company
1701 Houston Club Building
Houston, Texas 77002

Dear Mr. Bush:

Dr. Andre Delauze, to whom you wrote on 4 June 1965, has been on a project in the Bahamas until recently. Since we work together on a number of international projects, he was visiting me last night and requested me to write you and impart the following information:

He will be in London in July and will be pleased to meet with your Mr. Pat Linton. He regrets that he will be unable to meet with you during this trip, but is very interested in exploring areas of possible mutual interest, and will certainly make arrangements to meet with you next time he visits the United States.

Henri offers his apologies for being unable to write you himself, but his schedule is so tight that he requested me to perform this service for him. He really works on a close plane-conference schedule. If I may be of any further assistance, please call me.

Very truly yours,

MARINE SCIENCE INTERNATIONAL, Inc.

DP Allen

D. P. ALLEN
President

DPA/er

cc: Mr. Delauze

Ocean

June 4, 1965

Dear Pat,

Charles Drake, of the Lamont Geological Observatory, one of the leading oceanographic scientists in the United States, told me about Henri De Lauze. He tells me he is far more advanced in his thinking than Cousteau, the man who has done so much under water.

If by chance, De Lauze should get in touch with you, it might be good to go up, buy him a beer and discuss with him any new techniques he might have that might apply to the offshore drilling industry.

We are trying to look down the road as far as possible and keep in touch with new technology. This is purely exploratory and should require no all-out effort on your part, but if De Lauze calls, I would be most interested in your impression of him. If, by chance, you get near Marseilles on one of your trips and could get your eyes off the bikini-clad mademoiselles, why not go by and say "hello" to him. It's not worth a special trip but it might be worth your time if you're in the area.

The Maverick should be back at work in another two weeks. We got a good break on its repair. When the leg was pulled back, its foot came nicely into place. This down time on the Maverick has caused us a good deal of concern from an earnings standpoint, but it looks like it might be worked out now.

I had lunch with Doc La Borde yesterday and he tells me that he enjoyed seeing you over at Monaco.

Russ had a long talk about a deal in Nigeria yesterday. I'm sure you'll be hearing about this soon.

It's hot in Houston, but otherwise all is well.

Best regards,

George H. W. Bush

Mr. P. M. Linton
Three, Barton Commont Road
Barton-On-Sea
Hants., England
GB:as

[illegible]

June 4, 1965

Dear Mr. De Lauze,

I was talking to my friend, Charles Drake, the other day and he told me of the interesting work that your firm has been doing.

Our company has been actively engaged in the offshore drilling business for many years, and we are most interested in new techniques for the general field of offshore.

I am wondering if you have any information on your company or or any of the projects that you are undertaking. We would like to consider working with you if at all possible.

If you ever get to London, perhaps it would be convenient for you to contact Mr. Pat Linton ahead of time. His address is Three, Barton Common Road, Barton-On-Sea, Hants., England. He was formerly with Shell Oil Company for many years and now he is representing Zapata in that part of the world. I know he would like to come up to London and have a visit with you to explore the general field of offshore and see if there isn't some area where we might work together.

If you should come to the United States, we would, of course, be delighted to see you and be of any help to you that we could. The purpose of this letter is merely to say "hello" and to express the hope that we can get together and see if there are any areas of mutual interest.

Yours very truly,

George H. W. Bush

[illegible]

Mr. ~~Henri~~ De Lauze
33 Rue Sylvabelle
Marseilles 6, France
GB:as

Henri DeLauze
33 Rue Sylvabelle
Marseilles, 6, France

all award -

May 27, 1965

Dear Gene,

Thanks ever so much for your help on the oceanographic project. Mr. Melville was most courteous to Mr. Chapman, and it looks like the experiment will work out.

Best regards,

George H. W. Bush

Mr. Gene Catlett
Pel-Tex Petroleum
Americana Bldg.
Houston, Texas
GB:ao

Pel-Tex Petroleum
[illegible] C. Ry.,
Mr. CATLETT — George Bush call

↓

Harold Melville — Chapman call
(Production Supt.)

received O.K. by phone 5/27

↓ advised call

J.C. Hoot — Chapman call
Seabrook

arranged date for placing
strings on #1 well platform
(Saturday, May 29)

DEC

RECEIVED Oceanography

MAY 3 1965

THOMAS J. DEVINE
375 PARK AVENUE
NEW YORK 22, NEW YORK

April 30, 1965

Mr. George H. W. Bush, Chairman
Zapata Off-Shore Company
1701 Houston Club Building
Houston 2, Texas

Dear Pop:

I intended to leave with you the enclosed items from John Clark which outline the ocean floor research facility he has proposed. Maybe they will intrigue you or Bob Gow. What shall I tell John Clark?

You will recall that Frank Davidson played an early role in our efforts to sell Electric Boat's underwater completion technique to Socony Mobil. Frank's informal "syndicate" at that time included EB, Zapata, Shearman and Sterling, Morgan Guaranty and Glore Forgan. Frank recently re-introduced EB to Mobil. He told me this morning that they have had several subsequent meetings, including one this week. He does not know where matters stand, but feels that EB and Mobil must be getting somewhere and that EB still needs an operator or service company in the picture. If Mobil buys EB's scheme, he believes that the old "syndicate" should be in the picture and that Zapata should be the operator.

I choose not to swab Vince at this point because, as I think I said yesterday, I have the feeling EB wants to keep its freedom of action until they know if they will succeed with Mobil. On the other hand, Frank can check and probably will, and EB will probably decide again that they will need us if they succeed with Mobil. Let's have a <u>three</u>-way bidding contest.

I enjoyed yesterday very much. Good luck with the Maverick.

Sincerely,

T.

Enc.

BUSINESS CONFIDENTIAL

AN OUTLINE OF SUGGESTED RESEARCH

on an

OCEAN FLOOR RESEARCH FACILITY (OFRF)

Preliminary Description and Plan

March 5, 1965

Please do not disclose contents of this brochure to individuals outside of your own organization.

OCEAN ENGINEERING PROGRAM OFFICE
BATTELLE MEMORIAL INSTITUTE
COLUMBUS LABORATORIES
505 King Avenue
Columbus, Ohio 43201

BUSINESS CONFIDENTIAL

AN OUTLINE OF SUGGESTED RESEARCH

on an

OCEAN FLOOR RESEARCH FACILITY (OFRF)

Preliminary Description and Plan

from

BATTELLE MEMORIAL INSTITUTE

March 5, 1965

WHY AN OFRF?

To encourage the use of the oceans for commercial, scientific, recreational, and military purposes, Battelle is considering the construction and operation of a research facility on the ocean floor. This is very much in keeping with Battelle's traditional role of facilitating the transfer of the results of scientific research into practical application.

This Ocean Floor Research Facility (OFRF) will provide a means by which the problems of occupying and utilizing a sea-floor site can be investigated under realistic conditions. In building what will ultimately become a large sea-floor complex, tools, equipment, and methods needed for exploring and developing the sea floor will be developed and personnel will be trained. The operation of these sea-floor installations will prove to the skeptical that it is indeed possible to utilize the sea floor; thus, Battelle hopes to accelerate the exploitation of the ocean's resources.

The motivation is both economic and humanitarian. Our economic studies show that total expenditures relating to the deep ocean are now almost as large as those relating to space, and are increasing more rapidly. Numerous authors have discussed the vast wealth of the oceans; but each specific item of raw material in the oceans must compete with its dry-land counterpart. One by one, our familiar sources of basic raw materials are being exhausted and it becomes economically logical to turn to the sea for alternative sources. The mere presence in the sea of vast quantities of a desirable raw material does not justify its exploitation unless the total cost per unit is less than that of the same material from a land source.

The humanitarian motives arise directly from the economic ones; effective exploitation of the ocean's resources will result in people being fed, clothed, and housed at lower cost. In addition, the development of ways to explore and occupy the sea floor will open up vast new areas for recreational use. With the ever-increasing demands upon our limited beach areas, and the encroachment of urban areas into regions that were formerly wilderness, we should begin to consider our continental shelves as useful parts of our country.

