the pressure of a gas or the electric resistance of a wire "comes out" negative! To such men the recent introduction of the subjects of heat and electricity by the Board of Mathematical Studies, and the appearance of Thomson's *Electrical Papers*, Maxwell's splendid treatises, and other kindred books, have been happiness indeed. Open any one of these books, at any place, and concoct from it by whatever assumptions (however unphysical) are necessary, a problem which shall lead to an elliptic integral or a Bessel's function, and there you are! This cannot long go on without seriously impairing the progress of physical science in our great mathematical university. Mathematics is, in itself, a right noble and worthy study; but the embryo physicist should, from the first, be taught to regard it as (for him) an indispensable auxiliary only, not a source of natural (?) laws. The whole procedure is thoroughly characteristic of the Cambridge of to-day. It has, among its professors and elsewhere, many of the foremost of living physicists and mathematicians, as well as others destined in time to take similar rank:—but does not utilise them. Even its *one* real test of mathematical merit, real because conducted by such men, the Smith's Prize Examination, has just been abolished! So, it has a magnificent boat at the "head of the river," but *not one member* of that crew is sent to encounter Oxford at Putney! What can be expected, either in the boat-race or in the more arduous toiling over the scientific course, but thorough and most deserved defeat?

Differential Calculus for Beginners, with a Selection of Easy Examples. By Alex. Knox, B.A. (London: Macmillan and Co., 1884.)

THIS little book deserves hearty welcome from those who are engaged in leading forward students to the higher mathematics; not so much as a substitute for any other work at present in use, but as presenting a carefully-selected set of illustrations of infinitesimals, limits, and differential coefficients, which a student may profitably work through before entering upon the usual formal treatises on the calculus.

We know of no work in English comparable with the present since De Morgan's "Elementary Illustrations of the Differential and Integral Calculus."

The special symbols of the subject are not introduced into the work before us, attention being directed to the new principles involved in the method of the calculus; indeed, the chief aim of the author throughout is to give the learner a firm grasp of the idea of a differential coefficient—a fundamental notion which, in the minds of beginners, is usually shrouded in a haze. Care is taken to deal one at a time with the difficulties which present themselves in this subject. The book is divided into twenty sections, the latter two or three dealing with successive differentiation, Maclaurin's theorem, and maxima and minima.

But before new principles or processes are introduced, an endeavour is made to insure a precise comprehension of the meaning of terms already employed by the student. And the freshness of treatment, as well as the clearness with which the author brings before the mind the exact meaning of such terms as "point," "line," "superficies," in the first section of this book, will awaken the interest and arrest the attention of even an indifferent learner.

Many of the sections are independent of each other. There is much variety of illustration, the central principle being looked at from different points of view. A distinguishing feature is the great use made of arithmetical calculations, many examples of the method of finite differences occurring.

Besides the usual geometrical treatment based on Newton's "Lemmas," the ideas of time and motion are freely introduced, and illustrations taken from elementary kinematics.

The book closes with a set of examples worked out in full, and a series of one hundred easy exercises, the answers to which are appended.   A. R. W.

LETTERS TO THE EDITOR

Rock-Pictures in New Guinea

A FEW years ago I mentioned in a paper in *Globus* (lxiii. 94) that Mr. Th. B. Leon had reported the existence of pictures on rocks he had seen in the Ogar and Arguni groups of islands (south part of McCluer inlet), and that the officer in command of H.N.M.S. *Batavia*, who had been charged to make further inquiries, had not been able to find them. At that time Mr. Leon's account had not been published in the regular issue of the *Batav. Genootschap.* Since then, however, explorations by Mr. van Braam Morris, whilst on his voyage in New Guinea in 1883, and by some of the officers of H.N.M.S. *Samarang*, have resulted in the discovery of rock-pictures similar to those spoken of by Mr. Leon. The papers giving an account of these explorations (including Mr. Leon's) have been published in a recent number of the *Tijdschrift voor Indische Land-, Taal-, en Volkenkunde* (xxix. pp. 582-591), and an abstract of their contents may be interesting.

One day Mr. Leon set out from the kampong (village) of Arguni, situated on the island of that name, for the purpose of fishing. In the beginning, on account of the surf, he kept at a great distance, but the third island of the group he was able to approach. He perceived the distinct representation of a human hand, painted in white, and surrounded with red spots, and other drawings in white, which appeared to be meant for letters, though traced in characters unknown to him. Afterwards, on penetrating between two other islands of the group, he saw several hands, all similar to the first, and accompanied by similar drawings. He was not able to land; he estimated the height of the place at which they were drawn on the rock to be from 75 to 150 feet above sea-level, the hands being about three-quarters of the way up, and the other figures about 10 feet higher still. The hands were of all sizes, representing those of children, of full-grown men, of giants, and were in great numbers. He fancied the characters bore some resemblance to the written signs in use amongst the *Orang Kling*, the *Orang Bugis*, and the *Orang Mangkasser*; they were certainly not *Javan* or *Malayan*. He was greatly puzzled as to how they could have come there, since the face of the rock was perfectly perpendicular, and without any projections or caverns, so far as he could perceive. The only explanation he can suggest is that they must have been done at a time when that part of the rock-surface was nearer to the level of the sea, or the outward form of the rock must have been changed on that side by losing ledges or projections by which the native draughtsmen may have approached the place. It will be readily understood that the natives attribute these drawings to *Kasuak*, the prince of evil spirits, who, in their opinion, has his dwelling in one of the small islands, and of whom they are naturally greatly afraid. On another island Mr. Leon discovered a huge stone, which would probably require half a dozen men to lift it, rudely shaped like a bullock, and surrounded with several other stones, evidently arranged on some fixed plan.

Mr. van Braam Morris says:—On September 16, 1883, I came to McCluer inlet, and was told by the native chiefs that the figures I was in search of were to be found on Arguni, or the islands to the west of it. I discovered them on a small island a few hundred yards from the mainland. The shores of both the island and the mainland rose perpendicularly from the water, and in the rocky face of the former, about 5 feet above high-water mark, the surf had eaten out an excavation from 3 to 5 feet wide, thus leaving a narrow platform, on which several small *prahus* were deposited, some of them being 3 feet long. Various figures were drawn on the rock above, especially hands, both of full-grown people and of children. A hand had evidently been sketched in outline from