

LARGEST PRIMITIVE AREA

Dust devils and dinosaur bones occur everywhere in this vast desert wonderland recently explored in southeastern Utah by the U. S. Geological Survey. The rim rock here was laid down during the age of dinosaurs, 100 million years ago, when the arid lands were the shore of a shallow sea. The rocks are similar to the Mesa Verde formation, so puzzling that for years it was called "alibi sandstone" by oil geologists.

ARCHAEOLOGY

Peruvian Mummies Come to New York

TWO prehistoric visitors from Peru—mummies more strangely swathed than Egypt's ancient kings—have been unwrapped for the American public to behold.

At the American Museum of Natural History, where the Peruvian mummies are temporarily displayed, the first and biggest bundle proved to be no less than 60 layers of clothing, with a huddled mummy of a man in the heart of the wrappings.

Shawls and ponchos covering this American mummy show the wonderful textile arts of Indians in this region. Cats and monkeys are outstanding designs embroidered and woven into the materials. Bundled into the mummy wrappings, the museum curators found ears of corn, peanuts, and other food for the dead; also a calabash, which was possibly an ancient hip-flask, judging by a congealed substance in it, which may once have been a liquid.

The mummy was equipped with a false head made of wrappings. Trinkets of gold in the bundle include two sticks mounted with goldfish hammered out of gold, and a golden disk over each ear of the mummy decorated with a row of seven cut-out cats.

Science News Letter, February 5, 1938

GEOCHEMISTRY

Nature Changed the Rules Ten Billion Years Ago

Something Radical Happened to Radioactive Elements Now on Earth, Long Before This Planet Was Formed

NATURE changed the rules of the game of radioactivity 10,000,000,000 years ago, probably long before the earth was formed. It was then that potassium, an element essential to life, began disintegrating radioactively, Dr. A. K. Brewer, chemist of the U. S. Department of Agriculture here, has determined.

Measuring the rate of breakdown of potassium into a kind of calcium, a component of limestone, then determining the time that this breakdown has been going on from the amount of this calcium now existing, Dr. Brewer finds that the process has been going on for about 10,000,000,000 years. In reaching this figure, he assumes that all of this special calcium, which has an atomic weight of 40 instead of 40.08 as does ordinary calcium, was derived from the breakdown of potassium, and that the breakdown rate has been uniform since it started. A similar time has elapsed since a variety of rubidium, a rare earth, started to break down into a kind of strontium, another rare earth.

Attempts to determine our planet's age by studying the end products of radioactive breakdown, such as calcium derived from the decay of potassium, may be as futile as trying to find out how old a stove is by weighing the ashes. The method will show, Dr. Brewer believes, how long the disintegration has been going on, or more

simply, how long the fire has been burning.

Dr. Brewer's new studies in no way affect the ages determined for a number of rocks by radioactive methods. The amount of uranium, another radioactive element, in rocks is measured and then compared with the lead which it has added to the rock by uranium's previous decay. The oldest rocks, dated by this method, are about 1,500,000,000 years old.

With earth age estimated from a number of sources at not more than 2,500,000,000 years, some of the breakdown of potassium must have occurred before earth was formed. Under present theories, the breakdown began on the sun, seven or eight billion years before that little star was torn apart to create the solar system.

How matter behaved under the old

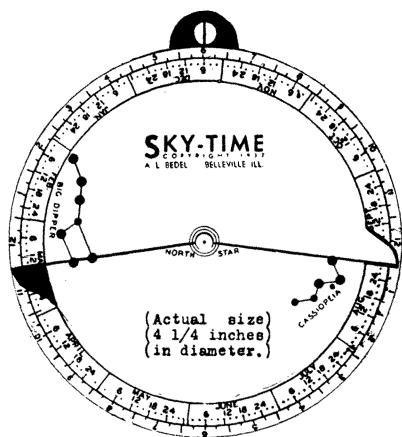
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RADIO

February 10, 4:00 p. m., E.S.T.

POWERFUL X-RAYS—Lauriston Taylor of the National Bureau of Standards.

Feb. 17, 4:00 p. m., E.S.T.

OLDEST CITY IN THE WORLD—Prof. E. A. Speiser of the University of Pennsylvania.

In the Science Service series of radio discussions led by Wadson Davis, Director, over the Columbia Broadcasting System.

rules, in force until ten billion or so years ago, before the formation of the solar system, Dr. Brewer will not state. His studies give no clue to older, now nonexistent states of matter.

Life, in the early days of our planet, hundreds of millions of years ago, may have been greatly affected by the radioactivity of potassium, says Dr. Brewer. Potassium is necessary to life, and if the minute fraction that is radioactive gets into a plant or animal, its radiations may damage the plant or animal and cause a sudden change of form, called a mutation.

Recently, by exposing fruit flies to X-rays, similar to radium radiations, Dr. Calvin Bridges, California Institute of

Technology geneticist, was able to produce freak flies in a very few generations. Millions of years ago, when radioactivity was stronger than at present, changes in life forms may have been greatly accelerated by radiations from this type of potassium.

Studies of the ages of rocks, using radioactive potassium as the clock, indicate to Dr. Brewer that their age cannot exceed 6,000,000,000 years, and probably they are very much younger. Disintegration long ago of other elements, now completely broken down, may make this age entirely too large. More work on radioactivity, leading to a more exact, and probably smaller value for rock age, is suggested by Dr. Brewer.

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CHEMISTRY

Oil's Hidden Chemicals Rival Products From Coal

COAL, particularly its sticky, uninviting tar, has been the wonder raw material of chemistry, showering the world with a multitude of dyes, drugs and other products.

Petroleum, considered useful primarily as a source of oil and gasoline for motor fuel, is being demonstrated as the source of hidden chemical riches.

This modern metamorphosis of oil is accomplished by the process of cracking, which consists of distilling the petroleum under heat and pressure to separate out its various components.

Cracking produces many more gallons of better gasoline than nature can manufacture. Dr. Gustav Egloff, research chemist for the Universal Oil Products Co., calls the cracking process a mighty conservation measure because without it some two barrels of crude oil would be needed where only one is used today.

In addition to motor fuel production, cracking has allowed the chemist to synthesize new substances from crude oil and to found new industries. It has given birth to a host of new products such as polymer and isooctane gasolines, lubricating oils, drying oils, resins, ethers, alcohols, glycols, chlorinated compounds, alkylated paraffins, aromatics and phenols.

The unsaturated gases and liquids or their derivatives from cracked products have found important uses in ripening of fruits, as growth promoters, and for maturing potatoes and nuts. Ethylene

and propane have found application as anesthetics in surgery.

The day is foreseen when the chemist will give industry essentially pure hydrocarbons from petroleum instead of the complex mixtures of our present gasolines and lubricating oils.

It is predicted by Dr. Egloff that the motor fuels of the future will be composed of but few if not single hydrocarbons, with more than double today's efficiency. Just now the fuel is ahead of the motors, as the chemist has ready an aviation motor fuel with an octane rating of over 100. No available engines will utilize efficiently that quality of fuel.

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METALLURGY

Spongy Iron Substituted For Lead Joint Packing

SPONGY iron that is soft and malleable like lead and employable for some of the same purposes has been developed in Germany by a physicist, Dr. Hans Vogt, after many years of effort. The material has the further advantages that it is much lighter, lower in price, and can be produced from native ores instead of being expensively imported.

One of the common uses of lead is for packing around iron plumbing; it is hammered into joints between the pipes. The new spongy iron is very well adapted for this use.

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