Descartes with regard to the law of this refraction, he was probably anticipated, and by a much longer interval. His Planisphere and other smaller works scarcely call for notice. On the whole, it may be said that Ptolemy was rather a collector and condenser of the scientific facts and methods than an original discoverer or investigator. And with all proper Baconian admiration for the wisdom of the ancients, we may be thankful that in our time, at least in the domain of natural science, the wisdom of the moderns has been added to it.

W. T. LYNN.

A VIEW OF KILAUEA.

THE interest of Kilauea is perennial. Popocatapetls may arise in a night, or Krakatoas may be blown to shivers, and attention may thus be temporarily withdrawn from the great Hawaiian volcano. But such cataclysms are exceptional. Kilauea, on the other hand, is always available to the student of vulcanicity, while Dutton's beautifully illustrated memoir, and Dana's great monograph enable observers to use their opportunities to the fullest advantage. Dr. Benedict Friedlaender's papers in *Himmel und Erde* (Bd. viii. 1895) are the latest addition to the extensive literature upon this subject, and give a series of photographs, which are a useful supplement to those of the two American authors. Dr. Friedlaender's narrative shows that the mountain can now be studied without inconvenience. A good track runs from Kilo, on the north-eastern coast of Hawaii, to the summit of Kilauea. It passes first through plantations of sugar-cane and banana, and past clumps of screw-pine (*Pandanus*). At the height of about 1000 metres the tropical vegetation is left behind; trailing Freycinetias and great Cibotias give place to tree ferns and an undergrowth of plants of temperate affinities, such as cranberries (*Vaccinium*). On the north-eastern edge of the crater, at the height of 1230 metres, is a good hotel, in telephonic communication with the coast. Dr. Friedlaender's description of the mountain takes us over a good deal of old ground; but his account records recent changes, and his notes and views bring out several characteristic features of the volcano. In the first place he emphasises the fact that though Mauna Loa rises to the height of the Jungfrau, neither it nor Kilauea have any claim to be called mountains. Whereas some of the Italian volcanoes have slopes of 30°, that of Mauna Loa is only 6°, and that from the summit of Kilauea to the north-east cape of the island is only 1° 35′. The summits of the volcanoes are not mountain summits, but only a high plain. Orographically, Kilauea is only a lateral crater on Mauna Loa; but geologically they must be regarded as two distinct volcanoes, as eruptions sometimes take place on Mauna Loa, while the lava lake in the other is at rest. As Mauna Loa is 3000 metres higher than Kilauea, and the weight of a column of basaltic lava of that length is 900 atmospheres, this independence of the two volcanic centres appears at first sight to be in contradiction to the fundamental principles of hydrostatics. The author explains this by the assumption, that the lavas in the central pipe of Mauna Loa are of lower specific gravity than those of Kilauea, owing to the greater abundance of

