pearl was attached without the least trace of a stalk, being merely embedded in the endosperm, and was quite easy to remove from the kernel. It lay exactly at the base of the nut, just under the spot where the germinating pores ought to have been, and thus agreed completely with the indications as given above.

This discovery, in my opinion, warrants the inference that the cocos-pearl actually represents a calcified haustorium, which has been retained in the nut after the primary germination was checked, owing to the plumule not being able to get through the shell on account of the absence of the porus pervius. As the inner shell of the *kĕlapa boeta* remains hermetically closed, the newly formed haustorium becomes encrusted under the influence of the coco-nut milk with calcium salts, although it still remains unexplained why the cocos-pearl consists almost entirely of calcium carbonate, while neither the cocos-kernel nor the coco-nut milk contains this carbonate.

The belief that a *kĕlapa boeta* invariably contains a cocos-pearl was sufficiently disproved by my experience, that of seven specimens, only *one* such formation was found in a "blind" coco-nut. On the other hand, it is probable, in my opinion, that it will be principally (or exclusively ?) the *kĕlapa boeta* that contains the cocos-pearl.

Annual Meeting of the Mathematical Association.

THE annual meeting of the Mathematical Association was held at the London Day Training College on January 5 and 6. The report of the Council showed that the number of members has increased to 1019, in addition to about 500 associates connected with local branches.

The presidential address was delivered by Prof. G. H. Hardy, the subject being "What is Geometry ?" Prof. Hardy suggested that the time has come to consider what the subject taught in schools under the name of geometry really comprises. It appears to be a mixture ; partly an investigation of actual space-relations, based on intuition, partly a system of pure geometry, based on axioms. But neither of these subjects is self-contained. Even the so-called projective geometry is not true projective geometry but is based on ideas of geometrical magnitude. While recognising that the early teaching of geometry must be a compromise, and that the Association has done very good work in improving it, he thought that an effort might now be made to introduce into schools a more logical study of modern systems of pure geometry.

Prof. H. Levy gave an address on "The Mathematical Laboratory ; its Scope and Function." He said that mathematics is not merely the handmaid of science. Mathematical methods based on logical proof are not sufficient for modern needs : the methods must be developed so as to meet the requirements of technology—of aeronautics, of biology, of industry. He gave an account of the work done at the mathematical laboratory of the Imperial College of Science and Technology, S. Kensington. The work, fundamentally, is experimental. Any instruments available may be used, and the traditional restriction to rule and compasses is abolished. Absolute accuracy is not regarded as essential, and graphical methods, giving results within about 0·5 per cent., are found to be sufficient. The problems to be solved are engineers' problems, not the mathematician's conception of engineers' problems. Differential equations are solved by approximation, by differentiation, etc. ; and their mathematical treatment in the lecture-room is followed by graphical treatment in the laboratory. The calculation of infinite series, and their differentiation, gives ideas of convergence and divergence of series, and a good deal that is of value can be derived from cases in which series obtained by graphical methods give incorrect numerical results in consequence of the series being divergent. Importance is attached to the study of cases in which different problems lead to the same mathematical equation. In the discussion on the paper, it was suggested that in a school the cost of equipment of a mathematical laboratory might be prohibitive ; but Prof. Levy pointed out that, as great accuracy is not essential, second-hand instruments are usually quite good enough.

A discussion on the teaching of arithmetic in schools was opened by Prof. J. E. A. Steggall, who suggested that more attention might be given to the study of the properties of numbers, and that, in the earlier stages, children might concentrate on the study of some particular table, such as the table of measures of length. The discussion raised some interesting points as to method, and questions as to the psychology of the pupil. Prof. Steggall, in replying, expressed his disapproval of the teaching of anything that could not be understood.

There was some discussion of the recent report (of the Association) on "The Teaching of Geometry in Schools." Prof. M. J. M. Hill dealt with various methods of arriving at the properties of parallel lines.

Mr. A. Buxton communicated a note on the treatment of a certain problem in optics by means of Bessel functions.

Dr. H. B. Heywood contributed a thoughtful paper on the reform of university mathematics. In foreign universities, courses are given in subjects of which students in Great Britain have practically no knowledge. The whole of our mathematical teaching in universities, even more than in schools, is dominated by examination requirements ; and no reform is possible until the examination system is modified. Some suggestions that Dr. Heywood made were that it is not necessary to examine over the whole field, but that an intensive study of some part should be allowed ; that theses, followed by oral examination, should be encouraged ; that more importance should be attached to reports by teachers ; and that over the whole range the study should be less academic. There is no border-line between mathematics and physics, and there is no need for physics to be made fictitious when it becomes a subject for mathematical treatment. The extent of ground common to mathematics and physics should be investigated. The decision as to the content of a mathematical course must be made on the basis of vitality ; and this requires a purposeful study of the whole domain of mathematics, to see what portions are alive and growing. Such a study would show what reforms are needed. In the discussion, Prof. E. W. Hobson agreed that reform must work downwards from the universities, but he was inclined to dissent, at any rate as regards Cambridge, from the view that the universities are more dominated than the schools by examination requirements. Prof. Hardy stated that he considered reform to be impossible without destruction, and said he would like to begin by destroying the mathematical tripos.

During the luncheon interval, on the second day, there was a very interesting exhibition of pieces of apparatus, designed by Mr. E. J. Atkinson, by Mr. C. V. Durell, and by Mr. D. F. Ferguson, for use in connexion with the teaching of mechanics.