

30 YEARS OF COOPERATION

NSGO-Q-94-003

UNITED STATES JAPAN

COOPERATIVE PROGRAM IN
NATURAL RESOURCES
(UJNR)

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May 1994

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F o r e w o r d

In 1964 the United States and Japan established the Cooperative Program in Natural Resources (UJNR) to promote conservation of marine and terrestrial resources through cooperation in applied science and technology. We have, on this 30th anniversary, an opportunity to celebrate the success of this important bilateral program. Through the bonds of friendship and three decades of scientific collaboration, the United States and Japan have made significant progress in understanding natural processes and promoting sound management of our precious natural resources.

Many of the achievements highlighted in this publication are the result of frank dialogue between the scientists of our two countries. As the UJNR amply demonstrates, the language of science is truly international, facilitating

communication between diverse cultures and nations.

As a result of collaboration under the UJNR, the United States and Japan are better able to understand and predict natural disasters such as earthquakes (and associated tsunamis) and fires, prevent the loss of important food and fiber resources, and manage and conserve the resources of the oceans and forests.

The benefits of 30 years of U.S.–Japan cooperation will accrue not only to the citizens of our two countries but to present and future generations of all nations. The scientists and technicians who have contributed to the UJNR have served the global community well and have provided an important foundation for far-reaching international cooperation.

John H. Gibbons
Assistant to the President for
Science and Technology

I n t r o d u c t i o n

The U.S.-Japan Cooperative Program in Natural Resources (UJNR) was established in 1964 when the bilateral Committee on Trade and Economic Affairs agreed that exchanging natural-resources information, specialists, technical data, and research equipment would greatly benefit the economy and welfare of both countries. As expected, these exchanges have enhanced the efficiency of natural-resources development and conservation and have allowed exploration and adoption of diverse ideas, thereby increasing the bonds of understanding between the United States and Japan.

The objective of the UJNR is to aid future generations by jointly addressing environmental issues. This objective is achieved through

- Communication and collaboration between U.S. and Japanese scientists, engineers, and technical specialists
- Exchanges of information, data, and literature
- Exchanges of research samples and equipment
- Exchanges of research personnel
- Joint conferences and symposia
- Joint projects and presentations of papers

As the UJNR program enters its 30th year, its importance as a tool for international cooperation continues to grow.

- Field excursions, technical study cruises, and tours of research and industrial facilities

The UJNR consists of 18 panels: 9 focus on marine science and technology, and 9 address non-marine activities in the field of natural resources.

The marine science and technology panels are

- Aquaculture
- Diving Physiology
- Marine Facilities
- Marine Geology
- Marine Mining
- Sea-Bottom Surveys

New marine science and technology panels scheduled to commence in 1994 include

- Pacific Ocean Observation and Research
- Submersible Research
- Marine Environmental Science and Technology

The nonmarine panels are

- Conservation, Recreation, and Parks
- Earthquake Prediction Technology
- Fire Research and Safety
- Forage Seed Production Panel
- Forestry
- Mycoplasmosis
- Protein Resources
- Toxic Micro-Organisms
- Wind and Seismic Effects

As the program enters its 30th year, its importance as a tool for international cooperation continues to grow. The UJNR is one of four research exchanges between the United States and Japan. The other three exchanges cover basic science, health and medical affairs, and social and cultural affairs.

Guidelines and Organization

The U.S. and Japanese Governments have primary responsibility for UJNR planning, organization, and control. However, nongovernmental organizations and individuals are often invited to participate as consultants or advisors at panel symposia. Research results are disseminated through professional journals, panel proceedings, technical reports, press releases, presentations, and other media.

Panels of the UJNR meet in joint session biannually to evaluate activities and determine if changes are needed. At these sessions, panels are strengthened, added, or eliminated, and participants are briefed on accomplishments and problems. Individual panels meet as needed, usually once a year, at sites alternating between the United States and Japan.

The free exchange of information, equipment, and personnel ensures that UJNR panels are bounded only by their imaginations.

Participating Agencies

In the United States, the overall UJNR is coordinated by the Bureau of Oceans and International Environmental and Scientific Affairs, Department of State. The National Oceanic and Atmospheric Administration (NOAA) of the Department of Commerce coordinates the committee's marine panels under the

Marine Resources and Engineering Coordination Committee (MRECC). The Department of Agriculture coordinates the nonmarine panels of the UJNR. The Departments of Commerce, Defense, Energy, Interior, and Transportation, the Environmental Protection Agency, the National Aeronautics and Space Administration, the National Institutes of Health, and the National Science Foundation also participate extensively in the program.

In Japan, all UJNR panels are coordinated by the Science and Technology Agency (STA) with participation and advice primarily from the Ministries of International Trade and Industry, Agriculture, Forestry and Fisheries, Posts and Communications, Transport, Labor, Health and Welfare, Foreign Affairs, and Construction, and the Environmental Agency.

The U.S. Embassy in Tokyo and the Japanese Embassy in Washington, DC, also play vital roles in program coordination and implementation.

Summary of Accomplishments and Benefits

The primary reason for the UJNR's success over the past 30

years is its communications network. The free exchange of information, equipment, and personnel ensures that panels are bounded only by their imaginations. Panel results benefit domestic programs of both the United States and Japan, as well as international relations. The individual panel reports contained in this publication detail UJNR accomplishments and the many benefits of these achievements. Briefly stated, these accomplishments include increased communication and collaboration among technical specialists; exchanges of information, data, and research findings; exchanges of equipment, materials, and samples; and hundreds of bilateral study missions.

The Future

Through 30 years of partnership under the UJNR, Japan and the United States have effectively furthered natural resource technology. Future plans include applying these technologies to environmental protection and increasing awareness of global environmental issues. The technical subjects of the UJNR are and will continue to be of great importance, particularly as our countries begin to build the framework for a new economic partnership for the 21st century.

Marine Panels

AQUACULTURE PANEL

Background

The National Oceanic and Atmospheric Administration (NOAA) in Silver Spring, Maryland, and the Japanese National Research Institute of Aquaculture in Nansei, Japan, have been working together for more than 20 years to enhance the development of freshwater and marine aquaculture.

During the 1960's when aquaculture production increased severalfold in the United States and Japan, the Aquaculture Panel bridged communication between the scientific communities of these two countries. The panel has facilitated the development of techniques for early diagnosis and treatment of aquatic pathogens and for improving maturation and spawning in the production of seed stock. This work continues through annual panel meetings and professional collaborations and exchanges.

Types of Exchanges

Each year, in addition to sharing data, equipment, and samples, a number of scientists visit their colleagues' laboratories to further key research. Joint studies have involved the development of recombinant DNA for the preparation of vaccines; salmon hatchery techniques; hormonal control of reproduction; interspecific



relationships between fish; king crab reproduction; fish parasites; and ecological models for fish populations. In addition to formal technical exchanges, the panel has mediated U.S. industry requests for information on Japanese algae-culture and flounder-enhancement techniques.

