

ASTRONOMY

Will Watch Minor Planets So They Won't Get Lost

► SAFEGUARDING the 1,500 or so minor planets that revolve around the sun between the orbits of Mars and Jupiter is one of the many problems to be considered at the meeting of the International Astronomical Union in Zurich, Aug. 11 to 18.

Most of these asteroids are so tiny that they can be distinguished from faint stars only by the fact that they move across the heavens. The majority of them are less than 50 miles across. They should be observed at least once every few years, because the paths they follow in space must be continually corrected to keep them from getting lost. Each minor planet will, in effect, be given a "guardian astronomer."

Plans will also be made to improve the study of variable stars. This project was originally assigned to the Germans, and later taken over by Russian astronomers.

About 40 astronomers from the United States are expected to attend the international astronomical meeting, the first general assembly to be held in a decade. Already some representatives from the United States are on their way, others plan to fly over early in August.

Six have been appointed voting delegates to represent the United States. Dr. Otto Struve, director of Yerkes Observatory of the University of Chicago, is chairman of the delegation. Others include: Dr. Dirk Brower, director of the Yale University Observatory; Dr. Hamilton M. Jeffers of the Lick Observatory, University of California; Dr. Edwin P. Hubble, Mount Wilson Observatory of the Carnegie Institution of Washington; Dr. Harlow Shapley, director of Harvard College Observatory; and Dr. Joel Stebbins, director of Washburn Observatory of the University of Wisconsin. Dr. W. S. Adams, director emeritus of Mount Wilson and vice president of the I. A. U., will not attend.

Science News Letter, July 31, 1948

ENGINEERING

Propose Allocating Costs Of Water Projects

► EACH of the various purposes served by water development projects, such as irrigation, flood control, navigation and power, can and should be made to bear their proper share in cost allocation, the American Society of Civil Engineers was told at a meeting in Seattle, by Col. F. W. Scheidhelm.

The colonel is chairman of a special committee of the society participated in by four divisions of the organization: Irrigation, Power, Waterways and Engineering Economics. The plan of procedure recommended for allocating costs, which often involve millions of dollars of federal funds,

is for greater protection to taxpayers through disclosure of all subsidies. It is designed to help standardize the financial analysis of such huge projects as the Hoover, Grand Coulee, and Bonneville dams, and the system of dams of the Tennessee Valley Authority.

The plan proposed is necessarily complicated because of the complexities of the subject, but is based on what is called a "proportionate use of capacity." It distributes joint costs upon the basis of the comparative use of the joint facilities, leaving the way open for possible needed later adjustments.

Under present national law, costs incurred in flood control and navigation are charged almost entirely to the federal treasury and, hence, paid by the federal taxpayers. Costs incurred for irrigation are repayable in part by water users to the treasury, and costs for power development are intended to be repaid to the government in full. For this reason an equitable system of cost allotment is essential.

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METEOROLOGY-ENGINEERING

Wave Recorders Benefit Waterfront Structures

► WAVE RECORDERS at strategic locations on the Pacific coast will register wave characteristics and the information gained will be of benefit in erecting waterfront structures.

Some of these wave recorders have been in use for over a year, the American Society of Civil Engineers was told at a meeting in Seattle, by Prof. J. W. Johnson of the University of California. Records from the wave recorders also provide a means of checking the method of forecasting waves from weather charts, he stated.

Of the various recorders which have been developed by the University of California, all work on the method of recording pressure fluctuations at the sea bottom and transposing these values to surface wave height. The fundamental principle of the method is that surface waves induce pressure changes in the entire column of water between the surface and the sea bottom. The instrument consists of an underwater unit to pick up and convert pressure fluctuations into electrical impulses which are transmitted by cable to a chart recorder on shore.

The records not only give the wave characteristics which structures must be designed to withstand, he said, but also give knowledge of value in determining whether structures are economically justified in view of the frequency of occurrence of waves of damaging character.

