

TECHNOLOGY

Electricity From Fusion

► A RUSSIAN SCIENTIST predicts that electricity will be produced by nuclear fusion using water as the raw material "maybe tomorrow, maybe in 10 years."

British, American and Russian scientists are working on the problem of controlling thermonuclear (H-bomb) reactions for peaceful purposes.

Writing in Pravda, Academician N. N. Semyonov says that the difficulties are still very great, "but undoubtedly this problem will be solved."

He foresees a time when human physical work will no longer be necessary. The world-wide use of electric energy could be increased a hundred-fold, the Russian says, by thermonuclear electric power stations and other new sources of power.

Such an abundance of energy could be used to control the weather, Prof. Semyonov predicts.

He forecasts use of three other sources of electric energy: the "electrichestkii element" or fuel cell; the direct conversion of the sun's rays into useful energy, and the heat deep in the earth that wells up periodically in the form of lava and geysers.

The fuel cell would chemically produce electricity without the heat transfer, mechanical moving parts or boilers required in conventional power plants. The efficiency of such a system would be 100% theoretically. But in practice it would be only 70%, Prof. Semyonov believes.

A fuel cell similar to an electric cell battery, but more powerful and efficient, would be most useful in transport and agriculture. Prof. Semyonov expects such a device will be in use in 10 to 15 years.

The greatest source of energy in nature is the sun. Plants convert the sun's radiant energy into chemical energy, but they are less than 10% efficient, according to Prof. Semyonov. Man someday will be able to convert solar energy into electricity at the rate of 40% to 45% efficiency, he predicts, urging scientists to work on the problem because "the quantity of solar energy is so immense that this would be an inexhaustible source of energy."

Using the heat in the earth's molten core is theoretically possible, Prof. Semyonov reports, but he does not predict when it will be done.

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cross-section under a microscope, tiny separated layers can be observed. These layers are so thin that about 30 of them would have to be stacked to make the thickness of a human hair.

The scientists assume on the basis of good chemical evidence that a single layer is the result of one year's decomposition. By counting the layers, it can be determined how long the glass has been buried.

The method is similar to the counting of tree rings to measure a tree's age, except that the glass-age method involves a destructive process rather than a process of growth.

Validity of the method was tested by counting layers in weathering crusts from objects buried for known periods of time.

The oldest object yet studied was a fragment found in the ruins of the ancient city of Sardis, Turkey. The building where it was found is believed to have been built in the late third century and was probably destroyed early in the seventh century.

The ring-counting technique indicated the fragment was buried about 378 A.D., plus or minus ten years.

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PHYSIOLOGY

Blood Pressure Changes With Arm Position

► IF A PERSON'S arm hangs down toward the floor when the doctor checks his blood pressure, the pressure will increase between 5% and 20%, enough to mark some otherwise healthy persons as unfit military candidates, or poor risks for insurance companies.

How different arm positions result in different arterial blood pressures has been measured by Drs. John Merendino and Frank A. Finnerty Jr. of Georgetown University School of Medicine, Washington, D. C.

They found that even slight increases in blood pressure are believed to tell a great deal about the progression of a disease. Doctors are usually meticulous in choosing a standard inflation cuff and stethoscope, in fitting the cuff to the arm properly, in cautioning patients to avoid deep breathing and in recording pressures for recumbent, sitting and standing positions of the patient. But very often little or no attention is given to arm position.

In 104 patients between 14 and 63 years of age, 78 of whom had normal blood pressure and 26 of whom were hypertensive, pressure was recorded with the arm in two different positions. In the first position the forearm was slightly flexed and rested on a table; the hand was open. In the second position the arm was lowered about 60 degrees and rested in downward position beside the body.

In all cases the second position resulted in higher pressure than did the first. About three-fourths of the patients showed a pressure increase between 5% and 20%. Both systolic and diastolic pressures were equally influenced and reactions of normal and hypertensive patients were about equal, the physicians report in the Journal of the American Medical Association, 175:51, 1961.

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ARCHAEOLOGY

Glass Dated by Its Crust

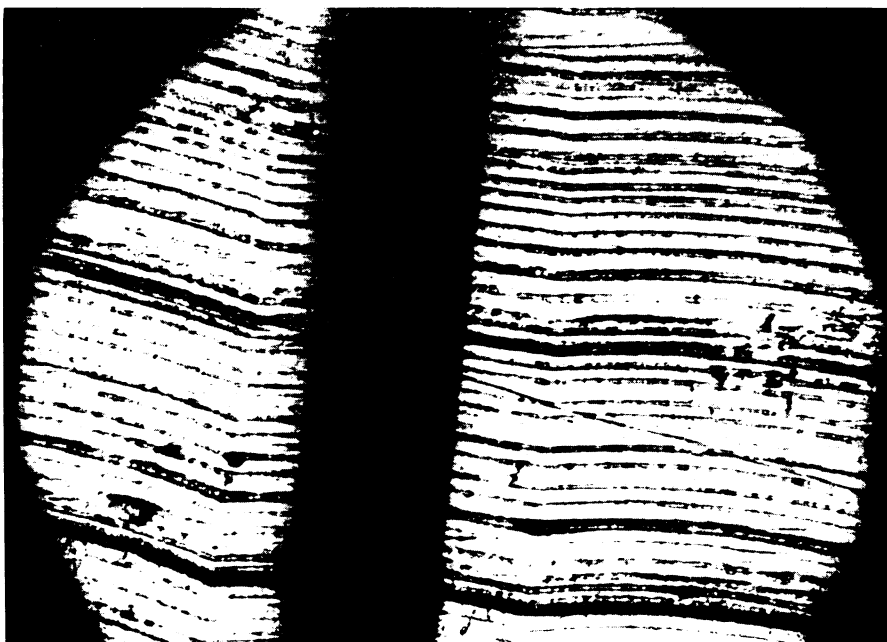
► THE AGE of ancient glass can now be measured by counting rings in its weathered crust.

Dr. Robert H. Brill of The Corning Museum of Glass and Harrison P. Hood of Corning Glass Works, Corning, N. Y., developed the new dating method.

When objects of glass are buried in soil

for a long time or submerged under water, they often undergo a slow chemical deterioration that produces a surface crust. This is comparable to the rusting of metal objects but takes place at a much slower rate.

When the weathering crust, generally one to two millimeters thick, is examined in



THE AGE OF GLASS—Photomicrograph shows the layers in glass crust.