Accomplishments

- With help from the panel, the Waddell Mariculture Center in South Carolina has developed a sister laboratory program with the Japanese National Research Institute of Aquaculture.
- Japanese abalone techniques are now being used successfully by U.S. abalone farmers.
- The U.S. National Marine Fisheries Service is using fish-enhancement data provided by Japanese scientists to help determine the feasibility of marine-fish stock enhancement.

- U.S.-developed salmon vaccines designed to reduce the mortality rates of hatchery salmon are being evaluated by Japanese scientists for commercial application.

- Both countries maintain libraries of scientific reprints pertinent to aquaculture.

Benefits

The most important benefit of this exchange is the continuous improvement of aquaculture techniques, from collection and preservation of genetic resources to the production of useful strains for culture. Long-term professional cooperation has saved both countries time and money.

Future Plans

Japan and the United States will continue to research the effects of hatchery-produced aquatic species on natural populations.

DIVING PHYSIOLOGY PANEL

Background

Twenty-two years ago, the United States and Japan met to establish a long-term program of cooperation in applied diving physiology and technology; diver safety; diving capabilities; medical aspects of diving; and basic hyperbaric physiology science and technology. The underlying philosophy of the Diving Physiology Panel is to pool resources to facilitate and improve ongoing diving research programs, develop state-of-the-art technology, and identify future needs.

Types of Exchanges

The Diving Physiology Panel has been responsible for more than 10 collaborative research saturation dives. The scientists have investigated physiological and medical problems associated with prolonged hyperbaric exposure; the use of various breathing gear; the development of diving tables; the effects of temperature and cold water immersion; diving equipment development; diver work capabilities and potentials; and safety as well as operational protocols.

Accomplishments

- The panel has conducted joint projects investigating the physi-

ology of ama divers; diving-related illnesses; long-term saturation research; and the effects of diving in hazardous and polluted waters. To investigate ocean-floor processes, research has been conducted using deep-diving submersibles and remote-operated vehicles.

- The "NOAA Diving Manual" and "Living and Working in the Sea" have been translated into Japanese.
- The panel has produced numerous joint publications, which have appeared in peer-reviewed journals worldwide.

Benefits

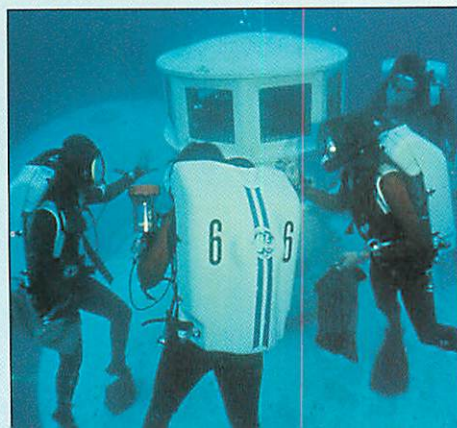
By sharing facilities and capabilities that are unique to each country, researchers have been able to conduct scientific studies and develop technologies that otherwise would not have been possible. Results regarding advances in minimizing and handling diving-related accidents and illnesses, procedures for diving in unique and hazardous environments, extending diver bottom time and

depth, and new diving equipment and technologies have been made available to the United States and Japan, as well as other countries.

Future Plans

Both Japanese and U.S. researchers will emphasize the use of diving physiology, science, and technology in solving environmental problems. In addition, the United States and Japan will implement long-term personnel exchanges, such as placing a Japanese researcher at the NOAA Aquarius saturation habitat in Key Largo, Florida.

At the 14th UJNR Administrative and Marine Resources and Engineering Coordination Committee plenary meeting in July 1993, it was agreed to divide the Diving Physiology and Technology Panel into the Diving Physiology Panel and the Submersible Research Panel. Cooperative research involving manned and unmanned submergence vehicles will be carried out under the Submersible Research Panel. Both the Diving Physiology and the Submersible Research Panels will be chaired on the U.S. side by NOAA and on the Japanese side by the Japan Marine Science and Technology Center.



MARINE FACILITIES PANEL

Background

Since its organization in 1968, the Marine Facilities Panel has been one of the most active groups within the UJNR. Panel members have advanced technology and shared expertise in assessing, developing, and utilizing the oceans and their resources.

Types of Exchanges

The panel meets every 18 months at sites alternating between the United States and Japan to exchange information and visit marine facilities and projects. Exchange topics have included ocean and coastal engineering;

facilities and techniques for ocean-resource exploration and development; advanced ship technology and marine transportation; under-sea systems, submersibles, and remote-operated vehicles; ocean-space utilization, artificial islands, and floating cities; ocean environmental measuring and observational systems; and pollution control, including waste management.

Accomplishments

■ The U.S. Navy, the U.S. Coast Guard, and Mitsui Engineering and Shipbuilding Company have collaborated on semisubmersible, small waterplane area twin hull (SWATH) ship technology. Mitsui initiated development of this technology based on the U.S.

Navy's Kaimalino ship and refined that design to the present 3,000-ton Kaiyo.

■ The Japanese have extended U.S. technological innovation by producing large offshore systems and floating platforms and by advancing ship development.

■ A close dialogue has been maintained regarding the development of shelf-mounted and floating-platform Ocean Thermal Energy Conversion systems and other ocean energy systems. Research in this area has focused on energy independence and related issues, such as freshwater and mariculture in island communities.



■ Research information has been exchanged regarding the effect of icefloes on ships and offshore structures; manned and unmanned undersea vehicles; vehicles operated by remote control; robotics; undersea works systems; and bottom-crawling vehicles.

■ The U.S. National Science Foundation and Japan's Science and Technology Agency have cosponsored workshops on the following topics: autonomous undersea vehicles and robotics; very large floating platforms and artificial islands; deep-ocean upwelling; and remote imaging for sea-floor surveys.

■ Japan's Ship Research Institute has cooperated with the U.S. National Oceanic and Atmospheric Administration (NOAA) to compile an extensive data base and issue the report "Winds and Waves of the North Pacific Ocean (1974-1988)." The same institute has also collaborated with the U.S. Maritime Administration on research of intelligent ship systems.

Benefits

The panel has been an excellent vehicle for equitable technical exchanges; avoiding duplicate research; expediting technological developments; instituting cooperative projects between

government and industry; and stimulating economic growth through scientific advancements.

Future Plans

Plans include continued cooperative research and results exchanges on intelligent ship system technology; coproducing reports on wave data in the North Pacific; participation in symposia on coastal ocean-space utilization; and technology exchanges regarding advanced marine facilities and related topics that emphasize sustainable development.

MARINE GEOLOGY PANEL

Background

The Marine Geology Panel is active in a broad range of multidisciplinary studies of the continental margins and ocean basins. These studies include tectonics; crustal dynamics; geohazards, such as earthquakes, volcanic eruptions, and submarine landslides; marine mineral resources including sea-floor hydrothermal processes and mineral deposits along spreading centers, cobalt-rich crusts, and manganese nodules; geologic evolution of petroliferous sedimentary basins; and transport and deposition of pollutants and waste contaminants in marine sediments.