Forecasting unusual waves and their probable heights is important in controlling marine and shore activities. The recorders have already proven themselves a valuable aid in these forecasts.

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ASTRONOMY

Faint Comet Discovered By California Astronomer

► A FAINT COMET has been discovered by C. A. Wirtanen of Lick Observatory of the University of California. Mr. Wirtanen found another faint comet about this time last year, and within the last 11 months has spotted two tiny minor planets.

The new comet is of the fifteenth magnitude and thus so faint you will not be able to see it without the aid of a powerful telescope. Located in the constellation of Equuleus, the colt, it is moving in the direction of the constellation of Aquila, the eagle.

Found on a plate taken the morning of July 15, the comet appears only as a small streak. At that time its right ascension was 21 hours, 13.7 minutes; its declination plus seven degrees, 55 minutes. It is moving slowly west and south, but to date its orbit has not been worked out.

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PHYSICS

Einstein Theory No Bar To Space Ship Navigation

► SUPPOSE you were in a space ship on the road to Mars. You had no radio connection with earth and your space ship had no windows. The only clue to your position that you could have would be a measurement of the forces acting on your ship. How would you find your way?

The solution to this riddle is demonstrated by John J. Gilvarry of North American Aviation, Inc., Los Angeles, in a report to the journal of the American Physical Society, *The Physical Review* (June 1).

It can be done if you happen to be a competent computer. If you know the pull of gravity at the point where you are, your centrifugal acceleration and the pull exerted on your ship by any rotating systems in the vicinity, you can figure out your position. The formulae used for doing this are the same type used in the instrument designed to fix the fuel cut-off point in the German V-2 rocket.

Einstein's equivalence principle has frequently been interpreted to imply that this riddle could not be solved. Mr. Gilvarry shows that this interpretation is wrong. What Einstein really means is that a pilot who had never been out of his space ship and who had never had a chance to measure gravity without being misled by the motion of the ship would be unable to solve this problem.

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CE FIELDS

GENERAL SCIENCE

U. S. Army Medical Library Sends Books to Europe

➤ MORE THAN a thousand books on medicine to build up war-ravaged libraries of Europe have been distributed from the stocks of the United States Army Medical Library.

Belgium, China, France, Great Britain, Hungary, Poland and Yugoslavia have received this aid from the U. S.

Libraries to receive American books were selected by the United Nations Educational, Scientific and Cultural Organization. The International Clearing House for Publications in Paris, a branch of UNESCO which coordinates the world-wide exchange of literature and directs the dispatch of gift volumes from donor to receiving countries, has handled the distribution of the books.

Thousands of publications are funneled monthly through the UNESCO Clearing House to needy areas. Particular emphasis is placed on war-devastated countries in accordance with UNESCO's Reconstruction Program.

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CHEMISTRY

Plastic Wraps for Fruit Are Moisture-Resistant

➤ A NEW plastic wrapper for fruits, vegetables, tobacco and other products, thin as paper and transparent as cellophane, was described in Los Angeles to the American Chemical Society. The chemicals used in the plastic films are made entirely from petroleum, and the films owe their preservative properties moisture resistance.

The chemicals used are known as S-polymers. The films keep moisture in or out. In a test with the new wrapper, S-polymer-wrapped oranges lost only one-tenth their weight in a 28-week period, while unwrapped oranges had shrunk to less than half their original weight in the same period.

The report on the new wrapping material was presented by W. A. Fairclough of the Enjay Company, New York. Co-authors were Raymond G. Newberg and J. R. Briggs of Esso Laboratories, Linden, N. J.

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CHEMISTRY

Chemist Gets Award for Work on Guayule Rubber

➤ THE Charles Goodyear medal of the American Chemical Society was awarded to a retired chemist, Dr. David Spence,

Pacific Grove, for his work on guayule rubber, the only natural rubber commercially made in the United States.

