

BIOCHEMISTRY

Biochemical Advance in Total Synthesis of ACTH

► **TOTAL SYNTHESIS** of ACTH, the important hormone used in the relief of rheumatoid arthritis and other serious illnesses, has been accomplished and marks a step forward in the field of basic research in biochemistry.

Two Swiss scientists achieved the synthesis through the development and application of new protecting groups, it was announced in *Nature*, 199:172, 1963. Although no practical application is seen the accomplishment is considered an important technical feat.

Dr. Klaus Hofmann of the University of Pittsburgh, who first synthesized ACTH in 1960, told *SCIENCE SERVICE* that Drs. R. Schwyzer and P. Sieber of CIBA Ltd., Pharmaceutical Department, Basle, Switzerland, had added 19 more amino acids to the 20 that he and his co-workers had announced.

These 39 amino acids, Dr. Hofmann said, extend the methods and make up the longest and most complex peptide chain yet discovered.

Dr. Hofmann said, "We synthesized the active part of the molecule, which is located in the first 20 amino acids. We also synthesized a molecule that contained 23 of the 39 amino acids, but we found that the active part is in the first 20."

Dr. Hofmann said there is no practical application to the Swiss discovery. Even the complexity of his own discovery makes it impractical to attempt replacement of the natural hormones from animals.

Asked if he foresees eventual synthetic production of ACTH that would compete with the product now made commercially from hog and beef glands, Dr. Hofmann said, "I don't think so."

The Swiss scientists report that detailed physico-chemical, chemical, biological and immunological investigations are underway.

ACTH belongs to the family of proteins, which in turn are made up of amino acids. Peptides are compounds of two or more amino acids into which the protein molecule is split during digestion.

• *Science News Letter*, 84:56 July 27, 1963

PHYSICS

Invisible "Bottle" Used To Hold Unearthly Fire

► **AN INSIDE-OUT** invisible "bottle" is being designed to contain the hottest known substance in the universe.

This substance is hydrogen plasma—ionized hydrogen gas many times hotter than the sun, so hot it would instantly destroy anything it touched.

Therefore, the 400-million-degree gas is kept in "bottles" whose walls are lines of magnetic force. These bottles have no physical substance—you could put your hand right through the wall of one. However, the superhot plasma has a high magnetic charge, and is confined by the magnetic force.

Until recently, these bottles leaked, especially at high-energy levels. Now, scientists are working on a bottle with a new shape—convex on the inside and concave on the outside. This makes it much harder for the plasma to escape, because the "bulge" is working against the force rather than in the same direction.

The plasma, once trapped, can then be "squeezed" and used to generate energy by fusion, the same process used uncontrolled in the hydrogen bomb. However, controlled fusion would provide a virtually unlimited source of power.

The new magnetic bottle is being designed and built by Dr. Tihoro Ohkawa of the General Atomic Division of General Dynamics Corporation, San Diego, Calif. A prototype of the bottle is now in experimental use, Dr. Ohkawa reported to the American Physical Society meeting in Buffalo, N. Y.

• *Science News Letter*, 84:56 July 27, 1963

TECHNOLOGY

Audible Communication By Use of Laser Beam

► **PRACTICAL USE** of light for communications was given another boost to reality with the demonstration of sending audible information on a laser light beam.

Although laser beams have been used to transmit television signals before, this was claimed the first time the light beam consisted of only one, pure color. The method was demonstrated by International Business Machines Corporation engineers in New York.

They used a so-called injection laser, developed only last year, a relatively simple device that converts electrical energy into light waves.

• *Science News Letter*, 84:56 July 27, 1963

BOTANY

Persimmon's Pucker Due To Tannin; Repels Birds

► **THE PUCKERING** power of persimmons is due to tannins, a type of chemical also found in tea.

Specifically, it is due to a particular type of tannin known as leucoanthocyanin. This complex chemical is found in ripe persimmons but breaks down as the persimmons go soft. When this happens, the persimmons lose their pucker.

However, persimmons can be made to lose their pucker without going soft, using one of several processes.

The most popular method is to store them for four or five days in a closed container filled with alcohol vapors—an old wine cask will do. This causes them to lose 99.5% of their astringency. If there is no wine cask handy, coating them with paraffin works almost as well, but lacks some of the benefits of the alcohol treatment.

Puckering persimmons are not eaten by birds but the sweeter variety is fast consumed, T. O. M. Nakayama and C. O. Chichester of the University of California reported in *Nature*, 199:72, 1963.

