LETTERS TO THE EDITOR.

[The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts intended for this or any other part of NATURE. *No notice is taken of anonymous communications.]*

Science and Government.

No one will contest the principle that it is in every way desirable that the State should support liberally such kinds of scientific work as are beyond the means of private institutions or individuals. It is, for example, a scandal that the relatively small sum is not forthcoming which would bring our Ordnance Survey into touch with modern geodesy; but the importance of such matters will not be appreciated until the literary atmosphere in which our statemen and officials are reared is penetrated by a scientific way of thinking. Nor is there at present any widely spread educated opinion which might react on the Government. A member of the House of Commons stated in his place that the sooner coal is exhausted the better, as electricity will do its work. One of our important journals thinks it plausible that the Jamaica earthquake should have been predicted in Europe by the "weather plant," and that telegony may have some bearing on marriage with a deceased wife's sister.

But I am by no means convinced that the *argumentum ad hominem* contained in your issue for September 12 is very helpful. Taking the revenues of the United States and of the United Kingdom as approximately equal, the disparity between an expenditure of (say) $2\frac{3}{4}$ and $\frac{1}{4}$ millions on "science" is at first sight overwhelming; but a little analysis of the figures will, I think, put a somewhat different construction upon them.

Of the total, the Department of Agriculture and that of Commerce and Labour take 2,107,670*l.*, or say two millions. It is assumed that the whole of this goes to scientific work. It would be less inaccurate to describe it as applied to technical purposes; but even that would not quite correctly state the position.

The United States Department of Agriculture publishes an annual report in a bulky volume. Its contents deal largely with purely administrative matters; the rest is mostly educational, even popular, and can scarcely be regarded as adding much to agricultural science. Nor is it intended to do so. The object of the department is rather to disseminate and apply existing knowledge than to add to it by advanced research. The explanation is obvious; agriculture is the fundamental industry of a country which is still largely in the condition of an undeveloped estate, and cultivation is carried on by a population which is to a considerable extent only imperfectly instructed in the art. Agriculture in the United States is far from having reached its intensive stage; this may be illustrated by the fact that while the mean production of wheat in the United Kingdom is thirty bushels to the acre, in the United States it is only thirteen.

The expenditure of the United States Government on Agriculture is rather a political necessity than the outcome of sympathy for science. All other industries are protected by a tariff; but protection is useless for agriculture which has to export its surplus produce, and it is probable that by restricting the imports by which the exported produce is paid for, protection diminishes the exchange value of what the farmer produces. The United States Government is therefore compelled practically to subsidise the farmer in various indirect ways—by the free distribution of seed, for example—as it cannot directly protect him. The writer in NATURE has omitted to set out in comparison what is done for agriculture in the United Kingdom. The Board of Agriculture and Fisheries has a vote of 130,355*l.*, and the Irish Department of Agriculture and Technical Instruction one of 190,146*l.*, or 320,481*l.* in all. Now the area of the United Kingdom is one-thirtieth that of the United States; but our State expenditure is per square mile $4\frac{1}{2}$ times as great. It should be noted that this includes Kew and the Ordnance Survey.

But this is not the only omission on the *per contra* side of the account which appears to me likely to be extremely misleading to foreign readers of NATURE. I shall not attempt to make Table II. complete, as I have not the means at hand. But there is no mention of the Royal College of Science (including the School of Mines) in London or of the similar institutions in Dublin; one of the science museums, the Government Laboratory, the Standards Department, the Patent Office Library, the Oxford Forest School, the Botanic Gardens at Edinburgh and Dublin, and the research work of the Local Government Board. Nor should the ethnographic department at the British Museum (Bloomsbury) be overlooked.

The first three heads in Table I. represent what the United States Government does for pure, *i.e.* for non-technical, science. They amount to 382,690*l.*, after deducting the casual and temporary item of 250,000*l.* for building; but a further deduction of 107,000*l.* must be made for surveying public lands and forest reserves, as these are merely administrative services. This brings the expenditure on pure science down to 175,090*l.*, an amount which does not strike me as anything to be particularly proud of.

The fact is that the attitude to science of American statesmen is not very different from that of our own; indeed, on the whole, I doubt if it be not even less sympathetic. The Smithsonian Institution has become an independent trust something like our British Museum, and the fact may be recalled that it owes its foundation to the munificence of an Englishman. It is by no means liberally subsidised by the Government. Nor has the United States any national botanic establishment on the scale of Kew.

What one would like to find imitated in this country is the noble idealism which impels those who are possessed of great wealth in the United States to place it at the disposal of the community for the advancement of learning. Our own Royal Society might be entrusted with funds which it would know how to apply to purely scientific purposes. This would be more useful than giving of medals and scholarships to distribute. Our ancient universities, Oxford and Cambridge, are in urgent need of endowments, which would enable them to strike out their own line unhampered by the purely educational aims of the colleges; but State aid dries up the streams of private liberality, and brings with it the cramping atmosphere of official supervision.

W. T. THISELTON-DYER.

Witcombe, September 17.

SIR W. T. THISELTON-DYER agrees, at all events, that the attitude of British statesmen towards science leaves much to be desired. Statistics can, of course, be treated in many different ways, but, despite the criticisms in the above letter, the general conclusion of the article referred to remains substantially correct. The data are avowedly incomplete; only those who have attempted to collate the material scattered throughout Government publications appreciate wholly the difficulty of the task.

Although Sir W. T. Thiselton-Dyer maintains that but a small part of the grant to the U.S. Department of Agriculture is devoted to scientific research, the facts of the case seem to support the conclusions of the article. For the fiscal year ending June 30, 1905, the expenditure on investigation work alone, exclusive of the salaries of permanent officials, was at least 201,000*l.* The annual report for 1905–6 of our Board of Agriculture and Fisheries on the distribution of grants for agricultural education and research shows that the grant for agricultural research amounted to 355*l.*! Since "agriculture in the United States is far from having reached its intensive stage," there is surely less need for grants in aid of agricultural research there than in this country.

Grants to colleges and universities were omitted intentionally—and special attention was directed to the omission—since this subject has been dealt with so often in NATURE; consequently, the administration by the Board of Agriculture of the Treasury grant for the purposes of agricultural education, much of the work of the Irish Department of Agriculture and Technical Instruction, the activities of the Royal Colleges of Science in London and Dublin, and the university colleges, fell outside the scope of the article. Had the subject of grants for higher educational purposes been under consideration, an equally great disparity between the amount provided from public funds in the United States and in this country would have been