an enormous quantity of very fluid basic lava has been discharged. This has flowed by a sinuous course of about ten miles into the sea, devastated some of the most fertile land in the island, and covered it up with lava fields probably not less than twenty square miles in area.

The crater contains a lake, or rather river, of molten lava so fluid that it rises in incandescent fountains, beats in waves on the walls, and rushes with great velocity down into a gulf or tunnel at one end of the crater. The lava, still liquid, runs in a passage, or perhaps system of passages, under the surface of the lava field, its course being traceable by a line of large fumaroles until, still in a fluid condition, it reaches the sea, into which it flows with energetic explosions and the discharge of large volumes of steam, black sand, and fragments of lava. Where the action is less violent a structure resembling that of some varieties of pillow lava is produced.

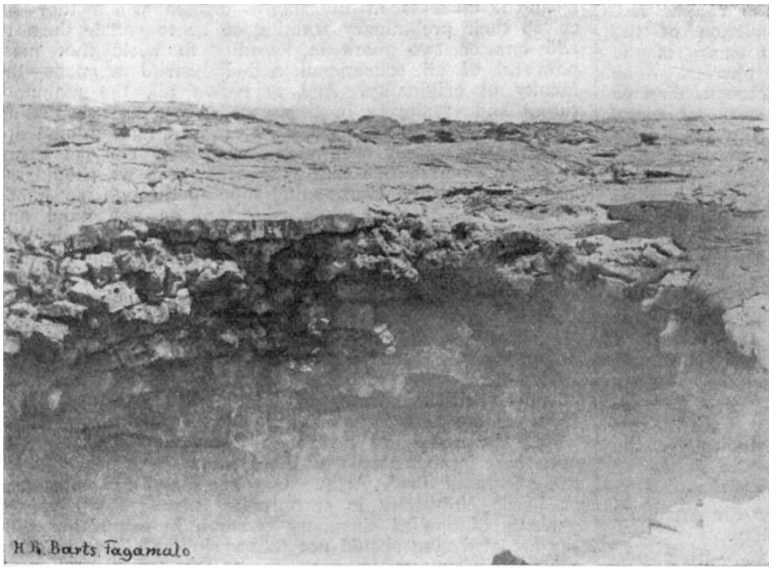


FIG. 2.—Pit Crater in Lava Field, on the line of the Lava Tunnel to the Sea.

*Photo.*] [*T. Anderson.*

FIG. 3.—Lava in Lagoon corded above high water-mark: Pillow Lava below.

The term pillow lava, originally applied to the results of a peculiar form of spheroidal weathering, is now extended to various smooth-surfaced lobular masses, which have been considered by Teall, Cole, and Gregory to be formed by lava flowing into water. This view has been combated by others; but Dr. Anderson watched the process actually going on, and photographed the results.

The formation of ordinary "corded lava" or "pahoehoe" takes place by a local quiet outflow of lava which forms a pool or lobe. The surface, being slowly cooled by the air, forms a more or less tenacious, treacly scum, which is pushed forward by the liquid mass underneath, and is puckered up into a cord or festoon. While this is taking place the new surface is becoming treacly, and in its turn is pushed forward into another fold, and so on until the whole surface is solidified, often with a very regular pattern.

Dr. Anderson said he had seen this taking place on Vesuvius, and had watched the same process going on at the sea-level at Matavanu. The surface of the lobes, however, being in that case exposed to the waves, was rapidly chilled, and solidified before it had time to be pushed forward to form "corded structure." A photograph of a recent flow into the lagoon showed corded structure above high-water mark, while lower down there was every transition into typical pillow lava.

The surface of the lava field shows several large pits along the line of the lava-conduit to the sea, out of which steam and vapours escape. They are larger than ordinary fumaroles, and appear to be formed by the remelting and falling in of the crust owing to the heat of the lava which flows beneath. The sections exposed in their walls show the lava field to consist of numerous very thin beds, partly surface flows, but probably in many cases intrusive sheets. This structure is very similar to that of the "pit craters" in Hawaii, the mode of formation of which is still unsettled. Possibly they may have been formed in the same way.

