

SCIENCE NEWS

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THOMAS JEFFERSON

THOMAS JEFFERSON'S two hundredth anniversary was given special observance at the annual spring meeting of the American Philosophical Society. For 1943 marks also a bicentennial milestone in the history of the society. It was in 1743, the year of Jefferson's birth, that the little informal club called "Junto," which Benjamin Franklin had got together to discuss scientific and other scholarly matters, was formally organized under the full title which it still retains: "The American Philosophical Society Held at Philadelphia for Promoting Useful Knowledge."

Thomas Jefferson was a young man and Benjamin Franklin was old when the two worked together in the cause of American independence; but the two could meet on common ground at many points. Science, especially physical and mechanical science, was one of the best-established of the common fronts existing between the elderly Philadelphian and the youthful Virginian; both liked to try to find out what made things go, and both had a decided bent towards the invention of ingenious and practically useful gadgets, like Franklin's lightning-rod and heating-stove and Jefferson's improved mold-board plow.

At one point, however, they diverged: Franklin was a city businessman, Jefferson was by choice a farmer. In this, Jefferson was more nearly at one with his fellow-Virginian, George Washington. This aspect of Jefferson's life and interests was discussed at the meeting of the Philosophical Society by M. L. Wilson, director of extension work in the U. S. Department of Agriculture. Owner of a hill farm (for Monticello stands on a mountaintop), Jefferson was one of the country's first practitioners of soil conservation methods, including the contour-plowing that is now being preached as the newest thing in soil-saving devices. He also introduced new plants and improved livestock varieties brought from Europe, and was an early believer in crop rotation.

Jefferson founded the University of Virginia (it is the one boast of achievement carved in his epitaph) just as Franklin was active in the establishment of the University of Pennsylvania. In one of his statements of desirable university policy, Jefferson came out positively for the inclusion of agricultural science among the subjects to be taught—something of a novelty in a day when higher education still centered almost exclusively around the classics. Yet Jefferson is not to be counted among educational leaders who place sole emphasis on the scientific and "practical" to the neglect of the classics and the humanities. He was himself well educated in Latin and Greek, but in his hands the old languages were not "dead," as Dr. Louis B. Wright, of the Henry E. Huntington Library and Art Gallery, pointed out. "In the early years of the republic," Dr. Wright reminded his hearers, "the classics had not yet foundered on the arid shores of pedantry."

Jefferson once declared: "No occupation is so delightful to me as the culture of the earth." Translated into

Latin, that could easily be passed off as a quotation from the *Georgics*, Vergil's great poetic work in praise of country living.—FRANK THONE.

A THEORY OF GRAVITATION

A THEORY of gravitation that makes it a push instead of a pull, thus avoiding the bugbear of action at a distance, and makes it a repulsion deep within the stars and planets, was presented by Anatol James Shneiderov at the meeting of the American Geophysical Union. Mr. Shneiderov holds the Russian degree of "Magister in Military Engineering" and is also a civil engineer. He is at present on the faculty of the George Washington University, where the meetings were held.

There is something occult about the motion of force at a distance, Mr. Shneiderov said. His theory is in a sense a modernized version of the theory of the Swiss scientist Le Sage, proposed some years ago. According to this theory, streams of particles incessantly traversing space in all directions impinge upon the farther sides of two planets or other celestial objects, but are screened from the nearer sides by the planets themselves, and so push them together.

In place of streams of particles, Mr. Shneiderov substitutes streams of energy. These pass through matter, losing energy as they go. He has developed a formula for the force produced which is more complicated than Newton's, but not as complicated as Einstein's. Outside a planet it gives the same force as Newton's law, and agrees with Einstein when account is taken of the increase of mass with the speed.

But inside a planet, Mr. Shneiderov gets very different results. The attractive force diminishes below the surface down to a certain level, where it becomes a repulsion which then increases exponentially the rest of the way to the center. According to Newton, the attractive force diminishes continually and becomes zero at the center. According to Mr. Shneiderov the force around the center of the earth is so great that all atoms are disintegrated, the nuclei stripped of the surrounding electrons. The core of the earth thus becomes an "electronic gas." This explains why the core does not transmit transverse earthquake waves which it would if it were solid as hitherto supposed.

These great forces in the deep interior of the earth are mainly responsible for earthquakes, and Mr. Shneiderov believes that a fuller understanding of them may lead to the possibility of predicting earthquakes long before they happen.—MORTON MOTT-SMITH.

MEASUREMENT OF LARGE QUANTITIES OF WATER

RADIUM in tiny quantities may be used to measure large masses of water, but the method is not as simple as it seems at first glance, was pointed out by Dr. Victor F. Hess, German Nobel prizeman in physics now at Fordham University, at the Washington meeting of the American Geophysical Union.

