

ASTRONOMY

Comet Had Small Nucleus

The Pons-Winnecke comet, which occasioned much excitement last summer when it came within 4,000,000 miles of the earth, had the distinction of possessing the smallest nucleus that has ever been observed in such a body. Probably it was not more than two or three miles in diameter. This is announced by Dr. V. M. Slipher, director of the Lowell Observatory at Flagstaff, Arizona.

Dr. Slipher took advantage of the close visit of Pons-Winnecke to watch it carefully with the observatory's big refracting telescope, which has a lens two feet in diameter. He had, he says, the best opportunity in years to make a measurement of the size of a comet's nucleus, the center which is supposed to supply the rest of its material. On most occasions, he says, "the nucleus of the comet was found to be perfectly stellar, i. e., very small and sharp." At such times "it was possible to distinguish the nucleus from stars only by its motion."

Even through the highest power telescope a star appears as a point of light. First Dr. Slipher compared the cometary nucleus with nearby stars. Then he took stars of similar brightness in another part of the heavens, near the planet Jupiter, and compared them with the large moons of that planet. As the size, and distance, of the Jovian moons are known, it was thus possible to estimate the size of the nucleus. Its distance from the earth was also known, and thus it was possible to get a rough approximation of its diameter.

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SOCIOLOGY

Red Cross Roll Call

Relief in seventy-seven disasters at home and twenty in foreign lands; assistance to an average of 62,000 disabled ex-service men and their dependents each month; welfare work in many fields; training of thousands of life savers and first aid experts; all these and many others are among the services rendered the past year.

Because of the constantly increasing demands on its many services, at the time of its eleventh annual membership roll call from Armistice Day through Thanksgiving—November 11-24—The American National Red Cross will seek an enrolment of 5,000,000 adult members for the coming year.

Science News-Letter, November 5, 1927

PHYSICS



JOHN AUGUST ANDERSON

A Modern Jove

Jove, so the old mythologies tell us, used to entertain himself by hurling thunderbolts down at the earth. The only difference between this performance and that accomplished by Dr. Anderson (described in our leading article of this issue) is that he hurls his thunderbolts into fine iron wires. And surely the results entitle them to be called thunderbolts.

Exploding wires is not his only claim to fame, however. Out in California plans are rapidly coming to fruition by means of which a chain of seismograph stations will keep earthquake experts informed of the state of the earth's crust under them, much as the barometer enables the weather man to keep tabs on the air above him. Perhaps eventually earthquakes may actually be predicted. What concerns us now, however, is that the seismographs are of a type known as the "Wood-Anderson," after Dr. Anderson and his colleague, Dr. Harry O. Wood, who jointly developed them. This instrument has filled the need for a small, inexpensive and reliable seismograph.

It is as an astronomer, rather than a physicist, that Dr. Anderson classifies himself in "Who's Who." It was as such that he traveled to Sumatra with the party from the U. S. Naval Observatory in January, 1926, to photograph the flash spectrum of the eclipse at that time. In 1905 he traveled to Spain with astronomers from the same institution for the same purpose.

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CHEMISTRY

Nordic Power is Chemical

By EDWIN E. SLOSSON

The most momentous movement in modern history is the spread of the power of the northern European branch of the white race over the entire world within the last 150 years. These people are now pre-eminent in the political, military, industrial, commercial, scientific and literary sense. Practically, there are only four countries that are not under their control: China, which is too numerous, Japan and Turkey which are too war-like, and Abyssinia which subsists by sufferance. This unparalleled expansion of imperialism is due to two factors; one, internal and the other external. The first is the native ability of the white race, and the other is their application in commerce and industry of the laws of gases and particularly Gay-Lussac's law that the pressure of a gas varies with the absolute temperature.

Modern civilization is based upon molecular anarchy. By releasing the atoms from their confinement in liquids and solids, they attain in the form of a gas absolute independence and democratic equality. That is to say, the development of modern civilization and the expansion of Nordic stock throughout the world is essentially a chemical reaction. It is the expansive force of gases released at high temperature from gunpowder and nitrocellulose that has enabled these peoples to become irresistible in warfare. It is the expansive power of steam that has given us the stationary steam engine, the locomotive and the steamship. It is the expansive power of water and carbon dioxide that has given us the internal ignition engine, the automobile and the aeroplane. The expansion of gases is, therefore, the principal physical factor in the world-wide expansion of north European races. These expansive gases have been produced from fossil fuel, coal and oil, which are limited in amount and capricious in distribution.