Other interesting points noticed were the formation of moulds by lava flowing round living tree trunks. The trees were, of course, killed, and when they decayed hollows were left corresponding to their former shapes. Occasionally, after the lava had solidified round a tree the remainder had flowed away; when the tree decayed a sort of hollow pillar was thus left, in which smaller plants sometimes grew.

## *UNIVERSITY AND EDUCATIONAL INTELLIGENCE.*

BIRMINGHAM.—The Huxley lecture will be delivered on November 23 by Prof. Percy Gardner, professor of classical archæology in the University of Oxford. The subject of the address is "Rationalism and Science in Relation to Social Movements."

BRISTOL.—In connection with the faculty of engineering provided and maintained in the Merchant Venturers' Technical College, a course of five monthly lectures on "Aviation" has been arranged. The selected lecturers are Prof. W. Morgan, Mr. A. R. Low, Mr. E. S. Bruce, Mr. L. Blin Desbleds, and Mr. Joseph Clarkson.

A new wing erected for the chemical and physiological

departments of the University, at a cost of 50,000*l.*, was opened by Lord Winterstoke on November 15.

CAMBRIDGE.—On Saturday last, November 12, a large assembly of physicists from all parts of Great Britain, and many members of the University, came together in the Cavendish Laboratory on the occasion of the presentation to Sir J. J. Thomson of a volume entitled "A History of the Cavendish Laboratory, 1871–1910." The volume had been prepared to commemorate the completion of the twenty-fifth year of Sir Joseph Thomson's tenure of the Cavendish professorship of experimental physics. The presentation was made by Dr. R. T. Glazebrook, director of the National Physical Laboratory, who was for many years associated with the late and present Cavendish professors. The volume begins by recording the fact that perhaps no post in the world has held three men of such supreme and varied genius as James Clerk-Maxwell, Lord Rayleigh, and Joseph John Thomson. It contains a remarkable record of work, and concludes with a list of the memoirs which have been published in connection with the Cavendish Laboratory, which extends over forty-two pages, and a list of some two hundred men of science who have researched in the laboratory. We hope to publish a review of the volume in an early issue.

Mr. A. Hutchinson, of Pembroke College, has been appointed chairman of the examiners for the Natural Sciences Tripos, 1911.

Mr. J. S. Edkins, of Gonville and Caius College, has been approved by the general board of studies for the degree of Doctor in Science.

LIVERPOOL.—On November 14 the honorary degree of LL.D. was conferred by the University upon Sir Archibald Geikie, K.C.B., president of the Royal Society.

OXFORD.—The Herbert Spencer lecture on "Evolution, Darwinian and Spencerian," will be delivered by Prof. R. Meldola, F.R.S., on December 8 at 2.15 p.m.

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IT is announced in *Science* that the State legislature of Arkansas has voted 70,000*l.* for the erection of four agricultural schools, and 100,000*l.* additional has been raised by the cities.

WE learn from the *Revue Scientifique* that the buildings of the medical faculty of the University of Toulouse were partially destroyed by fire on October 27. The library of more than 60,000 volumes was burnt entirely, and also the physiological lecture theatre and other rooms.

THE Department of Agriculture and Technical Instruction for Ireland has issued a programme of the Irish Training School of Domestic Economy for the session 1911–2. The school is situated at St. Kevin's Park, Kilmacud, Stillorgan, co. Dublin. The premises stand in grounds of about three acres, and the house provides ample accommodation for the staff and students, in addition to class and recreation rooms. A large fruit and vegetable garden is attached to the house. At the close of each school year, the Department, on consideration of the results of the examination held at the close of the course of household management, and the reports of their inspectors and of the teaching staff, selects for training as teachers of domestic economy a limited number of students who have shown themselves most capable of taking full advantage of the course of training provided. The course of training extends over at least two whole sessions, and involves a complete course of domestic economy suitable for teachers of this subject. It includes the principles of practical elementary science involved in domestic work; cookery; laundry; dressmaking and home sewing; housewifery (including household routine and the keeping of accounts); and practice in the teaching of these subjects. Practical instruction in home hygiene and sick nursing is afforded, and instruction is given in the theory and practice of education.

