

"Nebulium" May Be Oxygen

Nebulium, the strange "element" that has been supposed to exist in such bodies as the great cloud of glowing gas in the star group of Orion, seems to be nothing but oxygen and nitrogen, of which we take in about a pint every time we breathe. This is the opinion of I. S. Bowen, of the Norman Bridge Laboratory of Physics.

Following the discovery of helium, first as a strange line in the spectrum of the sun, and then as an actual element on the earth, a mysterious group of lines was found in the spectra of some of the nebulae. As most of the spectral lines are known to be due to certain elements, it was thought that the strange lines, of which one was green, might be due to an element as yet undiscovered.

Dr. Bowen's studies now indicate, however, that these lines are due at least partly to oxygen and nitrogen, of which the air is chiefly composed, but in what is termed the "metastable state." While in the laboratory atoms of certain gases can be induced to enter this state, they ordinarily return to the normal condition without giving off light, by bumping into another atom or the walls of the tube. In the nebula, however, the pressure is very low, probably much lower than the lowest terrestrial vacuum, which means that the atoms are not so crowded. They are therefore less apt to bump into each other, and the walls of the tube are absent. The result is that the atoms remain longer in the metastable state, and finally return to the normal condition spontaneously. According to Dr. Bowen's calculations, if this happened, light would be given off of the same wavelengths as the mysterious nebulium lines.

Dr. Bowen reported his conclusions recently to the British scientific magazine *Nature*. In a later issue, Prof. A. Fowler, a leading English authority on the subject, states that the evidence, on the whole, "appears to be in favor of Mr. Bowen's suggestions." He also suggests that one of the lines, in the part of the spectrum just beyond the red end, should be accompanied by a fainter line, on the side towards the visible spectrum. If astronomers can discover this in the spectrum photographs of the nebulae, it would be strong evidence in favor of Dr. Bowen's views.

Science News-Letter, November 12, 1927



WILLIAM ALLEN ORTON

The Newer Conquistador

We use the word "conquest" in two widely different senses, frequently even when we apply it to the same thing. The conquest of the tropics, sixteenth century style, was something very remote from the conquest of the tropics in the manner of the twentieth century. Then, the *conquistadores* fought the men they found in the territories they invaded, and robbed and killed them or at best allowed them to survive as chattel slaves for the purpose of a closer extractive exploitation of their country. Now, the foreigner seeks smaller but more numerous and more difficult enemies—insects, bacteria, the fungi that cause plant disease, and his conquests benefit the native as well as himself.

The newer view of the tropics, which envisages them as regions that must eventually become major instead of minor factors in the support of the world's population, finds one of its most active and best-informed exponents in Dr. W. A. Orton, scientific director and general manager of the Tropical Plant Research Foundation. This institution devotes itself to the solution of the problems in plant industry that beset the owners of tropical plantations and forest lands, and although it is not an old establishment it already has to its credit the clearing up of a number of difficult questions in plant pathology,

soil fertility, economic entomology and other phases of tropical agricultural science.

Although his birth and education were strictly of stony and chill New England, Dr. Orton displayed an interest in plant problems of warmer regions from his first connection with the U. S. Department of Agriculture in 1899, when he was placed in charge of cotton, truck and forage crop disease investigations. A variety of problems in plant pathology continued to hold his attention as long as he remained with the department. His transfer to his present position took place in 1924.

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New Flood Like Johnstown

The great flood which caused such a loss of life and property damage at Montpelier, Vermont, on November 4 was similar in many respects to the famous Johnstown flood. Unlike the Mississippi floods, the great damage in Vermont was not done by the river, but by the breaking of the big reservoir above the city, according to H. C. Frankenfield, of the flood division of the U. S. Weather Bureau.

"There would have been floods with some damage in any event," Mr. Frankenfield said, "and this was foreseen by the Weather Bureau. But of course we could not foresee the breaking of the reservoir. With unusually heavy rains Thursday night—4 inches was the report from the Concord, N. H., station, not far away—the reservoir gave way the following morning, and this did the great amount of damage.

"Montpelier is in the Winsooki River valley, which drains into Lake Champlain, but the Connecticut River is also swollen. Just how high the upper river became we cannot say, because the river gauge at Bel lows Falls was carried away when it registered 20 feet. Then it had already broken the previous record for this location of 19 feet, which was made on March 28, 1913. By Sunday night the crest of the flood was expected to reach Hartford, perhaps reaching a height of 26 feet. The record at Hartford was made in 1854, when the river attained 29 feet.

"Such floods as these in this part of the country are most unusual at this time of year. Ordinarily they occur in the spring."

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