Types of Exchanges

The panel has exchanged numerous reports, published scientific and technological data on geoscience and natural resource topics, and participated in research cruises and deep-sea submersible dives in the United States and Japan. Japanese scientists have visited U.S. Geological Survey Laboratories in the United States. Similarly, U.S. researchers have spent time at research institutions and on field excursions in Japan.

Accomplishments

- Panel scientists have participated in joint research of ocean drilling programs and projects sponsored by the United Nations Economic Commission for Asia and the Pacific, the Committee for Coordination of Joint Prospecting for Mineral Resources in Asian Offshore Areas, and the South Pacific Applied Geoscience Commission.
- Cooperative research efforts have resulted in more than 30 scientific publications jointly authored by panel members.

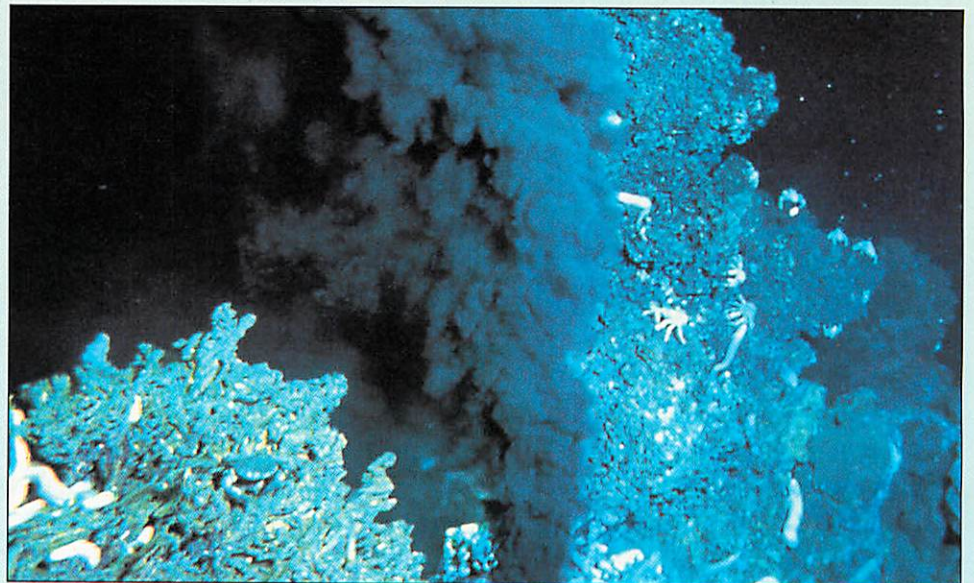
Benefits

The joint study missions and exchanges of personnel, publications, and ideas have provided an in-depth understanding of advances and trends in marine

geoscience research. Joint evaluation of a variety of topics and problems has enhanced the formulation of future research programs.

Future Plans

Panel members will continue joint research at national laboratories and aboard Japanese and U.S. ships and submersibles. While pursuing their present studies, the panel will also research earth processes relevant to scientific problems and societal issues of global importance. Multidisciplinary research on environmental processes of selected coastal oceans (and their spatial and temporal variations in the recent geologic past) will lead to a better understanding of and predictive capability for environmental changes and ecosystem responses.



MARINE MINING PANEL

Background

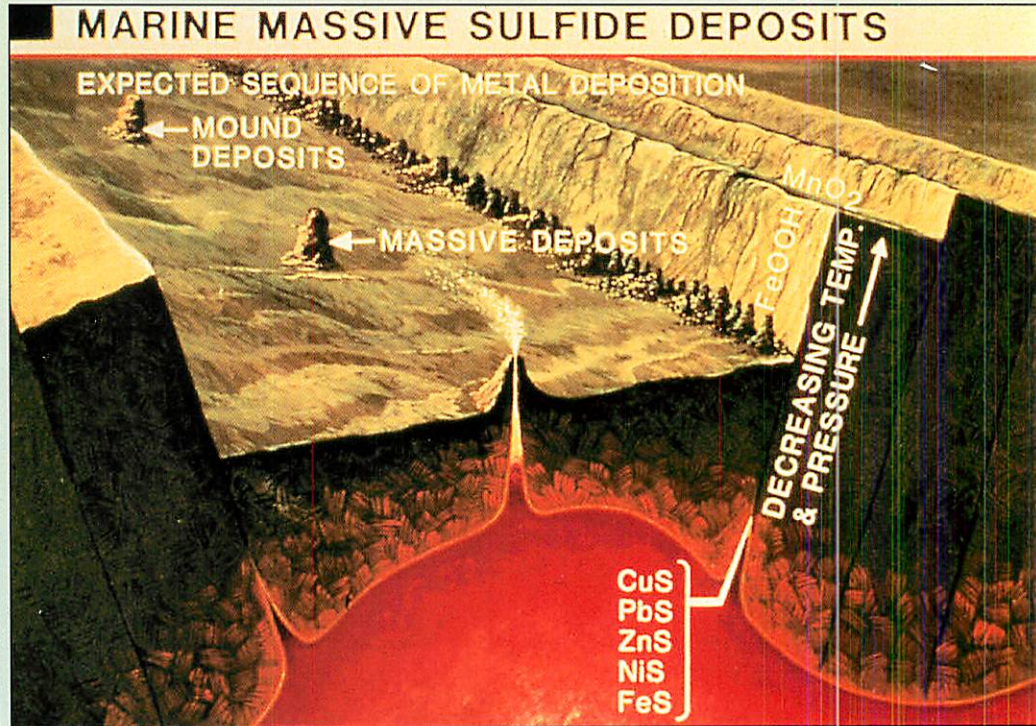
With an emphasis on environmental effects, the Marine Mining Panel has been studying the mining technology of deep-ocean manganese nodules, continental-shelf sand and gravel, polymetallic sulfides, and cobalt-rich ferromanganese crusts.

Types of Exchanges

Over the 23-year life of the panel, exchanges have occurred in four ways: joint meetings and other visits; shared research papers and reports; exchanges of research personnel; and cooperative research projects. Within the constraints of national or corporate security, each side strives to act as a conduit for the other with respect to areas of mutual interest, such as dredging and deep-seabed mining.

Accomplishments

■ Prior to U.S. panel members' visits to Japan, Western researchers were unaware that the world's largest offshore sand and gravel mining industry lay not in the North Sea, as most believed, but in Japan's coastal waters. Japanese researchers helped prepare papers on this topic for Western publication and arranged for several U.S.



scientists to visit offshore mining areas and shoreside processing facilities.

■ Widespread concern over dredging-induced turbidity led a Japanese firm to develop the Anti-Turbidity Overflow System (ATOS). This system prevents the formation of large turbidity plumes that normally emanate from hydraulic dredges. Exchanges of panel information and experts contributed to the development of the ATOS.

Benefits

Because of joint research on sand and gravel mining, the United States has determined that it is

environmentally acceptable to recover seafloor sand for beach replenishment only.

