As a third factor in landscape-formation one may mention the ice, which has many times spread from the neighbouring Vatnajökull over the whole country, and the effect of which, both in earlier times and in modern times, has been the subject of study.

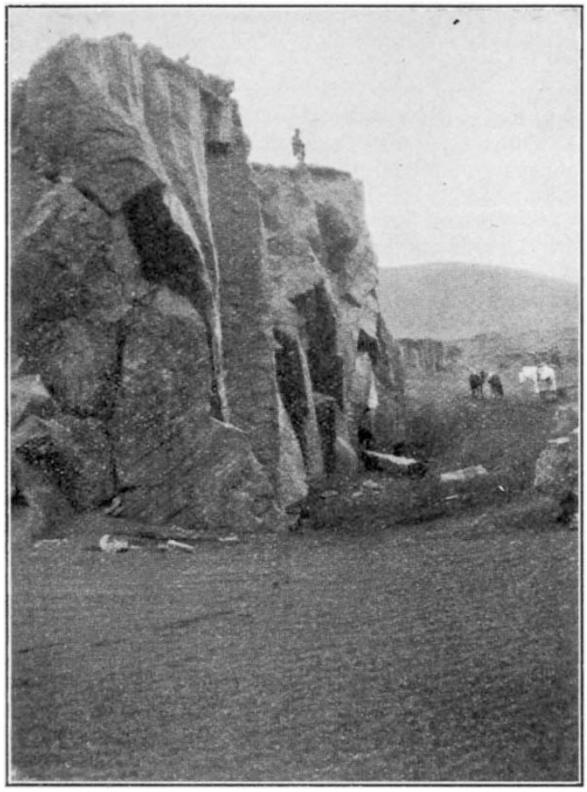

FIG. 3.—An earthquake-rift in the lava-fields west of Vatnajökull.

In this landscape, the origin of which, as has been stated, must be referred to three different sets of factors, a whole series of transforming forces are at work at this moment, and some of these have been specially investigated, because the conditions here in certain respects are abnormal. A very special rôle, for example, is played by the wind, the erosive power of which is very violent and is the cause of production of frightful sandstorms, which in their strength remind one of those that take place in the great desert regions of Asia and Africa. Another very real factor in erosion is the snow, which, together with the masses of water set free by its melting, greatly contributes to the transformation of the landscape. The reason why the above-mentioned factors play so great a part in this work, and can be studied with comparative ease, is that nearly the whole district is deficient in surface streams. Apart from the great rivers of melted ice, one finds only a few short streams, since the whole surface consists of very porous kinds of rock which absorb water with avidity and carry it underground a great distance until it emerges as springs of surprising abundance.

The expedition has met with great kindness and support on many sides both in Iceland and in Denmark, the conditions of work have on the whole been good, and the work has been carried out without serious misfortune to man or beast.

Obituary.

PROF. P. H. VON GROTH, FOR. MEM. R.S.

GEHEIMRAT PAUL HEINRICH RITTER VON GROTH, who died on Dec. 2, 1927, was born on June 23, 1843, at Magdeburg. His father was a portrait painter. His early academic studies were pursued first at the Bergakademie at Freiberg (1862–65) and then at the University of Berlin (1865–67), where he obtained his Ph.D. degree in 1868. He was successively assistant in the Department of Physics in the University (1868–70), reader of mineralogy and geology at the Bergakademie in Berlin (1870–72), and in 1872 was appointed professor in the newly constituted University of Strasbourg, where he remained for eleven years until his promotion to the chair at Munich. It was during Groth's tenure of office at Munich that the most important work of his life was accomplished. In 1874 he published his "Tabellarische Übersicht der einfachen Mineralien"—a comprehensive list of the mineral kingdom, containing not only a systematic classification of species, but also a critical survey of views on their chemical composition; subsequent editions with much new material appeared in 1882, 1889, 1898, and were followed in 1921 by a new survey, "Mineralogische Tabellen," in conjunction with Mieleitner. In 1876 he published his famous "Physikalische Krystallographie," a most readable and suggestive treatise which was for many generations of teachers and students an attractive introduction to a science that had previously been presented in a very unattractive form. Sir Lazarus Fletcher has recorded the fact that he was led to take up the study of the subject by happening to see a copy of the book in that year. Subsequent enlarged and revised editions appeared in 1885, 1895, 1905.

In 1877, Groth started the first volume of the *Zeitschrift für Krystallographie und Mineralogie*, which became universally known as Groth's *Zeitschrift*. This he edited with great skill for thirty-nine years, enlisting the co-operation of a large number of mineralogists from all countries; it was conspicuous for its international character and for the value not only of the original papers, but also of the abstracts which it contained. In a memoir which appeared shortly before his death in the *Zeitschrift*, he gave an account of its inception and a history of its progress during the period of his editorship. The fiftieth volume (1923) was a

(*Continued on p.* 107.)