A recent study by the National Academy of Sciences* examines some of the economic and humanitarian values associated with the ocean, and identifies rewarding areas for oceanographic research. Both Federal and private funds are being expended in collecting scientific data about the oceans; the need increases to develop basic knowledge to make these data useful. It is to this need the OFRF is addressed.

By building and operating an inhabited installation on the sea floor, we will acquire basic knowledge of the scientific, engineering, and practical problems involved in almost any utilization of the sea floor. This body of knowledge is the essential intermediate step between purely scientific oceanography and the commercial or military development of ocean resources. Relatively little attention is now being directed toward a systematic study of ways of working in the ocean, i.e., ocean engineering.

The OFRF will exemplify and utilize all known ways of performing useful work in the ocean.** Divers using hyperbaric technique and protected operators using telechiric (remote-control) equipment will work side by side, so that realistic assessment of the value of each can be made. Both hyperbaric and sea-level-pressure habitations will be used; each has advantages and disadvantages that should be determined by practical experience.

Historically both commercial and scientific work in the ocean have been carried out from surface vessels exposed to the vagaries of wind and weather. It is probable that future developments of the ocean will increasingly involve systems partly or wholly on the bottom, with minimal penetration of the surf zone. The OFRF will serve as a proving ground to develop systems and techniques that are as independent of the surface as possible.

In this preliminary description of the OFRF, our intent is to depict the Facility the way it may ultimately become, and to show how it can contribute to the general objectives presented above. This is a description of an "ideal"

---

*"Economic Benefits from Oceanographic Research", National Academy of Sciences, National Research Council, Publication 1228, 1964.

**Clark, John W., "Some Observations on Ocean Engineering", <u>Battelle Technical Review</u> (July, 1964).

OFRF, without much regard to practical limitations. By approaching OFRF design from this viewpoint, we bring out clearly the requirements that it must meet. In actuality the OFRF will evolve over a period of time, its ultimate configuration will depend upon the site selected, the specific research needs of the users, and experience gained in the process of constructing the OFRF itself. It may differ substantially in appearance from the description given below, but it will accomplish the same purposes.

GENERAL DESCRIPTION

A general description of the ideal OFRF is presented below, without reference to a particular geographical location. This description provides criteria against which to evaluate sites, and, at the same time, describes the layout and equipment of the ultimate OFRF.

The general requirements upon a site for the Facility arise from a need for compatible surroundings. An adequate labor pool should be available and supporting facilities ranging from machine shops to technical libraries should be reasonably close. Good transportation, both local and national, should also be readily available. The intellectual environment is perhaps the most important of these general requirements.

An area of controlled beach front should be available on which a shore station can be located. Figure 1 is a hypothetical map showing the desired general arrangement of the site. The beach should slope not too steeply to a site suitable for Research Station No. 1 at about a 100-foot depth. The other two research stations at, respectively, 500-foot and 5,000-foot depths should be located as close as possible to the shoreline. Permanent conduits provide electric power, communication, and perhaps atmospheric gasses to the three sea-floor stations.

Surface vessels, particularly stable platforms like those used for oil drilling, are an essential part of the OFRF equipment complement. These are used primarily for placing and removing large items of equipment to be tested, in close coordination with the on-bottom facilities. Dockside facilities adapted to the special needs of these craft should be available.

Small submarines are the "taxis" of the OFRF, for exploration of the undeveloped areas, and for bringing personnel to and from the sea-floor habitations. Equipped with manipulators, they can accomplish on-bottom tasks. A special, surface-handling facility will be needed for these boats. An underwater submarine dock and a boat or barge adapted to serve as a submarine tender will add to their utility.

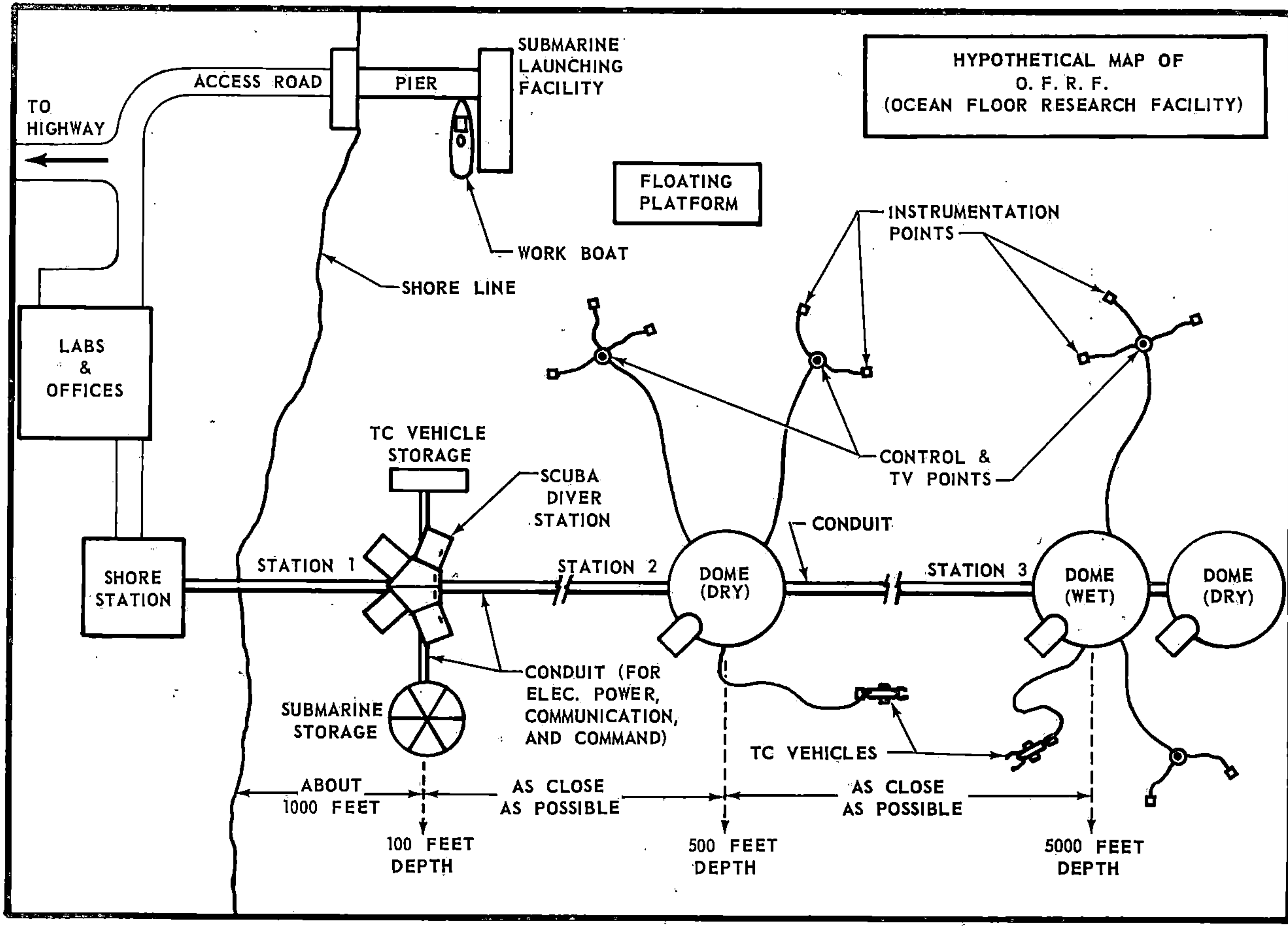

HYPOTHETICAL MAP OF
O. F. R. F.
(OCEAN FLOOR RESEARCH FACILITY)
TO HIGHWAY
ACCESS ROAD
PIER
SUBMARINE LAUNCHING FACILITY
FLOATING PLATFORM
WORK BOAT
SHORE LINE
INSTRUMENTATION POINTS
LABS & OFFICES
TC VEHICLE STORAGE
SCUBA DIVER STATION
CONTROL & TV POINTS
CONDUIT
SHORE STATION
STATION 1
STATION 2
STATION 3
DOME (DRY)
DOME (WET)
DOME (DRY)
CONDUIT (FOR ELEC. POWER, COMMUNICATION, AND COMMAND)
SUBMARINE STORAGE
TC VEHICLES
ABOUT 1000 FEET
AS CLOSE AS POSSIBLE
AS CLOSE AS POSSIBLE
100 FEET DEPTH
500 FEET DEPTH
5000 FEET DEPTH

FIGURE 1.