Future Plans

Panel researchers will be testing a simulated "miner" at U.S. and Japanese deep-seabed-mining license sites. In coming years, the focus of the panel will be reshaped.

SEA-BOTTOM SURVEYS PANEL

Background

The Sea-Bottom Surveys Panel emerged in 1970 as a forum that promotes the exchange of marine geophysical and bathymetric research and survey data, and related activities of marine science.

Types of Exchanges

In addition to annual activity reports presented at annual meetings, researchers exchange technical reports noting advances and new developments, particularly those regarding data acquisition and processing systems, including multibeam surveying and survey ships. More recently, the focus of this program has shifted to electronic charts and application of the Global Positioning System (GPS). The panel also conducts a very active technical personnel exchange program.

Accomplishments

Valuable information and data are readily shared. Japan and the United States have exchanged personnel and digital data to further the development of electronic charting systems. Panel members in both countries have been extremely responsive to problems and questions. The

panel has taken field visits and technical tours to give members firsthand exposure to the latest technologies and research findings in marine science.

Benefits

The exchange of information, data, and technical personnel has been invaluable. Solutions to data collection and processing problems have been jointly investigated, and potential shortcomings in associated systems have been avoided. Digital-data exchange formats necessary to the advance-

ment of electronic charts will continue to be developed.

Future Plans

The panel will concentrate on developing Electronic Chart Display and Information Systems and the transfer of digital chart data into the International Hydrographic Organization's exchange format. In addition, panel researchers will explore multibeam surveying systems and future applications for GPS.



NEW PANELS

Pacific Ocean Observations and Research Panel

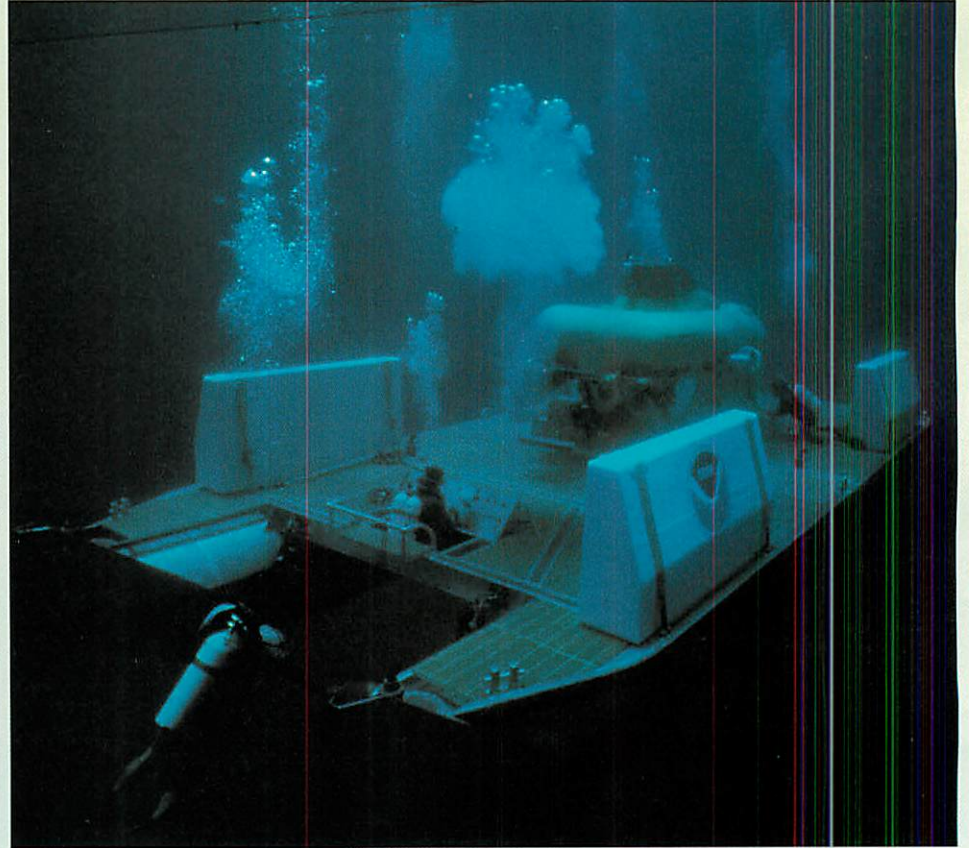
This panel, which was proposed under the U.S.–Japan Science and Technology Agreement of May 1993, aims to enhance bilateral development of a Global Ocean Observing System in the Pacific. The U.S. National Oceanic and Atmospheric Administration (NOAA) and Japan's Science and Technology Agency (STA) will coordinate efforts under this new UJNR panel. Initial research topics will range from fisheries studies to developing procedures for measuring greenhouse gases.

Submersible Research Panel

The panel will cooperate in both manned and unmanned submersible research and technology. Panel goals are to facilitate and improve ongoing studies, develop new technology, and identify future needs in undersea research. The panel will be chaired by NOAA and the Japan Marine Science and Technology Center (JAMSTEC).

Marine Environmental Science and Technology Panel

This panel will encourage and implement exchanges of marine environmental science and technology data, information, and



personnel, as well as the joint use of research facilities and equipment. In addition, it will develop collaborative projects of interest to Japan and the United States. Initial research may include the role of oceans in greenhouse-gas reduction, sequestration, and disposal; the assimilative capabilities of oceans for waste disposal; bioremediation of waterborne pollutants, such as heavy metals and sewage-related nutrients; and oceans as alternative energy sources.

Nonmarine Panels

CONSERVATION, RECREATION, AND PARKS PANEL

Background

Since its establishment in 1965, the Conservation, Recreation, and Parks Panel has studied the preservation and management of natural areas and protected heritage sites, and the interpretation of these sites for the public. These studies include national parks and forests, wildlife refuge systems, and urban and near-urban park and recreation areas.

Types of Exchanges

Panel activities have included periodic exchanges of information and professional personnel, joint conservation assistance to developing countries, and coordination of bilateral and multilateral conservation treaties.

Accomplishments

- The panel has assisted in improving visitor services for Japanese travelers to U.S. National Parks and has exchanged information and personnel to aid the interpretation of South Pacific World War II events in National Park System units.
- The panel has aided the protection of endangered species through the U.S.-Japan Migratory Bird Treaty.

