

Meetings

Kuroshio

A symposium on the results of the "Cooperative Study of the Kuroshio and Adjacent Regions" (CSK) was held at the East-West Center, University of Hawaii, Honolulu, 29 April–2 May 1968. The CSK area extends from 160°E to the mainland of Asia and from 4°S to 47°N. Subject matter of the papers presented at the symposium included oceanography, fisheries, and plankton.

In oceanography most interest centered on a subtropical countercurrent, transport, and velocity in the Kuroshio, and frontal processes and eddies associated with the Kuroshio-Oyashio interface. Other papers dealt with such widely varied topics as fine-scale temperature profiles (as revealed by thermistor chain) in the Kuroshio, currents in Korea Strait, and bathymetry of the South China Sea.

The existence of a subtropical countercurrent, which had been postulated earlier by Yoshida (University of Tokyo) on the basis of transport computations from seasonal wind-stress distributions, was verified by Yoshida as well as by Masuzawa (Japan Meteorological Agency), Muromtsev (State Oceanographic Institute, Moscow), and Uda (Tokai University). This eastward-flowing current is believed to be a permanent or semipermanent feature in the latitudes of 20°N to 24°N, best developed in winter and spring. Surface velocities are of the order of 10 to 20 cm/sec. A remarkable feature, which remains to be verified by more closely spaced observations, appears to be the existence of banding; easterly flow apparently takes place in bands located between 21°N to 22°N, 24°N to 25°N, and 27°N to 28°N. Data from the Hawaiian Islands region and the Sargasso Sea also showed indications of easterly flows north of 20°N. These results lead Yoshida to expect, in conformity with his earlier computations, that easterly

flows will be found between 20°N to 25°N and 20°S to 25°S in all the world oceans.

Information on transport and velocity at a number of geographic locations in the Kuroshio was presented by Chu (National Taiwan University), Nitani (Hydrographic Office of Japan), Nitani and Shoji (Hydrographic Office of Japan), Muromtsev, and Uda. Nitani, for example, finds the transport to be 30×10^6 m³/sec east of Luzon, 40×10^6 m³/sec east of Taiwan, and 45 to 50×10^6 m³/sec south of Kyushu. Transport and velocity estimates were based primarily on geostrophic computations, although some GEK observations were made. The need was felt for direct current observations at subsurface levels.

The Kuroshio-Oyashio front, and particularly the eddies associated with it, received attention from Barkley (U.S. Bureau of Commercial Fisheries, Honolulu), Ichiye (Lamont Geological Observatory), Muromtsev, and Uda. Barkley had recently presented a kinematic model of the front, consisting of a pair of von Kármán vortex streets arranged side by side. Although his model explained many major features of the region, it did involve an eastward displacement of the system of about 50 cm/sec, whereas in reality the system appears to be quasi-stationary. By taking Coriolis force into account, this feature is overcome and the model conforms to observation. Predictions arising from the model suggest the design of field work to test the model. Attention was drawn by Uda to the relation between the distribution and abundance of certain fishes and whales and the location of the eddies.

On the subject of fisheries, attention was centered on demersal fisheries, particularly in the Sunda Shelf region, fishery oceanography, species synopses and systematics of anchovy, threadfin-bream, and lizard fish, and subpopulation identification of skipjack tuna and

other fishes. Other papers dealt with such topics as the distribution and abundance of larval skipjack, tagging experiments on several species, and the association between tunas and floating objects.

The phenomenal development of the demersal fishery in the Gulf of Thailand, resulting from the introduction of appropriate new technology, was reported by Tiews (Bundesforschungsanstalt für Fischerei, Hamburg), Sucondharn (Department of Fisheries, Thailand), and Isarankura (Department of Fisheries, Thailand). The growth of the fishery has been so spectacular that it may now be considerably overcapitalized. Stock assessment studies are seriously handicapped by the lack of adequate catch and effort data and by the fact that the fisheries are based upon a large number of species. The demersal productivity of the Gulf of Thailand has proven to be much greater than was previously believed to be the case for tropical areas in general and for this area in particular. This productivity had led Tiews to estimate a rather startlingly high demersal productivity potential for Southeast Asia. As a consequence, Menasveta (Department of Fisheries, Thailand) reviewed all the available data on the demersal productivity of the Sunda Shelf. His results indicate that, while the productivity is not as high as suggested by Tiews, it is certainly higher than would have been believed 10 years ago. In connection with demersal fisheries, the need was felt for better catch and effort data and for stock assessment studies.

