E. W. Gudger Photo

GREATEST OF SHARKS

Whale sharks swim all the warm seas. They are the greatest of all sharks, lengths of twenty to thirty feet being common, and at least one nearly forty feet long has been taken. Like all sharks, they have no real bones in their skeletons, only cartilage, so that when hauled out of water they "squash out" considerably, as did this huge specimen.

PHYSICS

Revived Ether Concept Sets Cosmic Explosion Speed Limit

SEEKING to link the extremely minute realms of the new quantum mechanics with the wide-flung scope of the mechanics of relativity, Sir Arthur Eddington, the Cambridge astronomer, presented to the famous Royal Society of London new mathematical equations which may receive acceptance by scientists and thus extend man's understanding of the physical world.

To obtain tractable equations in linking microscopic quantum mechanics and macroscopic relativity, Sir Arthur found it necessary to use something mathematically simpler than the kilogram as a comparison standard of mass. As an intermediary, therefore, he uses an ideal uniform distribution of matter, described as a sort of ether.

The link between quantum mechanics and relativity is given by a quadratic equation: $10m^2 - 136mm_0 + m_0^2 = 0$.

The letter m is the mass of the electric particle and the two roots of the equation give the masses of the fundamental units of matter, the proton and the electron, found to be in the ratio of 1847.6 to one. The letter m_0 is the mass of comparison of the ether and it is calculable from a formula in terms of the following four fundamental constants: Planck's constant, the velocity of light, the de Sitter radius of empty space time and the number of particles in the universe. This number is 10^{79}.

In the maze of connections between physical constants developed by Sir Arthur this number of particles in the universe is the one pure number which has as yet no theoretical explanation.

One result of the equation that can be tested by observational astronomy is that there is a limiting speed of recession of the nebulae or the so-called red shift or Doppler effect. This limit is computed by Sir Arthur as 780 kilometers per second per megaparsec. This is a sort of upper speed limit for the explosion or expansion of the universe.

Sir Arthur Eddington, widely known as the author of "The Nature of the Physical World" and other books as well as for his scientific work in astronomy and theoretical physics, has in the past few years been developing a theory of the electron that can be reconciled with the relativity theory of Einstein, which incidentally Sir Arthur by his 1919 eclipse expedition did much to bring to the attention of science. (*See SNL, Nov.* 12, 1932, *p.* 303.)

Science News Letter, November 18, 1933

DEMOGRAPHY

Nevada and Missouri Lead in Homicide Rates

NEVADA had the highest homicide rate among white people for the years 1929 to 1931, while Missouri led the list for homicides among colored people, a statistical study conducted by the Metropolitan Life Insurance Company shows.

Statisticians who made the study, which has just been reported, are unable to give any reason for the geographic distribution of homicide. The rate for white people is three times as high in the United States as in Canada and ten or eleven times as high as in England.

Lowest homicide rates, for both white and colored people, were found in the New England states, particularly Maine, Vermont and New Hampshire.

Above-average homicide rates are concentrated in certain areas of the country. For white people there are two regions of highest homicide rates, one in the Southeast and the other in the Mountain states, with Oklahoma forming a connecting link.

The homicide rate for colored people was below average in the Southern states. The high homicide rates for negroes were found in states around Indiana, namely Illinois, Michigan, Ohio, West Virginia, Kentucky and Tennessee. In Indiana, however, the rate was lower than in these surrounding states.

The statisticians pointed out in their report that homicide is mainly a problem of cities, rural areas showing uniformly lower rates.

Science News Letter, November 18, 1933

ECOLOGY

Conifers Grow During Winter, Structures Show

EVIDENCE that the great evergreen trees of the Pacific Northwest grow all winter long has been found in microscopic details of their internal structure by Prof. Ansel F. Hemenway of the University of Arizona. The cambium, or growth layer just beneath the bark, appears to be in an active condition from early autumn until the summer drought sets in, as do also the sieve tubes, elongated cells whose function is considered by botanists to be the transportation of dissolved food substances.

Similar structures from the trunks of deciduous or broad-leaved trees of the