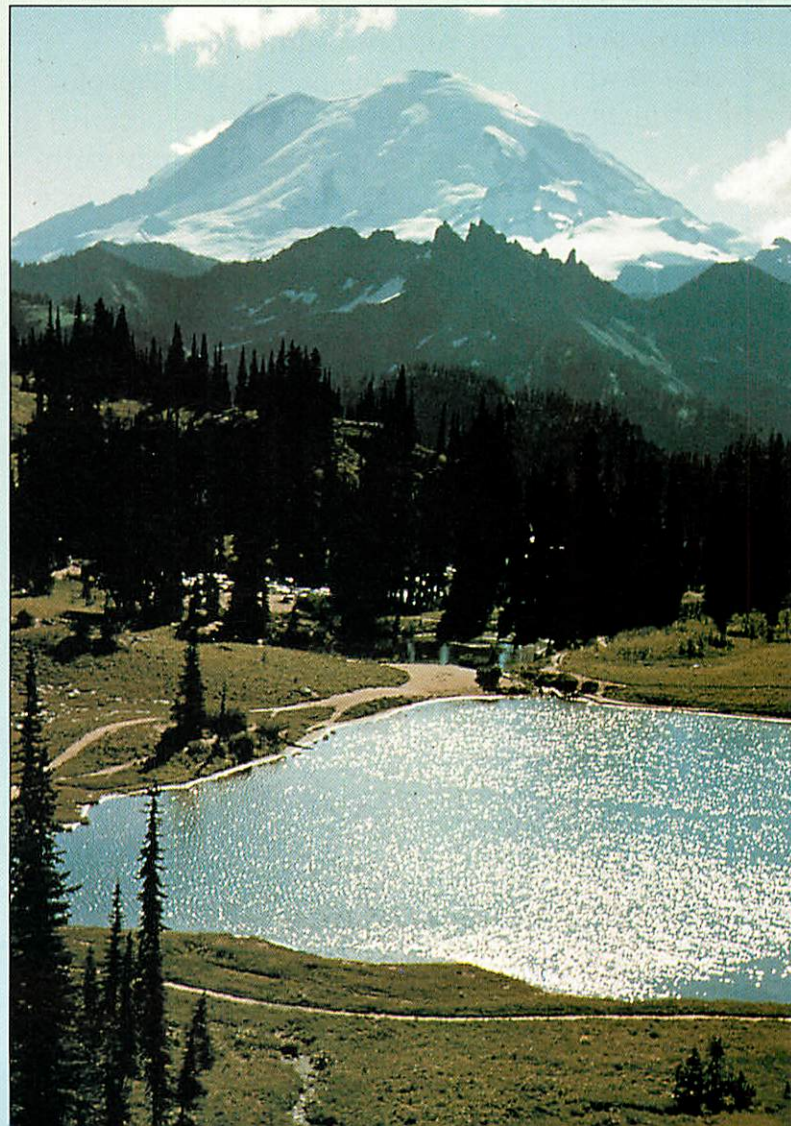
■ In accordance with the World Heritage and Ramsar Conventions, researchers have examined policies and actions of the United States and Japan regarding the protection of World Heritage sites and wetlands.

Benefits

The panel's work has improved the management and operation of protected natural and cultural properties in Japan and the United States.

Future Plans

Upcoming collaborations will emphasize preservation of biological diversity; ecosystems management; joint conservation-management assistance to developing countries; sustainable design of facilities in parks; and government and private sector cooperative-funding efforts.



EARTHQUAKE PREDICTION TECHNOLOGY PANEL

Background

In response to the devastation caused by earthquakes, both the United States and Japan have established vigorous national research programs in seismology, geology, and geodesy. The Earthquake Prediction Technology Panel combines basic and applied research to improve our understanding of the causes and effects of earthquakes and to facilitate the transmission of research results to those who implement hazard-reduction measures.

Types of Exchanges

The principal means of exchanging technical information has

been the biannual panel meetings. These meetings serve as intensive workshops and draw researchers from government and university laboratories in the United States and Japan. Presentations have covered a range of findings, including research on recent earthquakes; crustal deformation monitoring; precursory phenomena; modeling techniques; laboratory and theoretical studies; and automated processing of both seismic and crustal deformation data.

Accomplishments

Over the past 15 years, revolutionary changes have occurred in technology used to study earthquakes. These advances include more accurate sensors for measuring the source of an earthquake; the application of automated data

analysis to the routine study of seismicity; and the improvement of methods that detect crustal deformation, principally those that use space-based geodesy. The Earthquake Prediction Technology Panel has stimulated research on all of these topics and advanced their adoption by providing an ongoing forum for exchange of ideas and results prior to formal publication.

Benefits

Earthquake-monitoring and emergency-response operations in the United States and Japan have improved due to advances in real-time analysis of earthquake data and the use of Global Positioning Satellites for real-time measurement of crustal strain accumulation (ultimately the cause of earthquakes).

Future Plans

The panel will strive to advance the use of computer networks in archiving and retrieving seismic wave-form data. In addition, members will continue to cooperate in the application of space techniques to earthquake prediction research.



FIRE RESEARCH AND SAFETY PANEL

Background

The Fire Research and Safety Panel was established to explore the chemistry and physics of different kinds of fires. Research is geared toward understanding and predicting fire behavior and its effects on life and property.

Types of Exchanges

Collaborative research has enabled staff to maximize the strengths of each country's laboratory facilities. The panel has advanced fire science and technology in such areas as fire-smoke toxicity; fire detection; micro-gravity combustion; thermal

degradation of polymers; intumescent polymer burning; wall-fire modeling; smoke yields from pool fires; smoke flow in buildings; building-fire modeling; and rate of heat-release measurement.

