Can we, however, carry the argument one stage further? Why should the seed of the sycamore be globular, and that of the beech triangular? Is it clear that the cotyledons are constituted so as to suit the seed? May it not be that it is the seed which is adapted to the cotyledons? In answer to this we must examine the fruit, and we shall find that in both cases the cavity of the fruit is approximately spherical. That of the sycamore, however, is comparatively small, say $\frac{1}{8}$ inch in diameter, and contains one seed, which exactly conforms to the cavity in which it lies. In the beech, on the contrary, the fruit is at least twice the size, and contains from two to four fruits, which consequently, in order to occupy the space, are compelled (to give a familiar illustration, like the segments of an orange) to take a more or less triangular form.

Thus, then, in these cases, starting with the form of the fruit, we see that it governs that of the seed, and that of the seed, again, determines that of the cotyledons. But though the cotyledons often follow the form of the seed, this is not invariably the case: other factors must also be taken into consideration; but when this is done, we can, I venture to think, throw much light on the varied forms which seedlings assume.

I have thus attempted to indicate some of the principles on which, as it seems to me, the shapes of leaves and seedlings depend, and to apply them in certain cases, but the study is only in its infancy: the number and variety of leaves is almost infinite, and the whole question offers, I venture to think, a very interesting field for observation and research—one, indeed, of the most fascinating in the whole of natural history.

EUA ISLAND, TONGA GROUP.

THE following description of Eua Island (one of the higher members of the Friendly or Tonga Islands, and familiar to readers of "Cook's Voyages" as Middleburgh), written by Commander Oldham, of H.M. surveying-ship *Egeria*, will be of interest to geologists and those interested in the coral controversy.

W. J. L. WHARTON.

"When viewed from the westward, Eua is seen to consist of grassy table-lands and slopes, having clumps of dark-green trees dotted here and there, giving it a park-like appearance. It is formed of two coral terraces resting

ing on a volcanic nucleus. The upper terrace, about 600 feet above the level of the sea, rises to a summit 1030 feet high; the lower terrace attains a height of only 350 feet. On the western side of the island these terraces are separated a distance of from one to one and a half miles, and in some places there is a depression between them; the eastern side is very precipitous, the terraces there being very narrow, and forming cliffs at their seaward edges.

"The upper terrace seems composed of foraminiferous limestone and reef rock, with volcanic rock (a hydrated oxide of manganese) cropping out on the western side at the edge of the terrace where the coral rock has been removed by the effects of weather. The limestone is compact, reddish-brown, and largely foraminiferous. It is both *in situ* and scattered in detached blocks over the upper terrace, and when weathered has a honeycombed appearance.

"Low coral cliffs, which in many places form the shoreline, give indications of recent elevation, being marked by two distinct lines of erosion. On the beach, on the eastern side of the island, I observed that the sea had washed up recently high above the ordinary high-water mark; trunks of cocoa-nuts were lying about rotting, and the lower part of the stems of those still standing near the shore had been washed by salt water. This was afterwards explained by the fact that a very high tide occurred on March 18 (about the time of the hurricane at Samoa), which rose 2 feet above high-water mark, and remained so for fifteen minutes. A narrow fringing reef generally borders the island. On the eastern side of the island, below the summit, at an elevation of 300 feet, volcanic stones were observed lying in the bed of a stream, and on the beach, a little further south, are dykes of volcanic rock; one of diorite shows through the beach, another, which is close-to, is about 100 feet high, and can be traced a short distance inland. The inner part has *coral-reef rock, conformable, superimposed*. The beach for a considerable distance either side is strewn with blocks of conglomerate formed of coral and volcanic rocks cemented together.

"The higher part of the lower terrace on the western side of the island was found to be composed of coral-reef rock.

"The present volcanic nucleus must have been originally below the surface, but sufficiently near to allow coral to grow, and reef-making Foraminifera to be deposited on its summit. It was then evidently elevated about 300 feet (marked *aa'*, *bb'* in section) in a comparatively short interval, after which a long period of rest, or subsidence, followed, during which coral grew (forming the portion *bb'* to *cc'*), and a lagoon (*d*) was produced. Then another period of elevation raised the island to its present height, and exposed the volcanic foundation.

"C. F. OLDHAM."

