

and trigonometry, and to whom proof is of secondary importance.

The exercises given will make both books specially valuable to teachers, for the working of numerous examples is indispensable in the teaching of mathematical subjects.

Elementary Statics. By the Rev. J. B. Lock, M.A. (London: Macmillan and Co., 1888.)

WE gladly welcome another addition to Mr. Lock's excellent series of text-books. To the new terms already introduced by him, another is now added. This is the term "resolute" as a substitution for "resolved part," the argument for the change being that "the idea is so important in the subject that a definite name will be found useful." Those who have already become familiar with the older expressions may not be willing to accept the changes, but there can be no doubt that the new expressions are appropriate, and will be of great service to beginners.

The treatment adopted is based upon Newton's laws of motion, the author's opinion being—and we quite agree with him—that this greatly simplifies the subject. The parallelogram of forces is assumed, the student being recommended to postpone the proof until he commences his study of dynamics. The working of examples, as every teacher knows, is the only way to obtain a thorough knowledge of any subject which requires mathematical treatment, and Mr. Lock has fully recognized the importance of this. Typical examples, excellently selected, are worked out at full length, and numerous others are given as exercises. There is also a selection of papers from some of the Oxford and Cambridge examinations. A new departure is the introduction of a short chapter on graphic statics, which we highly approve of. The teaching of this subject has made rapid strides during the last few years, and the methods are so simple, and applicable in cases which would involve laborious calculations, that the introduction of the subject into text-books is very desirable.

The whole subject is made interesting from beginning to end, and the proofs of the various propositions are very simple and clear. We have no doubt that the book will be appreciated by all who have an opportunity of judging of its merits.

Catalogue of the Fossil Reptilia and Amphibia in the British Museum (Natural History). Part I., containing the Orders Ornithosauria, Crocodilia, Dinosauria, Squamata, Rhynchocephalia, and Proterosauria. By Richard Lydekker, B.A., F.G.S., &c. (London: Printed by order of the Trustees, 1888.)

THIS work forms a very valuable addition to the series of British Museum Catalogues, and will be welcomed by all palæontologists as giving a full and complete account of the specimens of fossil reptiles in the National Collection, many of which have an especial interest as being the "type-specimens" on which so many classical monographs have been based.

Mr. Lydekker adopts, with some alterations, the classification proposed in 1885 by Cope, with the modifications recently suggested by Baur. The reasons for the changes he has introduced are fully discussed in the introduction.

Full descriptions of the orders, families, genera, and species, are given in most cases, and the book is illustrated by sixty-nine woodcuts, many of which are taken from the works of Marsh, Dollo, and others. The introduction of the names of many of the larger groups which are not represented in the British Museum collection renders the work more complete, and the addition of so much descriptive matter, and of copious references to the bibliography of the subject, also increases its value far beyond that of an ordinary Catalogue.

The History of Australian Exploration. By Ernest Favenc. (Sydney: Turner and Henderson, 1888.)

THE author of this volume does not profess to give a complete history of the exploration of Australia. Much of the work of exploration has been done by private travellers and adventurers; and it is of course impossible that their labours can ever be adequately recorded. For the fulfilment of such a task the co-operation of hundreds of old colonists would be necessary; and the work, when completed, would not only fill many volumes, but, as Mr. Favenc says, would prove most monotonous reading. He has therefore confined his attention to public expeditions, dividing his subject into two distinct parts—land exploration and maritime exploration. His narrative covers a period of one hundred years—from 1788 to 1888. The book is issued under the auspices of the Governments of the Australian Colonies, and it is in every way worthy of this distinction. Mr. Favenc has invariably gone to the best sources for information, and has produced a record which is not only trustworthy, but full of interest. The value of the book is considerably increased by several maps and facsimiles.

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.]

The Protest in The Nineteenth Century.

THE present age is eminently a sensational one. Everybody deals in superlatives and universals. Morning and evening the newspaper bills vie with each other in appealing to that particular form of curiosity which feeds upon alarms. Our civilization is declared to be altogether wrong. Dr. Pangloss's doctrine is reversed—nothing that is right. We are incessantly invited to take stock of our arrangements political and social, and treated to denunciations of almost every detail of them. We are too serious, too frivolous, a prey to panics, stolidly blind to dangers, distrustful, credulous. To crown all, what was fondly supposed to be one of the greatest of modern improvements is roundly declared to be a sham; to be worse—a lure to destruction, mental and physical. Loud were the pæans sung some forty years ago over the then new system of competitive examinations which so vexed the soul of the author of "Gryll Grange." Now we are assured that the whole examinational system is utterly stupid, and, in effect, that it were better at once ended than in any way mended.