IN a letter to the *Yorkshire Observer* of November 11 Prof. R. Meldola, F.R.S., urges the need for the provision in this country of a larger number of scholarships for research. "Why, in the name of all that is sacred to the industrial welfare of this country, are not some of the vast sums now devoted to educational purposes available for research scholarships in existing institutions?" asks Prof. Meldola. Later in his letter he says, everything is ripe for the movement. There are competent teaching staffs; there is always a supply of promising students; there are funds from county councils and from public and private endowments; and there is the Treasury behind the Board of Education. There are scholarships given for all kinds of purposes other than for the continuation of the education of the most promising technical students in the institutions in which they received their preliminary training so as to enable them to add one or two years in learning to wield that most powerful of all educational and industrial weapons—the faculty of originality. And to crown all, the manufacturers and employers in this country are now beginning to take a more enlightened view of the situation, and are prepared to employ such men—when they can get them. It seems preposterous that year after year we should see ability, talent, and even genius slipping through our hands for want of means, when educators on one hand and employers on the other are both ready to play their part in promoting the industrial development of the country. We want, he concludes, a system of technical research scholarships which will be looked upon as a distinction to gain, for none but the most competent would be allowed to hold them. We want through such means to strengthen and encourage the work of the teachers by filling their laboratories with research students, and we want to advance British industry by handing over to the manufacturers the picked material from our educational institutions. As a leading article in our contemporary points out, there is no reason why the success which has attended the efforts of Prof. Arthur G. Green and his colleagues at Leeds University in encouraging among the advanced students of applied chemistry research in connection with the art of dyeing should not follow similar efforts in other centres.

IN Dr. Muir's report on education in Cape Colony in 1909, which has come to hand, he shows that in 1891 there were five colleges in the colony where students could pursue courses of study for a university degree, viz. the South African College, Cape Town, the Diocesan College, Rondebosch, the Victoria College, Stellenbosch, St. Andrew's College, Grahamstown, and the Gill College, Somerset East. A large proportion of the teaching power, however, in all these institutions was given to what was, properly speaking, school work, namely, the preparation of large classes for matriculation. Mathematics and chemistry, too, were the only sciences for the teaching of which provision was made. From its inauguration the policy pursued by the Education Department kept three aims in view. The first was the removal of the matriculation classes from the colleges, so that professors might have more time for advanced work, while the pupils of the junior classes might in the public schools be under a discipline more suitable to their years. The second was the institution of new professorships, more especially in the sciences, until then unrepresented; and the third was a reduction in the number of colleges—a number which seemed at the time excessive for the total number of students. Victoria College, Stellenbosch, was the first that agreed to part with its matriculation classes, the junior class in 1896 and the senior in 1899. In the latter year the South African College was induced to follow the example. At present practically all the colleges have ceased to retain matriculation classes. Since 1891 there have been instituted in connection with the colleges professorships of physics, applied mathematics, geology, botany, and zoology. In addition to the then existing courses in arts, law, and survey, there have been opened new courses in arts as well as professional courses in mining, civil and electrical engineering, medicine (preliminary), and forestry. On the literature side there has also been development, professorships in history and lectureships in Hebrew having been established in connection with the larger colleges. The movement towards greater concentration of effort in fewer colleges has been brought to a successful issue in the eastern province. The Gill College, Somerset East, has been closed, St. Andrew's College has restricted itself to school work, and in Grahamstown, by the happy union of all interests, the Rhodes University College has taken their places and become the centre of higher education for the eastern province.