

Letters to the Editor.

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The Constitution of the Elements.

IN continuation of my letter in NATURE of March 4, further experiments on mass-spectra have been made, the results of which may be briefly announced as follows:

Boron (atomic weight 10.9) is a complex element. Its isotopes are 10 and 11, satisfactorily confirmed by second-order lines at 5 and 5.5. Fluorine (atomic weight 19.00) is apparently simple, as its chemical atomic weight would lead one to expect.

The results obtained with silicon (atomic weight 28.3) are somewhat difficult to interpret, and lead to the conclusion that this element has isotopes 28 and 29, with possibly another 30.

Bromine (atomic weight 79.92) is particularly interesting, for, although its chemical atomic weight is so nearly 80, it is actually composed of approximately equal parts of isotopes 79 and 81.

Sulphur (atomic weight 32.06) has a predominant constituent 32. Owing to possible hydrogen compounds the data are as yet insufficient to give a decision as to the presence of small quantities of isotopes of higher mass suggested by the atomic weight.

Phosphorus (atomic weight 31.04) and arsenic (atomic weight 74.96) are also apparently simple elements of masses 31 and 75 respectively.

No line given by the above elements shows any measurable divergence from the whole number rule.

F. W. ASTON.

Cavendish Laboratory, June 20.

Applied Science and Industrial Research.

IN my reply to Mr. Williamson, published in NATURE of June 3, I stated that research workers and their assistants, aided by the Department of Scientific and Industrial Research, during the year 1918-19 received on the average 53s. weekly.

Sir Frank Heath has directed my attention to the unwarranted inference I have drawn. I assumed that the grants made were all annual grants, but I am informed by the Department that this is not the case; less than half the grants to research workers and students were grants for twelve calendar months' work; the sum of 14,170*l.* expended included nine grants for apparatus and grants for casual labour. Actually, eighty-five research workers and students received rather less than 13,000*l.* I am informed also that professors' recommendations are followed in making these grants, both with regard to recipients and to the amounts allotted.

Without expressing any further opinion as to the adequacy of grants to individuals, detailed information not having been supplied, I should be glad if you would afford me the opportunity of expressing my regret that in criticising the grants I unwittingly misconstrued the figures given on pp. 9 and 72 of the Report of the Committee of the Privy Council for Scientific and Industrial Research for the year 1918-19.

A. G. CHURCH.

National Union of Scientific Workers,
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Science and Scholasticism.

DR. SINGER's review of my book "Medieval Medicine" in NATURE of April 1 has only just come under my notice. The mails separate us from England more than before the war; may that be my excuse for a belated word? I have nothing to say for the book, it is thoroughly documented and must speak for itself; but may I say a word for poor Aristotle and Hugo da Lucca, whom I have brought under the reviewer's strictures?

Dr. Singer suggests that Aristotle has come into appreciation again because we have found that he made observations on animal life. Is not the reason rather that now that we ourselves have come to think through our observations to the principles beneath, we have found that Aristotle was usually before us? As Prof. Wundt said, after spending a lifetime at experimental psychology: "It is only the animism of Aristotle which, by joining psychology to biology, provides a plausible metaphysical explanation for the data furnished by experimental psychology." In nearly everything else where this generation has thought deeply enough they have found Aristotle before them whenever he had considered the subject. That is why we have come to appreciate better the medieval regard for him.

Hugo da Lucca must be allowed to rest on his own work just like Aristotle. Any man who operated on the skull, the thorax, and the abdomen seven hundred years ago, using a metal tube to secure the patulousness of the intestines while he was making an intestinal anastomosis, who got union by first intention and boasted of it, and whose cicatrices were "pretty and linear, so that they could scarcely be seen," may be trusted to posterity in our time. How he could have done such things without an anæsthetic is impossible to understand, so therefore the hints that we have of anæsthesia at that time must be taken as historic. We do not need to go to manuscripts for this; there are dozens of text-books of professors of surgery in the thirteenth century that were printed in the Renaissance time. The Renaissance printers had marvellously good judgment, and the authors they printed in their magnificent editions were worthy of the time and labour they devoted to them. We have no word from Hugo himself, but his son wrote a whole volume with regard to him which surely Dr. Singer must know, though it is very hard to understand the position that he takes if he does know of it.

It is always amusing to note how the saying of anything good about the Middle Ages arouses opposition. John Fiske's declaration, "there is a sense in which the most brilliant achievements of pagan antiquity are dwarfed in comparison with these (of the Middle Ages)," must wait for acceptance. When I ventured to say in a volume on "The Thirteenth the Greatest of Centuries," that they had fine technical schools and developed engineering, most people shied; and yet we have their stained glass, illuminated books, wonderful ironwork, carving, and all the rest that we are founding technical schools to secure, and the engineering of their bridges and cathedrals is a marvel.

The modern man of science balks at this. Here in the United States the authors of "A Short History of Science" (New York, 1918), professors at the Massachusetts Institute of Technology, treated the science of the Middle Ages in a couple of paragraphs, the most important part of which is: "In the thirteenth century it becomes plain that a new spirit is arising in Europe. . . . Thomas Aquinas writes his famous 'Imitatio Christi.'"

JAS. J. WALSH.

110 West 74th Street, New York, May 26.