Revival of the atomic theory

JOHN DALTON AND THE ATOM. By Frank Greenaway. 244 pp. Cornell U. Press, Ithaca, N.Y., $6.95

by L. Marton

To many of us, I am afraid, the name of Dalton is one of the names we have to learn in our undergraduate courses about atomic theory. I for one knew pitifully little about John Dalton until I read the excellent book of Frank Greenaway. From this well-documented and yet concise book John Dalton emerges as the unusually gifted amateur who succeeded in changing the course of the physical sciences by asserting the validity of the old atomic conception. I say old because the idea itself was well known as far back as the time of Democritos. Nevertheless, it was Dalton who succeeded in reviving the atomic theory and putting it on a quantitative basis. His major impact was in chemistry where many of the outstanding chemists of the early 19th century were quick to take advantage of the law of multiple proportions. What was slower was the acceptance of Dalton's belief in the physical reality of the atom. Almost a hundred years after Dalton's announcement of the atomic theory a great physical chemist, Wilhelm Ostwald, wrote, "The stochiometric laws will remain a part of chemistry long after the atoms will be only found in the dust of the libraries." Ostwald was the last to give up a stubborn opposition against the atomic hypothesis, and it took him until 1912 to recognize that the atom may exist, after all.

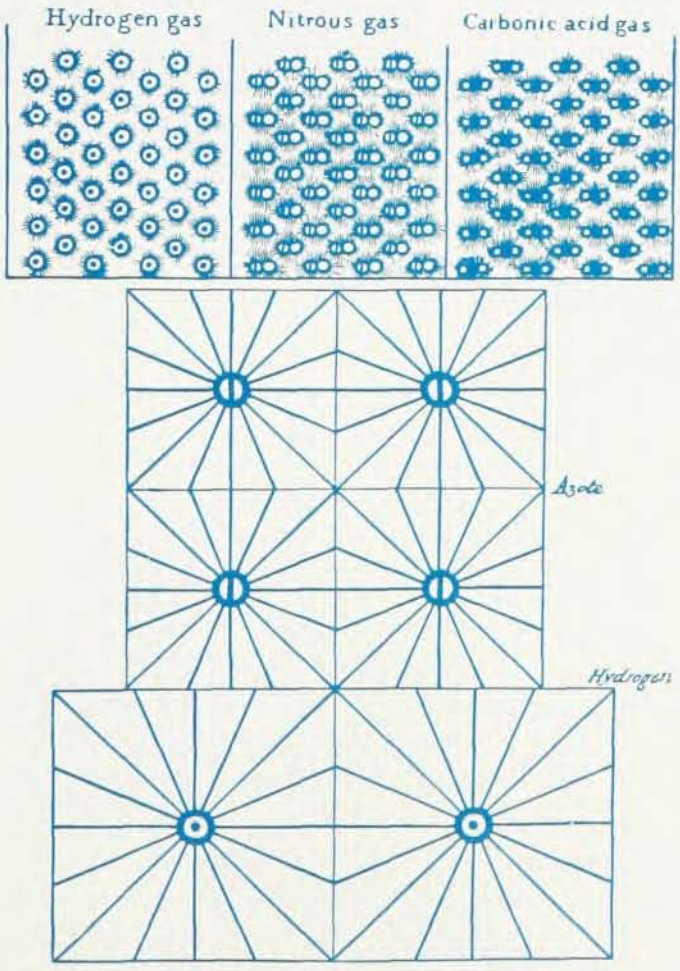
Another advantage of the biography written by Greenaway is that it brings out the other accomplishments of John Dalton. The word "Daltonism" is less used in English than in French for denoting color blindness. The patient and thoroughgoing investigation based on his own shortcomings is very well presented in this biography. Likewise, there is an extensive presentation of his work in meteorology. Even if he rediscovered certain phenomena, like the correlation between magnetism and aurora borealis which was discovered much earlier by Halley, it does not detract from the fact that a man without any formal training, who had to earn his living by very low-grade teaching practically until the end of his life, succeeded in a penetrating analysis of many physical phenomena and in leaving an enduring imprint on the physical sciences. He remained until the end of his life a very simple provincial, with strong adherence to his Quaker principles.

One more fine feature of this book is that it presents Dalton not as an individual alone, but brings in the whole background of contemporary science. It outlines very well the enormous difficulty faced by a man who could not easily get access to contemporary literature. Until he was twenty seven he lived in a very small place, Kendal, where access to scientific literature was practically nil. In 1793 he moved to Manchester, which even at that time was still a small provincial town. There he could get access to somewhat more literature, which he used with admirable skill to his advantage.

To anybody who is interested in the life of a very unusual and great man, the book is warmly recommended.

* * *

L. Marton is chief of international relations at the National Bureau of Standards.



DALTON'S ATOMS, reproduced from his book *A New System of Chemical Philosophy* (Manchester, 1810).