

got tacky, it is dusted over until covered with the barium platino-cyanide, which has been finely powdered.

Greater distinctness is obtained by this method, insuring, as it does, a thin but compact layer of crystals, unseparated by the fibres of the blotting-paper.

J. WILLIAM GIFFORD.

Chard, March 1.

Crush-Conglomerates in Ireland.

ON the sea-coast at Portrairie, Co. Dublin, there is an apparent thickness of over 700 feet of conglomeratic rocks, which have hitherto been regarded and described as of volcanic origin, contemporaneous with the Lower Silurian strata and associated felspathic igneous rocks.

This conglomerate is massive in character, and exhibits a structure resembling rude bedding. It consists of sub-angular and rounded blocks and pebbles of grey fossiliferous Bala limestone, calcareous grit, and occasional lumps and fragments of crushed felsite, the whole being enveloped in a brownish-grey argillaceous and calcareous matrix.

The Lower Silurian section here shows grey limestone passing upwards into alternations of grit, limestone, and argillaceous shale, with thick bedded calcareous mudstones at top, the whole series being more or less fossiliferous.

The associated igneous rocks are intrusive basic felsites of several varieties, and, like the sediments, present evidence of intense crushing.

Having had assigned to me, in the Geological Survey, the revision of the Silurian tracts in this part of the east of Ireland, I spent some time on the ground last summer, and was led to form the conclusion that this supposed conglomerate is not of volcanic origin. The work has not yet been officially inspected, but I am enabled, with the sanction of the Director-General, to state here briefly the results at which I have arrived.

I believe that instead of volcanic detritus contemporaneous with the deposition of the Silurian strata, we have here a vast crush-breccia or crush-conglomerate, formed by the breaking-up both of the Lower Silurian sediments and the igneous rocks, along particular zones of earth-movement, and a flowing and subsequent re-cementing together of the broken-up and rolled fragments. So far as I could judge, there are no truly contemporaneous igneous rocks in the district.

Where the intrusive rocks have come within the region of intense squeezing, they are sheared and ground into more or less powdered masses, having a resemblance to volcanic material, and this probably gave rise to the supposition that they were volcanic.

The breaking-up of the hard bedded rocks can best be studied at the south end of the section, and in some cases the beds of limestone and grit can be seen, as it were, in the process of being broken up into detached pieces, the fragments rolling off through the mudstones.

The conditions at Portrairie are repeated exactly on Lambay Island, three miles off, but apparently on a grander scale.

I consider this crush-conglomerate rock-structure to be of great importance in connection with many more supposed volcanic areas of Silurian age in Ireland.

ALEX. MCHENRY.

Geological Survey Office, Dublin, February 28.

Science and Morals.

ALL who are engaged in extending the boundaries of natural knowledge will be interested in the remarkable letter of Prof. Ramsay, in last week's NATURE, on the moral claims of original discoverers in relation to the work of subsequent investigators in the same field of research. As one whose experience is of sufficient duration to stand in both these relations, I should like to point out several objections to the position assumed by Prof. Ramsay on this question.

In the year 1866 I announced before the Royal Society the discovery that quantities of magnetism and electricity indefinitely small would induce quantities of these forces indefinitely great, and demonstrated the same, on a large scale, by means of a small magneto-electric, acting in conjunction with a large dynamo-electric machine.¹ The discovery excited considerable interest at the time, and my experiments were repeated by many electricians in Europe and America. Among these

¹ Proc. Roy. Soc., 1866; Phil. Trans., 1867.

were Varley, Wheatstone, Siemens of Berlin, and Farmer in America, who soon found that the residual magnetism of an electro-magnet was sufficient to supply the initial current required for exciting the dynamo; thereby dispensing with the permanent steel magnets of the magneto-electric machine. Although I had actually made experiments in the same direction some time previous to the announcement of my discovery, it never occurred to me, before reading Prof. Ramsay's letter, that I have all these years been a martyr to the injustice inflicted by unscrupulous electricians publishing, without my consent, the happy invention of the self-exciting dynamo machine.

The work of an original discoverer, though popular, is not unfrequently of a very subordinate character; increasing, in some cases, the value and importance of previous discoveries, or preparing the way for still greater ones, which the original investigator may be quite unable to deal with. The pretension set up by Prof. Ramsay, with its personal application, that the permission of an original discoverer should be obtained before the results of subsequent researches in the same field by other workers are published, strikes at the root of all scientific progress, and indicates a simplicity of character rarely to be met with in those engaged in philosophical pursuits.

Prof. Ramsay is again unfortunate in his analogy between the moral questions involved in a scientific discovery and in a patented invention. Law and equity alike encourage the publication of subsequent improvements on original inventions *without the consent of the first inventor*, and only intervene and censure when the right and title to *his own invention* are impugned.

The morality of Prof. Ramsay would suppress all investigations on the Röntgen rays, now being made wherever science is cultivated, or would render it impossible for the original discoverer to consider the numerous applications for permission to publish the results of further experiments.

The policy of secrecy and procrastination suggested as a corrective to the activities of subsequent investigators is not likely to meet with the approval of scientific men who have in mind the history of the discovery of the planet Neptune, and the rival claims of Adams and Leverrier. A great master of science (Sir George B. Airy) has well said with reference to this and other discoveries, "that it is advantageous for the progress of science that the publication of results, when so far matured as to leave no doubt of their general accuracy, should not be delayed till they are worked to the highest imaginable perfection."

February 25.

HENRY WILDE.

Inverted Images.

IN connection with the view advocated by Mrs. Scott in your last number, it may be of interest to state that, in my own personal case, I have been able all my life to read a book with the greatest facility upside down; it making not the least difference to me which way it is presented. I am told—but this is not within my personal recollection—that I learned to read by looking over the book of an elder brother who was being taught in the usual way, standing in front of him, not behind. The singular circumstance to my own mind is that I have precisely the same facility in reading upside-down books written in any foreign language with which I may be more or less acquainted, in which the letters differ from the English, as Greek and Hebrew; and the facility extends, to very nearly the same extent, to handwriting. I have never at any time practised it systematically; it appears to come perfectly naturally.

ALFRED W. BENNETT.

Remarkable Sounds.

A PECULIAR sound, apparently similar to the "soughing of the wind" (see p. 78, *ante*), is briefly described by Liu Wan-Ping, a Chinese Commodore, in his journal of voyage made in 1595 from Cheh-Kiang to Shan-Tung, in order to defend the latter province from the attack by the Japanese fleet. (Sie Tsai-Kang's "Wu-tsah-tsu," Japanese edition, tom. iv. fol. 46, a.) The passage is as follows: "Same night we anchored near Fuh-shan-tau [in Shan-Tung]. This mountain, as if inhabited by a deity, utters a voice sounding mournfully, although on it neither herb nor tree exists, and neither hollow nor cavern therein."

KUMAGUSU MINAKATA.

February 8.