Suppose then our race should be deprived of this physical and external source of its power. Would then the internal and psychical factor suffice to maintain our present supremacy? For some twenty-five hundred years the question has been in dispute whether the rise of a nation is due to its natural resources or to its native ability, to the physical or psychical factor. Obviously

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Nordic Power

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both are essential. Their relative value has been hotly argued and is still unsettled. From the point of view of a scientist, such arguments are futile. A disputed question by crucial experiment we should have to deprive the dominant race of its external advantage, the possession of the sources of inanimate energy.

Such an experiment is going to be tried on a world-wide scale. We can almost date the time, when the vexed question will be put to proof.

The supply of petroleum will largely disappear within a period so short that most of us may expect to live to see that day. The supply of coal is also limited and the date of its exhaustion in Europe is only a few hundred years.

What will be the sources of energy which will support the civilization of the future? We cannot tell but it is quite likely that it will involve a transfer of the sources of power to other lands and alien races. For instance, if we should have to rely upon water power, the richest continents would be Asia, Africa, and South America. If we should devise a means of utilizing solar energy where it is least impeded by clouds and rain in its passage from the central power-house of the solar system to the ground, the sources of wealth will be the great Desert of Africa, Asia, South America and Central Australia. That is to say, so far as we could foresee the future, the possession of power will gradually pass from the white to the black and yellow races. What difference this will make to the world is something that I will not venture to guess.

Of course there is also the possibility which is indeed, in the light of history, a probability, that the internal and psychical factor, that is, hereditary genius and native ability, may be lost to the dominant races and be developed by some small group of people in any part of the world. This also is a chemical change but of so delicate a character as not yet to be under the control of the experimental chemist.

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The trade rat, common in the southwest, is so called because when it takes an article away it leaves something else in its place.

A magnet that can lift 75 tons is used in a German steel plant.

A Modern Jove

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Born in Rollag, Minnesota, on August 7, 1876, Dr. Anderson studied at Concordia College and one of the normal schools of his native state, later going to Valparaiso College, in Indiana, where he received his B. S. in 1900. His Ph. D. came from Johns Hopkins in 1907, where he remained until 1916. Since then he has served as a physicist on the staff of the Mt. Wilson Observatory in Pasadena, California.

Science News-Letter, November 5, 1927

News-Letter Features

Born over five years ago of the demand and interest of those individuals who had caught a glimpse of *Science Service's* news reports to newspapers, the SCIENCE NEWS-LETTER has since proved interesting to laymen, scientists, students, teachers and children.

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Pons-Winnecke Comet

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This, he found, was not more than two or three miles.

Other studies of the comet were made by Dr. Slipher with the aid of a spectroscope attached to the big telescope. In this way, by analyzing its light, he found several very peculiar features. It has been supposed that comets are excited to great activity as they get near the sun, but the studies of Dr. Slipher of Pons-Winnecke as well as other comets, seems to contradict these views.

The spectrum showed very strongly the same dark bands that are revealed in the spectrum of the sun. This shows that the comet's light consisted largely of reflected sunlight. Also, in the band of spectrum there appeared rather weakly the bands that are associated with cometary light. A spray projecting from the nucleus towards the sun gave off more light of its own than any other part of the comet.

Besides having its activity reduced by approach to the sun, Dr. Slipher believed that its close approach to the earth may have also reduced the comet's light. In 1910, he said, it was found that the light emissions from Halley's comet were reduced as it approached the earth, and then became more intense as it drew away. Previously, it has been supposed that the earth has little influence on the activity of comets coming near it. If this is the case, it would account for the fact that Pons-Winnecke, despite its close approach to the earth, was much fainter than some astronomers had anticipated.

Science News-Letter, November 5, 1927

It has been found that the rubber tree has tubes containing the rubber juice close to the bark surface as well as deep in the center.

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