A man who partook of life as intensively and joyously as L. V. Heilbrunn is difficult to write about. Perhaps it is best to use his own words to illustrate the man. In the preface to his *An Outline of General Physiology* he wrote, "In dedicating this book to my students I have thought especially of the men who have done research with me in the laboratory. Eager seekers after truth, they have not hesitated to disagree with me when they thought I was wrong. In their young energy and courage I have taken pride; in their support I have found inspiration." Heilbrunn was an eager seeker after truth; his was ever-youthful energy and courage, and in his support many found inspiration.

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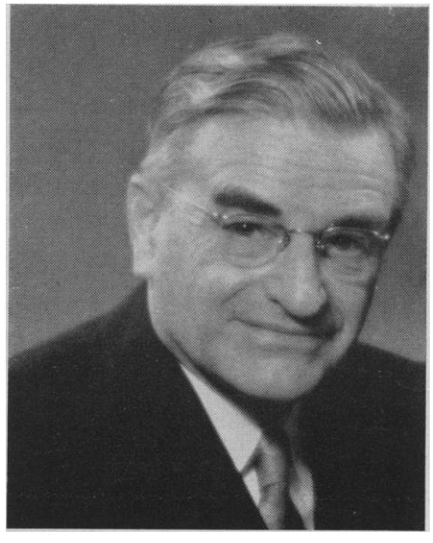
Science in the News

Academy Mission to Asia Will Study Scientific Cooperation

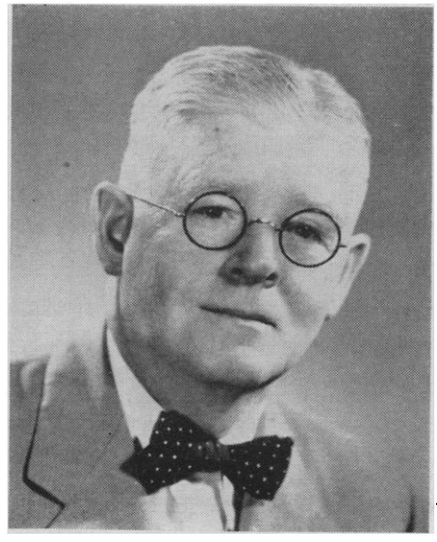
Two members of the National Academy of Sciences will visit 11 Asian countries during the next 4 months to explore with Asian scientific leaders how the development of their countries can most effectively be furthered by science and technology. The two academic ambassadors of science are Farrington Daniels, vice president of the academy and professor emeritus of chemistry, University of Wisconsin, and Ralph E. Cleland, distinguished service professor of botany, Indiana University, and chairman of the academy's UNESCO Committee on Science.

Between them, Daniels and Cleland will visit Pakistan, India, Burma, Thailand, Malaya, Indonesia, the Philippines, Viet Nam, Republic of China (Taiwan), Republic of Korea, and Japan, as well as Singapore and Hong Kong. Conversations, formal and informal, will be held not only with the heads of leading scientific organizations in each country but also with government officials in science and education, members of science and engineering faculties, and researchers in basic and applied sciences.

It is hoped that these contacts will lead to closer working relationships between scientists of both regions and to deeper understanding on the part of the academy of the scientific and technical aspirations of each country and of how these aspirations can best be served by the academy and the private and governmental organizations with which it is associated.



Farrington Daniels



Ralph E. Cleland

Asia Foundation Supports Mission

This first Asia-wide study of the problems of scientific development in emerging nations has been arranged under the joint auspices of the academy and the Asia Foundation (San Francisco, Calif.). The latter has representatives in nearly all countries to be visited and supports science programs in Asian scientific and educational institutions.

Robert Blum, president of the foundation, points out that in science, as in other fields, too few Asian leaders have had an opportunity to exchange views with Americans of distinguished reputation and broad interests. Blum sees the tour of Daniels and Cleland as part of a broader program in which outstanding Americans may visit Asia under private sponsorship for candid discussions on issues and problems of mutual interest.

In addition to their more general discussions, Daniels and Cleland plan to report on recent findings in two scientific fields of particular interest to Asian countries—solar energy and plant genetics. They will give popular lectures to large groups and technical lectures to professional specialists. Daniels—a distinguished physical chemist whose special interest in the applications of solar energy has taken him previously to India, Pakistan, and Thailand—will propose that concentrated research in this field of study offers greater and far more immediate rewards to most nations than corresponding efforts in the fields of atomic energy. Cleland, an internationally recognized botanist, will carry a similarly affirmative message on the subject of plant genetics; he says that there are many countries on his itinerary where agriculture could profit directly from an increased emphasis on research in this field.

Pacific Board Head To Join Tour

Accompanying Daniels and Cleland on part of the trip will be Harold J. Coolidge, executive director of the Pacific Science Board. Established by the academy in 1946, the board aids American scientists who wish to engage in scientific investigations in the Pacific area, advises governmental and other agencies on scientific matters pertaining to the Pacific, and furthers international cooperation in the field of Pacific science.

