

rapid deep breathing at half-hour intervals. A feeling of sluggishness or sleepiness may be almost completely dispelled. I have never noticed any reaction as in the case of most stimulants and altogether it seems to me very satisfactory.

3. The effect on muscular fatigue is also striking. A difficult arm exercise with heavy weights which I could not repeat under ordinary circumstances more than twenty times, I found after four minutes of this preparatory breathing that I could do twenty-seven times, *i. e.*, about thirty per cent. more. This increase I found to exist at all stages of fatigue, as might be expected.

4. The pulse beat goes up very rapidly while the breathing is continued, in my own case from about 65 to 106 after four minutes' breathing.

Another curious effect which perhaps is worth mentioning is the apparent rapid lapse of time during the latter half of a hard breathing period. This change in the time-sense is very noticeable.

I might add, in connection with paragraph one, that a friend of mine has found a five-minute limit to the time during which he is able to hold his breath after the preliminary breathing.

I should not have ventured to describe phenomena which are so easily in the reach of every one, had I not found in people at large, and even among scientific men, a surprising ignorance as to their existence. I have seen some very amusing betting on how long it was possible to hold the breath, and have seen the cock-sure bettor laid low by not knowing of this possible resource of his adversary.

As a mental stimulant, and as a means to increase the time during which the system can do without respiration, violent breathing might find considerable useful application, and daring rescues from suffocation are common enough to make a knowledge of this possible threefold endurance without air of no little value.

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ESPERANTO

MR. J. D. HAILMAN'S interesting letter on the use of Esperanto by scientific men¹ is, I venture to think, somewhat misleading. He says (p. 561):

This solution is the world-wide adoption of an *international* language—a second language which all will learn in addition to their natural tongue. . . .

The chemist, in order to be moderately well equipped, requires a good reading knowledge of English, French and German. Suppose we take a somewhat extreme case and assume that after January 1, 1910, under penalty of instant death, all chemical communications must be made in Esperanto, what would be the effect? Apart from the possible creation of a few desirable vacancies, the only result of such a law would be that chemists would have to know at least *four* or *five* languages, including Esperanto, instead of *three* or *four*, as at present. The reason for this is, of course, that the greater portion of the facts and theories which constitute chemistry has been contributed, hitherto, in English, French or German and, in many cases, it is absolutely necessary to have an author's original words.

The same conditions doubtless apply, *mutatis mutandis*, to other branches of knowledge.

I have no desire to obtrude an opinion regarding the merits and defects of Esperanto, nor to say anything as to the desirability or otherwise of an international language. I believe, however, that it is timely to point out that the adoption of Esperanto will involve an increase to the weight of languages which the scientific worker has to carry and that it will not be an alleviation of his burden. It is only fair to call upon the enthusiastic propagandists of Esperanto to state this fact clearly during their missionary labors.

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SCIENTIFIC BOOKS

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¹ SCIENCE, October 22, 1909.