GENETICS

Cell Inheritance Found

➤ A REVOLUTIONARY genetic discovery in which a type of cell inheritance is controlled by the structural organization of the cell itself, regardless of its gene content, was reported by Dr. Tracy M. Sonneborn, Indiana University geneticist, in a Vanuxam lecture at Princeton University.

Dr. Sonneborn said that in his laboratory, radically differing types of the one-celled animal paramecium, a type of protozoan, having identical genes, reproduced themselves true to type. Their progeny remained different in spite of gene similarity.

Previous research by Dr. Sonneborn and his associate, Dr. Ruth Dippell, demonstrated genetic control by factors in the cytoplasm, the jelly-like mass of the cell surrounding the gene-carrying nucleus.

The new hereditary basis, Dr. Sonneborn said, resides in the cortex, or outer layer of the cell.

By controlled treatment with antiserum during mating of the one-celled animals, the researchers produced new kinds of paramecia. Two cells became fused, forming a double animal, after which the abnormal doublets were mated with normal single cells. The doublets then reproduce themselves, as do the singlets.

There was the usual exchange of genes in the mating of the doublets and singlets, despite the fact that the doublets henceforth produced doublets and the singlets, singlets. Despite carrying similar cytoplasm, the two types were shown to reproduce themselves.

Portions of the cortex of one animal were broken off and attached to another as further proof that the cortical structure reproduces itself. These portions became part of the host animal, with two each of several of the usual parts. Its progeny all had the extra parts, although their genes were the same as those of normal ancestors.

Dr. Sonneborn said he did not doubt that the genes direct the production of all the substances utilized in the construction of the hereditary organization of the cortex. He even conceded that the genes may determine in some obscure way the mechanisms by which the various parts of the new cortex are produced during cell division.

But regardless of gene connection with the mechanisms, the geneticist said "the mechanisms are such that changes in the organization of the cortex reproduce themselves."

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ASTRONAUTICS

High Radiation in Space

➤ UNLESS ASTRONAUTS will risk exposure to extremely high levels of radiation in far space, man may be barred from travel to the moon and other bodies of the sun's system.

Dr. Cornelius A. Tobias of the University of California said that the radiation associated with solar flares presents the most serious hazard known to manned travel in space.

The lethal doses of radiation released by giant solar flares must be taken into consideration in planning any long-term space flight, Dr. Tobias reported to the symposium on Medical and Biological Aspects of Energies of Space in San Antonio, Tex.

Besides the giant flares, Dr. Tobias and Dr. Roger Wallace of the Lawrence Radiation Laboratory, Berkeley, Calif., have found that the sun's monthly activity would expose man in space to highly dangerous radiation doses—from five to 100 times the present levels of permissible occupational exposures.

Trying to avoid flare radiation by advance warning is impractical, since there is not sufficient time for evasive action, Dr. Tobias said. Shielding requires too much waste weight.

The problem, Dr. Tobias said, is sufficiently critical to require intensive study of solar flare activity.

One suggested solution is to design a space vehicle in such a way that the biological shielding would be provided by a material that also has other functions, such as a fuel reserve intended for the final retardation upon nearing earth on the return trip.

Another method for combating radiation damage might be "continuous treatment for radiation sickness" or other measures, Dr. Tobias said.

Besides learning more about solar flares, Dr. Tobias suggested investigating the dose rates that man can tolerate relative to the possible benefits of lunar and space flight.

The problem can perhaps be solved by a combination of a short trip, some shielding, prophylactic measures with regard to radiation sickness, and traveling at a period of minimum solar activity, Dr. Tobias said.

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ASTRONOMY

Astronomical Events Give Clue to Mayan Calendar

➤ A NEW WAY of converting dates in the archaic Mayan calendar into the familiar, modern calendar has been worked out by a United States astronomer.

The happy coincidence of an eclipse of the sun very close to the date of the passage of the planet Venus across the face of the sun gave Dr. Charles H. Smiley of Brown University, Providence, R. I., the conversion method. Because of the coincidence he was able to match the known date of such a pair of celestial events in ancient times with the date as recorded in Mayan records.

Dr. Smiley reported in Nature, 188:215, 1960, that the correlation rests in part on the assumption that the generally accepted Spinden correlation is correct within 100 years. This assumption has been confirmed by radiocarbon results. Dr. Smiley set the date 477 A.D. as the beginning of the Mayan calendar.

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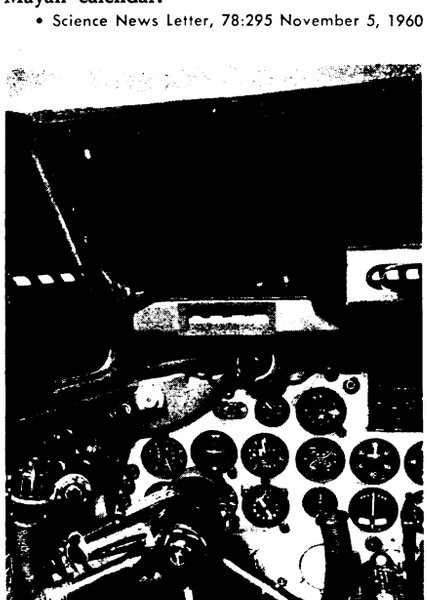

FLYING "BARBER" POLES

AERONAUTICS

Eye Level "Poles" Provide Flight Data

➤ A NEW FLIGHT indicator enables the pilot of an aircraft to "watch" his flight instruments without looking at them. It eliminates the potentially dangerous period that occurs during landing when the pilot has to transfer his attention back and forth from instruments to visual flight.

The indicator was developed to meet the requirements of the British European Airways for instrument flight control equipment on their three-jet short-haul airliner, the Airco D.H. 121.

The new system was described to the International Air Transport Association meeting at Lucerne, Switzerland, by A. M. A. Majendie and K. Fearnside, research engineers of Smiths Aircraft Instruments, England, who worked on its development.

They reported that although aircraft instruments usually have to be viewed before information can be extracted from them, the required information can be seen "out of the corner of the eye" with the new indicators. In the system, three small "barbers' poles" painted black and white are used to provide information on the airplane's attitude.

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