

which include a larger number of figures, mostly life-size. The author's purpose has been to give especial attention to the young fern from the time its first leaves appear up to the mature plant. These stages are illustrated by numerous figures, and these are supplemented by popular descriptions. The book will be very helpful to the class of people for whom it is primarily designed, while at the same time it will be useful to the scientific botanist who will find here much exact information about young ferns that he can not find elsewhere.

Somewhat like the last is Laing and Blackwell's 'Plants of New Zealand' (Whitcombe), which is designed 'to give an account of our native plants that will be intelligible to all.' It makes no attempt to notice or describe all of the species, dealing only with the more conspicuous flowering plants, and omitting the grasses and sedges, in addition to 'certain less important orders.' The introduction of nearly sixty pages includes a general discussion of the vegetation, in which the author has packed a great deal of most interesting information, although such words as 'formation,' 'zonation,' 'succession,' 'alternation,' 'facies,' etc., are conspicuously absent. Nor do we find that much-abused and long-suffering word 'ecology,' although the book is full of what it is now the fashion to call by that name. In short, this is an entertaining and instructive account of the plants of New Zealand told by men who have sufficient mastery of the English language to be able to write with clearness and accuracy. The book reminds us of 'Minnesota Plant Life,' written by Professor MacMillan, also a master of English, though by no means wanting in ability to write most technically on occasion. There is the same careful selection of material, the clear treatment and wealth of beautiful and apt illustrations. May we not here express the hope that Messrs. Laing and Blackwell may long continue to study and write about the plants of their country, and that New Zealand botany may not have to suffer such a loss as that involved in the retirement of Professor MacMillan from active

botanical work in this country. Science can not spare such men.

A STUDY OF THE COCONUT TREE.

IN an interesting paper published in the *Philippine Journal of Science*, Dr. E. B. Copeland gives the preliminary results of some studies of the coconut tree which he has made, especially with reference to its water relations. Incidentally a good many interesting facts are brought out in the course of the discussion. Thus even on large trees the roots are only about a centimeter in diameter, and they spring in great numbers (on large trees as many as 8,000) from the convex or obconical base of the trunk, which itself may reach a depth of 50 centimeters. These slender roots may be 5 to 7 meters long, and are simple, or branched at right angles to the root axis. They are very strong and elastic, and attach themselves to the soil with such firmness that the tree is never uprooted. The stem may reach 80 centimeters in diameter, and is so elastic as rarely to be broken even in the fiercest storms, although the favorite habitat of the tree is the seashore where it receives the unbroken force of the tropical winds.

Careful studies of the leaf were made, especially with reference to its loss of water (transpiration). These show that older leaves (one year old) lose more water than young leaves which have just reached their full size. This result agrees with observations made by Bergen on the leaves of the myrtle (*Myrtus*) in Italy. Some rough estimates were made as to the total amount of water transpired by the tree annually, which show that for an average tree it is more than 10,000 liters. This is a remarkably large amount when we consider the rather limited leaf area exposed by the tree.

CHARLES E. BESSEY.

THE UNIVERSITY OF NEBRASKA.

DISPUTED VESUVIAN ERUPTIONS.

NINE eruptions of Vesuvius are commonly admitted to have occurred during the first twelve centuries of our era, the volcano afterwards remaining quiescent until the paroxysmal outburst of 1631. Two minor disturb-

ances, however, are reported during the interval of repose, one in 1306, the other about 1500, but the authorities for both are usually discredited.

The reason for regarding the alleged fourteenth-century eruption as apocryphal is that the sole author reporting it, F. Leandro Alberti,¹ after mentioning the date adds that it happened 'when Benedict IX. was pope, and Conrad II. emperor.' As this parenthetical remark fixes the period between 1033 and 1039, critics are no doubt right in assuming that the passage applies to the eruption of 1037. Besides, supposing the event actually to have occurred in 1306, it would be strange if Petrarch and Boccaccio failed to allude to it in their geographical works of the same century, when speaking of Somma and Vesuvius. References to these authors will be found in Enrico Cocchia's interesting essay on the ancient form of Vesuvius, reprinted in volume III. of his 'Saggi Filologici' (Naples, 1902).

Our only authority for an early sixteenth-century eruption is Ambrogio di Leone, a learned physician, professor of medicine at the University of Naples, afterwards a resident of Venice, close friend of Erasmus, and highly esteemed scholar and author. Of him says one of his biographers: "Visse sempre onorato dagli eruditi e da' Signori, e singolarmente da Leone X." No reason has been assigned for doubting his statement that ashes were ejected for a period of three days, covering the country about Nola, except that contemporary Neapolitan writers make no mention of the occurrence. Their silence is the less surprising, however, considering the relative unimportance of the event, and the fact that the fall of ashes was in the opposite direction from Naples. It is possible, also, that the discharge took place from the northern side of the mountain, away from the city and invisible from it, instead of from within the crater itself, which was observed in the following century to be heavily wooded.

Leone, in his 'History of Nola' (Venice, 1514), was not only the first author to discuss the etymology of the name Vesuvius, giving

¹ 'Descr. Ital.,' Venice, 1561, 2d ed., 1577.

abundant classic references, but also the first to portray the mountain since Pompeian times. The view given is far from crude, being from the hand of the famous engraver Girolamo Mocetto, and it is noteworthy that the two summits are shown of about equal height. Later in the century we find two authors, Agricola and Francis Scot, reporting that the Somma cone overtopped Vesuvius, but their statements are at variance with the known condition of the summits prior to the great eruption of 1631. Probably the best estimate of their respective altitudes before and after this event is that given by Schmidt, in his 'Studien über Vulkane und Erdbeben,' pp. 215-218 (Leipzig, 1881).