Clear water and a clean sand or gravel bottom are desirable at all sites. The area should be free of severe currents or rip-tides and the weather should be such as to permit a maximum number of days' operation per year. The offshore site should be free of surface traffic and no anchorages included within it.

With these general requirements in mind, let us consider briefly the particular attributes of each of the major units in the Facility. Three separate operating sites are contemplated, at 100-, 500-, and 5,000-foot water depths, respectively. These depths are selected to evaluate distinctly different operating techniques. Research Station No. 1, at 100 feet, will utilize primarily divers; Research Station No. 2, at 500 feet, will use hyperbaric techniques and telechirics; Research Station No. 3, at 5,000 feet, will use telechiric equipment and submarines with external manipulating systems. Shore facilities provide essential supporting services. A fourth research station, at 12,000 feet or so, should be considered a future possibility.

Shore Facilities

The shore facilities include an administration, laboratory, and shop building, dockside facilities, and a shore station. The dockside facilities, as noted above, provide the operating base for the floating vessels and submarines.

The shore station is the major control and monitoring point for the entire Facility and is, accordingly, devoted primarily to television and sonar monitors and control consoles associated with the offshore installations. It also includes a power-distribution system for the offshore installations and a communication center for both subsurface and surface operations.

Research Station No. 1 - 100 Foot Depth

The first permanent installation contemplated in the Facility is Research Station No. I at a depth of approximately 100 feet. This depth is readily accessible to divers using either scuba or "hard-hat" equipment and these divers would perform most of the work involved in installing the station. Figure 2 shows the general configuration of Research Station No. I. Its principal feature is a central station that serves as a working base for the divers who operate the installation. A rigid conduit to the shore station provides electric power and communication. The power-distribution and control-and-monitoring junctions are located at or near the central station. Monitoring and control of fixed

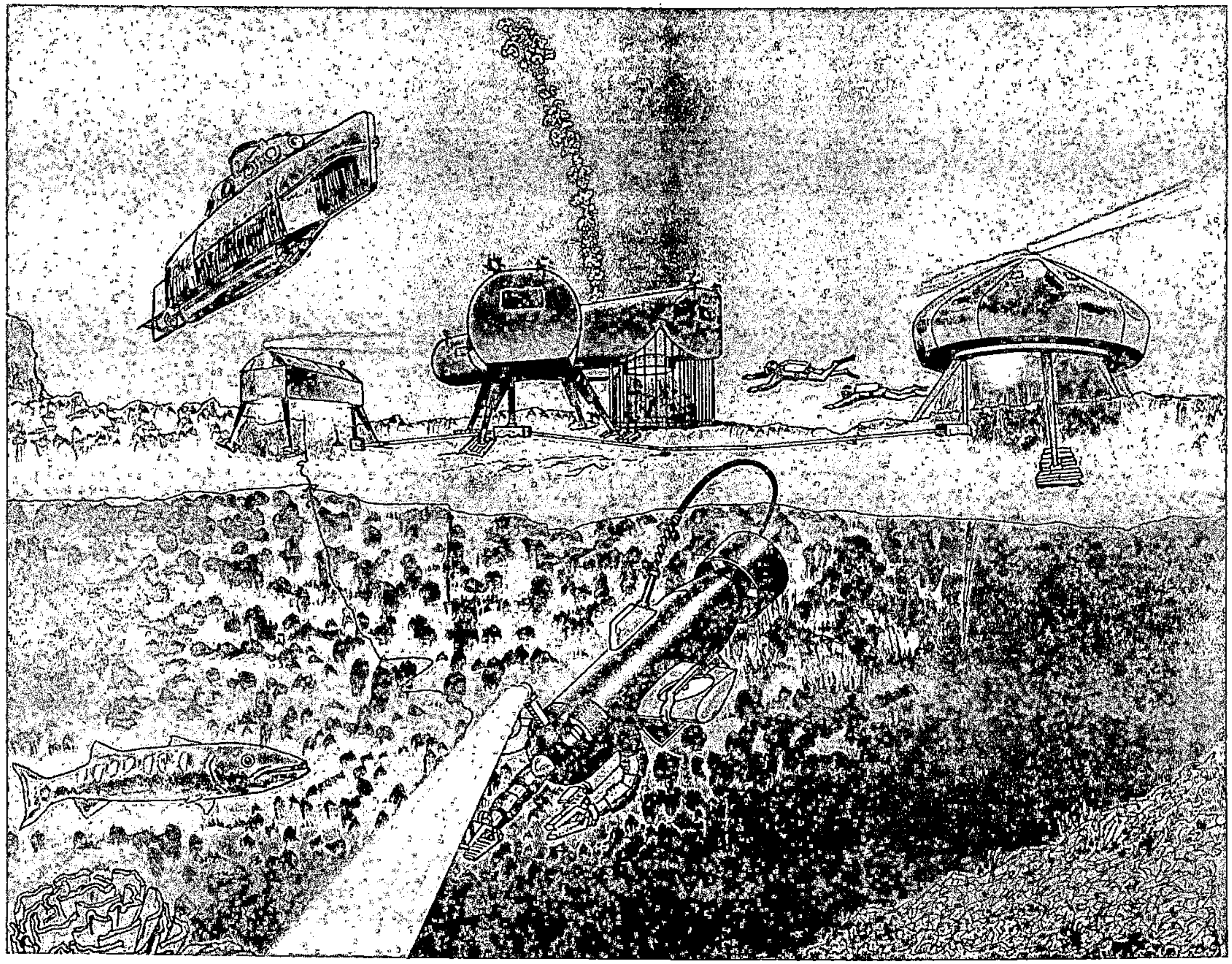


FIGURE 2. RESEARCH STATION NO. 1

and mobile equipment is duplicated in the central station and the shore station. The central station is patterned after the work of Cousteau*.

Entry to Station No. 1 is by diving, since all work is accomplished by scuba-trained personnel. Decompression equipment must be readily available. Consideration is being given to an alternative configuration in which entry is through a caisson from a surface structure.

The central station contains a mixture of 50 percent air and 50 percent helium at the local ambient pressure of about 4 atmospheres. It is large enough to contain four or five men continually or considerably larger numbers for short periods. Its atmosphere supply is derived from the shore station by pipeline; electrical power and communication cables are installed in rigid conduit. The equipment of Station No. 1 includes a storage facility for a small submarine, which can be entered without necessity of surfacing and utilized for exploration of the site. Station No. 1 also includes a small number of telechiric vehicles** used for supplementing the capability of the divers and as an aid to the development of Station No. 2. A preliminary concept of a general-purpose telechiric vehicle is shown in Figure 3.

Station No. 2 – 500 Foot Depth

Station No. 2 is located at a depth too great for conventional diving gear but accessible to divers using hyperbaric (i.e., special gas mixtures at local ambient pressure) technique. The central control station or dome is large enough to contain four or five men for a considerable period. Personnel are rotated by submarine equipped with a suitable personnel exchange lock. The Station will employ air at approximately sea-level pressure and will depend upon telechiric vehicles for accomplishing work in the surrounding area. Thus, the personnel involved are at no time exposed to the ocean itself and are not required to breathe an unfamiliar atmosphere.

A hyperbaric station patterned after Captain George Bond's "Sea-Lab" series*** will be located in the vicinity of the atmospheric station. The man assigned to this station must enter and leave by swimming, and must be skilled in the use of scuba gear. Provision for a decompression cycle must be made in order for him to return to the surface. Figure 4 shows the general appearance

*Cousteau, Capt. Jacques-Yves, "At Home in the Sea", National Geographic, 125, pp 465-507 (April, 1964).