Accomplishments

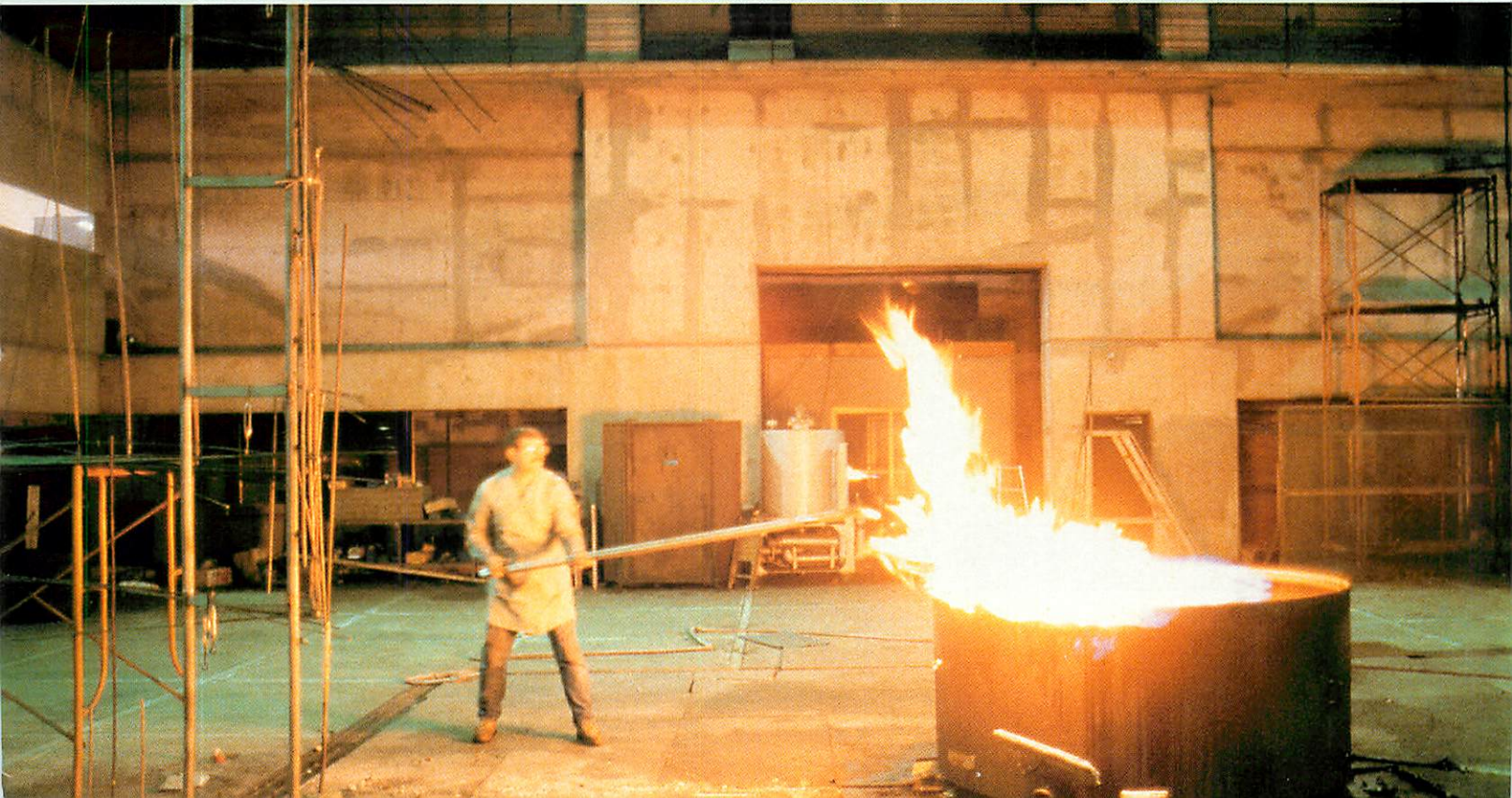
- Staff have published more than 300 papers in "Joint Panel Proceedings."
- Panel researchers have cooperated in conducting and interpreting fire tests to ensure the acceptability of wooden structural members in low-rise construction in Japan.
- The panel has developed methods for including corridor flows in zone models.

Benefits

Collaborative research has led to a new option for housing; a new method for testing fire-smoke toxicity; the formation of an international fire-safety science association; and access to unique fire-research facilities in both countries.

Future Plans

Panel members will continue to develop risk-assessment methods, fire-test methods, and design standards, as well as advancing fire-protection and -prevention technology.



FORAGE SEED PRODUCTION PANEL

Background

The Forage Seed Production Panel concentrates on forage seed production research and forage germ plasm exchange.

Types of Exchanges

Throughout its history, the panel has emphasized cooperative research, as well as information and germ plasm exchange. A number of study tours, hosted by Japanese and U.S. scientists, have been conducted under the auspices of the UJNR.

Accomplishments

Through panel efforts, 644 grasses and 158 legume accessions

have been introduced to the United States, and 1,201 accessions have been introduced to Japan. Panel researchers have identified 4 alfalfa and 73 timothy accessions that possess potentially useful genetic diversity. A timothy cultivar, 'colt,' released in 1993 for commercial use and a promising breeding line were both developed by FFR Cooperative Indiana in the United States and contain some genetic diversity from Japanese introductions.

Benefits

Forage germ plasm exchanges have enhanced the resource bases of both countries. Panel researchers in the United States and Japan have assembled abundant data on the performances of

introduced cultivars. Strong bilateral professional relationships have been established.

Future Plans

Future efforts will emphasize cooperative research on forage pathology and seed production. We will continue germ plasm exchanges, and bilateral evaluation and study tours. A major goal is to establish a rotating position for a Japanese scientist at the National Forage Seed Production Research Center in Corvallis, Oregon, to conduct seed production research on Japanese forage cultivars.



FORESTRY PANEL

Background

The Forestry Panel studies sustainable development and conservation of forest resources. Its objective is to increase mutual understanding of U.S. and Japanese forest-resource-management policies and practices through scientific exchange.

Types of Exchanges

The panel has participated in many exchanges of information and personnel covering a range of forestry issues, including sustainable forestry, mechanization, biotechnology, forest health and protection, watershed management, wood fuels; and international development assistance.

Accomplishments

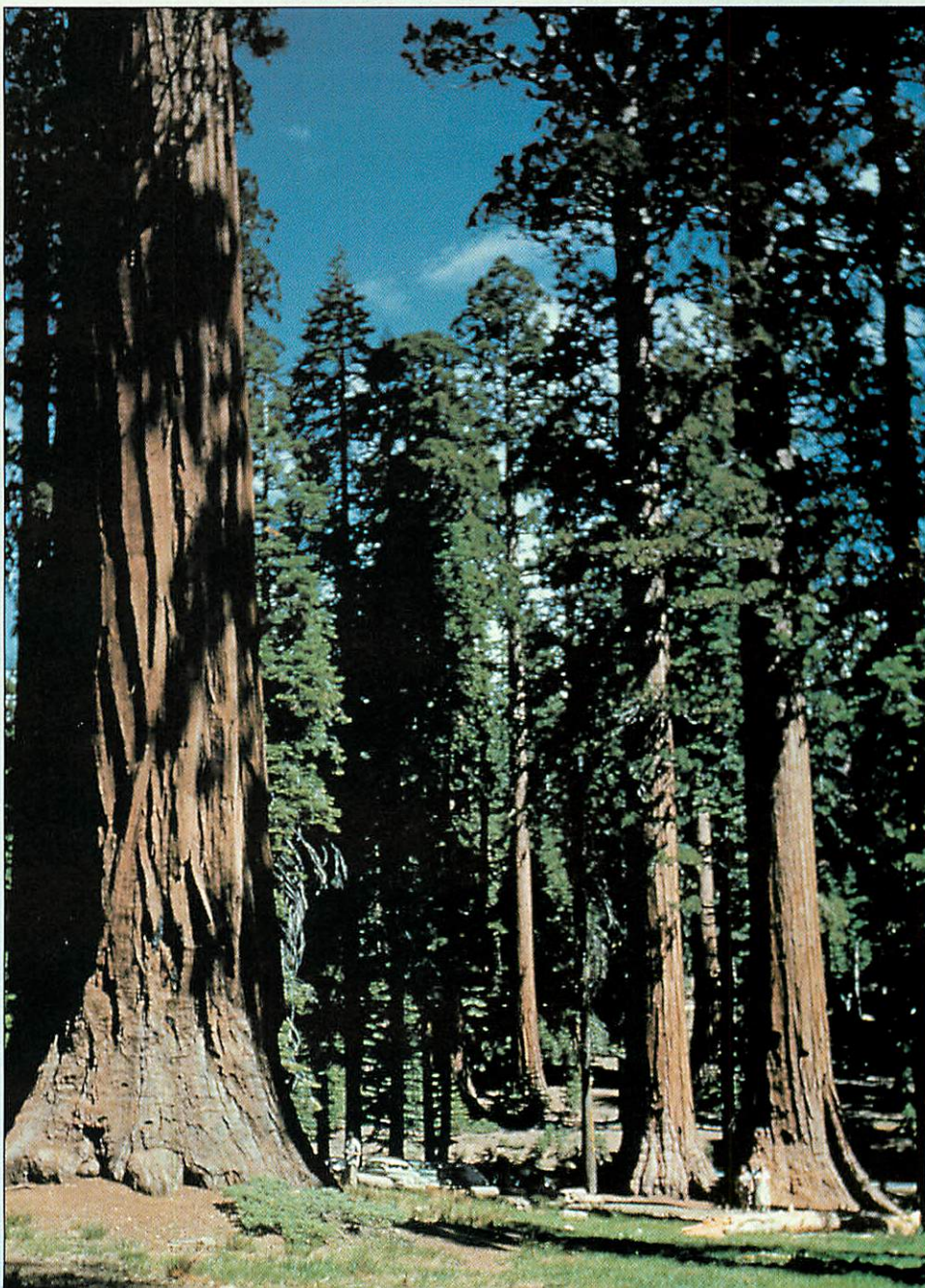
Through regular panel meetings and detailed reports, researchers exchange new forestry technology and information. In addition, long-term collaboration has improved research on landslide prediction and forest diseases.