But literary rhetoric, however brilliant, in these days produces but a momentary impression. We have so much of it that we have come to regard it with the contempt bred of over-familiarity. After the first shock of delight or astonishment has passed off, we begin to look for the facts and criticize the logic. Sweeping phrases, sounding invective, the vigorous style in general, cease to convince. There is too much of the scientific spirit abroad for the roar of the old lions or of the young lions to cause more than a passing alarm. Denunciation is always easy, though not, of course, of the forcible and brilliant kind with which Prof. Freeman and Prof. Harrison have made us familiar, perhaps a thought too familiar. I shall look forward with interest, and with the certainty of some instruction, to the statement which will, no doubt, be forthcoming of the facts the *Nineteenth Century's* protest is based upon, but as a competitive examinationist I look forward to it without anxiety.

Meanwhile, I venture to offer one or two remarks upon a single sentence in the protest. "Again and again," it is said (p. 620), "brilliant young men once full of early promise go down from the Universities as the great prize-winners, and do little or nothing in the after years." The reason, it is added, is that "they have lost their mental life before they are five-and-twenty"; in other words, that the examinational system, *quâ* examinational, has killed in them the love of knowledge by that age—a sad fact enough, if true.

But is it true? Brilliance of parts is not always, I am almost inclined to assert not commonly, accompanied by a disinterested love of knowledge, though often enough by ambition, which is a very different thing; nor, unfortunately, is a love of knowledge always associated with the capacity to gratify it. To many men, again, opportunities fail, or health, or energy of character, or perseverance, or the means enabling them to wait for success in the career chosen, or, lastly, circumstances may have compelled them to adopt an unsuitable career, and so their intellectual lives are wrecked. It is only in respect of the residue remaining after elimination of these cases that the reproaches addressed to the examination system are capable of being justified. What proportion that residue may bear to the totality of brilliant failures it may be difficult to determine. My impression is that it is a very small one. At any rate, it is so in the University to which I belong—the University of London. So large a proportion of the men who have taken high degrees at that University have in after life fully maintained, to say the least, the distinction of their University record, that the failure of the residue—if such failure there be—may be justly ascribed to causes of the nature above indicated rather than to any ill effect of the examination system. The assertion may easily be verified by reference to the Honours Lists, more especially in the Faculties of Science and Medicine. I mention these Faculties because it is much easier to trace the after life of graduates in them than in the other Faculties. But on looking over the list of M.A. medallists, I do not find a single name which suggests any lack of after-life response to earlier promise.

Finally, on turning to the University record of many, probably of most, of the eminent men of the day, the very reverse of the alleged disparity between promise and performance upon which the protest is based will be found to exist.

I am, for my part, fully convinced after several years' daily familiarity with the working of a purely examinational system, that in examinations we have the best means yet devised of testing the general ability and attainments of young men and women. And I have shown above that competition does not produce any of the evil results complained of in the protest. On the contrary, I believe it to be in most cases—but certainly not in all—a most useful discipline.

But I have no faith whatever either in piecemeal examinations, or in examinations in technical or special subjects, or in mere manipulative matters. I admit, too, that nothing like sufficient attention is paid to the progressive improvement of examinations in accordance with the advance and increasing volume of knowledge. In particular, the range of optional subjects at higher examinations should be greatly extended, that the test applied to each candidate may better correspond with his opportunities and with his mental structure. Above all, the tendency which unfortunately exists to increase beyond measure the difficulty of examinations requires to be carefully guarded against. Too highly pitched syllabuses necessarily involve a low standard of performance, with the result that the successful candidate and the public are equally deceived. F. VICTOR DICKINS.

Burlington Gardens, November 6.

Gresham College.

THE communication of Mr. R. D. Roberts states that the article of Prof. Ray Lankester "is based entirely upon a misapprehension as to the purpose and function of the London Society for the Extension of University Teaching and its position with regard to Gresham College."