**Clark, John W., "Telechirics – for Operations in Hostile Environments", Battelle Technical Review (October, 1963).

***Groves, LCdr Don, "Sealab I", U. S. Naval Institute Proceedings, pp 64-71 (February, 1965).

FIGURE 3. TELECHIRIC VEHICLE (ARTIST CONCEPT)

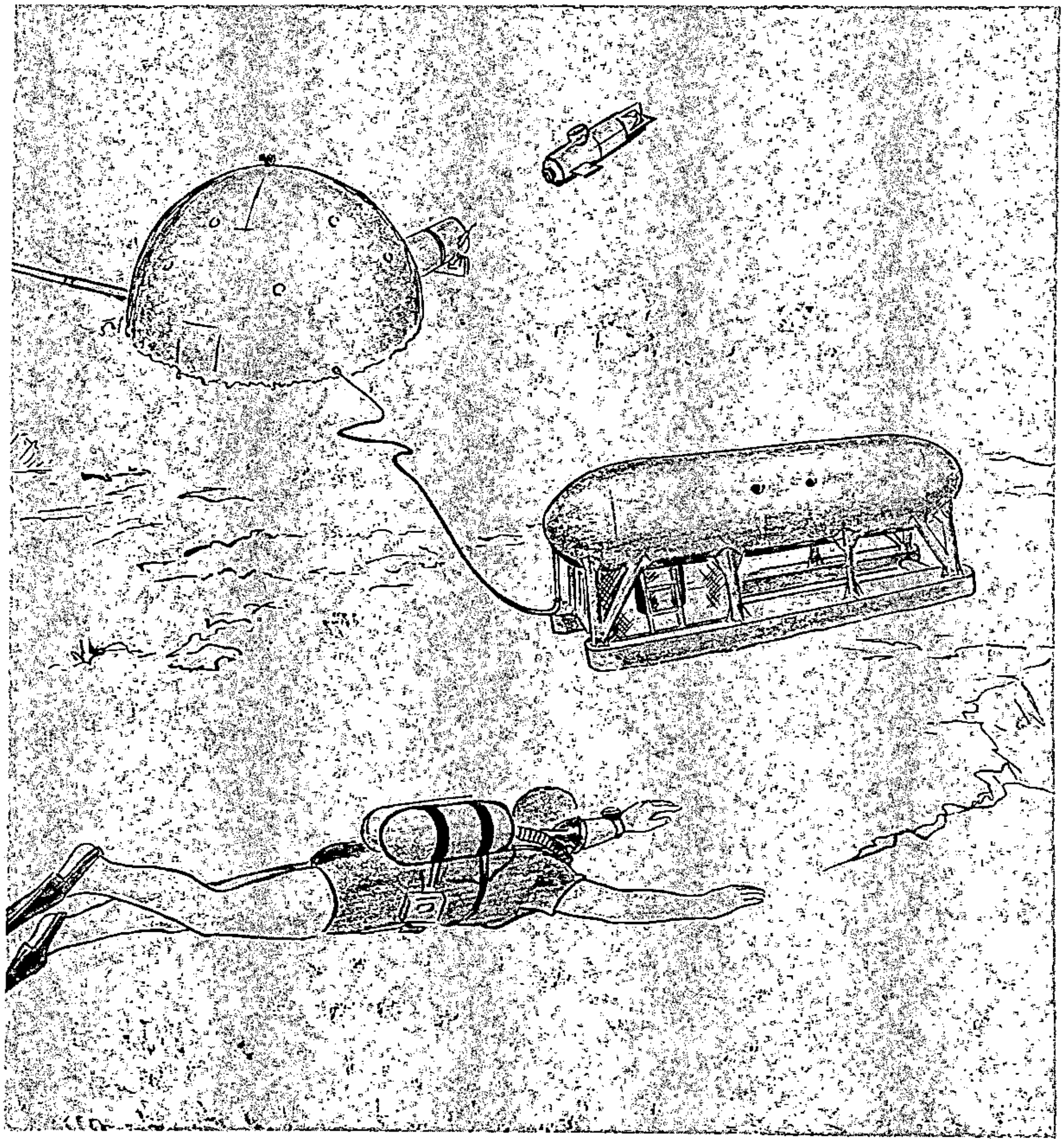


FIGURE 4. RESEARCH STATION NO. 2

of this site, with the sea-level-pressure station and the hyperbaric station in close proximity. Note the electrical conduit, which provides electric power and communications from the shore station via Station No. 1.

The construction and installation of Station No. 2 would be done cooperatively by divers with hyperbaric equipment, by telechiric vehicles controlled from within the dome, and by manipulator-equipped submarines. A realistic evaluation of the relative merits of these three techniques would result from this experience.

The configuration of Station No. 2 as briefly presented here exemplifies a concept for occupation of deep-sea areas. A habitable structure serves as the working base. Fixed control points are located in the area to be occupied, connected to the control center by cable. Each control point contains a TV camera and a light source, both of which can be pointed in any desired direction. The TV monitors are in the control center, and are duplicated in the shore station. Thus, the entire area can be observed. The control points are also equipped with junction boxes for temporary or permanent instruments, and may be used as connectors for telechiric vehicle cables.

Figure 5 is a general view of Research Station No. 2, with a control point in the foreground.

Station No. 3 - 5,000 Foot Depth

The depth for installation of Station No. 3 is deliberately chosen to emphasize the differences in technology between deep and relatively shallow sites. At 5,000 feet, complete darkness prevails and one must depend entirely on artificial lighting. These depths are forever inaccessible to divers, so that one must depend upon telechiric vehicles and manipulator-equipped submarines for all physical work. Further, at this depth of a mile or more, the use of surface vessels for maneuvering large and heavy equipment is feasible only during calm weather and is probably excessively costly except for very large and permanent installations.

Accordingly, the principal feature of Station No. 3 is a central dome which is flooded with either sea water or insulating oil and which serves as a central point for power distribution and for interconnecting the command and communication systems of the telechiric research vehicles upon which these operations depend. As in the other stations, electric power and communication cables are protected by rigid conduit. The conduit joins Station No. 3 to the

