

Synthesis and Survival—1966

by Barbara J. Culliton

Synthesis is the word for biology this year. Diabetic patients can be treated with synthetic human insulin and man-made insect hormones can be turned against insects as a weapon of biological warfare.



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In laboratories across the country, scientists working in a variety of biological areas pursued the search for the key to life, synthesizing hormones, examining the many forms of enzymes for their medical and biological implications, probing the hidden structure of messenger RNA or ribonucleic acid molecules, and uncovering the relationship between hybrid cells and the ways they speak to each other through RNA and DNA, deoxyribonucleic acid.

In the animal world, extinct animals from rare wolves to parrots and possums showed their faces, proving they were not entirely extinct after all, and exotic beasts such as gerenuks and dibatags became U.S. citizens after an introductory stay in New Jersey.

A look ahead mirrors the past with synthesis, synthesis and more synthesis in sight, auguring the time when biologists can create chemicals and hormones sick men may be missing.

Scientists synthesized secretin, a scarce hormone useful in diagnosing cancer and other diseases of the pancreas.

The origin of the hearing mechanism of man and other animals has been traced to members of a family of prehistoric fish, according to a new theory of the evolution of the middle ear. The theory states the middle ear originated some 50 million years earlier than had been thought.

Photosynthesis for the first time was conducted at high rates in complete form outside the cells of green plants.

Living combinations of hybrid cells, formed from species as diverse as hens and rabbits, and men and mice, were studied to determine their synthesis and regulation of DNA and RNA. It appears that the instructions transmitted by the genes of one species in the hybrid cell are understood and acted upon by the cell material of the other species.

Like other animals, insects were found to emit chemical signals that defend them against predators, warn of approaching danger, and exchange messages of courtship and other social activities.

Human insulin was synthesized making it the first human protein, and the third protein of any kind, ever made by man.

A single inoculation with sex hormones has prevented conception for a full year in animals.

Antiserum against urease, an enzyme whose action produces ammonia in the body, offered protection against radiation disease in mice. Inoculation of human patients helped them to fight liver disease.

In animal experiments tremors like those found in Parkinson's disease were associated with deficiency of two chemicals, serotonin and dopamine.

A device that processes protein from the leaves of vegetables was developed by British scientists.

A chemical having biological properties of the juvenile hormone of insects was synthesized. The chemical successfully disrupted the life cycle of many insects.

Support for the theory of a biological basis for certain mental illness has come from discovery of a "gross" disturbance of sodium-potassium equilibrium in the body cells of manic-depressives.

A new milling process for rice was developed which produces more rice, whiter rice, protein-rich rice bran and inexpensive rice oil.

A bird previously thought to be extinct, the Auckland Island rail, was discovered on desolate Adams Island, a windswept islet of the Auckland group 600 miles south of New Zealand.

Reptile skin, thought to be impermeable to water, was shown to allow a great deal of water to escape from the animal as a sort of "sweat." Crocodiles in particular lose water this way, it was found.

Nutrition of Australian cows was improved by feeding them old metal screws. The screws chipped away the lime deposits around the cobalt pellets the cows had swallowed as diet supplements, releasing the needed cobalt.

The Australian parrot, budgerigar, was found to have a faster heart rate

per ounce of weight than any other mammal.

A pigmy possum, the first of its species ever to be seen alive, was discovered in a ski hut in the Victorian Alps. The animal was identified as a *Burrhamys parvus*, a species previously known only through fossils dating back almost a million years.

For protecting sensitive people from often fatal bee stings, a solution of pure venom has proved to be 10,000 times more potent than the standard solution, made from the ground-up bodies of whole insects.

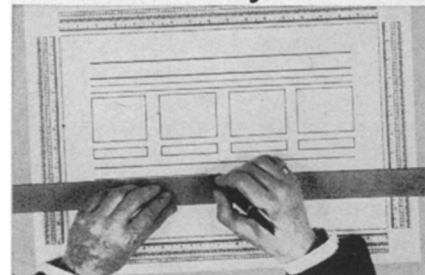
A new genus of worm was discovered in a northern Illinois fossil, 280 million years old. Dubbed the Tully monster, it had teeth, a wagging tail and a curious bar protruding from the back of its head.

A new instrument was developed for taking the pulse during surgical operations when no other technique will work. The instrument uses a photoelectric cell for monitoring the pulse, and is placed in the nose.

Tiny organisms at least three billion years old were found preserved in South African rock. The discovery indicates that life existed on earth a billion years earlier than previously supposed or thought possible.

"Birth control" in animals took a step forward as animal physiologists tested a small plastic intrauterine device in ewes, cows and sows.

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