Various aspects of fishery oceanography were reported by Han and Gong (Fisheries Research and Development Agency, Korea), Hattori (Tokai Regional Fisheries Research Laboratory), Hirano and Fujimoto (Tokai Regional Fisheries Research Laboratory), and Uda. Uda's comments on the association of fishes and whales with the eddies of the Kuroshio-Oyashio have already been noted. Hattori presented interesting information on the distribution of fish larvae in a section across the Kuroshio south of southern Honshu. These data could be categorized in four groups: those species found only inshore of the Kuroshio, those found inshore and on the offshore side of the Kuroshio but not in between, those found throughout the entire section, and those found only in the offshore area.

Fishes of the genera *Nemipterus*, *Saurida*, and *Stolephorus* have not been studied comprehensively. As a result, their systematics and nomenclature and the distribution of individual species are not well known. Systematic works on these genera by Eggleston (Agriculture and Fisheries Department, Hong Kong), Shindo (Seikai Regional Fisheries Research Laboratory), and Ronquillo (Philippine Fisheries Commission), respectively, were welcome. Summaries of information or species synopses in the format of the Food and Agriculture Organization were presented by Isarankura for *Nemipterus hexodon*, by Nakamura (U.S. Bureau of Commercial Fisheries, Honolulu) for *Stolephorus purpureus*, and by Tham (University of Singapore) for *S. pseudoheterolobus*.

Data based on a serum esterase system examined by Fujino (U.S. Bureau of Commercial Fisheries, Honolulu) show that the skipjack tuna, *Katsuwonus pelamis*, from Japan, Okinawa, Marianas, and Palau are genetically distinct from those found in the Hawaiian Islands and in the northeastern tropical Pacific. There was no evidence suggesting the existence of more than one subpopulation in the western Pacific. The need was recognized for subpopulation studies for a number of species and the saury, *Cololabis saira*, and chub mackerel, *Rastrelliger brachysoma*, were identified in particular as presenting pressing problems.

In plankton, interest was primarily on distribution and distribution in relation to environment. Other subjects were discussed including systematics. Particular interest was shown in the charts of Yamazi (National Science Museum, Tokyo) showing the distribution and abundance of a large number of plankters.

Participating in the symposium were individuals from nine countries. The convenor of the symposium, John C. Marr (U.S. Bureau of Commercial Fisheries, Honolulu), will act as editor of the publications—a volume including a summary report and abstracts of papers to be published in the immediate future and the proceedings, including the papers in full, to be published as soon as possible.

The symposium was followed on 3–4 May by the fifth meeting of the CSK International Coordinating Group. Kiyoo Wadati (Saitama University) serves as the international coordinator and Marr as the assistant international coordinator for fisheries. The CSK is

carried out under the sponsorship of the Intergovernmental Oceanographic Commission, UNESCO, and the Fisheries Department, FAO. Countries participating in the fifth meeting included China, Japan, Korea, Philippines, Singapore, Thailand, United Kingdom (Hong Kong), the United States, and the U.S.S.R. Absent were Indonesia and Viet Nam.

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Calendar of Events

National Meetings

September

1–6. American Soc. of **Hematology**, New York. (J. F. Mustard, Blood and Vascular Disease Research Unit, Univ. of Toronto, Ont., Canada)

2–3. American Soc. of **Zoologists**, Hanover, N.H. (F. V. McCann, Dept. of Physiology, Dartmouth Medical School, Hanover 03755)

3–7. **Botanical** Soc. of America, Columbus, Ohio. (Botany Dept., Indiana Univ., Bloomington)

3–7. American **Bryological** Soc., Columbus, Ohio. (Secretary-Treasurer, The Society, Box 36, Missouri State College, Springfield)

3–7. **Ecological** Soc. of America, Columbus, Ohio. (% Ecology Secretary, Health Physics Div., Oak Ridge National Lab., Oak Ridge, Tenn.)

3–7. **Genetics** Soc. of America, Columbus, Ohio. (Executive Director, The Society, 3900 Wisconsin Ave., NW, Washington, D.C. 20016)

3–7. American Soc. for **Horticultural Science**, Columbus, Ohio. (Executive Director, The Society, 615 Elm St., St. Joseph, Mich. 49085)

3–7. American Soc. of **Human Genetics**, Columbus, Ohio. (% Div. of Medical Genetics, Dept. of Medicine, Johns Hopkins Hospital, Baltimore, Md.)

3–7. **Mycological** Soc. of America, Columbus, Ohio. (% Pioneering Research Div., Natick Labs., Natick, Mass.)