The medal is a tribute to Charles Goodyear, credited with being the inventor of rubber vulcanizing. The Scotch-born Dr. Spence is honored for his contributions to the growth of the guayule shrub and the production of rubber from it. He is an outstanding authority on rubber chemistry.

Guayule, a native American plant, was one of the most promising sources of domestic natural rubber during the years when the foreign supply was cut off and before satisfactory synthetic rubber was being produced. Extensive plantings of the shrub were made in the Southwest and rubber was made from it. About two years is required to bring a guayule plant to the harvesting stage.

Other proposed sources of home-grown American rubber offered less promise. A Russian dandelion called kok-sagzy was proposed but its rubber yield is much less than that of the guayule shrub. There is rubber in various species of milkweeds, spurges and goldenrods, but the content is low and extraction is difficult.

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PHYSIOLOGY

Mammalian Hormone Now Proved Present in Hens

➤ A HORMONE or internal gland secretion known as progesterone, long supposed to be a monopoly of mammals, has now been proved to be present in hens by Dr. Richard Fraps, zoologist of the U. S. Department of Agriculture, who works at the great research center at Beltsville, Md., together with Drs. Charles Hooker and Thomas Forbes, of Yale University. Formal announcement of the discovery was made in *Science* (July 23).

In mammals, progesterone is responsible for the attachment of the first beginnings of the embryo to the maternal tissues that will nourish it and in time bring it to birth. Since nothing of this sort happens in birds, the role of progesterone in this great animal group is not altogether clear.

Dr. Fraps is inclined to think that the hormone may act as a kind of chemical trigger to two other hormones secreted by the pituitary, a small gland just under the brain. The release of these hormones in turn starts the egg on its career of formation and being laid. It may also have something to do with a substance in the egg white known as avidin, which has germicidal properties and thus protects the chick during its three weeks of helpless existence within the shell.

Existence of this supposedly "mammalian" hormone in the hen, and presumably in other birds as well, adds to the evidence that birds and mammals, unlike though they are, have a common ancestry somewhere back along the line.

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ENGINEERING

Rubber in Asphalt Makes Improved Road Surfacing

➤ RUBBER in asphalt is reported to make an improved road surfacing material. A 5% to 10% rubber powder mixture with asphalt gives a surface with longer life, more resistance to wear, and with better anti-skid properties, according to London authorities.

This is indicated in a recent report of the British Rubber Development Board. The conclusions of the board are based on its investigation of experimental stretches of rubber-asphalt roads in the Netherlands. Some of these stretches have now had a 10-year tryout. One, which had been subjected to very hard usage during the war years and on which little maintenance had been carried out, was in first-class condition when compared with adjacent stretches containing no rubber.

A Netherlands organization, together with an associated group in the Netherlands East Indies, carried out prewar research into the effects of the addition of small quantities of rubber on the properties of asphalt. It was found that the addition of from 5% to 10% of rubber powder affected the properties of the material when applied to roads in such a manner that penetration, resistance to impact, softening and lessening flow were particularly improved.

The reason for the improvement, according to the Rubber Development Board, is that the rubber powder slowly absorbs the light constituents of the asphalt, rendering it elastic and reducing its tendency to flow. Heat penetration seems also to be reduced. The rubber-asphalt roads are reported to be less soft in summer and less hard in winter than the asphalt roads without the rubber powder.

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BIOCHEMISTRY

Chemical from Fungus Halts Spread of Fungi

➤ A CHEMICAL called trichothecin, which is produced by a fungus itself, has the power to stop the spread of other fungi. It does this by preventing the fungi from reproducing.

Trichothecin has been extracted from the fungus species known as *Trichothecium roseum* by G. G. Freeman and R. I. Morrison of the Imperial Chemical Industries' Research Department in Ayrshire, England. They report their findings in a letter to the journal, *Nature* (July 3).

Full accounts of the chemical and biological properties of trichothecin are being prepared by the scientists. They may show that trichothecin will be a useful weapon in the war against fungus-caused diseases which affect both animals and plants.

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