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.

Science News Letter, February 5, 1938

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.

Science News Letter, February 5, 1938

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.

Science News Letter, February 5, 1938