ASTRONOMY

Astronomy Meetings

Executive Committee of the International Astronomical Union will convene at Copenhagen in March. Soviet and U. S. each to send three delegates.

➤ THE EXECUTIVE Committee of the International Astronomical Union, which had suspended activities for the duration of the war, will convene at Copenhagen on March 7. The three American delegates will be Dr. Otto Struve, director of the Yerkes and McDonald Observatories of the Universities of Chicago and Texas; Dr. Joel Stebbins, director of the Washburn Observatory of the University of Wisconsin and research associate of the Mount Wilson Observatory; and Dr. Harlow Shapley, director of the Harvard Observatory and president of the American Section of the International Astronomical Union.

Soviet astronomers look forward with great interest to the opening of the conference as the first practical measure for the restoration of international cooperation in science, according to a cablegram to *Science Service* from Prof. Gregory Neuimin, director of the famous Pulkovo Observatory near Leningrad. The Soviet Union will be represented by three delegates, Prof. Neuimin reports. He adds that Soviet astronomers are drawing up a number of proposals on the organization of scientific work and the participation of the Soviet Observatory in international undertakings.

The Conference in Copenhagen, Prof. Neuimin continues, will be attended by 20 astronomers from the ten most important countries in astronomical research. Some of the proposals that will be presented by the Soviet astronomers are the organization of an international center in Russia for the study of variable stars, and the participation of Russia in the renewed work of the Bureau, formerly centered in Germany, for the study of minor planets. At the Conference the Soviet delegates will report on the joint work of Soviet observatories in a compilation of a catalogue of faint stars, Prof. Neuimin states. They will also propose to foreign observatories that they participate in this work on faint stars; and they will submit also a number of other proposals on the organization of the international time service, the publication of astronomical annuals, etc.

The Pulkovo Observatory, of which Prof. Neuimin is director, was completely destroyed by German bombardments and bombs during the siege of Leningrad. Some of the library and a few of the astronomical lenses were taken from Observatory Hill and buried. Some of the other Russian observatories were also destroyed or badly damaged and it is now the plan of the Soviet government to restore all of the astronomical equipment and improve its quality and increase its quantity.

The plans for renewal of international work in astronomy were formulated on Pulkova Hill in June, 1945, when Dr. Harold Spencer Jones, Astronomer Royal of England, and Dr. Harlow Shapley were in Russia as guests of the Soviet Academy of Sciences.

The scope of research work now confronting astronomers, Prof. Neuimin stated in the cablegram, insistently demands cooperation and coordination of the comparatively few scientific institutions and individual scientists working in this field. Need for an international organization of astronomers as early as the 18th century led to the formation of a more or less stable international union to carry out tasks that are beyond the power of one observatory or even of all observatories of one country.

This tendency found more complete expression after the first World War when the International Astronomical Union was formed. A number of countries represented by their academies of sciences or by scientific committees entered the Union. The purpose of the Union is to coordinate and organize astronomical work in all its branches. Every three years the Union convenes a congress where past work is summed up and future tasks outlined.

The USSR joined the International Astronomical Union in 1935 and was represented at the following and last congress held in Stockholm in 1938. Germany didn't deem it necessary to join the union.

FOR BALANCING—Stroboscopic light played an important part in the exact balancing of rotating parts in the Norden Bombsight where tolerances were kept within 20 millionths of an inch. Timed light flashes permitted precise determination of rotating speeds and visual study of imbalance during laboratory tests. In the picture is a technician in the laboratory of the Victor Adding Machine Company using a General Radio Strobotac and a Gisholt Dynetric Balancer.

The work of the International Astronomical Union was brought to a standstill by the war. Observations were continued as far as possible at observatories that escaped destruction, but contact even between scientists of Allied countries was at best sporadic.

Science News Letter, February 9, 1946

CHEMISTRY

Concrete from Coral

Method using water from the ocean has promising uses for construction on coral islands without other rock or fresh water.

➤ GOOD QUALITY concrete was successfully made during the war with coral and sea water, it is now reported. This was done on Bermuda, where fresh water for the purpose was not available and where there is none of the ordinary rock usually employed in concrete making. A chemical compound added to the cement-coral mixture reduced water requirements and helped control the mix while setting.