I am indebted to Captain Wharton for sending me the specimens collected by Commander Oldham. The limestones, some of which are fairly crystalline in character, are composed of Foraminifera and water-worn fragments of calcareous Algæ ("Nullipores"). The deposit of hydrated manganese oxide cropping out from below the limestone is remarkable, but it has all the appearance of an ordinary terrestrial deposit. A much-weathered mass from the neighbourhood contains many beautiful crystals of magnetite. Although the rocks forming the nucleus of the island are of igneous origin, they are not modern volcanic materials. They consist of much altered glassy andesites (porphyrites) with epidiorites; and are suggestive of ancient volcanic masses that have been exposed at the surface by denudation. The significance of such facts as these has been pointed out by Prof. Bonney and Dr. Blanford; and it is quite incorrect to quote examples like this as lending support to the view that all oceanic islands are of volcanic origin. JOHN W. JUDD.

NOTES.

In the list of Birthday honours the merits of many different classes of public servants are duly recognized. The services of men of science in the Science and Art Department, however, following an unbroken rule, fail to receive any acknowledgment.

AMONG those who have received the honour of C.B., we are glad to see the name of Prof. W. C. Roberts-Austen, F.R.S., Assayer to the Royal Mint.

THE date of the second *soirée* of the Royal Society, to which ladies are invited, is fixed for June 18.

THE Jubilee of the Uniform Penny Post was well and worthily celebrated at the Guildhall on Friday last, the 16th inst., by the

Corporation of the City of London. The grand old hall was never applied to a better purpose. Every process connected with Post Office work, from telegraphy to sorting, was shown in actual operation. The Exhibition remained open for three days, and 25,000 people were delighted.

ON May 15 an influential deputation from the Marine Biological Association of the United Kingdom waited upon the Chancellor of the Exchequer to ask for an additional grant from the Treasury in aid of investigations in connection with food-fishes, crustacea, and mollusks, carried on by the Association. Mr. Joseph Chamberlain, M.P., introduced the deputation. Both he and Sir E. Birkbeck, M.P., called Mr. Goschen's attention to the large amount spent by the United States in the encouragement of the fishing industry; and Sir E. Birkbeck pointed out that even Scotland, with her grants to the Scotch Fishery Board, is in this respect ahead of England. After some remarks from other members of the deputation, the Chancellor of the Exchequer, in reply, said that the questions which had been put by him in the course of the speeches were not made from a critical or carping point of view, but merely to convince himself as to what were really the aims of the Association, which he regarded as excellent; but he could not say anything as to the practicability of their being carried out. He pointed out that the Treasury would very carefully consider the whole question of how to recast the Fisheries Department, but he felt that it would be an inconvenient thing to have four bodies, two in England and one each in Scotland and Ireland, whose jurisdiction might overlap. He hoped to be able in a short time to have an opportunity of consulting some of the scientific and other gentlemen present, in order to have further light thrown upon the subject before the Government took any action in the matter.

AT the Royal Institution, on Tuesday afternoon, May 27, Mr. Andrew Lang will begin a course of three lectures on "The Natural History of Society." The remaining lectures will be given on June 3 and 10.

MR. G. BERTIN is about to deliver, at the British Museum, a series of four lectures on the manners and customs of the Babylonians, from the cuneiform documents in the Museum. The lectures will be given on the following Tuesdays—June 3, 10, 17, and 24, at 3.30 p.m.

ON Monday evening Mr. T. W. Russell asked in the House of Commons whether the Committee consisting of certain members of the Royal Society appointed to inquire into the question of lighthouse illuminants had yet reported. Sir M. Hicks-Beach replied that there had been some unavoidable delay in the matter in consequence of a change made in the composition of the Committee. But he had communicated with the President of the Royal Society, and understood that the Report of the Committee might be expected in the course of the summer.

MR. F. H. SNOW, of Lawrence, Kansas, calls attention in *Science* to a remarkable fall of meteorites of unknown date in Kiowa County, Kansas. "Many of the citizens of Greensburgh, the county seat, were," he says, "aware of the existence of these strange irons, and commonly called them meteoric; but there seems to have been no suspicion of their true character and value. Indeed, until March 17, 1890, a specimen weighing 101.5 pounds, had ornamented the side-walk in front of a real estate office in the above-named town for about three years. The farmers in the vicinity of the locality where the fall had occurred had put some of the specimens to various uses." Prof. W. Cragin, of Washburn College, was the first scientific man who visited the farm upon which the meteorites had fallen. This was on March 13. He secured from one of the farmers five meteorites, aggregating in weight over a thousand pounds, the