GENETICS

Chromosomes Now Seen

Achievement resulted from new technique for smashing viruses in electron microscope and photographing the debris. Work done with bacteriophage.

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➤ STRANDS OF the heredity-inducing chemical, or "chromosomes," of a virus have now been seen and positively identified with the virus it came from for the first time.

This achievement was made possible by the freeze-drying technique for smashing viruses in the electron microscope and photographing the sub-microscopic debris developed by Drs. Robley C. Williams and Dean Fraser of the University of California.

The virus they worked with is a bacteriophage, a virus which infects bacteria.

"Bacteriophage 'chromosomes' are known to be almost pure desoxyribose nucleic acid, or DNA," said the biophysicists. "Nucleic acid is implicitly involved in determining the heredity of every living thing, and we believe that DNA is entirely responsible for the replication (duplication of structures as in genetic processes within the cell) of bacteriophage inside the bacterium. Therefore, we were extremely anxious to examine this substance as it comes from the virus and without chemical extraction and purification."

The ghost of a T_6 bacteriophage is shown in the picture on the front cover of this week's SCIENCE NEWS LETTER. It is on the right of the picture which was taken by Drs. Williams and Fraser. The "ghost" is the protein outer coat of the virus and the fibril strands of nucleic acid (DNA), which came from the particle when it was smashed, are scattered to the left. The sandpaper-like background is the collodion film on which the virus rests, as it appears under very high magnification. The large, black spot to the right of the "ghost" is just a pit in the film.

The scientists explained that other methods of preparing DNA for study usually result in elongate (polymerized) fibril strands of the substance or broken fragments of DNA "molecules." The researchers reported their determinations of the physical character of virus DNA strands in agreement with other methods for physical analysis of the substance.

Drs. Williams and Fraser report their work in the *Proceedings of the National Academy of Sciences.*

Science News Letter, September 19, 1953

PHYSIOLOGY

Spurs to Immunity

➤ DISCOVERY OF two chemical spurs to one of the body's important protective mechanisms was announced by Dr. John H. Heller of the Yale School of Medicine, New Haven, Conn., at the meeting of the International Physiological Congress in Montreal, Canada.

The two chemical spurs are vitamin B-12, known as the anti-anemia vitamin, and choline, which prevents fat from being deposited in the liver.

The protective mechanism they spur, or stimulate, is called the RES, short for reticulo-endothelial system. The RES was discovered about 30 years ago, but is still one of the least known systems in the body. RES cells are found throughout the body with a heavy concentration in the liver and spleen.

What little is known about the RES points to its playing a critical part in maintaining good health. Some of the clues about its unknown functions give hope that it may be the key to treating many serious diseases such as cancer and heart disease.

The RES is known to help produce the antibodies that fight disease germs, and gamma globulin now being used to fight polio. It seems to be important in helping to protect healthy tissue against radiation sickness, including that from atom bombs. And an important connection between the RES and cancer is known to exist though the exact relation has not yet been determined.

The experiments reported by Dr. Heller showed that when the RES had been depressed to below normal function in laboratory animals, an injection of choline or vitamin B-12 restored it to normal.

The fact that the RES was being stimulated could be determined by a method developed by Dr. Elemer Gabrieli of the Yale group. This method gives the first one scientists have had for accurately measuring the RES or telling whether it was being depressed or stimulated.

Dr. Gabrieli used for his test radioactive phosphorus made in the atomic pile at Oak Ridge, Tenn. This radioactive, or tagged, phosphorus is injected into the blood stream. The RES and only the RES will immediately pick up this radioactive chemical and remove it from the blood.

Before and after blood tests show how fast it is doing the job. If the rate is above normal, the RES is being stimulated. If it is slower than normal, the RES is not functioning properly.

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OCEANOGRAPHY

Discover Large Basin Under Water Off Mexico

➤ DISCOVERY OF an 8,400-foot deep basin six miles long and two miles wide on the floor of the Pacific ocean off the west coast of Mexico has been reported by the University of Southern California.

Covering an area of 1,500 square miles, larger than the state of Rhode Island, the newly-surveyed area was named the Velero Basin because it was found from the research ship Velero IV, operated by the Allan Hancock Foundation for Scientific Research.

Dr. Kenneth O. Emery, professor of geology, conducted the survey as a field trip of his oceanography class last year. His findings are reported in the *American Journal of Science* (Sept.). Graduate students participating in the work were R. E. Arnal, B. L. Conrey, W. E. Fortin, J. R. Grady, W. H. Hudson, J. W. Marlette, W. Orr, E. Uchupi, and F. C. Ziesenhenne.

The Velero Basin lies about 100 miles off Ensenada, Mexico, between the continental shelf and the coastline, at latitude 31.5 degrees north and longitude 118.5 degrees west.

It is the deepest point of the whole region east of the continental slope and north of that latitude. Its water is different from that of the open sea in that it is nearly the same temperature, 37 degrees Fahrenheit, from a depth of 6,000 feet to the bottom, has almost the same salt content and is of abnormally low oxygen content between 6,000 feet and 8,400 feet.

Science News Letter, September 19, 1953

GERONTOLOGY

"Smart" People Give Psychologists Surprise

➤ "SMART" PEOPLE get smarter as they grow older. This surprised even the psychologists who tested them.

Another surprise was finding that the two oldest of some 1,200 tested had grown smarter and scored higher than the group averages, even though they were not among the ones selected in 1922 for their "giftedness," or smartness. These two were tested simply because they were married to gifted persons in the original group.

These findings were reported by Dr. Nancy Bayley of the University of California and Dr. Melita H. Oden of Stanford University at the meeting of the Gerontological Society in San Francisco.

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