ASTRONOMY-GEOLOGY

From Now On: The Earth

The origin and age of earth are still mysteries to be penetrated by research. The findings, however, should never be regarded as dogma.

By WATSON DAVIS

Ninth in a series of glances forward in science.

➤ IF there is anything solidly known, it would be logical to suppose that it is the earth beneath our feet. Yet today there is less assurance than ever before about what lies within the earth, a mere few thousands of miles below us. There is even less agreement and positiveness about the origin of the earth.

We do know that the stuff of the central core of the earth must be about four times as heavy as the surface rock layers, which means that it is twice as dense as the densest materials known at or near the surface. The core is in a state of great compression.

There seems little doubt but that there are three distinct layers lying upon the earth's central core: The surface crust about 30 miles thick with rocks about three times as heavy as water, then a 720-mile layer of density four, and about a 1000-mile layer of density 5 to 6, and then the strange center of the earth which is density 10 to 13. Earthquake waves give us this information.

Geologists have long abandoned ideas of a "hell and brimstone" interior of the earth. Volcanoes give us no clue to what is deep within—for their molten lava is strictly on the surface, liquefied by temporary release of pressure.

Even the idea that the earth's surface was once molten is not in scientific favor now. Flow of the earth's materials deep within the globe is due to the enormous pressures. Under pressure the most solid stuff will move like so much liquid. But the surface of the earth, unlike that of the moon, does not have signs of having been molten.

The history of the earth goes back some three billion years or so when the earth was formed in some manner out of the nebula that gave birth to the sun and the other planets. You can take your choice of theories of the origin of the sun and planets, but the most recent of them returns to something akin to Kant's idea of a whirling cloud of dust out of which the bodies seem to have been accumulated.

There are many chemical puzzles in the rocks of the earth when scientists try to fit them into the geological picture. Why does the earth have as much water as it does? Dr. Harold C. Urey, Chicago Nobelist, who has turned from nuclear chemistry to earth chemistry these days, finds enough chemically combined water in the large amount of serpentine in the earthly rocks to account for the water.

The earth's origin is but one step in the process of providing a platform in time and space for the human race. Where did the original gas and dust come from? How can hot bodies like the sun and other stars be created out of cold gas and dust? There are theories, of course, and plausible ones at that.

But when some of the steps seem to be understood, someone asks: "When did time begin?" Then the question must follow: "What kind of time?" We are told earth's rotation (our clock) is slowing down one-thousandth of a second a century compared with the other planets. The quest for positiveness may be as endless—one hardly dares say—as time.

While we worry about the H-bomb, there are many deep mysteries that we can afford to strive to fathom, given the peace to do so. We may hope:

A. Astronomers, geologists and other scientists will ponder whence came and whither goes the solid earth beneath our feet and the stars over our heads.

B. Amidst our preoccupation with discoveries for new weapons, for the fight against world starvation, for countering disease, for new industries, we shall take a little time to inquire what it was in the beginning and whether it always will be.

C. Our ideas of past and possible future may never become dogma, for then our intellectual children will disown our brash finality.

Science News Letter, May 27, 1950

MEDICINE

R48 for Incurable Cancer

➤ A NEW drug has treated successfully some cases of hitherto incurable cancers of the lymph glands, bone marrow and other blood-forming tissues.

Dr. W. B. Matthews of Oxford, England, announces these successes to the medical world through a report to the British journal, LANCET (May 13).

The cancer-treating drug is called R48 and chemically it is beta-naphthyldi-2-chloroethylamine.

Dr. Matthews used the drug on patients with Hodgkin's disease, reticulosarcoma, acute and chronic leukemia, in which the white blood cells are affected, and in one case of polycythemia, in which the red blood cells run riot.

The polycythemia patient was completely cured and is still well one year after the end of treatment. One of the chronic lymphatic leukemia patients who was at the point of death became well enough under treatment to return to his job as stationmaster. A second victim of this disease also responded well to treatment with R48, but two others failed to get any major benefit and died.

Two successes were chalked up against chronic myeloid leukemia, but here, too, there was a failure to record. Against Hodgkin's disease aand reticulosarcoma, R48 was disappointing.

The new drug, first synthesized by Dr. A. Haddow, world-renowned English cancer research scientist, is a modification of the poison war gas chemical, nitrogen mustard. Nitrogen mustard has itself been used with some temporary success against blood cancers, but in every case treatment has had to be suspended because of its severe toxicity and because it soon blocked the veins into which it was injected.

R48 has the great advantage of being effective by mouth. Tablets of it are chewed by the patients after meals. It is much less nauseating than nitrogen mustard. Only one patient out of 17 treated had to stop taking the new drug because of excessive stomach upset.

R48 is not the final answer to the blood cancers, it is felt, but it is considered a step along the road toward the right answer.

Dr. Matthews was recently resident medical officer at Churchill Hospital, Oxford.

Science News Letter, May 27, 1950

MEDICINE

Identify Heart Disease From Recorded Heartbeats

➤ A TERRIER'S heartbeat recorded on a phonograph record offers Cornell University veterinary students a new way to detect faulty "tickers" in small animals. Purpose of the record is to help the students diagnose heart ailments correctly.

The record was made with a tape recorder connected to a stethoscope and a phonograph record-cutter. The heartbeat is that of a 12-year-old rat terrier suffering from an unusual type of cardiac irregularity.

Advantage of this medical recording, says Dr. Irving Stern, is that all students may now hear the same type of heart defect at one time and interpret it correctly. Furthermore, it eliminates the usual uneasiness of animals under inspection.

Formerly it was difficult to get an animal with the abnormality needed for the study of a particular type of defect. The correct sound is now permanently recorded and filed for future use.

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