

making predictions concerning a system on the basis of measurements made on another system that had previously interacted with it leads to the result that if (1) is false then (2) is also false. One is thus led to conclude that the description of reality as given by a wave function is not complete.

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Among the curious accidents that happen are a number of instances of small live fishes becoming impacted in throats of men.

"The buffalo was the great forerunner of the automobile; he made the best pioneer roads and the widest," says a writer in *Outdoor Indiana*.

PHYSICS

Earth's Lop-Sided Magnetism Provides Check of Cosmic Rays

THE lop-sided magnetism of the earth is now being used to study the nature of cosmic radiation, it was indicated in the address of the world-famous Belgian scientist Abbé Lemaître before the meeting of the American Physical Society.

Father Lemaître read the paper of Prof. M. S. Vallarta of Massachusetts Institute of Technology on the "Longitude Effect of Cosmic Radiation." Prof. Val-

larta with Father Lemaître developed the theory of cosmic rays so well supported by scientific evidence which assumes that all the incoming rays are of a particle nature and are charged with electricity.

The earth's magnetic field, Father Lemaître explained, is not perfectly symmetrical, but acts as if its center were about 186 miles from the ideal center of the earth. The resultant field on the outside, therefore, is a bit off-center too.

Calculations on what the magnetic lop-sided effect should be on cosmic ray intensity at widely separated points about the earth gives almost perfect agreement with experimental measurements, Father Lemaître said. Data taken in places all around the world from zero longitude at Greenwich, England, to the Antipodes on the opposite side of the earth all fall on the new calculated curves.

There is but one set of observational data which does not fit the new theoretical curves. These data were obtained by Prof. Robert A. Millikan and Dr. Victor Neher on an automatic instrument placed aboard a ship enroute from Honolulu to Sydney-Melbourne. Other data by these scientists fit perfectly well, Abbé Lemaître explained. The new report lends additional support to the idea that cosmic rays are particles.

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PHYSICS

Create Forces Equal to 1,200,000 Times Gravity

SPINNING a duralumin rotor in a vacuum, science can create forces equal to 1,200,000 times that produced by the gravitational pull of the earth, it was reported to the American Society by Dr. E. G. Pickels, of the University of Virginia.

Such an enormous force offers the possibility of being able to pull molecules apart. Centrifugal force 1,200,000 times as great as the force of gravity may be explained by saying that gravity makes an object dropped from a high building fall 16 feet in the first second. If the force of gravity were as large as the force in Dr. Pickels' ultracentrifuge, a dropped

- 1 $\Psi' = A\Psi = a\Psi$
- 2 $\Psi = e^{\frac{2\pi i}{h} P_0 x}$
- 3 $P = \frac{h}{2\pi i} \frac{\partial}{\partial x}$
- 4 $\Psi' = P\Psi = \left(\frac{h}{2\pi i}\right) \frac{\partial \Psi}{\partial x} = P_0 \Psi$
- 5 $q\Psi = x\Psi = a\Psi$
- 6 $P(a, b) = \int_a^b \Psi \Psi dx = \int_a^b dx = b - a$
- 7 $\Psi(x_1, x_2) = \sum_{n=1}^{\infty} \Psi_n(x_2) u_n(x_1)$
- 8 $\Psi(x_1, x_2) = \sum_{s=1}^{\infty} \phi_s(x_2) v_s(x_1)$
- 9 $\Psi(x_1, x_2) = \int_{-\infty}^{\infty} e^{\frac{2\pi i}{h} (x_1 - x_2 + x_0) P} dp$
- 10 $u_p(x_1) = e^{\frac{2\pi i}{h} p x_1}$
- 11 $\Psi(x_1, x_2) = \int_{-\infty}^{\infty} \Psi_p(x_2) u_p(x_1) dp$
- 12 $\Psi_p(x_2) = e^{-\frac{2\pi i}{h} (x_2 - x_0) P}$
- 13 $P = \frac{h}{2\pi i} \frac{\partial}{\partial x_2}$
- 14 $v_x(x_1) = \delta(x_1 - x)$
- 15 $\Psi(x_1, x_2) = \int_{-\infty}^{\infty} \phi_x(x_2) v_x(x_1) dx$
- 16 $\phi_x(x_2) = \int_{-\infty}^{\infty} e^{\frac{2\pi i}{h} (x - x_2 + x_0) P} P dp = \frac{h}{2\pi i} \delta(x - x_2 + x_0)$
- 17 $Q = x_2$
- 18 $PQ - QP = \frac{h}{2\pi i}$

EINSTEIN USES THESE COMPLEX EQUATIONS

