type in the opossum supports the assumption that the XX-XY type originated before the separation of marsupials and insectivores and before the evolution of the eutherian reaction pattern. The separation of the anuran amphibians into -XY frogs and ZW- toads makes it clear that here the genetic mechanisms of sex differentiation evolved after the anurans (Salientia) had made their appearance (Jurassic period) but before separation into the families of today. When the available evidence is pieced together, it appears that genic sex determination in tetrapod vertebrates originated during the Jurassic period, an estimated 150 million years ago. Since evolution proceeded more slowly in some groups than in others, continued studies in comparative cytogenetics can be expected to furnish a complete recapitulation of the successive steps in the evolution of sex-determining genes and of sex chromosomes (*20*).

Summary

Certain characteristic patterns of physiologic sex determination are not causally linked with types of genic and chromosomal constitution (XX-XY or ZW-ZZ). The observed widespread but not universal parallelism in the distribution of genetic and physiologic patterns among vertebrate groups expresses genealogic relationship. On the basis of this interpretation one may estimate the approximate evolutionary age of the mechanism of genetic sex determination. It is concluded that in all tetrapod vertebrates these mechanisms originated during the Jurassic period. Environmental conditions seem to affect the progress of this evolution.

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News of Science

International Oceanographic Congress To Meet at United Nations Headquarters

The world's leading oceanographers, perhaps 600 strong, will meet in New York at the end of August for their first international congress. The scientists, representing more than 35 countries, will participate in a broad study of the oceans—of their histories, their inhabitants, their boundaries and basins, and their deep areas. The congress, which will be the first large scientific meeting ever held in the United Nations headquarters, will be in session from 31 August to 12 September. Seven oceanographic vessels, including the Soviet Union's new *Mikhail Lomonosov,* are expected to be on display at New York piers during the 13-day congress.

Three scientific organizations—the AAAS, UNESCO's International Advisory Committee on Marine Sciences, and the Special Committee, on Oceanic Research of the International Council of Scientific Unions—are sponsoring the meeting. Financial support is being provided by 21 governmental and private agencies.

A number of factors lie behind the decision to hold the oceanographic congress. The primary one was the success of the AAAS's 1955 Arid Lands Conference, held at Albuquerque, N.M. This meeting, which was attended by 525 people, showed the value of international gatherings of experts from scientific fields in which, because of the interdisciplinary nature of the field, congresses are seldom or never held. Reports indicated that conservation groups throughout the world found new support for their programs as a result of the arid lands meeting. Because no such congress had been held in oceanography, the officers of the AAAS and the other sponsoring organizations planned the forthcoming meetings.

There have been a number of recent indications of a growth of interest in oceanography. One was the publication early this year of a 12-part report by the committee on oceanography of the National Academy of Sciences–National Research Council. This report, which represented the work of the committee since its establishment in 1957, assessed the current state of oceanography in America and outlined a program for the future. The picture presented was not encouraging; less is known, the committee reported, about the ocean floor than is known about the near side of the moon.

Hearings in the U.S. Congress were held to study the 10-year program called for in the report. This resulted in an increase in interest on the part of the scientific community and the public. Recently *Time* devoted its cover story and six pages of photographs to oceanography and to Columbus Iselin, director of the Woods Hole Oceanographic Institution.

Papers and Events

During the morning sessions of the conference, some 30 papers will be offered by leading oceanographers. Papers to be read on the opening day are "Shape and structure of ocean basins," by Maurice Ewing of the Lamont Geological Observatory; "Forces and processes at work in ocean basins," by Sir Edward Bullard of Cambridge University; and "Stratigraphy of the deep sea," by Edwin Hamilton of the U.S. Navy Electronics Laboratory, San Diego, Calif.

