

12-1930

Cosmic Rays as Barometers

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SCIENCE BULLETIN

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NOBEL PRIZES FOR 1930

The Nobel prizes in science, each amounting to nearly \$50,000, have recently been awarded, as follows:

Physics: to Sir C. V. Raman, Professor of Physics in the University of Calcutta, and a native Hindoo, for discovery that when light of a single color shines upon certain transparent substances it is partly changed to other colors.

Chemistry: to Prof. Hans Fischer of Munich, Germany, for his researches on human blood, in particular for his recent success in synthesizing hemin, which is one of the constituents of hemoglobin, the red coloring matter of the blood.

Medicine: to Dr. Karl Landsteiner, of the Rockefeller Institute for Medical Research, for the discovery that human blood is of four different types, and that the different types do not always mix. This is of the greatest importance in cases of transfusion, for unless the blood of the patient and the donor freely mix it may prove fatal to the patient. On this account the two bloods are always "matched", that is tested before the transfusion, to see if they are compatible and belong to compatible groups.

The prizes in non-scientific lines were awarded as follows:

Peace: to Dr. Nathan Soderblom,

archbishop of Upsala and pro chancellor of the University of Upsala, Sweden.

Literature: to the American novelist Sinclair Lewis.

Dinosaur Eggs Discovered in Montana

Dr. Glenn L. Jepson, of Princeton University, director of an expedition into southern Montana, has reported the discovery of dinosaur eggs in that region. These are the first such eggs to be found in America. By this discovery Montana becomes a rival of the Thibetian plateau, where Roy Chapman Andrews and his party have made similar valuable discoveries.

Fossils of Three Toed Horse in Wyoming

An expedition of the Harvard University Museum of Comparative Zoology, under the leadership of Erich M. Schlaikjer, has recently discovered near Torrington, Wyoming, an enormous fossil deposit in which were found thousands of little three toed horses that lived about 35,000,000 years ago. It is believed that the horse of the present day developed from some such pygmy ancestors, and it is hoped that this discovery will reveal some of the missing chapters in the story of that development.

Cosmic Rays as Barometers

Prof. R. A. Millikan, discoverer of the Cosmic rays, has recently reported to the National Academy of Science a practical use for those rays. These are the most penetrating radiations known, far exceeding X rays and even the very penetrating gamma rays of radium in that respect. Like all other electro magnetic waves, these rays suffer loss of intensity on passing through air, water, or other materials, the reduction in intensity increasing with amount of material traversed. The cosmic radiation arrives at the outer limits of the atmosphere with constant and uniform

intensity, regardless of latitude and season of the year. The intensity remaining after it reaches the earth's surface will therefore be less the greater the depth and density of air traversed. Since it is just these factors that determine barometric pressure the intensity of the cosmic radiation at any point will be a clear index of barometric pressure. Prof. Millikan believes that the accuracy attainable by this new means far exceeds that of the familiar mercurial barometer.

however, it was critically tested from the standpoint of modern physics, celestial dynamics, geology, and biology and was found to have a number of serious weaknesses, so serious, indeed, that a new hypothesis was necessary. Though given up with great reluctance, it is fair to say that the La Placian hypothesis has been abandoned. Many geologic inheritances from it, however, are still held with great firmness by the world in general.

E. J. Cable.

QUESTION BOX

Question:

Which hypothesis for the origin of the earth is in best repute.*

Answer:

The hypothesis most generally accepted among scientists today is the "Planetesimal" theory of Chamberlin. This was first enunciated in 1905. Up to that time, the "nebular hypothesis" of La Place was the one generally accepted. According to La Place the material in the solar system was once in the form of a hot rotating gaseous spheroid large enough to embrace the whole of the space of the present system. This mass shrank in cooling, the contraction accelerated the rate of rotation, and this in turn caused an increase in the equatorial bulge. An equatorial ring finally separated from the body of the nebula, and ultimately became a planet. The further contraction of the parent mass led to the formation of other rings in succession, each of which finally formed a planet of our present system.

For over a hundred years this hypothesis was generally accepted. With the beginning of the twentieth century,

Question:

Can ice become colder than zero degrees centigrade? If not, why?

Answer:

Ice forms at zero degrees centigrade, and melts at the same temperature, it can therefore not become warmer than zero centigrade. It can, however, become colder, and does become so, as a thermometer will show, when in surroundings below that temperature. This is why snow brought into a warm room on a very cold day does not begin to melt immediately. It must first have its temperature raised to the melting point by absorption of heat from the room.

Question:

Will the lack of uniformity in the bore of a mercurial barometer tube affect its reading except for the temperature correction?

Answer:

No, the size of the barometer tube and variations in size have no effect on the height of the column except for the wholly negligible variation in capillary action due to differences in diameter. The pressure of the atmosphere is balanced by the hydrostatic pressure of the mercury. The latter depends entirely on the height of the barometric column and the density of the mercury, and not on the diameter or uniformity of the tube.

* An article by Dr. Cable on the Planetesimal Hypothesis will be published in an early number of the Bulletin.