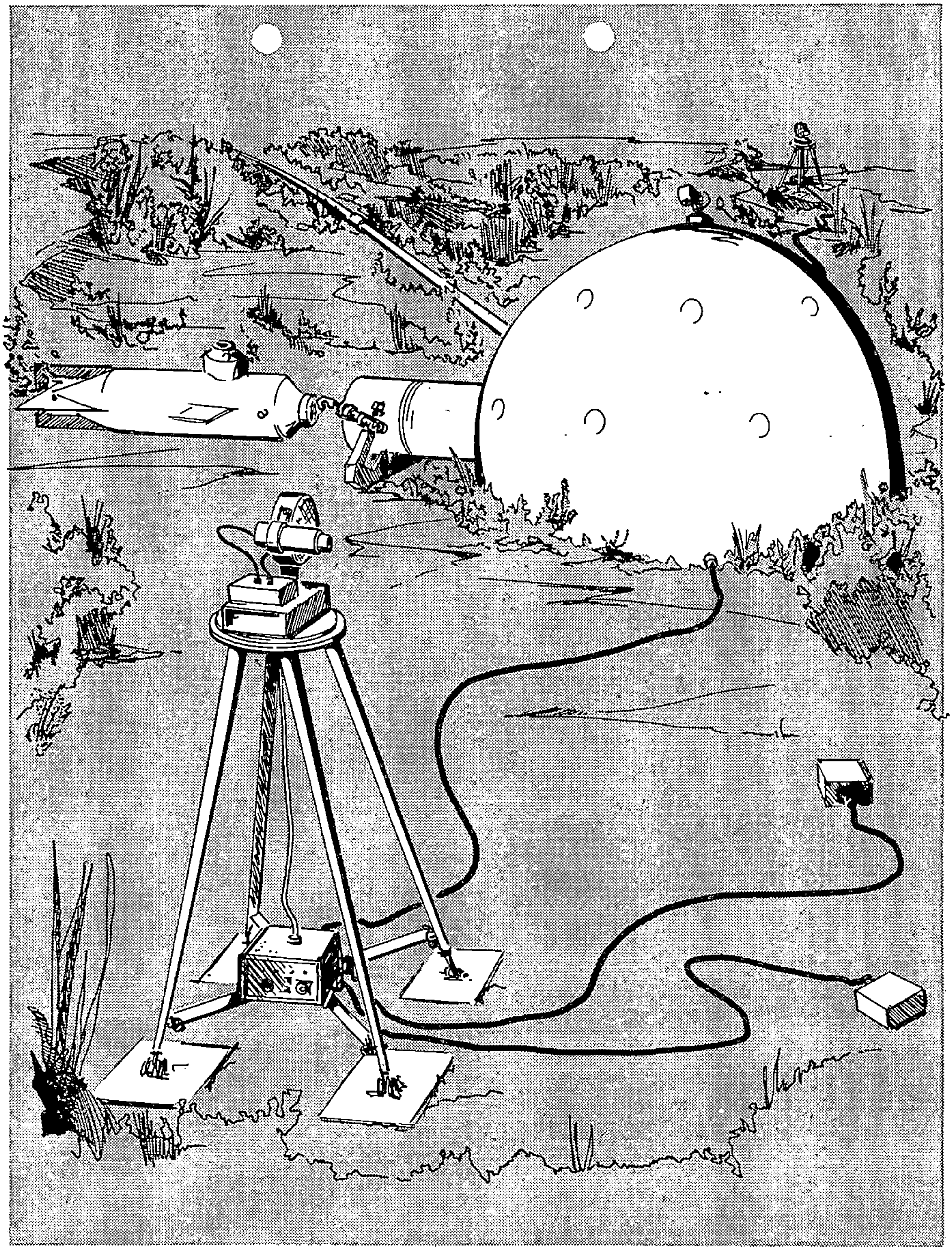


FIGURE 5. RESEARCH STATION NO. 2

shore station, via Stations No. 1 and No. 2. For experimental purposes, an inhabitable dome is also installed at Station No. 3. A variety of atmospheres can be introduced into the dome and personnel can enter it when necessary. However, the primary control of Station No. 3 is obtained from the shore station.

Station No. 3, like Station No. 2, would be equipped with a variety of fixed instrumentation points and a smaller number of central television and sonar observation points. This would enable personnel to obtain a fairly good general view of any experimental procedures involving a considerable area in Station No. 3. The general appearance of Station No. 3 would be similar to that of Station No. 2, as in Figure 5.

TYPICAL RESEARCH PROJECTS

Perhaps the most valuable research results of the OFRF program will arise from the building of the Facility itself. The actual construction and operation of a deep-water, sea-floor facility will force the participants to face up to all the problems that must be solved to make utilization of the sea floor possible. Both academic knowledge and practical "know-how" will be gained in this operation.

A few examples of typical research projects for which the completed OFRF will be particularly well suited are the following:

* Materials Testing

  Samples of structural materials, coatings, paints, cathodic protection schemes, and the like, can be installed at the desired depth, observed during the test period, and recovered when desired.

* Sea-Floor Equipment Evaluation

  Prototype equipment for sea-floor installation (e.g., a wellhead for an oil well, a sonar array) can be installed on the sea floor, and routine maintenance operations performed. Simulated emergencies or accidents can be studied. Thus, the equipment can be fully evaluated before it is accepted for use in the uncontrolled ocean.

* Submarine Evaluation

  Experimental submarines can be evaluated with minimum hazard to the crew and maximum production of test data. The integrity of the pressure hull, the maneuverability of the vessel, and the adequacy of the viewing ports are typical items to be studied. External manipulating systems will be desired on most "work" submarines or DRV's; the OFRF will be particularly suitable for evaluating these.

* Recovery-Equipment Evaluation

Equipment and systems for recovering disabled submarines or other valuable objects in the deep ocean can be thoroughly tested and evaluated in the OFRF. Such systems will consist of various combinations of submarines and floating vessels; since these are primarily emergency vehicles, it is particularly desirable to evaluate their performance and to exercise their crews under controlled conditions.

* Floating Platforms

The OFRF will furnish an excellent proving ground for floating platforms, such as those used by the oil industry for drilling and those used for placing large structures on the sea floor.

* Telechiric System Evaluation

Tethered or free-swimming telechiric (remote-control) systems can be realistically evaluated in the OFRF. Simulated tasks can be performed under controlled conditions to obtain engineering and cost data.

* Equipment for Divers

The OFRF is particularly suitable for evaluating experimental equipment for divers, to avoid the personnel hazard associated with such experiments under controlled conditions. (At least three men have been killed to date in deep dives using a He-O_2 mixture.) Experiments with exotic gas mixtures, new kinds of breathing apparatus, and the like, can be performed with minimum hazard in the OFRF. Wet subs, power tools, and other aids to the diver should be evaluated in the OFRF for safety and effectiveness before being released for general use.

* Navigation, Surveying, and Mapping

Sea-floor navigating must clearly be accomplished in ways quite different from those used on the surface; as a controlled and monitored area, the OFRF will provide an ideal proving ground for testing and developing experimental navigating, surveying, and mapping methods.

* Method and Feasibility Evaluation

The OFRF will be particularly useful in experimental feasibility studies and evaluation of operating methods (as distinguished from equipment evaluation). A typical example would be the installation of a large, sea-floor structure by lowering it from the surface. Observation of such operations, perhaps using simulated equipment, would give practical data on precision, reliability, and cost.

* Instrument Evaluation

Oceanographic instruments can be observed, studied, and perhaps calibrated in the OFRF. The means of positioning the instrument, its behavior in the environment, methods of recovery, etc., should be evaluated in the OFRF as an aid to interpreting the readings obtained in the open sea.

* Scientific Observation

Oceanographers working in the OFRF will be able to study marine flora, fauna, geological structures, etc., in situ in a manner which was never before possible. Detailed scientific knowledge, even of a relatively small area of sea floor, will be a significant contribution to our basic knowledge of the oceans.

* Communication and Localization

Equipment for transmission of acoustic waves through water can be effectively studied in the OFRF. As a controlled and instrumented region, it will provide a calibrated testing range for underwater communication gear and for equipment to locate submerged objects ("sonar").

* Life-Support Systems

Any inhabited structure in the ocean, whether a mobile submarine or a habitation fixed permanently on the sea floor, must include a life-support system. The OFRF will furnish an excellent testing ground for life-support systems under practical conditions.

2560 Charing Road
Columbus, Ohio 43221
April 26, 1965

Mr. T. J. Devine
Train, Cabot & Associates
375 Park Avenue
New York, New York (22)

Dear Tom:

I enclose as per your telephone request a hasty summary of the ocean floor research project which is my suggested plan to build an Ocean Floor Research Facility. I also enclose a preliminary description of the OFRF itself and an outline of a plan to carry out this ambitious project with maximum leverage upon the initial investment and minimum risk to the original investors.

This plan should be read sympathetically; I am afraid it is not self-explanatory! Please call if any of the points made are not clear.

If this plan is of real interest, I will be glad to meet with you and your associates to discuss specific sites for the OFRF on which I have detailed information; specific candidate companies for acquisition; and specific personnel who would strengthen the operation.

I believe all of the vital points in this project are covered in the enclosures. With your knowledge of the ocean and business related thereto, the value of this unique approach to the market should be rather evident.

I look forward to hearing from you.

Best regards.

Very truly yours,

John

John W. Clark

JWC/bsp
Enclosures

Ocean Floor Research Project

The exploitation of the ocean's resources
The scientific study of the ocean
The military use of the ocean

will increasingly involve exploration, utilization, and occupation of the ocean floor

the Ocean Floor Research Project was conceived as a way to develop the necessary materials, tools, components, instruments, and methods; and acquire practical experience in deep-ocean work

the long term object of the Ocean Floor Research Project is to learn how to use the ocean floor effectively and economically; those who participate will have a significant advantage in entering the growing market for ocean-related products and services; this will be done by building an Ocean Floor Research Facility, as described in the attached brochure.

Potential Participants in
Ocean Floor Research Project

Manufacturers of equipment, components, and materials for all kinds of deep-sea service

Offerors of services in the ocean environment

Constructors and facility contractors

Foundations and scientific trusts

Large corporations desirous of diversifying into ocean-related business

Potential Users of Ocean Floor Research Facility

(As the Ocean Floor Research Project progresses, a useable facility, the OFRF, will start to become available. Revenue from the use of this Facility is expected to make it more-or-less self-supporting.)

