

GENETICS

Heredity-Bearing Genes and Death-Dealing Viruses Alike

X-Ray Studies Reported to International Congress Suggest Possible Essential Similarity; May Be Free

GENES, the bearers of life, and viruses, that bring disease and death, may be very much alike.

This revolutionary suggestion was laid before the meeting of the Seventh International Congress of Genetics in Edinburgh, Scotland, by Prof. John W. Gowen of Iowa State College.

Prof. Gowen also told of his use of X-rays as measuring tools, to give an estimate of the size of both these types of vitally important particles, which are too small to be seen with even the most powerful of microscopes. He found the virus particles to be super-sized molecules, with a molecular weight of approximately 16 million. This is in fairly close agreement with measurements obtained by other means.

Regarding the possible essential similarity between genes and virus particles, the American scientist said:

"Possibly the only difference between these small viruses and the gene is that the latter is attributed a place in the cell chromatin whereas the former is free to move, making its isolation in relatively pure form possible. But even this difference is likely to break down. With better techniques of recognizing gene effects, these substances may very possibly be found within the cell cytoplasm or even in the circulation of the animal or plant."

The idea of genes wandering at large in plants and animals, instead of always roosting securely on or in the chromosomes, is a new slant in genetics. It would put both genes and virus particles in the position of being complex chemical entities that go about giving orders to the rest of the protoplasm. The difference would be that genes are "natives," with a right to do this, while virus particles would be outsiders, muscling in and forcing the protoplasm into abnormal behavior.

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Benefits to Well-to-do

FAMILY allowances for all who earn up to \$10,000 annually to encourage more children and prevent the world's

new freedom of voluntary parenthood from becoming disastrous is advocated by Dr. R. A. Fisher, Galton professor of eugenics, University College, London, in answering Science Service's inquiry as to how the world's population could be improved most effectively genetically. (See *SNL*, Aug. 26)

"Parenthood is now voluntary," stated Dr. Fisher, one of the world's leading authorities on human heredity. "If this new freedom is not to be disastrous, it is necessary that in all grades of society parents and non-parents, contributing by their work equivalent services, shall enjoy equivalent benefits. On the economic and industrial side this problem is now solved in countries which apply systems of family allowances.

"In English speaking countries the issue has been obstructed and obscured by giving such allowances only, or principally, to the unemployed, and to those in special need. Contributory systems should be applied to all wages and salaries up to \$10,000, as are contributory systems of superannuation benefit.

"We might then cease to destroy the best qualities of our peoples, as we now do, by selecting native ability from all classes, and effectively sterilizing its possessors by drafting them into occupations where small families, or none, are customary.

"There is no biological reason why the large houses of the prosperous should not support more children than the cramped quarters of the poor, and there is every reason in the name of both inheritance and environment for seeing to it that they shall do so."

Dr. Fisher is one of several world leaders in genetics to whom was put the important inquiry by Science Service.

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Triple-Resistant Wheat

A TRIPLE-RESISTANT variety of wheat, able to defy three of wheat's worst natural enemies, will be ready for distribution to growers in 1943, Prof. Fred N. Briggs of the University of California promised.



SMALLEST METAL TUBE

About the size of an average hair of your head is a World's Fair wonder at the West Virginia Building. Material: Pure nickel. Diameter: 26/10,000th of an inch. Its hole is less than a third that. Use: None except to be seen, although hypodermic needles use only slightly larger tubes. At left is tube, at right hair. Center, the point of a pin.

The wheat breeder is able to make this prediction with confidence that when the time comes he will deliver the goods because of the method used in producing the new variety, Prof. Briggs explained. By crossing a resistant strain with a productive but non-resistant one, and then back-crossing the hybrid offspring with one of the parent stocks, the desired character of the parent can be stabilized or fixed in the new variety.

Back-crossing thrice repeated has already produced a wheat resistant to both bunt and Hessian fly, in the California breeding fields. Seed of this variety will be available to California growers in 1940. The triple-resistant wheat will require five backcrosses.

Back-crossing is also being used for the production of hullless and awnless barleys. A number of other crops are under experiment, Prof. Briggs stated.

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Teosinte Not Ancestral

CORN is not descended from the heavy-stalked Mexican grass called teosinte; more likely teosinte is descended from corn.

Evidence pointing strongly in this direction was presented by Prof. P. C. Mangelsdorf of Texas Agricultural Experiment Station.

It has long been contended that corn

was derived, in some long-forgotten age, from teosinte, largely because teosinte grows abundantly in the wild state in Mexico and Central America, where corn, whose wild ancestor has never been found, was the staff of life of the great Indian civilizations.

Prof. Mangelsdorf, suspecting that teosinte, not corn, might be the descendant, tried making hybrids of corn with a related wild grass, *Tripsacum*. He obtained intermediate forms, that suggested teosinte in some of their properties. A critical re-examination of teosinte disclosed the interesting fact that every character of teosinte is found in either corn or *Tripsacum*, or is intermediate between the two.