The discovery of the method of making concrete satisfactory for construction purposes from coral and sea water is important now because the United States may find it necessary to build naval and other facilities on other coral islands without ordinary rock. It will mean a great saving in transportation costs if local coral is used instead of crushed rock shipped many miles from continental sources of supply.

Coral, rich in calcium, is the skeleton structure created by tiny marine animals known as polyps. It is filled with tiny holes and is highly water-absorbent as well as light in weight. Aggregates made with it would have moisture-retaining properties which might cause dangerous rusting in steel reinforcing rods.

The story of the use of concrete from coral and sea water in Bermuda is told in *Industrial and Engineering Chemistry,* an official publication of the American Chemical Society. Bermuda has plenty of coral but none of the ordinary American varieties of rock. It has no fresh water except the rainwater caught on roofs and run into reservoirs. In spite of the lack of rock and fresh water, concrete was a military necessity for bases for the armed forces on this island.

The decision was made to experiment with local materials. The National Bureau of Standards and the cement industry had conducted research on the use of sea water for mixing concrete. It had been found that sodium and other chlorides would not induce corrosion. Sulfides might, but these were present only in very small quantities.

Cement and water provide the mortar or binder which fills the spaces when stone and sand are mixed in concrete making. The engineers in Bermuda obtained a considerable reduction in the water-cement ratio by using a pozzolanic (volcanic ash) compound in the mixture. Chemically the compound used was calcium lignosulfonate. Its use reduced water requirements by about 17%, and resulted in a concrete that tested over 4,000 pounds per square inch in strength.

Science News Letter, February 9, 1946

PHYSICS

Thermometers Measure Speed of Jet Planes

➤ THE USE of thermometers to measure speeds of supersonic jet planes and other high-speed aircraft has been announced by the Navy Department. At the same time an instrument to measure the speed of helicopters and other slow-moving aircraft was revealed.

The thermometer method was discovered by Dr. Theodore Shedlovsky, at the Rockefeller Institute, in connection with work in developing a way to measure true outside temperature during flight. Outside temperature strongly affects the readings of all the major aircraft instruments.

Dr. Shedlovsky mounted two thermometer "probes" in the air stream, one shielded and the other exposed to the full air flow, determining true temperature electrically by the difference in readings between the two probes.

Then he discovered that the difference in rise shown by the two probes is proportional to the square of the speed of the plane.

The slow-speed instrument was developed at the National Bureau of Standards. Its key is a set of light-weight anemometer cups mounted on practically frictionless bearings which start rotating in less than two knots of wind and give extremely accurate readings.

Science News Letter, February 9, 1946

PHYSIOLOGY-MICROSCOPY

Plastic Impressions Show How Blood Cells Look

See Front Cover

➤ RED BLOOD CELLS, human hair, fibers and a host of other things in the submicroscopic world can now have their "footprints" caught for study by a new film-plastic technique in combination with the electron microscope. The photograph on the front cover of this SCIENCE NEWS LETTER shows what red blood cells look like when magnified 13,000 diameters.

Scientists were baffled for a time in trying to make greatly magnified photographs of nylon fibers, sulfadiazine crystals and bacteria because they were too thick to be penetrated by either light waves or electrons. But now, just as FBI experts use moulage to preserve and study footprints of criminals, so the impressions of these submicroscopic objects can also be examined.

Little pressure is used in getting a plastic cast of these delicate materials that might easily be crushed beyond all recognition. The markings left by the specimen on the thermoplastic film are permanently recorded by deposisting a thin film of silica upon it. It is the silica film that is actually photographed by the electron microscope.

The new technique was first used in studying the surfaces of fibers. The scales and fine markings found in replicas of wool fibers are those characteristic of all fur fibers. Replicas of nylon fibers show long grooves made by imperfections in the spinnerette through which the hot nylon plastic was forced in making the fiber.

How the replicas are made with simple equipment is told in a technical paper in the *Journal of Applied Physics* by Dr. R. Bowling Barnes, Charles J. Burton and Robert G. Scott of Stamford Research Laboratories, American Cyanamid Company.

Science News Letter, February 9, 1946

New *germicide materials,* known as quaternary ammonium compounds, destroy bacterial life within five minutes after exposure of the organisms to concentrations as low as one part in 20,000 parts of water.