• *Science News Letter*, 84:56 July 27, 1963



CONSERVATION

New Use of Land In U.S.: Recreation

► **THE IMPACT** of more people in the United States is bringing about a new use for land—recreation.

The traditional use of land has been for its timber, grass or minerals, or for growing crops, Dr. Edward Crafts, director of the Department of the Interior's bureau of outdoor recreation, told a Conservation Roundup in Fontana Village, N.C.

However, now population pressure is creating a new use—the enjoyment of trees, grass and water. These are non-consuming uses, and are of economic value to the person who supplies equipment or facilities.

Nature is a "miraculous tranquilizer," Dr. Crafts noted, but in order to continue enjoying nature, U.S. citizens must make sure certain areas are preserved as they are.

Among the areas already battlefields for preservation are Fire Island, N.Y.; Assateague, Va. and Md.; Whiskeytown, Calif.; Oregon Dunes, Oreg.; Sleeping Bear Dunes, Mich.; Flaming Gorge, Utah and Wyo., and Picture Rocks, Mich.

Dr. Crafts called for more research on recreation programs, more information and education on the subject, and more aid from Federal and state governments.

• *Science News Letter*, 84:56 July 27, 1963

PSYCHOLOGY

Alcohol Upsets Dream Life, Studies Show

► **TOO MUCH ALCOHOL** upsets a man's dream life.

Ask the seven medical students who gulped down the equivalent of six ounces of 100 proof gin before starting a good night's sleep.

Electrodes were attached to their bodies to permit scientific observation.

Records from the electrical instruments showed a substantial reduction in their dream lives.

The reduction, a team of investigators said, was indicated by the men's brain waves and eye movement patterns.

Scientists have learned that very active brain waves and rapid eye movements are associated with dreaming. Therefore, when the alcohol slowed down these patterns, it meant the alcohol was also reducing dream life.

Caffeine, taken in a dose equivalent to about three cups of coffee, did not have the same effect. Nor did it increase dream life as the investigators had predicted.

Drs. Samuel C. Gresham, Wilse B. Webb and Robert L. Williams of the University of Florida, Gainesville, reported this research in *Science*, 140:1227, 1963.

• *Science News Letter*, 84:56 July 27, 1963

CE FIELDS

MEDICINE

Potent New Swiss Drug Used for Iron Poisoning

► A POTENT new drug to treat iron poisoning, first tested on humans in Switzerland, is also being used clinically in the United States, the Ciba Pharmaceutical Company said.

The drug, called Desferal in Basel, Switzerland, is believed to be a "significant therapeutic advance" in treating "overloads" of iron in cases of severe anemia.

The Swiss research is reported in the *New England Journal of Medicine*, 269:57, 1963, but the Ciba medical department in Summit, N. J., said that Dr. Elmer Brown did preliminary clinical work at the University of Southern California in Los Angeles.

When the drug will be licensed for production is not known.

Drs. Sven Moeschlin and Urs Schnider of Solothurn, Switzerland, reported work with eight humans suffering from iron intoxication after being treated for anemia, who benefited from Desferal.

The Swiss doctors experimented first with guinea pigs that had acute ferrous sulfate poisoning, and found that if treatment starts after only six or 12 hours, 80% of the animals survive.

Desferal, called DFOM for its generic name desferrioxamine-B, is today the treatment of choice in certain conditions of iron poisoning.

Iron poisoning causes a brownish coloring of the skin called hemochromatosis and, to eliminate more iron than any other treatment in cases of primary disease, blood-letting is practiced.

But the investigators reported that secondary hemochromatosis in aplastic and sickle-cell anemia responded best to Desferal. Iron poisoning in a Mediterranean type of anemia that is particularly severe in children also responds to the new drug.

• *Science News Letter*, 84:57 July 27, 1963

PUBLIC HEALTH

Free Emphysema Tests Given to Congressmen

► ALL MEMBERS of Congress were offered to have their lungs tested free for emphysema, a serious disease that makes breathing difficult and may damage the heart.

The Alabama Emphysema Research Unit from Birmingham was opened to senators and representatives. At the invitation of Rep. Kenneth Roberts (D-Ala.) and Sen. Lister Hill (D-Ala.) they may participate in a new mass screening technique to emphasize the need for early detection and treatment of this lung disease.

Emphysema comes from the Greek word meaning "inflation" and not only makes breathing difficult from the lung enlarge-

ment, but may cause damage to the heart.