Not only is this the case, but analysis of the heredity-bearing chromosomes within the cells of his hybrid plants showed that the germ-plasms of corn and *Tripsacum* are capable of the intimate mixtures and interchanges that are required for the origination of stable hybrid forms.

As more probable ancestor to corn, Prof. Mangelsdorf pointed to pod corn, a strange type with each kernel covered in an individual husk, now grown only as a curiosity. He suggested that a wild pod corn may still be growing, somewhere in the lowlands "back of the Andes," in whose valley and plateau lands corn was first extensively used by highly civilized Indian nations.

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Tumors in Fruit Fly

IT IS hard to think of an insect no bigger than a gnat being afflicted with tumors. Yet such is the case. Prof. Mary B. Stark of New York Medical College told of such growths which she has studied in the larval stage of *Drosophila*, the gnat-sized fly that is the favorite animal of geneticists.

In certain strains of *Drosophila* these tumors appear generation after generation, in the digestive tract. They are sex-linked, appearing only in males—and they kill half of these. In another strain, the tumors appear in both sexes, but are not lethal.

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White Feathers: Thick Shells

DEFINITE hereditary physiological traits go along with visible bodily character in different breeds of fowl, Prof. F. B. Hutt of Cornell University told the meeting. Thus, White Leghorn hens lay thicker-shelled eggs than do heavier breeds like Plymouth Rocks or

Rhode Island Reds, and they adjust more readily to changes in temperature.

Inheritance of abnormalities in fowls, producing the seldom-seen "freak" breeds such as Creeper and Dark Cornish, were reported by Prof. Walter Landauer of Connecticut Agricultural Experiment Station. In these breeds there is a hereditary shortening of the leg and wing bones, producing a kind of Dachshund-in-feathers effect. In the purest-bred (homozygous) specimens this shortening extends to other bones, and the phenomenon may be so pronounced that the chick is unable to hatch at all, but dies within the shell.

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Cells Fail to Divide

SOME of the strangest cells ever seen through a microscope were described by Dr. Charles A. Berger, S. J., of Woodstock College.

If twice or four times the normal number of the heredity-bearing chromosomes are found in the cells of an animal or plant, that is considered something worth mentioning at a scientific meeting. But Dr. Berger has found cells in the lining of the digestive tract of mosquito larvae that have 48, 96, and once in a while even 192 times the normal chromosome number.

Ordinarily a doubling in chromosome number within a cell is the preface to division into two cells. But these strange cells in the mosquito "wigglers" just pile up their chromosome counts without dividing. Finally, when the larva is preparing to change into a winged adult, the divisions appear all at once, and the chromosome numbers go back to normal in the new cells.

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PUBLIC HEALTH

England Making Ready For Blood Transfusions in War

ALL EUROPE makes ready for possible war with a grimness that must stifle much constructive and creative activity. Air raid protections are being constructed in gardens, public parks, and in basements. Medicine too is preparing for the immense overload on its services that will come if other countries are bombed as Spain was in its recent war.

Most extensive of the medical preparations in England is the emergency blood transfusion scheme. If bombs rain on England, much blood will be spilt. Spanish experience showed that at least a

tenth of the casualties could be saved by blood transfusions. Now when it is possible to do so, men and women by the thousands are having their blood group determined so that their blood can be used to save lives when and if the need arises.

In making a transfusion not just any blood will do. It must be of the proper group. Blood that does not match may actually kill the patient. In addition, the prospective donor of the blood must not suffer from any blood-carried disease. Typing and testing a person's blood is a skilled operation that takes time. It is better to have that part of the job done before the need arises.

Healthy men and women between 21 and 65 are volunteering at 70 centers throughout England as blood donors. Already 10,000 have been tested in the London area alone. For Greater London and surrounding area, 250,000 are needed. Accepted donors are given distinctive cards telling to which of the four groups their blood belongs. Already it is planned to give blood donors extra rations to maintain their blood quality if food becomes scarce.

Because blood can be kept in cold storage until needed, blood storage depots, each equipped with at least 10,000 bottles and apparatus for its collection and distribution, have been arranged.

War, if it comes, will be bloody in a saving sense as well.

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PHYSIOLOGY

Air Defense Experts Are Worried About "Blast"

ADVANCE reverberations of war from London: Pieces of metal sprayed about by exploding bombs are not the only hazard. "Blast," the very rapid rise in air pressure followed by a slightly slower fall caused by a near-by explosion, has defense experts worried. It is a physiological problem not licked by air raid shelters. Earth and iron protection may stop bomb splinters, but they don't stop the air blasts. Science needs to know more about "blast," but it does know its lethal effect is dependent upon the rapid fluctuation of pressure. Grim figures—tests indicate that there would be 17 casualties per ton of bombs dumped on London if all were protected by Anderson air raid shelters, and they won't be. Estimates the President of the Air Raid Protection Institute: "Germany alone could dispatch 3,000 tons of bombs per day to Britain."

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