Festband in honour of his eightieth birthday and contained papers by many of his old pupils, representing twelve countries.

In 1878, Groth's "Catalogue of the Strasbourg Collection" not only showed how active he had been in getting together an important teaching collection in six years, but also served as a model for future mineral catalogues. His reputation as the foremost teacher of mineralogy and crystallography had been firmly established when, in 1883, he was transferred to Munich as professor of mineralogy and Director of the State Collection. His department at Strasbourg had been remarkable for its international character; young men from all the countries of the world, who were destined to be the professors of the next generation, flocked to his laboratory; and at Munich the new department preserved the same character. Here again he built up a great collection and inspired a remarkable succession of researchers; a guide to the collection appeared in 1891, an introduction to the study of precious stones in 1887, an introduction to chemical crystallography in 1904, the elements of physical and chemical crystallography in 1921. But his energies were mainly concentrated on a sequel to his life's work in the form of a vast book of reference—a complete dictionary of the physical and chemical characters of crystallisable substances—mainly based upon the material contained in fifty-five volumes of the *Zeitschrift*. "Chemische Krystallographie" appeared in five volumes between 1906 and 1919, and is an invaluable work of reference.

A life so strenuously devoted to teaching, to the writing of treatises and text-books, to the organisation of university departments, to the inspiration of students, and to the supervision of their investigations, left little time for research. Except through the work of his pupils, the name of Groth is not associated with any great discovery. But he was always occupied in welcoming and in fostering new ideas, and he always had problems for his students to work out. At the beginning of his career he made a striking study of changes of form in the crystal produced by the substitution of one element or radicle for another, especially among organic compounds, and introduced the term 'morphotropy' for this effect; it guided his masterly studies on the composition of minerals; and the connexion between chemical composition and crystalline form was always his chief interest. The avidity with which he absorbed the new experimental work and theories about crystal structure in his old age is evidenced by his latest publications.

Devotion to academic duties and to the *Zeitschrift* left comparatively little time for travel, but Groth made mineralogical expeditions in France and Italy. In 1904 he visited England for the British Association meeting and made a tour in Wales. In Great Britain his position in the scientific world was fully appreciated fifty years ago when he was elected an honorary member of the Mineralogical Society. He was afterwards elected foreign correspondent (1895) and foreign member (1900) of the Geological Society (and received its Wollaston Medal in 1908), and foreign member of the Royal Society in 1911. He received the Hon. Sc.D. degree from Cambridge in 1904.

The present writer has a vivid recollection of Groth as an active young professor at Strasbourg in 1881; energetic and busy with his class and his collection, but always accessible and ready to help and inspire the little group of eager research students who worked in his laboratory. He always impressed them as a strenuous worker, a great teacher, and a most genial, sympathetic, and loyal friend. H. A. M.

MR. THOMAS BAIRD.

A TRAGEDY on the Cairngorms has deprived the University of Glasgow of two brilliant and promising men, of whom one, Thomas Baird, was on the staff of the Geological Department. He attracted attention early in his geology course by his quickness as an observer, his intellectual ability, and his enthusiasm as a student. His early death at the age of twenty-two years has prevented him completing any of the research work on which he had entered, but he had done enough to give promise of great success. He has recorded some sections exposed in the foundations of the new buildings of the National Bank, and described the glacial sands there interbedded with the boulder clays. He had begun the investigation of volcanic necks at Yieldshields Hill, near Carluke, and was working out their inclusions with some help from Dr. Tyrrell.

Baird's special interest was in mountain structure, and he was studying some Dalradian rocks in the Grampians to the east of Kinloch Rannoch, of which the correlation is in doubt. Mr. Baird's interest in mountain geology led him to take every opportunity of training as a mountaineer. He had made some winter ascents and gained experience in ice-climbing. It was his ambition ultimately to explore some of the Asiatic mountain ranges of which the structure is still unravelled.

With this end in view, Baird arranged the recent excursion to the Cairngorms in order to gain further experience of mountaineering under winter conditions. He and his companion, Hugh Barrie, a medical student and graceful poet, were both thoroughly competent for the expedition. They appear to have spent three nights at the Corrour bothy between Ben Macdhui and Cairn Toul, and from such clues as are available they probably gained the summit of Braeriach on the return route to Aviemore on Sunday, Jan. 1. Some accident must have happened there, for Baird's left hand was injured as if he had caught hold of some rock or rough ice. He probably exhausted himself either in the effort to help Barrie to shelter, or, as appears more likely, when trying to find his comrade after their separation by the accident. Baird had reached the floor of Glen Eunach, and there, caught in a furious blizzard, collapsed on the roadside a few hundred yards from a hut. He was found next morning, but died before help could arrive from Aviemore.