Meetings

Tsunami Runup: United States–Japan Cooperative Science Program

A symposium on tsunami runup and local effects, held 16–24 April 1965 in Sapporo (Hokkaido) and Tokyo, Japan, resulted from a resolution adopted during a seminar on tsunamis and storm surges, held in May 1963 under the auspices of the U.S.–Japan Cooperative Science Program. No formal papers were presented at the symposium, but a dozen invited participants informally presented the results of current research by themselves or their associates. Because the world's specialists in this field participated, and because the discussions covered most aspects of the tsunami problem (from generation to eventual decay), it is felt that this symposium was one of the most productive ever held on this particular subject. The high technical level of the discussions was aided by the exchange of presentation summaries among participants some weeks before the meeting.

The final session was devoted to summarization and resolution, as follows:

1) The wave pattern near the origin of a tsunami can be computed with some confidence if the spatial extent and time history of the bottom motion are known. Some information on bottom motion can be obtained from seismic and barometric evidence (there is evidence that tsunamis are also generated in the atmosphere by large earthquakes).

2) The propagation of tsunami energy and tsunami waves outward from a known source over a spherical ocean with arbitrary depth contours appears to be a difficult but not mysterious problem. Present efforts are underway to develop, with high-speed computers, rapid analysis techniques for such calculations. Computer tapes containing the ocean bathymetry as a function of position are already available for all oceans.

3) Present theory and experiments indicate that wave behavior in shallow water in the nearshore region can probably be computed within an acceptable degree of accuracy by linear hydrodynamic theory. Such computation can be achieved almost to the point of wave breaking, although the calculations become increasingly complex in shallow water. It is still an open question as to whether it is easier to study nearshore problems by numerical methods or by hydraulic models. It appears that fairly rough numerical models would give average effects to an acceptable degree of accuracy.

4) The fine details of water motion at and above the shoreline seem to be beyond the scope of computation methods because of the influence of nonlinear effects such as friction, turbulence, and Mach-stem reflection. Therefore water motion is more appropriately studied by hydraulic-model experiments.

5) In order to minimize scale effects, tsunami models of the nearshore region must necessarily be very large. No facility of sufficient size presently exists anywhere in the world.

6) The advantage of an international tsunami research center and model facility was unanimously stressed as the best means of providing solutions of particular engineering problems and for the general study of coastal effects.

The Japanese delegation, headed by Tsutomu Kishi (Hokkaido University) did an excellent job in planning the sessions, which included visits to hydraulics laboratories at the University of Hokkaido and to the Kashima Institute of Civil Engineering Research. This meeting provided a comprehensive, up-to-date picture of the general phenomenology of tsunamis, and suggestions for future work on still unsolved problems.

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Forthcoming Events

August

14–6. **Digital Computers** for College Teachers of Science, Mathematics, and Engineering, Univ. of Southwestern Louisiana, Lafayette. (J. R. Oliver, Box 133, USL Station, Lafayette 70506)

14–19 Sept. International Assoc. for **Quaternary Research**, 7th congr., Boulder and Denver, Colo. Field conf., *14–29 Aug.* and *5–19 Sept.*; general assembly, *30 Aug.–5 Sept.* (G. M. Richmond, Room 2462, Bldg. 25, Denver Federal Center, Denver 80225)

15–20. American Inst. of **Biological Sciences**, Urbana, Ill. (AIBS, 3900 Wisconsin Ave., NW, Washington, D.C.)

The following societies will meet in conjunction with the AIBS. Unless otherwise indicated, the local chairmen are at the University of Illinois, Urbana.

American **Bryological** Soc. (G. N. Jones, Dept. of Botany)

American **Fern** Soc. (G. N. Jones, Dept. of Botany)

American **Fisheries** Soc. (G. Bennett, Aquatic Biology Section)

American **Genetic** Assoc. (S. Price, Room 210 S. Bldg., Plant Industry Station, Beltsville, Md.)

American **Microscopical** Soc. (L. J. Thomas, Dept. of Zoology)

American Soc. for **Horticultural Science**. (C. J. Birkeland, Dept. of Horticulture)

American Soc. of **Limnology and Oceanography.** (W. Larrimore, Illinois Natural History Survey, Urbana)

American Soc. of **Plant Physiologists** (J. B. Hanson, Dept. of Agronomy)

American Soc. of **Plant Taxonomists.** (W. Payne, Dept. of Botany)

American Soc. of **Zoologists.** (L. Ingle, Dept. of Zoology)

Animal Behavior Soc. (G. P. Waldbauer, Dept. of Entomology)

Botanical Soc. of America. (D. J. Paolillo, Dept. of Botany, 302 Natural History Bldg.)

Ecological Soc. of America. (L. C. Bliss, Dept. of Botany)

Mycological Soc. of America. (D. P. Rogers, Dept. of Botany)

National Assoc. of **Biology Teachers.** (H. Weaver, Dept. of Recreation and Municipal Park Administration)

Nature Conservancy. (L. J. Stannard, Illinois Natural History Survey, Urbana)

Phycological Soc. of America. (L. Hoffman, Dept. of Botany)

Society for **Industrial Microbiology**. (L. D. Witter. Food Science Dept.)

Society for the Study of **Development and Growth.** (D. L. Nanney, Dept. of Zoology)

Society for the Study of **Evolution.** (L. J. Stannard, Illinois Natural History Survey, Urbana)

Society of **Nematologists.** (D. P. Taylor, 106 Horticulture Field Laboratory)

Tomato Genetics Cooperative. (A. Thompson, Dept. of Horticulture)

15–20. **Energetics**, American Soc. of Mechanical Engineers, conf., Rochester, N.Y. (ASME, 345 E. 47 St., New York)

15–21. **Ophthalmology**, 8th Pan Ameri-