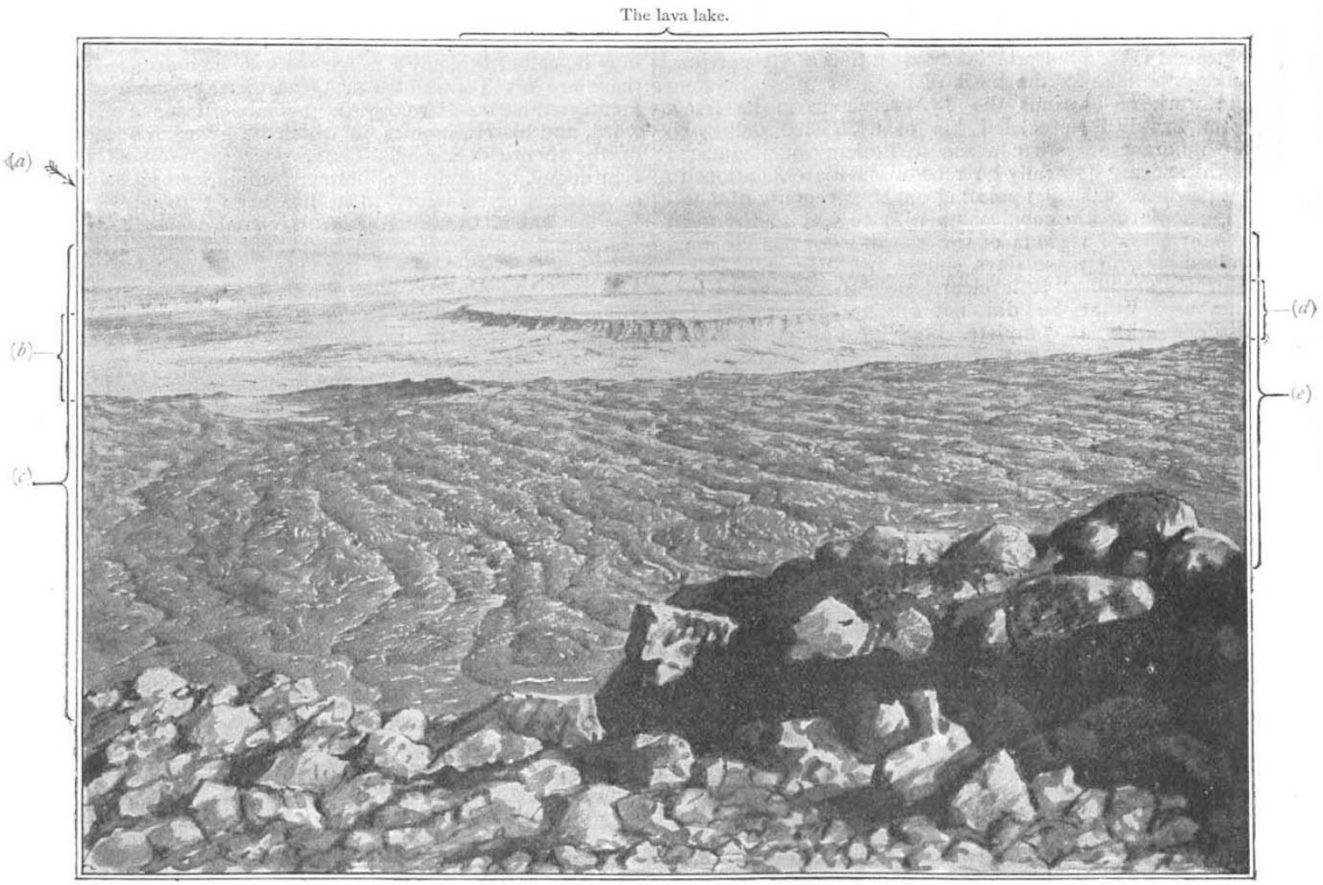

FIG. 1.—(*a*) Hut. (*b*) Margins of the secondary crater. (*c*) Margins of the primary crater. (*d*) Secondary crater. (*e*) Primary crater.

gas in them. The insignificant action of steam in Kilauea is declared by the author to be the most remarkable fact about it; for he says that it works "practically without steam, but with colossal quantities of highly fluid lava." Hence explosive action is very exceptional, though such an eruption did once occur in that year of violent upheavals 1789. It is owing to Kilauea having been built by the slow, quiet, piling up of lavas without explosions, that its crater is so very different from that of the Italian volcanoes. Instead of a narrow, deep, gullet, it is a broad, open, cauldron-shaped depression. The accompanying view illustrates the nature of the crater; it is from a photograph taken from the north-western corner, and looks due southward. In the foreground are some blocks of lava, on the margin of the plateau in which the crater lies; beyond this is the flat floor of the primary or major crater, at the foot of a vertical lava wall, 140 metres in height. The greatest diameter of the major crater is 4·7 kilometres; but the width to the opposite wall, seen in the figure as a long, low line in the far distance, is at this point only a little over 3 kilometres. In the centre of the view is seen the famous lava lake, 250 metres in diameter; this occurs in a raised tertiary crater in the centre of the depressed secondary crater. This latter extends across the view from side to side, but it is small in comparison with the primary crater; its average diameter is only 700 metres, so that its area is only about half a square kilometre, whereas the major crater occupies 10·6 square kilometres. The depth of the secondary crater is about 20 metres.

Dr. Friedlaender remarks that in addition to the subjective difficulty in the description of a volcano, there is, also with Kilauea, the objective difficulty of the rapid changes that take place there. These render necessary frequent periodical re-descriptions. One such change is now in progress, for after a pause of fifteen months the mountain is again in active eruption.

NOTES.

THE British Section of the International Memorial to Pasteur has now assumed definite shape, and the Provisional Committee, which already includes the names of the Dukes of Devonshire and Westminster, and many distinguished men of science from all parts of the United Kingdom, held its first meeting last Friday, at the rooms of the Royal Society, Burlington House, under the presidency of Sir Joseph Lister. It was unanimously decided to apply for subscriptions towards the erection of a monument to Pasteur in Paris, from persons in the United Kingdom, India and the Colonies, interested in science and the various industries which have been benefited by Pasteur's labours. An Executive Committee was formed, consisting of Sir Joseph Lister, Sir John Evans, Sir Henry Roscoe, Dr. Thorne Thorne, and Prof. Percy Frankland (Hon. Secretary). Subscriptions may be sent to Sir John Evans, who will act as Hon. Treasurer, at the Royal Society, Burlington House, W.