Benefits

The benefits of panel cooperation include information exchanges, Japanese sponsorship of U.S. foresters' long-term study in Japan, and increased understanding of U.S. and Japanese perspectives on international development.

Future Plans

In coming years, Japan and the United States will focus on ecosystems management and furthering sustainable forestry in developing countries.



MYCOPLASMOSIS PANEL

Background

The Mycoplasmosis Panel promotes the exchange of scientific information involving mycoplasma organisms that affect livestock and, especially, poultry. These organisms are economically important to animal industries in the United States and Japan and are extremely difficult to diagnose, treat, and control.

Types of Exchanges

Japanese and U.S. scientists have visited one another's laboratories for extended collaboration and research. Numerous published and unpublished documents concerning the control of mycoplasmosis in poultry and swine have been exchanged by the two countries. Also, subject matter has expanded to address new or emerging organisms affecting these animals. For instance, panel research has produced new information on the porcine reproductive and respiratory syndrome virus.

Accomplishments

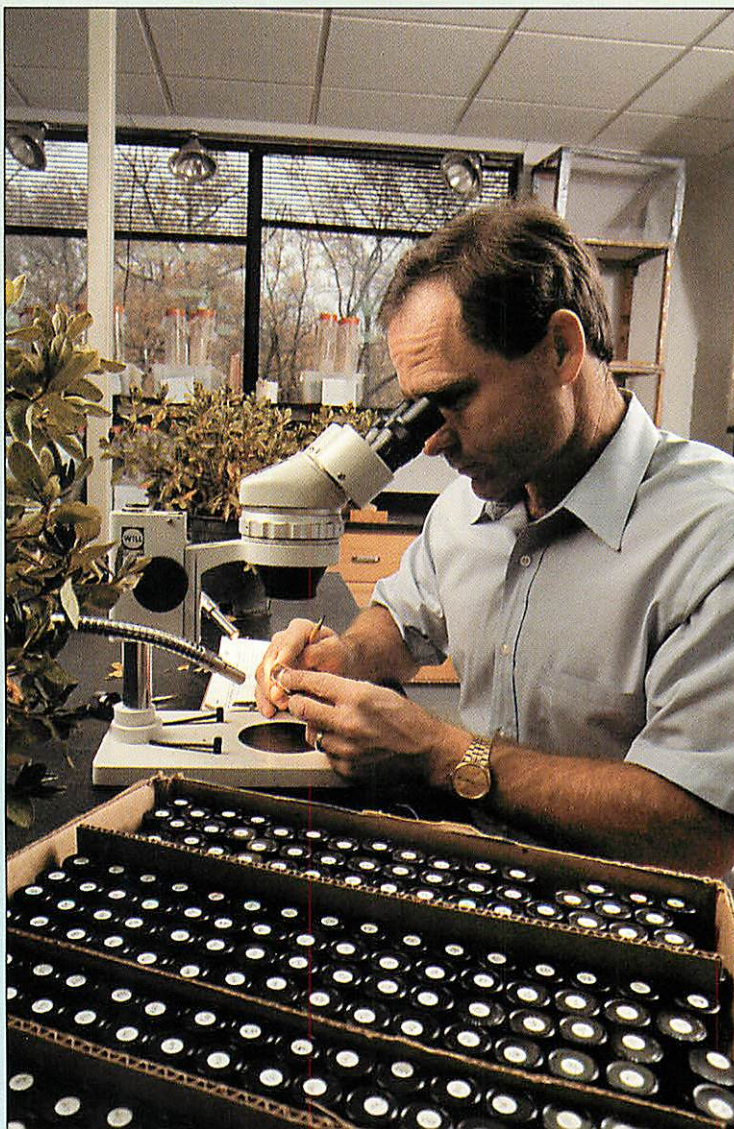
Through data and research exchanges, the panel has increased communication on mycoplasmal livestock and poultry diseases.

Benefits

The activities of this panel have contributed to a better understanding of animal-disease problems and control programs.

Future Plans

While continuing to emphasize mycoplasmal diseases of livestock and poultry, panel members are expanding their research to include all major infectious diseases of these animals.



PROTEIN RESOURCES PANEL

Background

The Protein Resources Panel focuses on optimizing production of agricultural resources and developing technologies for cost-effective, energy-efficient conversion to valuable food products. Panel programs include structure, function, and engineering of proteins; food and feed products from plants and animals including fish, mollusks, and microorganisms; product quality and nutrition; microbial food safety; improved technologies for food storage, handling, processing, and distribution; and uses for agricultural byproducts and wastes.

Types of Exchanges

At annual panel meetings, members, as well as researchers from Japanese and U.S. industry, government, and academia, discuss ongoing research, recent technological advances, and relevant publications. Papers presented at meetings are published as proceedings. Meetings also include study tours to research institutions. To facilitate collaborative research, panel members have arranged short and extended stays at laboratories in the United States and Japan.

Accomplishments

Through panel programs, communication and cooperative research are greatly enhanced. The annual panel meetings advance new technologies for distributing and marketing plant-, animal-, and fish-protein products, and the meeting proceedings in which these results are published are recognized as an excellent scientific reference. Sabbaticals by U.S. and Japanese researchers are advancing soybean- and grain-protein products as new foods.