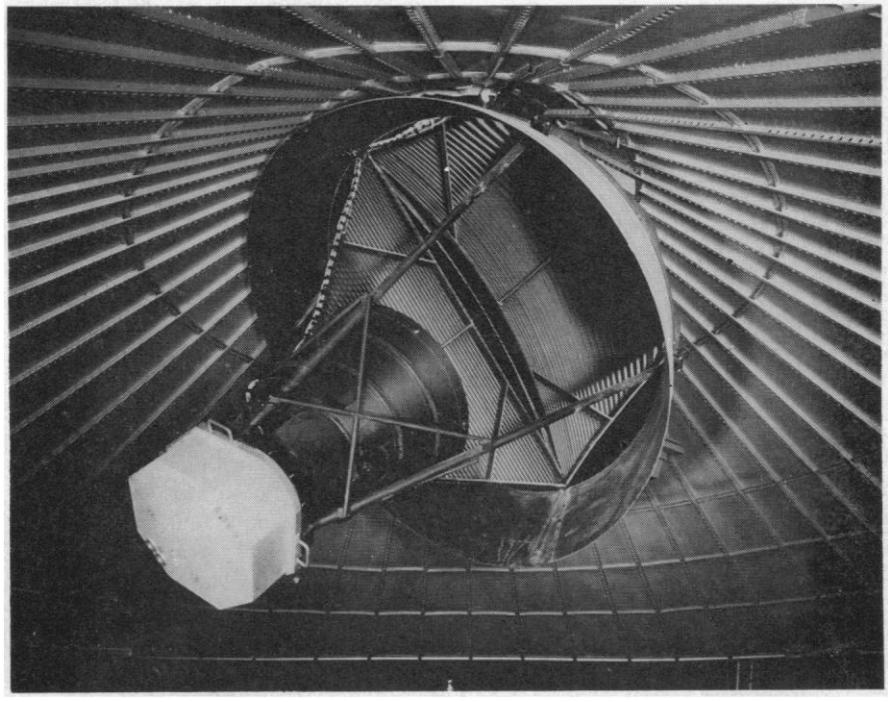
The afternoon sessions will be taken up with seminars, at which shorter papers will be read and discussed. Approximately 460 of these brief addresses, of which many will be read by title only, are listed in the program. Some of the titles for the first day's seminars are "Seismic waves from nuclear explosions and the structure under the Western Pacific," by D. S. Carder of the U.S. Coast and Geodetic Survey; "Pacific Oceanic crust," by R. W. Raitt and G. G. Shor, Jr., of the Scripps Institution of Oceanography; and "The exploration of an interplain deep sea channel," by A. S. Laughton of Great Britain's National Institute of Oceanography.

Among the tours and special events which are planned are a cocktail party at the American Museum of Natural History, a visit to the New York Zoological Park, a trip to the Bureau of Commercial Fisheries' Biological Laboratory in Milford, Conn., and various dinners. In addition, it is expected that the United Nations Building will be open for inspection. An information center will be located in the Hotel Commodore, 42nd St. and Lexington Ave., in the South Room, off the lobby. The center, which will also serve as a lounge for all registrants and guests, will be operated by the Woods Hole Oceanographic Institution.

U.S., International Atomic Energy Units Sign Contract

The first research contract between the U.S. Atomic Energy Commission and the International Atomic Energy Agency was signed recently. The contract makes $20,000 available to the IAEA for research on the production of calcium-47, an important radioisotope now in short supply. This is the first contract negotiated under the U.S. offer, made at the second IAEA General Conference, held in Vienna last October, to explore with the Agency a program in which specific research projects could be assigned by the United States to the Agency. The latter would then make contracts with existing nuclear centers and universities throughout the world. As explained to the Vienna conference by AEC chairman John A. McCone, then also chairman of the U.S. delegation, the objective is "to bring the wealth of scientific and technical competence throughout the world to bear on the advancement of peaceful uses of nuclear energy."

Calcium-47 is of great potential significance in biological and medical research. It can be used in clinical research and for limited routine diagnosis of disease. It can be used to study normal calcium metabolism, thus opening the way to investigations of malfunctions in calcium metabolism which occur in certain endocrine-gland and skeletal disorders. It is also expected to be of use in localizing the spread of bone tumors before they can be detected by conventional means such as x-rays. The contract calls for the IAEA to use the $20,000 in a research effort to develop a cheaper method of enriching calcium-46. The funds were allocated from the Atomic Energy Commission's Division of Biology and Medicine, and the contract will be administered by the commission's New York Operations Office.



Radiometer used by the U.S. Navy to measure the thermal power radiated by ocean surfaces. The device is attached to the underside of Naval airships.

Airborne Radiometer

The Naval Research Laboratory, according to a report in *Naval Research Reviews,* has been engaged for the past few years in a study of the physical properties of the oceans as revealed by measurements of radiant energy from their surfaces, with particular emphasis on the optics of the atmosphere and sea. One of the tools developed for this study is a massive radiometer designed to be flown in big Navy airships, at an altitude of 1000 feet. The instrument measures and records continuously the thermal power radiated by the sea, plus that small portion which orginates in the sky and is reflected from the sea.

Radiometers of two different configurations are employed. The first utilizes a single receiver. It consists of a parabolic mirror 100 inches in diameter, with a focal length of 70 inches. The second radiometer has a differential configuration. The 100-inch mirror is split along a diameter and is opened outward 15 degrees, thereby forming two independent collecting areas.

By means of the radiometers, much has been learned about the radiometric properties of the sea and their relationship to the state of the sea. For example, the radiometers have revealed that man-made oil slicks alter the wave structure enough to effectively improve the reflectivity of the surface where the slicks occur, thereby making those surfaces reflect more sky radiation. This means that the slicks are colder, in general, than the surrounding water. The radiometer has also shown that isolated clouds casting their shadows on the water during the day produce colder areas, while clouds at night produce warmer areas. The opacity of the clouds acts as a shield against incoming solar radiation during the day and, similarly, against reradiation to the cold sky at night. When these clouds drift on, they leave detectable warmer or colder patches on the water.

Cat's paws (water sufaces which have been ruffled by the wind) differ radio-