



GLASS LACE

To insulate the coils of powerful electric motors, glass marbles, three-quarters of an inch in diameter are used to draw strands much finer than human blonde hair. The thread thus formed is made into gauze-like tape, fireproof and moisture proof, which is being used experimentally by Westinghouse engineers.

only be necessary to examine the bottom portion of the mass to get the diamonds.

Body Pierced by Atoms

The work of scientists smashing atoms with giant disintegrating machines, or studying atoms blowing themselves apart in radioactive processes, may seem remote from everyday living, but the truth is, that man himself is just a walking sample of disintegrating atoms. Every minute over 500,000 atoms—yes, your own atoms too—are tearing themselves apart. And at each disintegration, wherever it may occur in the body, rays are sent out which pierce the tissues for a distance of about a fifth of an inch.

Before the meeting of the American Chemical Society, Dr. A. Keith Brewer of the U. S. Bureau of Chemistry and Soils, Washington, D. C., told of the amazing and vastly important role which the element potassium plays in living and in inanimate nature.

One variety of potassium, known as K_{40} , is the culprit which is disintegrating within the body at the rate of 600,000 atoms a minute for a man weighing 160 pounds. Of all the chemical elements necessary to sustain life potassium is the only one which is radioactive.

Some investigators, explained Dr. Brewer, hold that potassium's radioactivity is the cause of the heart beat and that it has a basic role in the germination of seeds. And because it liberates piercing radiation there is a suspicion that it has played a part in causing these freak offshoots in man's natural evolution. Radiation from X-ray tubes and tubes from radium, very similar in nature, have been shown to produce mutations, as these freaks are called.

May Cause Mutations

Thinking biologists, since the discovery of piercing cosmic radiation, have asked whether such rays might cause mutations also. Dr. Brewer has no answer to that question but he has evidence indicating that one needs to look no farther away than one's body to see a greater, possible cause of mutations. Radioactive potassium, he has found, has a 75-to-one better chance of causing a mutation than does a cosmic ray.

Back 250,000,000 years in the carboniferous geologic age, when coal was in the making, there was much more potassium. In that long past epoch of geological time, estimates Dr. Brewer, potassium had a 375-to-one chance over cosmic rays.

In disintegrating, potassium 40 can

create either of two elements, calcium or argon. K_{40} , says Dr. Brewer, is the "parent" of over 99 per cent. of all the calcium in the world today. Thus man's teeth and his bones, and those of other animals, owe this debt to the disintegrating potassium element. In fact, from the known abundance of calcium—in various forms—in the earth's crust, it is not very much wrong to say that much of the world and much of the animal life on it sprang from exploding potassium atoms.

Geologic Puzzle

The passage of potassium into a form of argon, Dr. Brewer states, explains a long-baffling puzzle of geologists; the presence of argon gas deep within the earth. Argon, an inert, colorless gas, is one of the constituents of the earth's atmosphere. Disintegrating potassium accounts, according to Dr. Brewer's estimates, for over 95 per cent. of all the argon over or in the earth.

Atoms of potassium, breaking up, form a most important means of checking the age of matter, Dr. Brewer points out. In fact, of all the known elements, radioactive potassium is the most important in determining the geological age of the earth.

Other radioactive "time clock" methods, he explains, deal with determinations of the amount of helium in rocks, the ratio of uranium to lead and so on. But all these methods give only a measure of the time which has elapsed since the earth's crust solidified and the minerals—as we know them today—were formed. Such estimates give the age of the earth's crust as something like 5,000,000,000 (five billion) years.

The methods using disintegrating potassium as a "time clock," do not suffer from this limitation. Dr. Brewer is able to estimate that it has taken 15,000,000,000 (15 billion) years for potassium to produce the amount of calcium in the world. Thus the age of matter is at least this long, and, naturally, considerably greater than estimates based on the age of the earth's solid crust.

Whether 15,000,000,000 years goes back to a time when the earth was part of the sun, Dr. Brewer has no way of knowing, of course.

America's Potash

America is now free of dependence on foreign countries for its supply of potash, valuable chemical widely used by the nation's farmers as an ingredient in fertilizers.

How a dry lake (*Turn to Page 274*)