I beg to be allowed to state that I can indorse Prof. Ray Lankester's statements with regard to the London Colleges. It is nine years since my connection with King's College ceased, but for nine years I was a lecturer in the Evening Class Department of the College. I know that the College staff, often at great personal sacrifice on the part of some of its members, threw such energy into the teaching of evening classes that their efforts can best be described as thoroughly educational in the highest sense. The number of lectures in the winter courses were twenty-five to thirty, in the summer ten. They were, as a rule, as complete and advanced as similar courses in the Universities, some of them more complete than such courses elsewhere.

At the time when the Society for the Extension of University Teaching was first established, it appeared to me to be a superfluous and mischievous institution. The leading idea which it communicated to the public by very extensive advertisements and reports of meetings was, that there was no such form of educa-

tion in London, and that the teachers subsidized by the Society were bringing enlightenment from the Universities of Oxford and Cambridge. For several years there were courses consisting of only three or four lectures, delivered in districts widely separated, as, for instance, in Mile End, Kensington, and Dulwich, while a long course consisted of only ten lectures. There was no curriculum in any one centre in either arts or science. The courses of lectures were not even grouped into Departments or Faculties, such as modern languages and literature, Latin and Greek, ancient history and archaeology, pure and applied mathematics, experimental science, or biological science. Desultory instruction, not education, appeared to be the object of the Society. The lecturers were, as a rule, qualified for the duties they undertook; some were eminent men, even of the highest eminence; but I do know that others from the Universities should certainly not have been intrusted with the duty of public lecturers until they had undergone an additional term of instruction and training of at least three to five years as assistants to Professors. The Society provided employment for a number of unemployed graduates from Oxford and Cambridge; and at the time, no doubt, it was considered politic and conciliatory to make an assumption of carrying culture to the masses. The young men were willing to take up such duties, for they gained opportunities for practice in the art of teaching which led to possibilities in the way of promotion. There is little doubt that the Society has improved latterly, and it may or may not deserve to be supported by public subscriptions; but it would be a monstrous injustice to King's and University Colleges to place the funds of Gresham College in the hands of this Society. The injustice would be the greater in the case of King's College, because, as I understand, University College has discontinued its Evening Class Department; but for at least twenty years before this London Society for the Extension of University Teaching was in existence or thought of, the staff of King's College, without endowment, were teaching by night as well as by day, and with inadequate remuneration doing more than fulfilling the intentions of Sir Thomas Gresham. The City clerks, engineers, and manufacturers left their places of business to attend these lectures, and obtained sound theoretical and practical instruction in art and science, ancient and modern literature and languages. I have in mind many who have risen to distinction; and there are, no doubt, thousands who are ready to acknowledge the benefit they derived from the evening classes of King's College.

I doubt whether these facts were placed before Mr. Goschen on the occasion when he made his speech on the subject of this Society and Gresham College. It seems to me that the matter should be put before him and all others concerned in a true and proper light, and without partiality.

In conclusion, I will state it as my carefully-considered and deliberate opinion that the Lecture Society called the London Society for the Extension of University Teaching has done no educational work which for extent or solidity is worth consideration in comparison with that of King's and University Colleges.

W. N. HARTLEY.

Royal College of Science, Dublin, November 9.

Divergent Evolution.

SOME of your readers may possibly remember a paper of mine on "The Variation of Species as related to their Geographical Distribution," which appeared in *NATURE*, vol. vi. p. 222. About the same time I prepared a paper on "Diversity of Evolution under One Set of External Conditions," which was published in the *Linnean Society's Journal—Zoology*, vol. xi. pp. 496-505. I refer to these papers simply to say that the problems there discussed have occupied my attention more or less ever since.

Part of my paper relates to the subject discussed by Mr. Romanes in his paper on "Physiological Selection"; but as it has been independently worked out, I believe it will be of interest to all who have followed the discussion on the "Origin of Species." The abstract of Mr. Romanes's paper given in *NATURE*, vol. xxxiv. pp. 314, 336, 362, did not come into my hands till the following January, when my theory of "Divergent Evolution through Cumulative Segregation" was, for the most part, written out in its present form. Since then, and with reference to the discussion on "Physiological Selection," I have worked out the algebraic formulæ given in the fifth chapter, and have introduced explanations of the same.