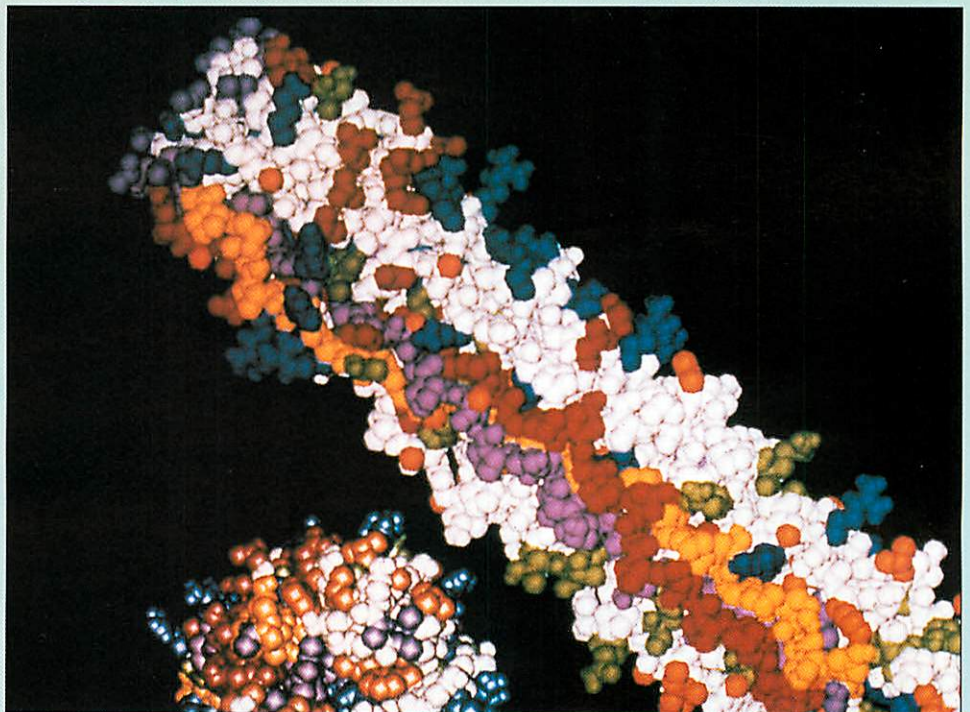
Benefits

Panel meetings foster collaborative studies and scientific

exchange. Researchers share materials regarding the most efficient use of agricultural resources, especially in basic and applied protein studies. Informal discussions during the meetings and study tours promote understanding of U.S. and Japanese cultures and aid cooperation.

Future Plans

Exchange of research personnel and promotion of collaborative projects will continue to be emphasized. Future studies will focus on nutrition and nondestructive analytical methods for determining use of agricultural commodities for food and non-food products.



TOXIC MICRO-ORGANISMS PANEL

Background

The Toxic Micro-Organisms Panel examines algae, bacteria, and fungi that contaminate food and cause human or other animal diseases and looks for ways to prevent such illnesses.

Type of Exchanges

Panel members routinely exchange cultures as well as laboratory reports and other publications on toxic micro-organisms. Other exchanges have included botulism toxins, methods for mycotoxin decontamination in commodities, and toxin standards used in analyses.

Accomplishments

Eight books have been published, most through the sponsorship of international symposia, on topics that have never been covered or summarized in a book or review. One of these landmark publications introduced pioneering Japanese work on the food-poisoning bacterium *Vibrio parahaemolyticus* to the international scientific community.

Benefits

Through the panel's collaborative efforts, avian botulism has been identified as the cause of epidemic

wild-waterfowl poisoning in Japan. Japanese manufacturing processes incorporated into U.S. businesses have increased production efficiency. Also through panel efforts, U.S. peanut germ plasm and processing methods have been supplied to Japan; seafood poisonings previously unknown to U.S. researchers have been identified; and bacteria-tolerance regulations for use in U.S. and Japanese meat and poultry industries have been developed.

Future Plans

In coming years, the panel will emphasize molecular approaches to food-safety issues that involve toxic micro-organism. This focus will help both U.S. and Japanese scientists better understand and control microbial toxins, intoxication diagnosis, and micro-organism pathogenicity, thereby ensuring a safer world-food supply.



WIND AND SEISMIC EFFECTS PANEL

Background

The Wind and Seismic Effects Panel promotes exchanges of technology for the prevention of damage caused by strong winds, earthquakes, storm surge, and tsunamis. Through the panel, U.S. and Japanese researchers share seismic and high-wind measurement records as well as technical data and information on design and construction of civil-engineering lifelines, buildings, and waterfront structures.

Types of Exchanges

Research exchanges have advanced technology regarding the effects of seismic forces on steel, concrete, and masonry structures; liquefaction risk analysis; modeling of water seepage in dam foundations; and comparative analysis of seismic design of U.S. and Japanese bridges.

Accomplishments

- The panel has exchanged more than 200 guest researchers and contributed to improved structural standards and building codes.
- Panel scientists annually visit more than 12 major public-works construction projects to view

innovative civil-engineering techniques. Researchers also visit research laboratories to observe unique test and measurement capabilities. Such visits enhance research, design, and construction procedures used by both Japan and the United States.

- Teams working under panel auspices have performed postdisaster surveys to improve constructed facilities.

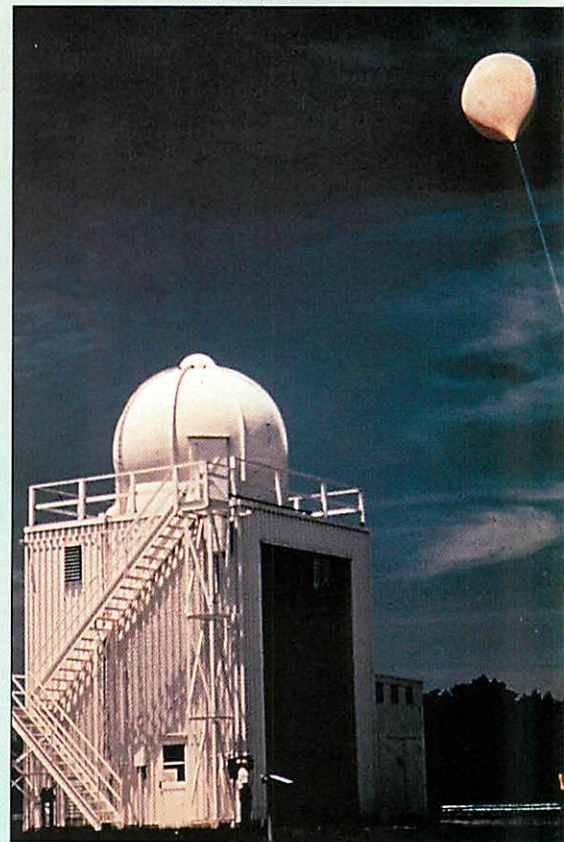
Benefits

Panel activities have improved building and bridge standards and codes, and aided structure design and construction in Japan and the United States. In addition, panel members have created and exchanged digitized earthquake records; shared earthquake engineering information and strong-motion measurement techniques with seismically active countries; produced database systems for improved prediction of soil liquefaction; and verified mathematical models of storm-surge and tsunami warning systems.

Future Plans

The panel will continue to publish its annual meeting proceedings, proceedings of workshops of its 10 Task Committees, and translations of Japanese civil infrastructure reports. It will

also begin publishing a semiannual newsletter to disseminate panel information to peers, decisionmakers at government laboratories, and other organizations concerned with wind and seismic effects.



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