Some indirect means is desirable for accurately measuring large quantities of water in reservoirs, where direct weighing is not possible. One method that has been tried has been to dissolve a lot of salt in the water, then collect a sample of it as it comes out of the tailrace of the power plant and determine the salt concentration in that.

Some time ago the noted French physicist, Dr. J. Joly, suggested the use of minute amounts of radium, which diffuse rapidly and evenly in water, but he did not do any experimental work on the method himself. Dr. Hess has done so, making use of a large tank in Pennsylvania, loaned for the purpose by a power company.

Sources of error were found to be more numerous than anticipated. There was a tendency for part of the radium to become tied up in insoluble form with "hardening" chemicals in the river water; this could be partly overcome by adding hydrochloric acid. Minute but variable amounts of radium are naturally present in the water, so that their effect has to be measured in advance and proper allowances made. Even the type of glassware used in the laboratory may falsify results unless great care is exercised. Dr. Hess concluded by cautioning his hearers not to "attempt blindly to set out to measure large volumes of water with too little radium."

LIGNITE DEPOSITS OF THE UNITED STATES

THE huge lignite deposits in the United States are a potential source of war power was reported to the American Society of Mechanical Engineers by Professor C. J. Eckhardt, Jr., and C. W. Yates, of the University of Texas. Only an insignificant fraction of the nation's 939 billion ton reserve is being utilized. But soaring fuel consumption to meet war needs brings increased attention to this low-rank fuel.

Lignite, often called "brown coal," is more widely used in Europe than America. It appears to be a halfway station between wood and coal, occurring at a more youthful age than its true coal relatives.

Lignite contains more water and ash than ordinary coal. But misconceptions are commonly held about the properties of lignite that stand in the way of its more extended use. "The failure to use appropriate grate surfaces has caused this fuel to be maligned with regard to sifting losses from size reduction of the fuel particles as heat is applied and moisture is driven off. Yet the water losses are no greater than those of some of the more admirable fuels and the size reduction while this fuel burns can be rendered inconsequential. The most serious misconceptions relate to its tendency to undergo size-reduction processes while in storage and while being handled."

More than a sixth of the nation's mineral-fuel reserve is lignite. Principal deposits are mainly in Texas, Montana and the Dakotas, where no mountain-making movement of the earth's crust has occurred.

ITEMS

OCEAN current surveys for the Navy will be made this spring on the Atlantic Coast by floating radio robots—

boat-like metal buoys with radio masts fifteen feet high. A streamlined meter containing a compass will be suspended from each buoy to record the velocity and direction of the current. It automatically broadcasts this to the mother ship. At the receiving end, the radioed impulses of the meter are recorded by a robot mechanism in groups of three; the distance between two of the "ticks" giving the velocity and the location of the third between them giving the direction of the current. Dr. L. O. Colbert, of the U. S. Coast and Geodetic Survey, speaking before the American Geophysical Union stated that the new radio current meter decreases the number of vessels needed for such a survey as simultaneous observations can be made at several current stations. Another advantage is that the streamlined current buoys can remain at their posts during bad weather and in strong currents with less difficulty than a ship anchored under similar conditions.

A PHOTOGRAPHIC recorder used to replace previous methods of obtaining a series of wind velocity measurements was described at the meeting of the American Geophysical Union by Dr. Leonard B. Corwin, of the U. S. Soil Conservation Service. Dr. Corwin stated that the recorder was developed to secure simultaneous measurements of wind velocity at several different levels where electrical power was unavailable. The dials or faces of several counters were photographed as the simplest and surest way to obtain multiple records. By adjustments, photographic observations could be obtained at intervals of one minute up to an hour or more. Dr. Corwin stated that the photographic recorder "appears to offer a means of obtaining an autographic record of many if not most meteorologic and climatic values." Further simplification of the apparatus is contemplated.

SYNTHETIC plastic material to supplement the available supply of mica necessary in war-used electrical equipment is promised in the near future. Priorities have been granted for the materials to construct a plant where the synthetic product will be made. It is expected that the plant will be in production about July 1. The material is a synthetic polymerized resin. It is reported to have high temperature resistance and low dielectric loss. These properties will permit its use in several types of radio equipment now requiring mica. It will be known under the trade name of Pollectron. This new plastic is a product of the General Aniline and Film Corporation. It has been tested for the corporation by the laboratories of the Massachusetts Institute of Technology and those of one of the large industrial companies making electrical apparatus. It has been tested also at Wright Field. Much of the mica now in use is obtained from India and Brazil. It has been called by the War Production Board an urgently needed raw material vital to mechanized warfare, and mica users and fabricators were warned many months ago to conserve the supply in every way possible. One ton of the new plastic, fabricated into mica replacement material, will replace from ten to fifteen tons of the imported block mica, it is expected, thus saving much strategic material.