

BIOLOGY

Predict Future Man

One hundred years after the theory of evolution was first enunciated by Charles Darwin in his *Origin of Species*, scientists are tracing man's past and looking for clues to cancer.

OVERSPECIALIZATION may be the ruin of man.

All those creatures that have become extinct in the past have disappeared because of overspecialization and right now man seems to have overspecialized in brains, an anthropologist told SCIENCE SERVICE. However, this form of overspecialization has one advantage compared with overdeveloped muscles, for example. Man at least has the chance to use his brain to prevent his extinction, said Dr. L. S. B. Leakey, curator of the Coryndon Memorial Museum, Nairobi, Kenya.

Dr. Leakey, lecturing at the Darwin Centennial in Chicago, predicted what man may look like in the future. Generally speaking man has become less robust and this will probably continue. Men may now be taller than their grandparents, but they are not as strong. Another characteristic of future man is that he will probably represent a mixture of the races.

The various races or subspecies of man, which result from isolation of groups, are converging, Dr. Leakey explained. This could mean something genetically very good as the re-pooling or mixing of the races occurs.

Describing his recent find of an early man in Africa, older than Java man or Peking man, Dr. Leakey pointed out that the skull was found with extremely primitive stone age tools at a campsite some 220 feet underground. This find represents the oldest known man, more than 600,000 years old, Dr. Leakey said.

There are several characteristics that indicate the skull's place in the development of modern man. These include enormous sinuses, the way the head is placed on the neck, its nasal openings and its mastoids—all of which are man-like rather than ape-like. The skull was found in the Olduvai Gorge area of Tanganyika Territory, British East Africa.

The new man, called *Zinjanthropus boisei* might be described as the lowest "Low Brow," Dr. Leakey said. The brow is very low, while the skull shows an unusually long face. A strange finding is the presence of a bony shelf below the ear hole. The man was probably 18 years old, with massive shoulders and spindly legs.

Right now, Dr. Leakey said, researchers are working on dating the find by the potassium-argon method. This very new technique has been used some, but never before to date a discovery so important to the evolution of man. It is basically a test for mineral involving the release of gases. Dr. Leakey expects to have a date for the new skull sometime early next year.

We now have about 10 links in the development of man after the appearance of

the first "humanoid," a creature that represents the junction where the two branches, man and ape, meet. More early men can certainly be expected to be uncovered, Dr. Leakey predicted. Scientists can even predict what these men would look like: small, walking upright and "heading toward man" as we know him today, Dr. Leakey said. It is doubtful that tools will be found along with any of the remains.

Pliocene beds—deposits some millions of years old—in East Africa are promising sites for future explorations, Dr. Leakey said. On the basis of what is known about animal life of the period, anthropologists have a good idea of where more of these links in the chain of the evolution of man may be found.

Cancer Clue Sought

A SEARCH for the possible equivalent of cancer cells among microorganisms could be used to attack the cancer problem, a Russian scientist suggested during the Darwin Centennial celebration.

Dr. G. F. Gause, scientific director of the institute of antibiotics and professor of biology at Moscow University, pointed out that, by showing that all living forms have evolved from common ancestors, Dar-

win had suggested that pathological processes may be found in their most primitive forms among lower organisms.

Recent experiments indicate that specific differences in various strains of microorganisms, such as differences in how they "eat" and "breathe" may be similar to the differences that distinguish cancer cells from normal cells. This is one of the promising paths Darwinism has led to, the Russian scientist explained.

Some 2,000 persons gathered in Chicago for the five-day discussion of what has happened in evolution since Charles Darwin published his world-famous "Origin of the Species," 100 years ago, on Nov. 24, 1859.

A panel of experts including Sir Charles Galton Darwin, grandson of the "evolutionary Darwin," discussed the origin of life as an issue in evolution.

Concerning the problem of the guidance of human evolution, Dr. Hermann J. Muller of Indiana University, a Nobel Prize winner, suggested that natural selection is now operating in a way that is, in some respects, the "reverse of what would ultimately be useful and desirable."

Individuals need to recognize their genetic responsibility as well as their responsibility for educating and keeping their children healthy.

Persons who have more than the average share of genetic defects should, he suggested, refrain voluntarily from reproduction. In contrast, it will be considered a "social service for those more fortunately endowed to reproduce to more than the average extent.

