PHYSICS

New Fundamental Particle

Anti-proton becomes fifteenth elementary particle of matter. Negative counterpart of the heart of the hydrogen atom tracked on one cosmic ray photograph.

➤ THE LATEST and fifteenth elementary particle of matter is the anti-proton, or the negative counterpart of the heart of the hydrogen atom.

So far it is known by only one track on a cosmic ray disintegration photograph made by Dr. Robert B. Leighton, physicist at the California Institute of Technology.

This was in the decay of another seldom-photographed cosmic ray particle, called the neutral V particle. The negative proton track was like a conventional hydrogen heart track but its direction in the magnetic field showed that it was opposite in electric charge. Scientists never see the particles themselves, only the swath they cut in the photographic emulsion.

Only when many more such tracks are found will the discovery of the anti-proton be claimed.

There are three kinds of V-particles known, positive, negative and neutral. They are called V-particles because they form V-shaped tracks on the photographs of atomic disintegrations by which we know most about the constitution of matter. When Drs. G. D. Rochester and C. C. Butler of the University of Manchester, England, found them four years ago they were called heavy mesons. But the V-particles, all three kinds—positive, negative and neutral—are sufficiently different from the other mesons, known by the Greek letters mu and pi, to be considered a different breed of particles.

All of these particles with mass, with the exception of the stable electron, proton and positron (positive electron) are very short-lived. Most of them exist less than a millionth of a second. The neutron, which triggers the atom bomb, can live about 20 minutes.

The anti-proton, now being sought, would have a short life. That is one of the reasons that it is hard to find. Dr. Carl D. Anderson of the California Institute of Technology, who won a Nobel prize for his discovery of the positron, expected the anti-proton to be found.

The anti-proton would be rated as the fifteenth elementary particle, if there are included the photon which is the massless "particle" of radiation, and an undiscovered entity, also without mass, called the neutrino which is required to balance out disintegrations from atomic collisions.

The anti-proton would be 1,845 times the mass of the electron, as is the proton, but it would have a negative charge upon it instead of the positive charge upon the proton.

Scientists travel to the tops of high mountains or send cosmic ray recorders to great heights by balloons, which are mistaken for "flying saucers." They do this to catch on sensitive photographic plates the debris of atom smashing caused by the mysterious cosmic rays from outer space that come into the top of our atmosphere most strongly.

Dr. Leighton reported to the American Physical Society meeting in Washington, D. C., that he has found 53 V-particles among thousands of cosmic ray photographs taken.

A team from the University of Manchester took cosmic ray recording apparatus to the top of Pic-du-Midi in the Pyrenees. They recently reported that in six months they captured 43 of the V-shaped particle tracks.

Attention is being paid to these very infrequent and very technical happenings because that is the only way that we discover the constitution of the matter of the universe in the hope of molding it for use in peace and war.

Almost as "unpractical" experiments gave the world the information about the fission of uranium out of which grew the atomic bomb.

Science News Letter, May 12, 1951

TECHNOLOGY

Rubber-Fabric Drums Replace Metal Ones

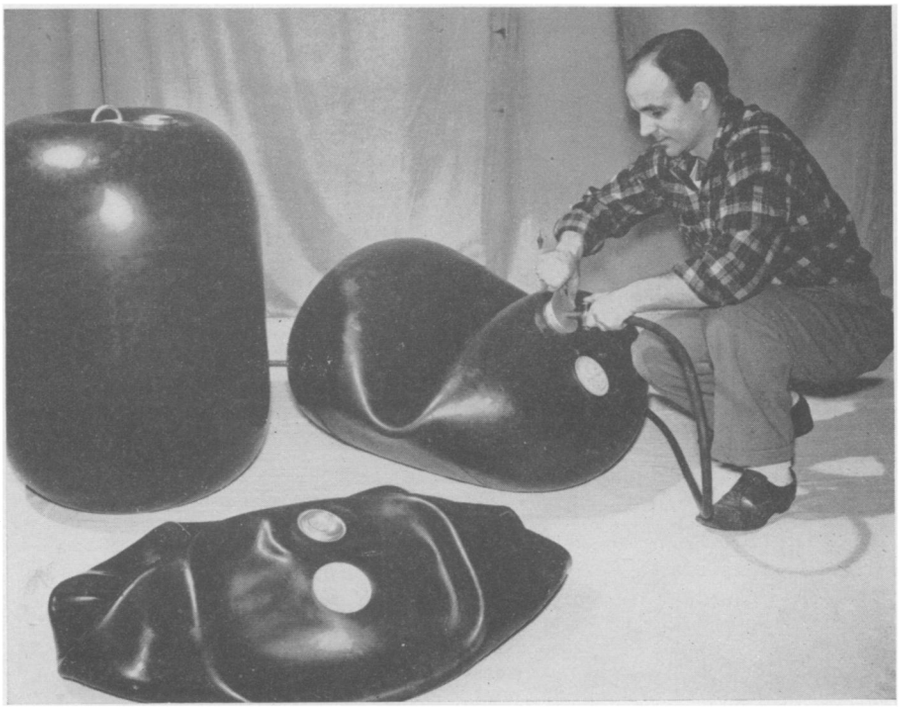
➤ RUBBER-FABRIC drums, suitable for replacing the metal drums now widely used in shipping liquids, have been developed by the United States Rubber Company. They have capacity for 55 gallons, and after shipping can be returned for reuse.

When empty they collapse. Some 2,500 of the collapsed drums can be shipped in a single box car that would hold only 300 of the common metal drums. This means a great saving in freight costs.

These rubber drums are suitable for the shipment of petroleum products, oils, greases, fats, acids, paints, emulsions, soaps, dry powders and a variety of pharmaceutical and industrial chemicals. They are tough, light in weight, easy to lift, roll, handle and stow. They are made of material that is non-corrosive, non-absorbent and resistant to weathering.

The material is strong, low-stretch cotton textile impregnated with synthetic rubber and molded in one piece. Handles are provided so that the drums may be easily carried.

Science News Letter, May 12, 1951



RUBBER SHIPPING DRUM—The new 55-gallon rubber drum suitable for shipping liquids is shown in three stages. At left is a filled drum, in the foreground, a collapsed drum, and at the right a drum being filled, for which no vent is needed. Since the drums collapse when empty, valuable shipping space can be saved when they are being returned.