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 depositing 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.