The Alabama unit has just finished a statewide emphysema research survey, sponsored by the Alabama Tuberculosis Association, the Medical College of Alabama and the Air Pollution Division of the U.S. Public Health Service.

Medical authorities report that emphysema is by far the most common chronic disease of the lungs, surpassing tuberculosis or lung cancer and is the major single cause of disability having a pulmonary origin.

The disease is on the increase but no accurate records are available since individual states do not keep records in the same way. However, California figures show a high increase in an eight-year period and this increase may be true across the country.

• *Science News Letter*, 84:57 July 27, 1963

SOCIOLOGY

Keep Talking to Help Solve RR Threat

► KEEP THEM TALKING, talking, talking, hours on end. This is the advice given by psychologists to help settle labor conflicts and international conflicts alike. It may aid the railroad labor situation.

So long as they keep discussing their differences, representatives of labor and management have a chance of obtaining the settlement of a potential strike. Similarly, talks between the Soviets and the United States over international problems such as atomic test bans must be considered hopeful if they do not break down.

If, through various devices, such as the injection of a new arbitrator, the fateful beginning of a strike can be postponed, there continues to be the chance that the parties can finally agree and work can go on.

Marathon bargaining sessions have aided solutions of many labor conflicts, most recently the New York newspaper strike.

• *Science News Letter*, 84:57 July 27, 1963

EDUCATION

Foundation Announces Educational Study Grants

► UNDERPRIVILEGED children and young people will benefit from Ford Foundation grants.

The money, totaling nearly \$2.5 million, will be used to aid programs designed to give equal opportunities in education and in later life to those who start off with a handicap for economic, cultural or ethnic reasons.

They will give aid to youngsters in age groups ranging from the preschool through the university level. They will enable slum children to prepare for school, and will help high-school dropouts find jobs or return to school at the college level.

The Foundation is also supporting programs in fields related to improving the chances for underprivileged children. These include teacher-improvement programs, delinquency prevention efforts and a guidance center to aid young prisoners in Detroit.

These programs will help combat the increasing wastage of human resources due to lack of education.

• *Science News Letter*, 84:57 July 27, 1963

MEDICINE

Parlor Game of Fainting No "Lark" for Players

► FAINTING in Britain is now a parlor game called a "lark" but it is causing more trouble to the medical profession than the feminine swoons of Queen Victoria's day.

In the *British Medical Journal*, July 13, 1963, Sir Aubrey Rumball, Air Vice Marshal and consultant in medicine, Royal Air Force, reported examining for pilot duties two young men who had played the potentially hazardous parlor games of the "fainting lark" and "mess trick."

Prolonged fainting had caused neurological symptoms and pulmonary edema (excessive accumulation of fluid). Both were unconscious and hospitalized after the fainting episodes involving breath-holding. The young men recovered but said they would never repeat their prank.

One of them described the "fainting lark" ordeal: He squatted on the floor and breathed in and out moderately deeply every three or four seconds. Then he closed his mouth and pinched his nose, all the time trying to breathe out. Both ears "plopped" and he felt as though he were drowning, blacked out, became unconscious and was taken to the hospital.

Sir Aubrey concludes: "Neither the fainting lark nor the mess trick can be regarded as safe. They are potentially hazardous parlor games. Risk of head injury from a sharp fall with sudden unconsciousness predominates, especially when the lark is not conducted on a soft or carpeted surface, well away from walls and hard furniture.

"To my knowledge disregard of these precautions has accounted for cerebral concussion by impact with parquet flooring in two instances, and with walls and hard furniture in four more.

"Two skulls were also cracked through lack of precautions. Now there is evidence that non-traumatic risks are present which, if numerically fewer, are no less unpleasant or hazardous."

• *Science News Letter*, 84:57 July 27, 1963

EPIDEMIOLOGY

Canine Rabies Decreases As Wildlife Cases Rise

► RABIES among wild animals is rising, two veterinarians reported in the *Journal of the American Veterinary Medical Association*, 143:52, 1963.

While rabies among wildlife increased from 1,479 in 1953 to 2,174 in 1961, rabies in dogs decreased 92% since 1946. Compared to 8,000 canine rabies cases in 1946, less than 600 were reported in 1961. The number of cases affecting man dropped from 22 to 3 during the time.

Skunks, bats and foxes are the principal carriers of infection. Geographically, rabies has decreased in all areas of the country except the Pacific and West North Central regions.

A fatal disease, rabies is characterized by mental derangement, spasms, fever, vomiting and profuse secretion of saliva.

• *Science News Letter*, 84:57 July 27, 1963