

Meetings

Physical Oceanography: Plans for U.S.-Japan Cooperation

Seven Japanese and seven American oceanographers participated in the planning meeting on physical oceanography of the Pacific Ocean, held in Tokyo, 18-23 March 1964, under the auspices of the United States-Japan Cooperative Science Program.

The oceanographers envision the establishment of a series of recording stations along the Asiatic and North Pacific coasts and at island stations in the Pacific Ocean which would supply a continuous flow of data for study by the scientists of the two nations. These stations would provide continuous observations of temperature, salinity, sea level, standard meteorological elements, and solar radiation. Such observations are of primary importance in the study of climatological variability of the sea, oceanic circulation, and the energy exchange between the atmosphere and ocean.

Felix Favorite, of the Bureau of Commercial Fisheries Laboratory, Seattle, put forth a proposal based on his group's experiments with drifting interrogating-transponding telemetry buoys. It is his aim to obtain continuous oceanographic and meteorological observations in the open ocean by use of drifting rather than anchored buoys.

He further proposed that Japan and the United States cooperate in a series of experiments in the launching and tracking of test buoys to determine the feasibility of tracking telemetry buoys from Japan across the Pacific to the United States. T. Hirano of the Tokai Regional Fisheries Research Laboratory indicated his willingness to assist in this program.

It was proposed that further consideration be given to the establishment of a network of permanent interrogating and receiving radio stations to transmit oceanographic and weather data when it has been demonstrated

that buoys can be tracked across the ocean by ship, aircraft, or both.

The participants in the meeting examined mutual oceanographic problems on many levels and suggested ways to provide solutions by future joint United States-Japan scientific efforts. The first three days were devoted to the discussion of topics of direct interest and concern to the individual participants: (i) The preparation of historic, average, and synoptic charts of temperature at the sea surface and at selected subsurface depths in the Pacific Ocean; (ii) the relation of thermal structure to ocean circulation, to distribution of mass, and to sea level fluctuation; (iii) thermal structure in upwelling and frontal zones; (iv) relationship between seasonal and permanent thermocline and the main pycnocline; (v) the air-sea energy exchange problem, and (vi) theoretical studies of the above processes.

A number of general recommendations resulted from the discussions: That oceanographic data be exchanged promptly; that provisions be made for the exchange of out-of-print or unpublished scientific data; that annotated bibliographies be prepared of all papers written by Japanese oceanographers; that articles of major importance and general interest to oceanographers, published in the Japanese language, be selected for translation; that continuing efforts be made in the field of standardization and intercalibration of instruments and methodology for oceanographic work; and that the exchange of Japanese and American scientists be encouraged and implemented. It was recommended that seminars be held to report scientific findings and that such seminars should include, but not necessarily be limited to, the following specific topics: (i) Physical processes associated with fluctuation in the depth of the thermocline, (ii) oceanic fronts, (iii) specific topics related to air-sea interaction, (iv) changes in sea level and related

changes in mass distribution and currents, and (v) the relation between seasonal variation in thermal structure below the surface and seasonal variation in current systems. It was agreed that all scientists in both countries who are interested in and actively working in the types of research discussed in these meetings be encouraged to participate in the work, either by direct or by general invitation.

Many of the more specific recommendations resulted from a review of problems in which the individual participants are now engaged. For example, both J. H. Johnson (Bureau of Commercial Fisheries, San Diego) and M. Hanzawa (Japan Meteorological Agency) are engaged in the preparation and publication of synoptic sea surface temperature charts. The American agency publishes charts covering the eastern Pacific, and the Japanese agency publishes charts covering the western Pacific. The participants recommended the immediate implementation of a program to prepare and distribute each month a single sea surface temperature chart covering the entire Pacific Ocean north of 30° south latitude, and sea surface temperature anomaly charts showing the deviations of temperature from the 1950-59 mean temperatures in this area. In order for this recommendation to be carried out, rapid exchange of data will be required.

A further recommendation was made that historical charts of sea-surface temperature be constructed which would make use of both Japanese and American collections of data.

The participants also recommended that the United States and Canadian agencies which are currently carrying out observational programs in the sub-Arctic regions make plans to coordinate their 1965-66 programs with the UNESCO-sponsored study of the Kuroshio in which the Japanese are participating.