Manufacturers of equipment, components, and materials for operation in the ocean environments--for research and environmental testing

Offerors of services in deep-sea operation--for evaluation and demonstration of new servicing methods

Government agencies--for R&D in the ocean

Preliminary Plan

Phase I - Planning - 3 months
J. W. Clark and secretary and travel
Contact promising acquisitions
Contact key personnel
Obtain option on key real estate
Formulate detailed Phase II plan

Phase II - Organization - one year
Establish a corporate structure, preferably by acquisition
Expand operations within the structure
Make other acquisitions by exchange of stock
Purchase key real estate
Formulate detailed Phase III plan

At end of Phase II we will have:
A going concern with operating income
A seasoned professional staff
A plan, and key real estate for OFRP

Phase III - Operation
Form a new corporation, to carry out the OFRP; to be owned by ten(?) non-competitive companies interested in ocean business; the Phase II corporation to have an equal share by virtue of know-how and real estate, while the others contribute cash. The approximate schedule of income and investment is:

(thousands of dollars)

	Year 1	Year 2	Year 3	Year 4	Year 5
Expense	500	800	1200	1200	1500
Capital	1000	1200	1200	1200	1000
Income	200	800	1200	1500	2000

from this point on, the OFRF continues to recover its expenses and earn about 5% on fixed assets. Continuing investment at about $1,000,000 per year will be required.

The financial return to the participants will come through sales of equipment and services developed in the OFRF; to the investors in Phase I and II, by the leverage on their original investment which will make them equal partners with a much smaller dollar investment.

Assets Created by the Ocean Floor Research Project

(These will be owned in proportion to the respective investments made by the participants)

- the OFRF, which will more-or-less pay its own way
- "know-how" in deep-sea operations, structures, and civil engineering
- proprietary rights in products and services for deep-sea use
- effective channel to the ocean-related markets
- reputation and PR
- a "focus" for the activities of diversified companies

Oceanography

THOMAS J. DEVINE
375 PARK AVENUE
NEW YORK 22, NEW YORK

March 30, 1964

Dear Pop

Here is a newsworthy piece by the Carbide group on deep commercial diving. Andre turned down a Carbide proposition because he thought that Lockheed makes more sense

Cheers

T.

Routine Man-In-The-Sea Commercial Operation Is Aim Of New Company

Rear Adm. Edward C. Stephan, USN (Ret.) Vice President, Ocean Systems, Inc.
Edwin A. Link, Chief Marine Consultant, Ocean Systems, Inc.

The formation of Ocean Systems, Inc. was undertaken to advance underwater technology beyond the realm of the pure science of oceanography into the practical field of routine commercial operations. This step in the development of man-in-the-sea programs makes maximum utilization of scientific knowledge gained through private and government supported oceanographic research over the past decade.

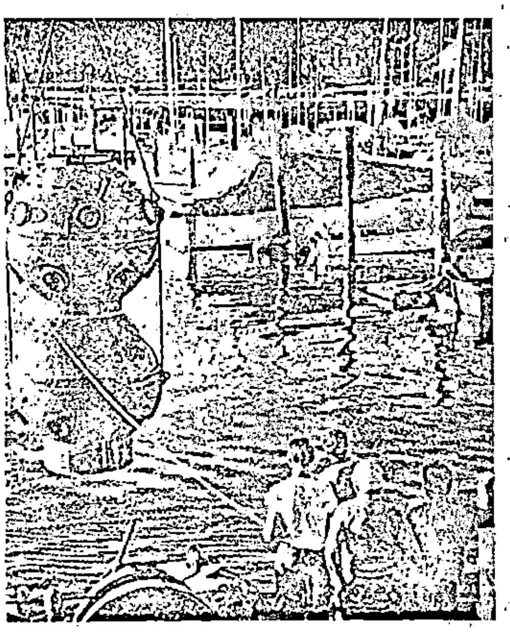
In addition the company is dedicated to furthering the advancement of ocean engineering science through a variety of related development projects focused on the goal of increasing man's capability to perform useful work safely and efficiently at greater ocean depths.

Ocean Systems is already deeply involved in underwater work connected with oil well drilling operations off the coasts of western U.S. and the Gulf of Mexico. In the future it plans to extend its scope of operations into undersea mining, exploiting the sea's food resources and aiding in underseas defense and warfare.

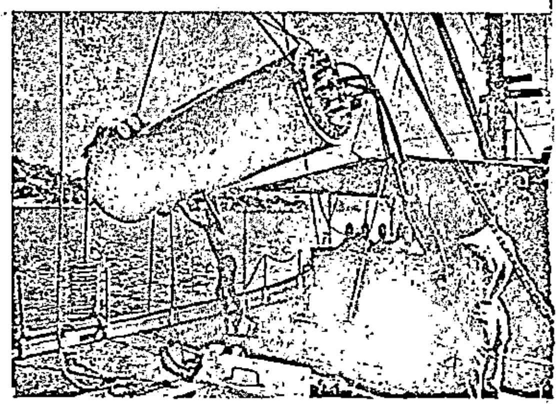
The formal amalgamation of the talents of the Union Carbide Corporation, General Precision, Inc. and Edwin A. Link was a logical outgrowth of work they performed together last year informally. Union Carbide, which owns 65% of the Oceans Systems stock, has been involved in life support systems through its Linde Division for years and in fuel cell development and research. GPI, a 25% stockholder, for 25 years has been developing and producing sensors, computers, navigation and control systems for use in the fields of navigation, guidance and weapon fire control for use in the marine environment. Edwin A. Link, former GPI President, has long been associated with diving research. His most recent exploit in a series of deep diving operations which began in 1962 was last July when two men, Jon Lindbergh and Robert Stenuit lived and worked at a depth of 430 ft. for two days. Link holds 10% of the Ocean Systems stock.

Navy Sets Pace

Ocean Systems acknowledges that the Navy's Deep Submergence Systems Project, an outgrowth of the earlier Deep Submergence Systems

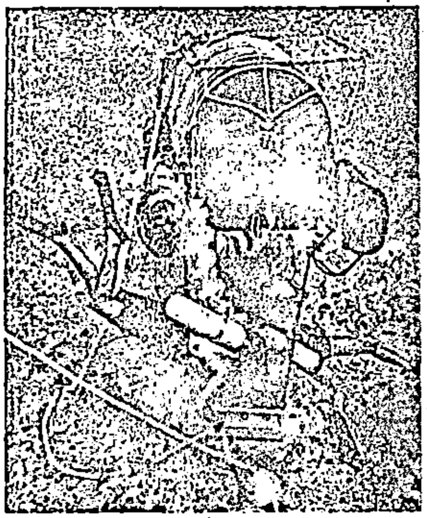


Dual chamber submersible system of Ocean Systems, Inc. holds one diver in lower chamber who exits for work while standby remains in upper chamber at atmospheric pressure.



Courtesy, National Geographic Magazine, (C)National Geographic Society

Shown here is a single chamber submersible decompression system designed by Edwin A. Link, Ocean Systems, Inc. Chief Marine Consultant. Chamber was used in 49 hr. deep test in the Bahamas last summer.



Courtesy, National Geographic Magazine, (C)National Geographic Society

Jon Lindbergh and Robert Stenuit spent two days at 430 ft. last July off Stirrup Key, Bahamas. Both work for Ocean Systems, Inc. Flexible bottom house is shown above.

Review Group, of which Adm. Stephan was Chairman, has lent impetus to the collective military-industry effort to find ways for man to work in the deep sea environment. It is the company's intention to lend its capabilities to the military effort, while at the same time looking forward to other commercial fields.

Timothy J. Coleman, company president says, "Mineral exploration should prove fruitful, fresh water discovery may be productive, fish farming has started on a small scale, telephone cables need protection, sewer outfalls should be extended and lowered much deeper and manned underwater facilities have to be constructed. Therefore, we believe the time has now arrived for a concentrated effort in the engineering aspects of oceanography."

