He made the first practical electric meter for measuring watts, the forerunner of some 30,000,000 meters now installed in homes, factories, and stores.

Fifteen major medals in science and engineering have expressed the regard of his colleagues in scientific research and engineering. He was the first wearer of the famed Edison medal of the American Institute of Electrical Engineers and he is the only person to have been awarded the three high British science awards, the Hughes, Kelvin and Faraday medals. The John Fritz medal is another of Elihu Thomson's honors. He is, of course, a member of the National Academy of Sciences and he is a foreign member of the Royal Institution of Great Britain.

As a youth in Philadelphia his playtime was spent in mechanical and electrical experiments. He made tops with a foot lathe, constructed a frictional electric machine that knocked his father off his feet, ground lenses for an intricate microscope, built a pipe organ, and followed photography as a hobby.

Interested in astronomy for many years, he has his own observatory and a small telescope which he made himself. Nearly 35 years ago he suggested the use of fused quartz for telescope mirrors and the climax of a long career may be the construction under his supervision of a fused quartz 200-inch-diameter mirror for the giant telescope proposed for California.

Science News Letter, April 1, 1933

CHEMISTRY

Dyes Fading in Light Become New Compounds

COLORED fabrics that fade on exposure to light are not fading in the same way that they do when their colors are "washed out" in the laundry. The latter process is merely a reversal of dyeing: the dyestuff becomes "unstuck" and diffuses out into the water.

Sun-faded fabrics have their dyestuffs actually changed over into other substances, which may have colors of their own. This accounts for the fact that a sun-faded fabric may not merely be paler than it was when new, but may have a quite different hue.

These facts about sun-fading were brought out in a discussion before the meeting of the American Chemical Society, by William D. Appel of the U. S. Bureau of Standards, and William C. Smith, of the Lowell Textile Institute.

Science News Letter, April 1, 1933

ARCHAEOLOGY

Oldest Old Testament Scenes Unearthed on Euphrates

Magnificent Frescoes Surprise Scholars by Revealing That Christian Artists Borrowed From Jewish Art

ARCHAEOLOGISTS digging into ruins of Dura-Europos on the Euphrates have made a discovery of sensational importance. They have found a Jewish synagogue built in 244 A.D. and adorned with paintings from the Old Testament. The pictures show Moses and the Tablets of the Law, Pharaoh pursuing the Israelites into the Red Sea, and other familiar Bible scenes. With the art of the Catacombs, these are the oldest pictures of Old Testament scenes ever uncovered.

News of the discovery has been received at Yale University from Prof. Clark Hopkins who is directing excavations at Dura. The site is being excavated jointly by Yale and the French Academy.

"I think that few excavators in this century have had the honor and privilege of reporting more astounding and magnificent discoveries than those made this last month at Dura," Prof. Hopkins' reports says.

Describing the excavation of the synagogue, he explains: "We have dared so far to dig only two and a half meters down, but as far as we have dug we have found the walls completely covered with a most magnificent series of frescoes. Eleven scenes are complete, some six others we have in part without counting the frescoes of the front and side walls."

Commenting on the significance of the Bible paintings, Prof. M. I. Rostovtzeff of Yale said the frescoes reveal that Christian art borrowed from Jewish pictorial art in style, composition, and subject matter. Few scholars had even suspected that this might be the case. It had been a common belief among some students that Jewish religion forbade decorating religious buildings with paintings, though recent discoveries have undermined this theory.

Prof. Rostovtzeff said: "This sensational discovery at Dura is of great importance for the study of the Bible, the history of Judaism in the days following the destruction of the Temple, and, first and foremost, for the history of the early development of Christian art."

The archaeologists at Dura have built a roof over the remains of the synagogue to protect it from sun and rain. Photographs and colored drawings of the frescoes have been made. When all the preliminary work is completed, the murals will be removed from the walls and transported to a public museum for exhibition.

Science News Letter, April 1, 1933

PSYCHIATRY-EDUCATION

More Children Headed for Asylums Than for College

AT the present rate, more public school children will go to insane hospitals than will go to college, declared Prof. C. E. Turner of the department of biology and public health, Massachusetts Institute of Technology, in a report to the American Physical Education Association.

Pleading that the schools not reduce too drastically their health and physical education budget, Prof. Turner said:

"One would not be so absurd as to say that physical education is a specific preventive against insanity, but it is not far-fetched to say that teaching our people to play is one of the few important agencies through which we can combat that increasing pressure upon mental and emotional life.

