GENETICS

'Evolution by Mistake'

Changes in man's delicately balanced relationship to his environment are likely to create variables in the "pool of genes" from which he draws

➤ ANOTHER genetic theory—"evolution by mistake"—has been added to such well-known ones as natural selection and adaptation.

"Human beings are like autos: they are built to function," Dr. F. J. Berry, a geneticist at the Royal Free Hospital School of Medicine, London, told the British Association for the Advancement of Science meeting in Nottingham, England.

"To put it rather crudely," Dr. Berry said, "if their design is faulty, they can be a problem to both themselves and others. This is one of the reasons why we see so few genetical changes in the process of happening: useful genes have already been incorporated into our mechanism."

Man's relationship with his environment is so finely balanced, he said, that a change in environment is always likely to produce a change in the "pool of genes" to which we have access.

"For example, it is an advantage to carry the gene which causes sickle-cell trait of the red blood corpuscles if you live in a malarial region, because you will have some protection against severe attacks of subtertian malaria.

"It is not a good thing to have sickle-cell trait if you live in a non-malarial region, and the frequency of sicklers among American Negroes has fallen to nine percent from an estimated 15% in the three or four centuries since they left Central Africa."

The Negroes taken to America by the slave traders did not go voluntarily. The genetic change that has occurred in them is a consequence of their change of environment; it so happened that they carried genes with them that were deleterious in their new country. Although natural selection is acting to reduce this genetical load, sickle-cell trait is still a common characteristic of the colored American population.

As another example, Dr. Berry cited "several thousand" U.S. citizens who suffer from an inherited progressive degeneration of the central nervous system.

"They can all be traced back to a loose lady living in a Suffolk village, whose sons emigrated to New England in 1630," he said. "Some of their immediate descendants were burned for witchcraft on account of their uncoordinated behavior. The original trait—even though carried by only three people—was frequent in the population because the population was so small; it is now no more frequent, but the population has increased so much that more people carry the deleterious gene.

"Even more spectacular," he added, "is the increase in the number of carriers of a gene causing porphyria (a breakdown of hemoglobin and chlorophyll) in South Africa. This originated in a Boer man and his wife, an orphanage girl shipped out to Capetown in 1688. Nowadays, three in 1,000 of the white population of South Africa have the condition, an 8,000-fold increase in the gene. However, the original population of South Africa has increased 12,500-fold in this time, so the frequency of the gene has actually declined, possibly due to selection against it."

Dr. Berry concluded: "Evolution is not a lottery depending on the random juggling of genes, but neither is it merely the consequence of orderly successions of natural selection and adaptation. Evolution may take place as a consequence of apparently inappropriate genes being delivered to start new populations. This means that evolution may take place by mistake—but the mistake may give information of value to archaeologists, anthropologists or medical epidemiologists."

NIH

NO GERMS HERE—This germ-free rat sniffs at food offered to him in a stainless steel spoon. Rats are born and raised in germ-free isolation for use in laboratory research at the National Institutes of Health, Bethesda, Md.

GENETICS

A-Bomb Genetic Damage May Be Curing Itself

➤ AFTER 21 years, genetic damage sustained by survivors of the Hiroshima and Nagasaki A-bomb blasts may be curing itself.

Tentative indications of this were reported by Dr. A. D. Bloom at the International Congress of Haematology meeting in Sydney, Australia.

Dr. Bloom, who is working with the Atomic Bomb Casualty Commission in Hiroshima, said that a study of survivors showed only a relatively small percentage now suffering from radiation-caused defects in the chromosomes or genetic material of blood cells.

Some 188 survivors, selected from 20,000 in both cities, were divided into two groups—half who were within 1,400 meters of the center of the blast and sustained an excessive amount of radiation and half as a control group who were up to 4,000 meters away and received comparatively negligible amounts.

The nearer group sustained radiation of 200 or more rads, which is not fatal, but sufficient to damage the highly sensitive chromosomes. The other group received an average of only one rad.

Dr. Bloom said Japanese scientists have found that only 35% of the nearer victims now suffer from defective chromosomes, and in the other group only one percent (which may or may not be due to blasts). Findings may indicate that the defective cells are gradually being eliminated from the survivors' bodies.