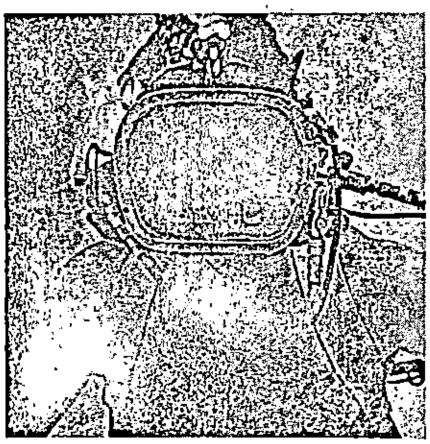
Offshore petroleum production is the immediate goal of Ocean Systems' underwater engineering services. This is an ideal first step for two reasons: first, as producers push their exploration further out on the continental shelves they are reaching depths that the older types of air breathing diving systems cannot reach; the alternative to developing highly complex deep diving underwater robots to perform submerged well completions is much more expensive than devising means to enable man to work effectively at greater depths.

Diver Based On West Coast

Nucleus of the company's offshore petroleum operations is Offshore Divers, based at Santa Barbara, Cal. Its manager, H. Dan Wilson, has been in the diving business since 1948 and was the owner and operator of General Offshore Divers, Inc. He and his company became part of Union Carbide's ocean engineering group in July 1964.

More than 40 of the Offshore Divers' men are qualified to work at depths up to 400 ft. In the latter half of 1964 they made 300 dives to depths greater than 250 ft. with times for remaining on the bottom of at least 40 minutes. In several instances these free swimming operations have reduced the costs of diving operations to 3% of total well completion costs from 10% when using other methods at shallower depths. In other cases diving assignments which would cost approximately $100,000 can now be performed for about $20,000.

Much of the engineering research being performed by Ocean Systems is aimed at making it practical to work at greater depths. As a step toward the goal of working at depths between 600 and 1,000 ft., the company is planning to send men down on a practical demonstration and test mission, probably this summer off the Pacific coast. Much of the credit for being able to perform at these depths is due to helium-oxygen-nitrogen mixtures devised by Wilson. The newer tests will benefit from the work of Dr. C. J. Lambertson, a pioneer of high pressure respiratory physiology, who is chief medical consultant, and Dr. Joseph MacInnis, who in addition to his medical specialty is an experienced diver.



Wide angle viewing is possible in new scuba mask designed by Dan Wilson of Ocean Systems.

Submersible Chambers Being Designed

In planning for dives at more than 400 ft. the company has devised a submersible chamber which serves to transport the diver to and from the ocean floor. Acting as more than an underwater elevator, the vehicle supplies the diver with his breathing gas mixture and with electrical power for his underwater tools. It also acts as a decompression system, permitting the operators to bring the diver to the surface in five minutes to complete the cycle on the deck of the support vessel.

As a step further, Ocean Systems is currently developing four Advanced Divings Systems (ADS) to serve a variety of operations. ADS-1, also known as the "Purisima", was launched last December and is now undergoing tests. It is a dual chamber system, with one sphere mounted on another, with the bottom one accessible to the sea through a trunk lock. The upper sphere permits an observer or standby diver to observe the work site while in a shirt sleeve environment at normal atmospheric pressure.

ADS-II, will also be a double sphere arrangement but it will have the added capability of acting as a Submersible Decompression Chamber (SDC). ADS-III will have the capabilities of a double chamber SDC but in addition will be able to mate with a Deck Decompression chamber (DDC). ADS-IV will be a single chamber SDC designed to mate with a companion DDC. Hull construction of all of the chambers is designed for a working depth of 1,000 ft. and a test depth of 1,500 ft. All of the ADS perform as tethered vessels.

The company plans to make use of mobile manned submersibles to locate equipment lost on the ocean floor, for inspection and maintenance, routine servicing of bottom installations and bottom exploration. In the future the company intends to have submersibles that will have lock-out chambers to permit divers to work from them in a manner similar to the tethered ADS equipment.

Break With Surface

A basic premise of Ocean Systems is the eventual need and ability to completely sever the dependence of underwater systems on surface facilities. Capt. Ray Pitts, USN (Ret.), General Manager, Operations Department, predicts that off-shore wells will one day be drilled completely on the ocean floor with the aid of new types of automated drilling equipment. Ocean engineers will work for extended periods of time from permanent bottom-installed facilities. These submerged operations will be immune to surface storms.

It is believed that the petroleum industry must break connection with the surface mentally as well as physically. In the past, with only limited diving capabilities available, producers considered diving only as an emergency measure to be used only when no other way of solving a problem. Ocean Systems is offering services to producers that would become standard operating procedures, saving money in the long run.

Oceanography

5/10/65

Pop

John C is descending on me Thursday to name names, tell me things he does not want to write etc on his deep ocean laboratory scheme.

Attached is rewrite of part of what I ~~handed~~ mailed you several days ago.

Perhaps we should put up entire $30K for John's "Phase I".

Any views in advance of my meeting with Clark?

Best regards
G.

2560 Charing Rd.
Columbus, Ohio 43221
May 8, 1965

Mr. T. J. Devine
Train, Cabot & Associates
375 Park Ave.
New York 22, N. Y.

Dear Tom:

The enclosed "Plan for a Deep-Ocean Business" is a somewhat more coherent description of the plan than the hasty summary I sent you on April 26.

Roughly, Phase I will cost $30,000 and take three or four months; Phase II, $250,000 and a year. Income can begin in the early months of Phase II, by acquisition of carefully selected small companies. The reason for suggesting this phasing is to achieve a position of strength from which to approach investors for Phase III financing. The leverage on the initial investment should be pretty substantial.

So much for generalities. When we meet on Thursday, I will be prepared to go into detail on:

1. immediate business opportunities;
2. acquisition possibilities, including skilled people, contracts, facilities and products;
3. patents available for licensing;
4. real estate suitable for an Ocean Floor Facility.

These special situations, taken together, constitute an opportunity to enter the deep-water equipment and/or service business at a modest initial investment. We can explore how best to approach this after discussing the details.

I'll call you Thursday morning to firm up the exact time of our meeting.

Regards---

John

John W. Clark/bsp
April 28, 1965

Plan for a Deep-Ocean Business

Introduction

Development of the ocean's resources is literally the last frontier. The continental shelf areas of the U. S. may well be comparable to the Louisiana Purchase in the potential wealth which they offer. The exploitation of these resources is logically done by free enterprise; a single, mammoth government program (like the space program) is not appropriate here.

Development and occupation of sea-floor sites seems likely to become a necessity as we go to deeper water; we therefore propose a business plan based on the experimental development and occupation of a selected sea-floor area. The very carrying out of this bold plan may well accelerate the development of ocean-related businesses; the participants in the plan will be in a uniquely strong position to furnish the necessary goods and services to them.

A general discussion of the ocean, its potential, and its problems has been presented before(1). The continuing broad study of ocean-related business has identified two potentially important areas not now being developed by any company or government agency. These constitute the business opportunity which is the subject of the discussion which follows. The areas are:

an ocean floor research and testing facility (OFRF)
telechiric (remote control) systems (TC)

Actual occupation of sea-floor sites will be increasingly important as ocean operations move toward deeper water; hence the potential need for a research and testing facility in which systems, components, materials, and methods can be developed and tested. The requirements upon this facility, its possible ultimate configuration, and some of its uses are discussed in the attached booklet(2).

There are three ways of accomplishing manual tasks in the ocean: divers, with tools and supporting systems; small submarines (DSV's) with external manipulating systems; and telechiric systems(3). Two of these three are being energetically exploited: divers by Ocean Systems, Inc. (UCC & GPE new joint-venture company); and DSV's by Westinghouse through their newly established underseas division. Telechiric equipment for deep-sea operations offers a unique market opportunity for the equipment manufacturer and/or the offeror of services.

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(1) Clark, John W., "Some Observations on Ocean Engineering", Battelle Technical Review, July, 1964.
(2) "Ocean Floor Research Facility", Battelle-Columbus, March 5, 1965.
(3) Clark, John W., "Telechirics..for Operations in Hostile Environments", Battelle Technical Review, October, 1963.

The following sections present the broad outlines of a plan to develop a business based on a sea-floor laboratory and on telechirics, which can grow with the expanding uses of the ocean.

