

It will be noted that the phenomenon as witnessed was more or less a repetition on a minor scale of what is usually seen in the Arctic circle. We might assume that on the date in question the aurora possessed abnormal brilliance, and it was easy to imagine the polar landscape illuminated thereby.

SCRIVEN BOLTON.

Bramley, Yorkshire, November 9.

Science in National Affairs.

IN your article on "Science in National Affairs" (October 21) the subject of school science was referred to in such a manner as to awaken the interest of all science teachers, who will generally endorse the opinion of Mr. Buckmaster and of the writer of the article that the present position of science in our schools is inferior and unsatisfactory. The status of science in our secondary schools, in particular, must have an important bearing on its status in our national life, and now that the pressure of circumstances has caused a wave of national introspection, science teachers expect, and will welcome, any investigations which would lead to a more extended recognition of their claims. Though there may be much still capable of betterment in the practice of science teaching, it will be generally admitted that the comparative neglect and consequent want of success of school science are traceable to unfavourable external conditions, viz., the indifference of the general public, the conservatism of universities which control the curricula through their examination systems, and, connected therewith, the overwhelming preponderance of non-scientific headmasters.

The general question of the national neglect of science has been mooted so fully in the scientific Press that amongst scientific men there can scarcely be a doubter left. What is now required is some concentrated, organised effort to reach the general public and their representatives. Failing the Royal Society, the matter is essentially one for a body like the British Science Guild. Is it not time for isolated efforts to be co-ordinated, and for a definite, organised plan of campaign to be entered upon with the prime object of getting into touch with the general public, and of pressing the claims of science, *urbi et orbi*? The obstacles may be great, the prejudices many, but is it too much to ask that our scientific leaders should emerge from their seclusion, enter the arena, and show that touch of character which alone can supply the driving power for the realisation of reforms? Oh, for half an hour of Huxley!

E. H. TRIPP.

3 Milton Road, Bedford, November 5.

THE subject of this letter was suggested to me on reading the recent leading articles in NATURE, in which it is pointed out that the present lamentable lack of knowledge of scientific methods and activities on the part of our political leaders is due largely to the neglect of science in our schools.

I have taken the trouble to find out (from the "Schoolmaster's Yearbook, 1914") how many of the headmasters of our public schools hold academic qualifications testifying to their having received any kind of scientific training. Out of a total of 113 public schools—the number of schools represented last year on the Headmasters' Conference—there are 82 headmasters whose sole qualifications are in classics or theology (about half of these are in holy orders), 13 whose main qualifications are in mathematics, while the total number of entries showing any qualifications at all in science is 10. Of course, I do not wish to draw the conclusion from these figures that science teaching is neglected in the great majority

of our public schools. On the contrary, I know well that excellent work is being done in most of them; but I do think that one may safely argue that under this state of affairs the spirit of respect for scientific knowledge is bound to suffer. How can that spirit of reverence and respect for science which is so lacking in our leaders be cultivated in the classical atmosphere of our schools where for so long science has been regarded as a subject on a slightly higher level than, say, book-keeping, and tolerated purely for its utilitarian value? In the school in which I myself teach, which is certainly, as regards laboratory accommodation, one of the best equipped schools in the country, and in the fourth forms which I take as most typical of the whole, a boy gives six periods a week to experimental science, including both physics and chemistry. The same boy gives no fewer than eight periods to Latin (or German as an alternative), while on the classical side of the school a boy may "complete" his school education without so much as ever hearing the names of Newton, Lavoisier, or Faraday.

Surely science will come to its own only when it is generally recognised and taught that the great natural truths and systems contain as much of what is noble, beautiful, and uplifting as anything yet revealed by the purely humanitarian studies. Moreover, if the true scientific spirit is not inculcated in our public schools, how can it ever reach the country as a whole while our political leaders and even our journalists are for the most part recruited almost direct from the public schools?

G. N. P.

Chemistry at the British Association.

WITH reference to the closing remark of the article with the above title in NATURE of November 4, "To the chemist this is perhaps more convincing than a volume of deductions by a physicist," the "this" being Dr. Whytelaw Gray's contributions to our knowledge of isotopes, I think it only fair to other chemists to point out that Dr. Gray is by no means the first or only chemist to study isotopes. Putting aside the numerous recent atomic weight determinations, which scarcely come under the category of volumes of deductions by a physicist, the beautiful researches of von Hevesy and Paneth had previously proved rigorously the chemical and electrochemical identity of lead and radium-D, which Dr. Gray has so far done only very roughly, though in his choice of some of the properties studied he broke fresh and interesting ground, and much is to be hoped from the continuation of the work. But even von Hevesy and Paneth only confirmed rigorously in this and a few selected cases what had been abundantly and comprehensively established by Fleck in this country, as they would be the first to point out. The benediction of other chemists on fundamental advances in their science is pleasant to have, no doubt, but if anything could be done to shorten the initial period of scepticism, which the history of this subject seems to show is necessary, it would be even more welcome.

F. S.

I AM much obliged to the Editor for giving me an opportunity of answering the letter from "F. S.," as I should not like him to think that the writer was oblivious to the work of experimenters other than Dr. Gray. Far from it: it is the very recognition of the work of the numerous physical chemists, in whose number (if I guess aright) "F. S." should be counted, that prompted the final remark. The whole difficulty appears to turn on the word "this." It was intended to mean experimental observation as opposed to theoretical deduction.

THE WRITER OF THE ARTICLE.