3–7. American Soc. of **Naturalists**, Columbus, Ohio. (Executive Director, 3900 Wisconsin Ave., NW, Washington, D.C. 20016)

3–7. Society of **Nematologists**, Columbus, Ohio. (V. R. Ferris, Entomology Dept., Purdue Univ., Lafayette, Ind. 47906)

3–7. American **Phytopathological** Soc., Columbus, Ohio. (C. W. Ellett, Dept. of Botany and Plant Pathology, Ohio State Univ., Columbus)

3–7. American Soc. of **Plant Physiologists**, Columbus, Ohio. (% Dept. of Biology, Yale Univ., New Haven, Conn. 06520)

3–7. American Soc. of **Plant Taxonomists**, Columbus, Ohio. (% Botany Dept., Univ. of California, Berkeley)

3–7. Society of **Protozoologists**, Colum-

bus, Ohio. (D. Hammond, Dept. of Zoology, Utah State Univ., Logan 84321)

3–7. Society for **Applied Spectroscopy**, 19th, Columbus, Ohio. (K. N. Rao, Dept. of Physics, Ohio State Univ., Columbus)

5–7. American Assoc. of **Obstetricians and Gynecologists**, Hot Springs, Va. (R. B. Wilson, 200 First St., SW, Rochester, Minn.)

5–7. **Scoliosis** Research Soc., Houston, Tex. (W. J. Kane, Univ. of Minnesota Hospitals, Minneapolis 55455)

6–7. **Cardiovascular** Symp., 9th, Virginia Beach, Va. (J. D. Price, 523 Boush St., Norfolk, Va. 23510)

8–13. American **Chemical** Soc., Atlantic City, N. J. (A. T. Winstead, Natl. Mtgs. and News Div., ACS, 1155 16th St., NW, Washington, D.C. 20006)

8–13. **Illuminating Engineering** Soc., Phoenix, Ariz. (National Technical Conf. 345 E. 47th St., New York 10017)

9–13. American **Fisheries** Soc., 98th, Tucson, Ariz. (R. F. Hutton, 1040 Washington Bldg., Washington, D.C. 20005)

12–15. American **Electroencephalographic** Soc., San Francisco, Calif. (P. T. White, Marquette Univ. School of Medicine, 8700 W. Wisconsin Ave., Milwaukee, Wis. 53226)

12–17. Pacific **Dermatologic** Assoc., Coronado, Calif. (M. S. Falk, P.O. Box 1268, Reno, Nev. 89504)

13–15. Mid-Continent **Psychiatric** Assoc., Little Rock, Ark. (W. Young, 3504 Hill Road, Little Rock 72205)

15–21. **Electron Microscope** Soc. of America, 26th, New Orleans, La. (School of Chemical Engineering, Olin Hall, Cornell Univ., Ithaca, N. Y. 14850)

16–19. American Acad. of **General Practice**, Las Vegas, Nev. (M. F. Cahal, Volker Blvd. at Brookside, Kansas City, Mo. 64112)

18–20. **Cancer**, 6th natl. conf., Denver, Colo. (R. N. Grand, 219 E. 42 St., New York 10017)

19–22. American **Medical Writers** Assoc., Washington, D.C. (E. G. Dailey, P. O. Box 267, Arlington, Va. 22210)

22–25. American **Fracture** Assoc., Houston, Tex. (H. W. Wellmerling, 610 Griesheim Bldg., Bloomington, Ill. 61701)

22–27. **Water Pollution Control** Federation, 41st, Chicago, Ill. (The Federation, 3900 Wisconsin Ave., NW, Washington, D.C. 20016)

23–25. American Inst. of **Aeronautics and Astronautics**, El Centro, Calif. (W. J. Brunke, 1290 Sixth Ave., New York 10019)

23–26. **Transplantation** Soc., 2nd, New York. (F. T. Rapaport, New York Univ. Medical Center, 550 First Ave., New York 10016)

24–26. American Soc. for **Metals**, San Francisco, Calif. (American Soc. for Metals, Metals Park, Ohio 44073)

24–27. American Soc. for **Testing and Materials**, Cincinnati, Ohio. (T. A. Marshall, Jr., 1916 Race St., Philadelphia, Pa. 19103)

28–2. Western **Orthopaedic** Assoc., Colorado Springs, Colo. (V. Mathiesen, 354 21st Street, Oakland, Calif. 94612)

29–2. American Soc. of **Photogrammetry**, San Antonio, Tex. (E. C. Palmer, 105 North Virginia Ave., Falls Church, Va. 22046)

29–3. Association of **Medical Illustration**