AT the stated meeting of the Royal Irish Academy, held on March 16, the Earl of Rosse, K.P., F.R.S., was elected President, in succession to Dr. J. Kells Ingram, whose term of office had expired. The President nominated as Vice-Presidents—The Rev. Dr. Haughton, F.R.S., the Most Rev. Bishop Donnelly, D.D., Dr. J. Kells Ingram, and Dr. Ben. Williamson, F.R.S. The following were elected Honorary Members in the Department of Science—Sir Joseph Lister, Bart., P.R.S., Sir W. H. Flower, K.C.B., Rev. T. G. Bonney, F.R.S., and Prof. Wm. Ramsay, F.R.S.

IN the Japanese Imperial Budget for the current year, we observe that a sum of 21,639 dols. has been set aside for earthquake investigation. This is a grant over and above the usual expenditure of the Central Observatory controlling the seismic survey of the country.

THE monument to Lobachevsky will be unveiled this autumn at Kazan. It consists of a bronze bust of the late geometer, one metre high, placed on a column of black polished granite, about 50 centimetres in diameter and 1·4 metres high, standing upon two steps of grey unpolished granite. The total height of the monument is 3·6 metres, and its cost about 3,300 roubles (£330).

WE learn from the *British Medical Journal* that Prof. Behring has given the half of the Alberto Levi prize of the Paris Academy of Sciences, recently awarded to him (amounting to £1000) to the Prussian Government Fund for the Furtherance of Research on Serum Treatment. The moneys received by the official control stations, where the diphtheria antitoxin is tested before it is allowed to be sold, will also be paid into this fund.

THE National Academy of Sciences, acting on the request of the Secretary of the Interior of the United States, has reported a Commission to investigate the forestry problem, consisting of Charles S. Sargeant, Alexander Agassiz, Henry L. Abbot, William H. Brener, Arnold Hague, and Gifford Purchot. The Secretary will recommend to Congress an appropriation of 25,000 dols. to cover the expenses of the Commission.

GENERAL JOHN B. WOODWARD, under whose able administration the Brooklyn Institute developed into the largest local scientific society in the world, with a membership of 3700, died on March 7, of pneumonia, after a short illness. General Woodward was for many years President of the Brooklyn Institute, but declined re-election last spring. He held many other prominent stations, having been a general in the army during the war of the rebellion, a bank president, candidate for mayor of the city, and President of the Society of Titans, none of whom were less than six feet two inches high. He was sixty years old.

THE Brooklyn Institute has completed negotiations for the purchase of the collection of Lepidoptera made by the late Berthold Neumoegen, comprising 40,000 to 45,000 specimens comprising 13,000 to 14,000 species, upwards of 1000 being type-specimens. This is the finest collection in America. As much as 100 dols. was paid by Mr. Neumoegen for a single specimen in several instances. The Institute will also secure the collection of Jacob Doll, of over 55,000 specimens, and will employ Mr. Doll as curator. Edward L. Graef will present his collection of about 20,000 specimens. The Institute already owns the Calverley collection; and the aggregate of all will give it the most complete collection of Lepidoptera in the world.

THE opening of the bicycle season shows the importance of that vehicle as a means of locomotion, and its potency as a factor in promoting good roads. The New York and Brooklyn Bridge has just been made free to bicycles, a change which required an Act of the Legislature to secure it. The grant for paving in New York City this year includes 1,000,000 dols. for asphalt pavement in a total amount of 1,250,000 dols. The pneumatic tire has been applied to ambulances in Brooklyn with great success. The ingenuity of inventors is taxed to devise improvements in all parts and appliances of the machine; and while the New York Cycle Exhibition last January was the largest exhibition of any special machinery that has been held in America, the exhibition now in progress in Brooklyn adds several apparently useful novelties not shown heretofore.

THE Governor of New Jersey has signed the Bill ceding the palisades of the Hudson to the United States Government for a national park.

THE General Electric Company and the Westinghouse Electric Company have combined, and each will be allowed to use the patents of the other.

IN connection with the Hungarian Millennial Exhibition, which will be opened on May 2, a Congress of Mining and Geology will be held at Budapest on September 25 and 26.