The Plan

Fortunately, the OFRF does not have to be constructed as a unit. It is logical to go step-by-step, starting in shallow water with simple facilities, to gain experience and confidence before committing funds for multimillion-dollar expenditures.

Phase I, Planning. The first proposed step is to select a site (based on the preliminary site survey already completed) and establish a temporary operating base in the vicinity. Key technical and management personnel would be moved there, to work with local oceanographic, Navy, and potential customer organizations.

During this phase, we would observe operations at sea to obtain practical engineering data, learn potential customer needs, and establish rapport with the local scientific and business community.

Technical manpower is the heart of any technically-oriented business. There are less than a dozen really mature ocean engineers in the U. S.; any of them would be delighted to participate in a project like the one described here. Most of them could bring small organizations, and contracts, with them. Recruiting of key men would start in Phase I.

Candidate sites would be evaluated and the permanent OFRF site selected. An option to buy would be negotiated with the owner, and zoning and land-use restrictions evaluated.

Phase II, Organization. The objective of this phase is to establish a position of strength from which to justify investment in Phase III. The selected parcel of real estate is to be purchased and hiring of key personnel (which may include acquisition of small companies) accomplished.

A detailed market study would be made, to determine the exact requirements for telechiric vehicles. These would become the basis for a line of these vehicles to be offered for sale; these to be developed one-at-a-time, starting with the simplest possible vehicle and working up to more complex systems; license arrangements to be negotiated with the holders of applicable patents.

Cost analyses of several alternative configurations for the OFRF would be made and the most effective one selected. A time-phased plan for construction of the OFRF would be worked out; this is the Ocean Floor Research Project (OFRP).

During Phase II, limited income-producing operations based on the acquired people and/or corporations, would be initiated. These are not expected to support the entire organization; but they would be self-supporting and establish an entree into the market.

Phase III, Operation. On this Plan, we would enter Phase III with key scientific and engineering personnel, the unique real estate required for OFRP, designs for a line of TC equipment, a detailed knowledge of the markets for ocean-related products, and a detailed plan giving the cost and income of the OFRP over a ten-year period. This is the position of strength from which to approach an investor or investors for the multi-million-dollar commitments required for the OFRP.

During the period of perhaps a year required to negotiate with the investors, preliminary operations on the sea-floor should start. These should be on a modest scale, using diver huts and remote TV cameras, to establish occupation of the sea-floor area.

The other "Phase II" activities, planning, marketing, equipment development, etc., and expansion of the acquired businesses, would continue in parallel with these negotiations.

Full-scale implementation of the OFRP, and development of TC equipment for commercial sale, would be expected to begin in the second year of Phase III. The rate of capital input from that time on would be guided by market acceptance of the products and services offered.

Assets Created by OFRP

The organization or organizations which participate in the development and occupation of an ocean floor area will gain practical experience and "know-how" in undersea work that will give them a major advantage over their competition. As the Project proceeds, the OFRF will increase in capability and will produce correspondingly increasing revenue.

Numerous products and services required for deep-sea work will be identified, developed, and sea-tested in the process of building the sea-floor facility. The participants will retain proprietary rights in these; it is here that the largest financial return is to be expected.

Telechiric systems have been identified as an important and neglected technique for deep-ocean work. The OFRP will use TC systems when appropriate, and provide a proving ground for them. Actual working demonstration of these unfamiliar systems seems to be a prerequisite to their acceptance.

The participants in the OFRP will be in daily contact with the offshore oil industry and the Navy; the principal customers for deep-sea goods and services. They will be "insiders" and have a ready and effective communication channel to the ocean-related markets.

The PR value of the OFRP is obvious. It will be a spectacular, and genuinely important, project. As such it will add stature to its participants as well as facilitating their entry into the business.

Cost

A preliminary estimate of the cost of the OFRP is presented below. This is based on certain assumptions concerning the rate of implementation, and rough estimates of the cost of each major item. Both of these would be reconsidered during Phase II; but the total cost of the facility is realistically indicated by these figures.

The complete OFRF will take about 10 years and cost about $20,000,000 ($10,000,000 capital and $10,000,000 expense). The annual investment and income for the first five years of Phase III might look something like this:

(thousands of dollars)

	Year 1	Year 2	Year 3	Year 4	Year 5
Expense	500	800	1200	1200	1500
Capital	1000	1200	1200	1200	1000
Income	200	800	1200	1500	2000

(It might be better to delay major capital commitment until Year 2.)

In Year 6 and later, the OFRF would be expected to recover all expenses and earn about 5% on fixed assets. Continuing investment at about $1,000,000 per year will be required.

Competition

At present, there is no known competition to the OFRP as described herein, nor to TC systems as a product line.

The Navy has a variety of facilities in being and planned, but none contemplate an actual sea-floor laboratory. Its value is recognized by many Navy technical personnel. The Navy would become an important and early customer for the OFRF, and would make technical data available during Phase II.

The Pacific Oceanics Foundation, in Hawaii, is attempting to raise money to build a manned deep-sea station patterned after Sea-Lab II; this is like a part of Station No. 1 of the OFRF. POF does not have the engineering capability to design or build such a station; they would have to contract it. The status of their fund raising is not known; they have approached the large aerospace companies.

No telechiric systems are commercially available today. Litton Systems, North American Aviation (Anaheim), and ACF Industries have designs for "arms" which can be attached to DSV's, but which have very limited task capability.

Withdrawal/Redaction Sheet
(George Bush Library)

DOCUMENT NO. AND TYPE	SUBJECT/TITLE	DATE	RESTRICTION	CLASS.
01. Letter	From Robert Gow to Duncan Chapman RE: Personnel information (2 pp.)	3/19/65	C	

COLLECTION

George Bush Personal Papers
Zapata Oil File
Business Alphabetical Files

FILE LOCATION

Oceanography - GHWB [1965]

OA/ID Number

Date Closed 01/05/00

RESTRICTION CODES

Presidential Records Act - [44 U.S.C. 2204(a)]

P-1 National Security Classified Information [(a)(1) of the PRA]
P-2 Relating to the appointment to Federal office [(a)(2) of the PRA]
P-3 Release would violate a Federal statute [(a)(3) of the PRA]
P-4 Release would disclose trade secrets or confidential commercial or financial information [(a)(4) of the PRA]
P-5 Release would disclose confidential advise between the President and his advisors, or between such advisors [a)(5) of the PRA]
P-6 Release would constitute a clearly unwarranted invasion of personal privacy [(a)(6) of the PRA]

C. Closed in accordance with restrictions contained in donor's deed of gift.

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F-8 Release would disclose information concerning the regulation of financial institutions [(b)(8) of the FOIA]
F-9 Release would disclose geological or geophysical information concerning wells [(b)(9) of the FOIA]

YB

ZAPATA OFF-SHORE COMPANY

INTER-OFFICE CORRESPONDENCE

TO: BOARD OF DIRECTORS

FROM: GEORGE H. W. BUSH

CC:

DATE: March 18, 1965

SUBJECT: OCEANOGRAPHIC RESEARCH

You will recall that at the Directors Meeting I discussed with you the interest that various space companies are taking in Zapata.

Bob Gow has been doing some looking into the oceanographic field. In fact, he has even set up some experiments in his garage. He and I together have looked into several deals which would involve Zapata's getting further into the oceanographic field, but we've not come across anything too attractive.

Both Westinghouse and Lockheed have shown interest in doing some business with Zapata.

With all these things in mind, I today have authorized Zapata's spending $20,000 a year on oceanographic research. This is a small amount, and I have asked Bob Gow to handle these expenditures, reporting to both Mark Gardner and me.

This is a very small expenditure as far as Zapata is concerned but Bob feels, and I agree with him, that it will get our foot into several doors and we can try some experiments always with the idea of keeping our experimentation aimed towards "making a buck." Bob has in mind taking on a man experienced in oceanographic research, to be understood by this man that should Zapata abandon this project after a year, the man would seek other employment.

I think this program will help us in establishing communities of interest with the large companies mentioned above and, even more important, I think from it we might come up with some ventures which will be real money makers.

We're not going to say anything about all this publicly at this time due to the small size of the program, but I did want you to know where we stood.

FORM #128