Japan has already begun a program for the installation of continuous recording instruments for meteorological and oceanographic data. K. Hishida of the Meteorological Institute, Tokyo, conducted the participants on a trip to observe the new observation tower recently installed 400 meters from shore in water of 20 meters depth near Ito in Sagami Bay. The observations which are carried out automatically from this tower include measurements of air and sea temperature, salinity, radiation, wind, water level, tidal cur-

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D-Arabinose-C14 (U)	1-5
Erythritol-C14 (U)	2-4
D-Fructose-C14 (U)	2-4
D-Fructose-C14 (U)	50-100
[High specific activity]	
D-Galactose-1-C14	2-4
D-Galactose-1-C14	20-30
[High specific activity]	
D-Glucose-C14 (U)	2-4
D-Glucose-C14 (U)	50-150
[High specific activity]	
D-Glucose-1-C14	2-4
D-Glucose-1-C14	20-30
[High specific activity]	
D-Glucose-2-C14	1-4
D-Glucose-2-C14	20-30
[High specific activity]	
D-Glucose-6-C14	2-4
D-Glucose-6-C14	20-30
[High specific activity]	
D-Glucose-6-T	100-500
D-Glucose-6-T [High specific activity]	>1000
D-Glucose-C14 (U)-6-phosphate	2-4
D-Glucose-C14 (U)-6-phosphate	50-150
[High specific activity]	
D-Glucose-1-C14-6-phosphate	2-4
myo-Inositol-C14 (U)	10-50
Lactose-1-C14	4-12
Maltose-C14 (U)	4-10
Maltotriose-C14 (U)	100-250
D-Mannitol-1-C14	10-30
D-Mannose-C14 (U)	2-5
D-Mannose-1-C14	1-4
D-Mannose-1-C14	20-35
[High specific activity]	
D-Mannose-2-C14	1-3
Methyl-(α -D-glucosyl)-C14	2-150
pyranoside (U)	
Potassium D-gluconate-6-T	100-250
Potassium D-glucuronate-C14 (U)	2-5
Potassium D-glucuronate-6-C14	2-5
D-Ribose-C14 (U)	2-4
D-Ribose-1-C14	2-4
D-Ribose-1-C14	15-30
[High specific activity]	
Sodium D-gluconate-C14 (U)	2-6
Sodium D-gluconate-1-C14	2-5
Sodium D-gluconate-6-C14	1-4
Sorbitol-C14 (U)	5-10
Sorbitol-1-C14	2-5
L-Sorbose-C14 (U)	2-4
Starch-C14 (U)	2-50 μ c/mg
[Tobacco leaf; amorphous]	
Sucrose-C14 (U)	5-15
Sucrose-C14 (U)	150-200
[High specific activity]	
D-Xylose-C14 (U)	1-4

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The detailed proposals for cooperation on individual, institutional, and governmental levels are included in the final report of this planning meeting submitted to the Japanese Society for the Promotion of Science and to the National Science Foundation. Persons interested in participating in this program may request copies of the final report from the Office of International Science Activities, National Science Foundation, Washington, D.C., 20550. Proposals have already been submitted to the official Japanese and American committees for the exchange of four oceanographers under this program. It is hoped that this report of the success of this meeting will encourage many oceanographers to actively participate in the United States-Japan Cooperative Science Program.

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Forthcoming Events

December

15-18. **High Energy Astronomy**, symp., Univ. of Texas, Austin. (Office of Aerospace Research, 4th and Independence Avenue, SW, Washington, D.C. 20233)

15-18. **Relativistic Astrophysics**, symp., Univ. of Texas and Southwestern Center for Advanced Studies, Austin. (Mrs. J. Wardlaw, Dept. of Physics, Physics Bldg. 438, Univ. of Texas, Austin 78712)

16-21. **Inter-American Congr. of Psychology**, 9th annual, Miami, Fla. (V. D. Sanua, Yeshiva Univ., 110 W. 57 St., New York 10019)

20-24. **Theoretical and Applied Mechanics**, congr., Kanpur, India. (M. K. Jain, Indian Inst. of Technology, Kharagpur)

21-23. **American Physical Soc.**, Berkeley, Calif. (W. Whaling, California Inst. of Technology, 1201 East California St., Pasadena)

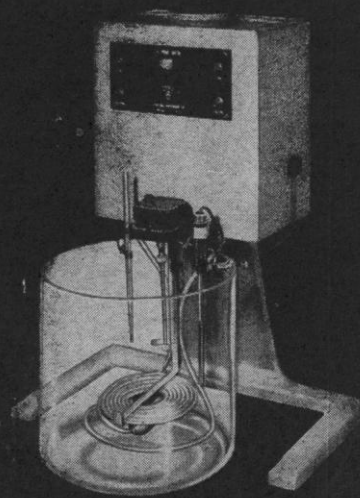
21-23. **Biology of Marine Microorganisms**, conf., Univ. of California, Berkeley. (R. Newton, Letters and Science Extension, Univ. of California, Berkeley 94720)

26-29. **Society of Systematic Zoology/American Soc. Zoologists/Herpetologists' League**, annual, Univ. of Tennessee, Knoxville. (J. G. Rozen, Jr., Dept. of Entomology, SSZ, American Museum Natural History, Central Park West and 79th St., New York, N.Y.; A. G. Richards, ASZ, Dept. of Entomology, Univ. of Minnesota, St. Paul 55101; J. M. Legler, HL,

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