is incorporated with clay, with the bases of which it for the most part combines. With this powder goes another consisting of a porous substance saturated with sulfuric acid. A small quantity of each powder is scattered over the manure pile and by the action of the sulfuric acid on the fluosilicates fluosilicic acid is generated which acts as an antiseptic. In describing this process in the *Chemiker Zeitung* C. Elschner suggests that it would be more economical to absorb the gases directly by lime and then dry the calcium fluosilicate formed, and that a powdered bisulfate could be more advantageously used than sulfuric acid. Should some practicable method be devised for utilizing these noxious gases it would give great value to many apatite deposits which contain too much fluorspar to be utilized at present.

A GYPSUM WEATHER-SCALE.

Around the 'Stone Gallery' at the base of St. Paul's Cathedral is a balustrade of Portland stone, surmounted by a heavy coping of the same material. All of the stone is greatly weathered and coated with a gray or black deposit, much resembling boiler scale. Under the coping this attains a thickness of three-quarters of an inch. An examination of this deposit is given by E. G. Clayton in the *Proceedings* of the Chemical Society. It contains no fungoid matter, and contrary to expectation no carbonates were found in it. It is essentially calcium sulfate, with a small amount of silica. Since there is no neighboring source of sulfates the conclusion is reached that it has been formed by two centuries' solvent and weathering action of rain, charged with sulfurous and sulfuric acids derived from the gases and smoke of innumerable surrounding chimneys. The rain water, running and dripping from the under side of the coping stone, has here left an especially thick deposit, which presents a curiously close resemblance to a deposit of calcareous tufa.

J. L. H.

CURRENT NOTES ON PHYSIOGRAPHY.

PHYSIOGRAPHY OF WISCONSIN.

Collie has contributed two articles on the physiography of his State. The first ('Physiography of Wisconsin,' *Bull. Amer. Bureau Geogr.*, II., 1900, 270–287) is a general and elementary account, giving fuller statement of features due to glacial action than to those determined by the underlying rock. The second ('Wisconsin shore of Lake Superior,' *Bull. Geol. Soc. Amer.*, XII., 1901, 197–216) is the result of detailed local study, with special reference to shore features in the neighborhood of the Apostle Islands. These islands consist of horizontal sandstones, usually cliffed and caved along the waterline, but also modified by bars and spits, of which the largest encloses Chequamegon bay.

In both these papers the bluff by which descent is made from the northwest border of the uplands of disturbed Keweenawan rocks to the lower land of horizontal sandstones bordering Lake Superior is described as a fault scarp, 'formed by the movement of rocks one upon the other, * * * particularly noticeable because it is not formed, as most of the Wisconsin cliffs are, by erosion.' This interpretation of the recency of the fault is novel. The considerable erosion indicated by the truncation of the upturned edges of the sandstones near the fault line throws some doubt upon the accuracy of Collie's view; should it be proved correct the scarp would be an interesting addition to our physiographic types, for faults that are young enough to preserve something of their initial topographic expression are rare in the eastern half of our country.

GLACIAL EROSION IN SKYE.

The laccolithic mass of the Island of Skye, west of Scotland, was deeply dissected in preglacial time. During the glacial period, its mountains bore local glaciers, whose eastern members stemmed the great ice sheet that came westward from the Scotch highlands, dividing it into two parts which flowed northwest and southwest out to sea. The effects of the Skye glaciers as agents of erosion have lately been studied by Harker ('Ice Erosion in the Cuillin Hills, Skye,' *Trans. Roy. Soc. Edinburgh*, XL., 1901, 221–252, map). He finds that the floors and walls of the ice-scoured valleys exhibit much less relation to rock structure than is usual in districts of

subaerial erosion only, and regards this as a natural consequence of the massiveness and relative rigidity of the ice streams. The valleys are comparatively straight, with broad floors and rather smooth and steep sides, heading in amphitheaters or corries that seem unduly large for their drainage areas. The valley floors frequently descend by abrupt slopes to lower and lower levels. Rock basins, excavated in the valley floors, and holding lakes, are justly regarded as subordinate and incidental to the general scouring of the shallower and narrower preglacial valleys to their present trough-like form. Short side glens open characteristically on the walls of the larger valleys to which they are tributary. The divides between the uppermost corries of the main valleys are sharply serrate, in consequence of the retrogressive erosion of the glaciers that headed in the corries, as has been pointed out by Richter for the Alps, and by Matthes for the Big Horn range of the Rocky mountains.

The comparison instituted by Harker between rivers and glaciers is not altogether satisfactory inasmuch as it fails to point out certain similarities between the two. It is stated that, 'the bed of a river which has attained a mature state maintains a steady gradient so long as the volume of water is unchanged'; but it is the surface, not the bed, of the river that should be thus described. The bed of a mature river, such as the Mississippi, has numerous hollows, whose dimensions are to those of the river in about the same proportion as the dimensions of rock basins are to those of the glaciers that scoured them out. When a mature river crosses a reef of resistant rocks, it habitually sweeps out a shallow basin-like depression in the weaker rocks next up stream; while another basin may be eroded by the plunge of the waters down stream from the reef. Rivers whose volume is greatly reduced in the dry season exhibit the hollows in their bed as a series of pools strung together by the diminished stream. It therefore seems wrong to say that 'ice erosion does not, like water erosion, work constantly towards the establishment of an even gradient along a valley.' Both tend to establish even gradients in their surface; both produce inequalities in their beds; the inequalities of a river bed receive little attention; they are comparatively small and are usually out of sight; the inequalities in the beds of existing glaciers are even less open to observation, although it can hardly be doubted that they exist. The inequalities in the beds of extinct glaciers are often so large and so plainly visible that their analogy with the hollows in river beds is too commonly overlooked.

THE SEVERN BORE.

A SERIES of views of the Severn bore taken with a bioscope camera by Vaughan Cornish was thrown on the screen at a meeting of the Royal Geographical Society of London in November last, the first cinematographic illustration of this tidal phenomenon. Four of the views are reproduced in the *Geographical Journal* for January, 1902, and show the approach and passage of the bore with some distinctness. Cornish proposes to make similar studies of other tidal rivers. His well-known studies of rippled sands, under waves, tides and winds have been published in recent years.

W. M. DAVIS.

RETIREMENT OF MONSIEUR HATON.

THE report of the proceedings at a meeting of the faculty, alumni and friends of M. Haton de la Goupilliére on the occasion of his retirement from the directorship of l'Ecole nationale supérieure des Mines, accepting Vice-Presidency of the Conseil général des Mines is just distributed. This ceremony took place June 8, 1901, in the great auditorium of the Société d'Encouragement. The list of contributors numbered 580 and the farewell offerings were numerous and various, including a bust of M. Haton and bronzes by Dubois and others. The bust is reported to have proved a very accurate likeness of its distinguished original. The addresses were made by M. Carnot, Director of the Ecole des Mines, and M. Lemonnier, president of the Association.

M. Haton was 'Élève ingénieur' in 1852, when about 20 years of age, was made professor in the preparatory course immediately on graduation as Ingénieur, taught general