SCIENCE

VOL. 83 FRIDAY, MAY 1, 1936 No. 2157

SCIENCE: A Weekly Journal devoted to the Advancement of Science, edited by J. MCKEEN CATTELL and published every Friday by

THE SCIENCE PRESS

New York City: Grand Central Terminal

Lancaster, Pa. Garrison, N. Y.

Annual Subscription, $6.00 Single Copies, 15 Cts.

SCIENCE is the official organ of the American Association for the Advancement of Science. Information regarding membership in the Association may be secured from the office of the permanent secretary, in the Smithsonian Institution Building, Washington, D. C.

RESUSCITATION WITH CARBON DIOXIDE[1]

By Professor YANDELL HENDERSON

YALE UNIVERSITY

ON the morning of May 9, 1794, in the Place de la Revolution in Paris, Antoine Laurent Lavoisier died under the guillotine.

One hundred and seven years later (1901) Michael Foster in his history of physiology wrote:

> As the sharp stroke of the guillotine severed his neck there passed away from this world, in his fifty-first year, this master mind of science, who had done so much to draw aside from truth the veil of man's ignorance and wrong thought; and there passed away too, the hope of his drawing aside yet other folds of that veil, folds which perhaps wrap us round even to-day.

What I have to say is concerned with one of those "folds of the veil of ignorance and wrong thought" which it has been my good fortune to some extent to draw aside.

A few years before his death Lavoisier had demonstrated the true nature both of combustion and respiration—a fundamental likeness between fire and breathing. It is oxygen, both in combustion and in respiration (in its broadest sense), that unites with carbonaceous matter, liberates heat and produces carbon dioxide.

From this fundamental conception have come far-reaching practical applications and an understanding of the unities of nature that is even more important. We can now measure the energy expenditure of the body by determining the amount of oxygen consumed. We can compare, as Lavoisier suggested, the combustion in the working muscles of a laborer and the reasoning brain of a scientist. We see that respiration

[1] Read before the American Philosophical Society, Philadelphia, April 23, 1936.