The members of the academy mission, using slides and films, will lecture to scientific societies, and they will participate in symposia and seminars that concern their various scientific specialties. They may also invite distinguished scientists from Southeast Asia to spend several months in the United States as guests of the National Academy of Sciences. A 3-year program to provide for such visits has been developed in cooperation with the Asia Foundation in order to familiarize scientists from that region with the structure of science organization in this country.

Facilities for Biological Study on Oceanographic Research Vessel

The Woods Hole Oceanographic Institution is proceeding with its plans for the design and construction of an oceanographic research vessel. Funds for the purpose have been made available by the National Science Foundation.

Planning for biological research at sea presents many problems in the design of the vessel, in particular because of the wide variety of programs which may be undertaken. This brief account of the special facilities that are proposed for the new ship is given to inform biologists of the facilities which will be available and to invite suggestions concerning additional facilities which they feel should be included.

Proposed Special Facilities

General information. According to present plans, the total complement of the ship will be 39 men, of whom 15 to 19 will be members of the scientific party. The ship, of about 1000 tons, will be approximately 175 feet long and will have a cruising radius of about 7000 miles.

Space for scientific work. At the present stage of planning it appears probable that 50 percent of the total area of the ship will be reserved for the scientists. This will include deck areas, laboratory space, and living quarters. The other 50 percent will be used for ship operations, crew quarters, mess halls, and so forth.

Laboratories. Preliminary plans call for about 1700 square feet of space for enclosed laboratories. Between one-quarter and one-third of this space will be used to house permanent equipment, such as echo sounders and navigational aids. The remainder will be used for removable equipment, so that for each cruise at least 1000 square feet of laboratory space will be available for installation of special equipment. A chemistry-laboratory type bench will be installed, with vacuum lines and supplies of gas, compressed air, nitrogen or other tank gas, and fresh and salt water.

Deck area for scientific purposes. Preliminary plans provide for about 3000 square feet of open deck for scientific purposes. The main after deck will accommodate the large nets and trawls. Uninterrupted deck space to permit the handling of a bottom core 80 to 100 feet long, or other long equipment, will be available.

Speed control and maneuverability. Speed control and maneuverability of the ship are essential for towing plankton nets and dredging. Provisions will be made for continuous and gradual speed control, from less than 1 knot to full speed (about 12 knots). In addition, some type of bow propulsion is being seriously considered; this would give the vessel a very short turning radius at low speeds and would otherwise increase maneuverability.

Winches and wire. Several winches with wire comparable to standard hydrographic wire (5/16 inch in diameter) and one main trawl winch with heavier wire (⅜ to ½ inch) will be provided. At least one winch will be equipped with armored power cable—the one-conductor or the four-conductor "well-logging" cable. This will permit direct recording, on deck, of the depth of the bottom end of the wire and will provide means of determining when the appropriate depth for deep-sea operations, such as the opening and closing of nets, has been reached.

Sea-water system. A completely independent nontoxic system of running salt water is being provided. One or more taps will be available in each laboratory and at appropriate places on deck for rinsing plankton nets.

Aquaria. One laboratory will be provided with running-sea-water aquaria. At present, installation of six aquaria, each about 3 by 3 by 4 feet, with individual temperature control, is contemplated. The organisms collected could thus be maintained at the temperature of their natural habitat.

Deepfreeze. A walk-in Deepfreeze for scientific purposes will be provided. This will be ample in size to freeze large fish and will provide storage space for large numbers of samples frozen for preservation or for chemical analysis. One section will be for quick freezing.

Box observation chamber. A suggestion that the bow be made bulbous, with underwater observation ports and space for two observers, is being considered. The ports would be 10 to 12 feet below the water line and should provide a good opportunity to observe fish and their behavior and, possibly, a means of observing equipment in operation under water.

Center well. Construction of a center well about 3 by 4 feet or larger, extending from the upper deck through the hull, is being considered. This well would be of use in lowering equipment into the water from enclosed spaces and would probably have some biological uses. It might be used to house living organisms by closing the bottom with an appropriate grating, or used by skin divers as a means of entering the water in rough weather.

Acoustic properties. Every effort will be made to keep the operation of the ship as quiet as possible. Complete silence of operation will be achieved by using banks of batteries, adequate for several hours' operation. Such silence is essential in various geophysical studies and will also make it possible to monitor biological noises.

Portable laboratories. The use of separate laboratory structures, about the size of a trailer truck, which could be moved on and off the ship easily and could be quickly secured in place, is being considered. Such portable laboratories could be fully equipped ashore between cruises. All radioisotope studies would probably be done in such portable laboratories to avoid background contamination of the ship's permanent laboratories.

Suggestions Welcome

Comments concerning requirements for biological facilities for this ship should be sent to Bostwick H. Ketchum or Frank Minot, both of the Woods