by the phenomenon of geometrical symmetry, and corresponding numerical symmetry of parts in 4's, 6's, 8's, 12's, and so on. We are dealing with what look like vibration-phenomena, with their nodes and inter-nodes; and that is just what I think they really are. Romanes, when he was studying the Medusæ, remarked that "the organism is constructed on what we may metaphorically [?] term a very definite plan"; that its organs had "a very precise geometrical relation" to one another, and that its radial canals were "disposed with perfect symmetry." These are indeed very remarkable features, and the vibration hypothesis seems fitted to account for them all.

What the motions are which the vibrations of the little bell set up in the surrounding fluid, and how these current or vortex movements may react upon the shape of the bell itself, is (I think) another chapter of the same story. D'ARCY W. THOMPSON.

The University, St. Andrews, July 31.

The Encouragement of Invention.

WHILST everyone, including our Government, expresses anxiety to encourage invention in this country, this same Government does what it can to stifle it by taxing royalties on patents as unearned income. If any income is earned, and dearly earned, I should say that it is that derived from patents.

SPENCER PICKERING.

THE EDUCATION BILL.

THE third reading of the Education Bill was agreed to by the House of Lords on Monday, August 5, and it is expected that the measure will receive the Royal assent during this week. The Bill passed through its second reading and Committee stages in the House of Lords without noteworthy changes. Lord Lytton moved the second reading on July 23, and represented the Board of Education during the Committee stage.

Lord Sydenham made a praiseworthy effort to secure the insertion of the words "including instruction in science" in sub-section 1 of the Bill, but unsuccessfully. He pointed out that it is remarkable that the word "science" does not appear in the Bill, and he rightly urged that in the twentieth century no educational measure is complete which overlooks the power of science and the influence of the scientific spirit. Cookery is mentioned in the Bill, yet Lord Lytton objected to the insertion of the words suggested by Lord Sydenham on the ground that reference should not be made to specific subjects of instruction. It was misleading for Lord Lytton to refer to science as an *item* in the curriculum, and to object to the inclusion of the word in the Bill on that account; for Lord Sydenham's amendment had as its intention not so much the prescription of a particular subject of study as the recognition of a prime factor of modern life.

Lord Crewe, leader of the Opposition, paid a high tribute to Mr. Fisher for the masterly way in which he had been able to satisfy so many of the educational needs of the country, and at the same time to commend his reforms both to the House of Commons and to the country. He regarded the concession of the postponement of compulsory continuation education in the case of children between sixteen and eighteen as mainly justified by the

impossibility of obtaining the requisite supply of teachers, but was somewhat more doubtful about the reduction of the hours of attendance in continuation schools from 320 to 280.

In reply to some critical observations on the financial aspects of the Bill, Lord Lytton said it was not possible to give an accurate estimate of what the Bill would cost, but the largest item would be the expenditure on continuation schools. In England and Wales, with a population of 36,000,000, the expenditure on secondary and higher education is 6,500,000*l.* For the same purposes Prussia, with a population of 40,000,000, spends 10,000,000*l.*, and in the United States, with a population of 91,000,000, the expenditure has risen from nearly 38,000,000*l.* in 1913 to 44,000,000*l.* in 1916. In view of these comparisons, Lord Lytton asked: Could we afford to neglect further provision for higher education? We spend 30,000,000*l.* on elementary education, and do not get the full benefit of the expenditure.

These comments by the Government spokesman for the Bill seem to be somewhat disingenuous, seeing that the Bill provides no guarantee of any sort of the much-needed development of higher education in the only real sense—that is, of persons *above* the age of eighteen. This is distinctly a blot on the Bill, the more noticeable because no undertaking has been given by Mr. Fisher that adequate provision will be made for the development of university education and the encouragement of scientific research. One result of the Bill is sure to be that rate-aid for education and the attention of local education authorities will be fully mortgaged for elementary and secondary education. It will, therefore, be incumbent upon the Government to provide a large part of the funds required for university education.

During the discussion of the Bill in the House of Lords, Lord Bryce expressed the view of an ancient corporation that the Board of Education should hold its hand before creating any more universities in this country: A more helpful suggestion would have been for the appointment of some impartial authority to examine the whole question of the provision of education of university type, and the facilities available to enable men and women to obtain a university education. On one hand, the war has shown that the country needs a much larger supply of highly trained men and women, and, on the other, it is common knowledge that thousands of qualified students are unable to afford a university education, the financial incidents of which will become much more difficult after the war. If the soldier in the trenches, who, by the qualities of courage and cheerful fortitude he has shown during the war, has satisfied the highest tests of education, is found to require further instruction, what would be the verdict in the case of our diplomats, Civil Servants, and Staff officers? It is to be hoped that Mr. Fisher, having achieved a great personal triumph in the passing into law of his Education Bill, will attack the problem of higher education with equal fervour and success.