"Our people need play and relaxation more than ever before," he continued. "In the hospitals of the United States there are more patients suffering from mental disease than from all other diseases combined.

"The excitement and pressure of modern life has increased together with the number of facts children must learn and the number of adjustments they must make. Every social indication points to the need of physical and recreational activity under wise leadership—a physical activity program which will develop enjoyment of exercise,

skill, and the proper mechanical use of the body."

Commenting that although the health program is one of the latest to be added to school activities, it should be one of the last to be cut, he pointed out that this program came with a fundamental change in living conditions.

"If we should abandon our health program, our city and consolidated schools would find themselves presented with an epidemic of communicable disease at the beginning of each new term as did the city schools prior to 1890."

Science News Letter, April 1, 1933

CHEMISTRY

Tellurium Added To Lead Protects Against Acid

SMALL AMOUNTS of tellurium added to lead increase remarkably the resistance of the metal to concentrated sulphuric acid, W. Singleton and Brinley Jones of the Associated Lead Manufacturers' Research Laboratories have reported to the Institute of Metals at London, England. The physical properties of the lead are also profoundly affected. Rolled sheet of the tellurium-lead alloy with a wide range of properties can be produced. Tellurium additions also affect similarly various lead alloys.

Science News Letter, April 1, 1933

PHYSICS

Cat's Fur Electricity Ready To Yield Greatest Voltage

Huge Static Machine Will Soon Emit 10,000,000-Volt Discharges With Power of Town Generating Station

TEN MILLION volts will soon be available to a group of Massachusetts Institute of Technology physicists. In an airship hangar on Colonel E. H. R. Green's estate in Massachusetts, the largest building they could borrow for their experiments, a gigantic electrical machine is being groomed for its test run. It consists of two columns surmounted by fifteen-foot hollow aluminum spheres. Men can climb into these hollow metal balls, and the interiors of which will serve as laboratories where the effects of high voltage electricity upon matter can be observed.

The giant electrical machine will provide the world's highest potentials of electricity under human control. Lightning has higher voltage but man cannot effectively harness the lightning.

One surprising thing about this ten million volt generator is that it needs no electrical input. It is its own power house. No large transformers are needed. One of the oldest methods of generating electricity is used in this newest high voltage machine. Benjamin Franklin experimented with static machines and that other great American pioneer in physics, Joseph Henry, used frictional electricity generators to shock students holding hands in a circle.

Stroke a cat or comb your hair on a dry day and see the sparks fly. This method of generating static electricity is essentially the same as that in the ten million volt static machine about to be tested in New England. Static electricity antedates the electro-magnetic method that is used in the generation of practically all of the electric power today. The Greeks knew that by rubbing a piece of amber with a cloth an electric charge could be generated. With the practical application of the discoveries of Faraday and Henry, that motion in a magnetic field can generate a current, with the development of the vast electrical industry based upon these principles, static electricity did not have the opportunity of becoming practically useful but remained within the laboratory in the bags of scientific tricks of physics professors.

A modest young man, just thirty-two, is responsible for the application of the principles of static electricity in the development of the electrical machine which will soon give science useful potentials of many millions of volts. Dr. R. J. Van de Graaff was a Rhodes Scholar in Oxford when it first occurred to him to use static electricity to obtain high voltage. While in England he did not have the opportunity to make the necessary experiment but after leaving Oxford he went to Princeton University as a National Research Council fellow. There with the cooperation of Dr. Karl T. Compton, then professor of physics at Princeton and now president of the Massachusetts Institute of Technology, Dr. Van de Graaff made the first Van de Graaff generator. It cost less than a hundred dollars and it exceeded, in volt- (*Turn to Page* 204)

WEAPONS OF A PIONEER

The two hundredth birthday of Dr. Joseph Priestley, pioneer of chemistry in England and later in America, discoverer of oxygen, philosopher, philanthropist and friend of Washington, Jefferson, Franklin and Adams, was celebrated in connection with the meeting of the American Chemical Society in Washington, D. C., March 27 to 31. A feature of the celebration was the display of many pieces of his scientific apparatus, surviving in spite of the inevitable dispersals and breakages of a century and a half. The photograph reproduced here was taken at an earlier celebration: the centenary of his discovery of oxygen, held in 1874, at Priestley's old home in Northumberland, Pa.