Dr. Muller foresees a time when improved techniques and facilities will permit storing germ cells, and testing, selecting and manipulating those that are desirable. It



DENTAL TV—An optical dental probe, shown in use by a dentist, projects a magnified view of the teeth onto a large screen. Currently being developed by the medical science technology department of the Avco Corporation, Wilmington, Mass., the device consists of a fingertip-size lens system, held in the dentist's hand, and a small bundle of three-foot-long glass fibers leading to a closed-circuit television camera.

would thus be possible to adopt children even before fertilization—in a manner of speaking—he said.

"By these means the way can be opened for unlimited progress in the genetic constitution of man, to match and reinforce his cultural progress," Dr. Muller concluded.

Creating Test-Tube Life

MAN MAY be able to create life in the test tube within the next 1,000 years.

There seems to be no reason why scientists will not be able to rediscover the physical and chemical conditions that once determined and directed the course of evolution, Dr. Hans Gaffron of the University of Chicago predicted at the Darwin Centennial.

Scientists have now extended Charles Darwin's concept. While Darwin described the evolution of each living thing from a less complex ancestor, with modifications that enabled it to meet better the stress of its environment, it is now believed possible to carry this description one step further.

There must have been a first primitive living cell or group of cells. If this is admitted, it seems that living matter could be made in the laboratory, Dr. Gaffron said.

Thus, while it took nature three billion years to form the first living cells, scientists may be able to achieve the feat in the laboratory test tube within the next 1,000 years.

The four stages that led from the lifeless compounds to the living were described as follows by Dr. Gaffron:

1. A layer of water vapor-methane-hydrogen-ammonia covering the earth provided for the accumulation of important organic compounds.

2. Oxygen began to replace hydrogen in the earth's atmosphere.

3. Organisms capable of living in an oxygen-less atmosphere gave way to cells deriving their energy from visible light.

4. Green plants which produce oxygen became dominant.

Dr. Gaffron pointed out that in recent years laboratory evidence has been obtained to show that this is an accurate description of what did occur.

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ROCKETS AND MISSILES

Rockets May Service Satellites in Earth Orbit

ROCKETS may soon soar up to satellites in orbit, service them, feed information to them, change parts, photograph and even "psychoanalyze" them.

Recently the Air Force's 199B Air Launched Ballistic Missile (ALBM) was fired up for a short visit alongside the Paddlewheel satellite, Explorer VI.

The two-stage missile was launched from an airborne Air Force B-47 stratojet bomber.

The space-age experiment was intended only to test accuracy of the new guidance

system in the missile, but results were so spectacular that the Air Force is now considering the proposal of Martin, builders of the ALBM, for a Satellite Surveillance Program that would include many experiments involving a missile-satellite relationship.

The rockets would be fired to the same height and at about the same speed as the satellites, but they would return to earth after moments of flight.

Some of the rockets would photograph the satellites to determine their condition after exposure to bombardment of particles from outer space. Other rockets would interrogate them, or pass radio information back and forth.

It has been speculated by experts that improved guidance systems might enable the rockets to attach spare parts to satellites, or add experiments. Recoverable rockets may clamp on to the satellite and bring it back to earth intact.

The Air Force has hinted at the military advantage of the ALBM as an instrument to knock enemy satellites from their orbit, or recover them intact.

ALBM's, or rockets like them, have been proposed to carry food, water and supplies to astronauts in manned observatory satellites that stay in orbit for long periods.

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MATHEMATICS

Plotting 24 Points On Globe Is Solved

HOW TO plot 24 points on the surface of a globe so that each is as far as possible from all neighboring points has been solved for the first time.

The best arrangement is to make the points form the tips of 32 equilateral triangles and six squares on the sphere, with one square and four triangles meeting at each point. Previously the problem of plotting points on a sphere at the longest possible distances from each other was solved only for nine and 12 points on the surface.

The 24-point solution was reported to the American Mathematical Society meeting in Los Angeles by Dr. R. M. Robinson of the University of California. It is not known to have any practical application at this time.

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Questions

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ENGINEERING—How can telephone line tapping be detected? p. 384.

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Do You Know

Cobalt, a somewhat magnetic element, is used with iron in making magnet steels and alloys.

Ozone, a form of oxygen that occurs in minute amounts in the atmosphere, can be used as an excellent tracer of air movements in the lower half of the stratosphere.

The production of *uranium oxide* in the free world is running ahead of requirements.

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