Accepting Leone's testimony as trustworthy, though lacking in details, there are one or two circumstances connected with the eruption which deserve mention. In the first place, it is interesting to learn from contemporary documents which have been published for the first time within recent years that the disturbance was preceded by a severe earthquake, in which two hundred and sixty inhabitants of Nola lost their lives and much property was destroyed. Following is an account of the disaster, taken from the late Bartolommeo Capasso's publication of the original:²

A li 6 di xbre 1499 se sentio no forte terremoto a le 6 hore de la notte, dove cadero multe case et ce morse assai gente, cioè circa 24 gentil' uomini, et 236 populani; dove che fo veramento gran pietà lo vedere tante povere persune cossi crudelmente ammazate et sepelite sotto le fabriche, huomini, femine et certe figliole, che stavano appise a lo pietto de le meschine matri, che fo no pianto unevsiale ad mirare quello miserabile spettacolo. * * *

Furthermore, we learn from various independent sources that Vesuvius was not wholly inactive during the greater part of the sixteenth century. Gonsalo Fernandez de Oviedo y Valdes, who ascended the mountain in 1501,

² *Archiv. Storico Prov. Napoletane*, Ann. VII. (1884), p. 107. Also in his 'Fonti della Storia delle Provincie Napolitane,' p. 239 (Naples, 1902). This earthquake is unrecorded in scientific literature, not even in Baratta's exhaustive catalogue, 'I Terremoti d'Italia' (Turin, 1901).

observed smoke issuing from the crater, and was told that flames were sometimes visible at night. Fumeroles were seen within the crater by Stefano Pighio in 1582, by Braccini in 1612, by the physicians Magliocco and Nicola de Rubéo, and by Padre Salimbeni, all in 1619. It will also be recalled that the year 1538 is memorable for the Monte Nuovo upheaval, one of the recorded features of which was a violent radial blast, comparable in a small way, no doubt, to the frightfully destructive agency which played such a tragic part in the West Indian catastrophes, still fresh in memory. Such being the condition of things in the sixteenth century, we have every reason to regard Leone as a credible eye-witness of the eruption which he claims to have observed from Nola in 'nostra vero tempestate.'

Finally it should be said that we owe to the well-known editor of the 'Monumenta Neapolitani Ducatus' a valuable list of references to mediæval chronicles in which several early eruptions are mentioned. Capasso's revision of the dates makes some changes necessary in the accepted catalogues. Thus, reckoning the eruption of 685 as the fifth on record in history, the succeeding ones should be referred in order to the following years: 968 or 969, 999, 1007, 1037, 1139, *circa* 1500, 1631. There are no contemporary authorities for the eruptions sometimes quoted for the years 1024 (Capaccio), 1049 (Lyell, Phillips), and 1184 (Mallet).

C. R. EASTMAN.

SCIENTIFIC NOTES AND NEWS.

THE University of Greifswald has, on the occasion of the celebration of its four hundred and fiftieth anniversary, conferred the honorary degree of doctor of philosophy on Professor William M. Davis, of Harvard University.

At the meeting of the British Medical Association, held last week at Toronto, the degree of doctor of laws was conferred by the University of Toronto as follows: Professor Thomas Clifford Allbutt; A. H. Freeland Barbour; Sir Thomas Barlow; Sir James Barr; Sir William H. Broadbent; H. W.

Langley Browne, M.D., chairman of the council of the British Medical Association; George Cooper Franklin, retiring president of the association; Professor William Dobinson Halliburton; Sir Victor Horsley; Dr. Donald McAlister, president of the British Medical Council; William Julius Mickle; M. Louis Lapicque; Professor L. Aschoff, and Dr. W. J. Mayo, M.D., president of the American Medical Association.

DR. H. DAVY, of Exeter, will be president of the next meeting of the British Medical Association to be held in that city.

DR. W. N. SHAW, director of the British Meteorological Office, has been elected an honorary member of the Austrian Society for Meteorology.

THE Technological Institute of Munich has conferred the degree of doctor of technical sciences on Dr. W. H. Perkin, in connection with the recent jubilee of the coal tar color industry.

MR. W. EAGLE CLARKE has been appointed keeper of the natural history collections of the Museum of Science and Art, Edinburgh, in succession to Dr. R. H. Traquair, F.R.S.

PROFESSOR F. CAVARA, of Catania, has been appointed director of the Naples Botanical Garden.

DR. F. W. T. HUNGER, of Utrecht, has been appointed director of the experimental station at Salapig, Java.

PROFESSOR POZZI has been presented with a gold medallion portrait by the sculptor Chaplain and a memorial volume of researches by his former students on the occasion of the twentieth anniversary of his work at the Broca Hospital.

THE Moxon medal of the Royal College of Physicians of London has been awarded to Dr. Jonathan Hutchinson, F.R.S.

WE learn from *Nature* that at the concluding meeting of the International Conference on Hybridization and Plant Breeding the Veitch gold memorial medals were presented to Mr. W. Bateson, F.R.S., the president of the conference, Professor Johannsen, Professor Wittmack and Professor Maurice