tion of the results. This contention was supported by means of a table proving that the results arrived at by experiment agreed with those predicted by the theory. He showed that a weak solution of permanganate of potash when frozen yielded at first nothing but pure colorless ice, all the color, and hence all the salt in solution, becoming concentrated in the central unfrozen part. While seeking to establish that the same held true for the metals Mr. Neville and himself had hit on a method which he believed to be one of importance and which was shown that evening for the first time. Gold was very readily dissolved by metallic sodium, and if a solution of gold in sodium were allowed to solidify very slowly then sections cut from the solid alloy would appear perfectly uniform to the eye. If, however, the sections were placed on a photographic plate and exposed to the X-rays, on developing the plate a picture was obtained showing the actual structure of the solid alloy, the sodium being transparent to these rays, while the gold was opaque. By means of lantern slides sections were exhibited cut from sodium-gold alloys containing different percentages of gold. These sections showed that crystalline plates of sodium traversed the mass both horizontally and vertically, and that the gold, as the solution solidified, had become concentrated between the crystalline plates of sodium. The analogy between the solidification of an alloy and the solidification of an aqueous solution was thus established.

UNIVERSITY AND EDUCATIONAL NEWS.

The will of the late Judge B. R. Shelden, of Rockford, Ill., bequeathes $100,000 to Williams College, $100,000 to the Hampton Institute and $10,000 to Rockford College.

It is stated in the New York *Medical Record* that Dr. William H. Welch and Dr. William Osler, of the Johns Hopkins Medical School, of Baltimore, have declined the call extended to them by the University of New York, which has lately been consolidated with Bellevue Hospital.

Professor Albert Bushnell Hart has been promoted to a full professorship of physics at Harvard University.

Professor W. F. Edwards has been elected President of the Washington University, Seattle, in the place of Dr. Mark W. Harrington.

Dr. Andr. Lipp has been appointed professor of analytical chemistry in the Polytechnic Institute at Munich. Professor Sissingle, of the Polytechnic Institute of Delft, has been called to the chair of physics in the University of Amsterdam, and Dr. George Scheffers, of Leipzig, to an assistant professorship of mathematics in the Polytechnic Institute in Darmstadt. Dr. Wülfing, docent in mineralogy at Tübingen, and Dr. Max Siegfried, docent in physiology at Leipzig, have been promoted to assistant professorships.

DISCUSSION AND CORRESPONDENCE.

THE RE-DISTRIBUTION OF TYPE-SPECIMENS IN MUSEUMS.

I can't think why Mr. F. A. Lucas, in his most friendly review of my paper 'How may Museums best Retard the Advance of Science?' (Science, April 2, V., p. 543), should say: "Mr. Bather seems to use the term type a little vaguely, as one does not feel quite sure whether he means type or typical material." The term I used was 'type-specimen,' which has for me, and doubtless for Mr. Lucas, one meaning and one only. The question raised in my paper has been much discussed of late in England; permit me to put my view, which differs from that of Mr. Lucas, without satirical obscurity.

The object of museums is after all to advance and not to retard science. Take the case of a provincial museum, say at Thurso, in the extreme north of Scotland; suppose that this museum by some chance acquires a single specimen of a new Mexican beetle; suppose that some wandering 'Koleopterolog' from Germany chances on this and describes it in the *Zoologischer Anzeiger*. The specimen is now a type-specimen, "and no museum," says Mr. Lucas, "can afford to permanently part with these." But does the retention of this specimen at Thurso, in charge of some underpaid jack-of-all-trades curator, do anything

other than retard science? Would it not be better for all parties, including the museum and people of Thurso, if this priceless specimen were sent to Mexico, or to Washington, or to the Godman-Salvin collection in London, or even to Berlin, in exchange for a good teaching set of zoological specimens intelligible to the Thurso fisher-people?

This is a strong, though by no means an impossible case. Every specialist knows similar instances. Of what advantage was it to science that, when Dr. Otto Jaekel was writing his admirable memoir on the Devonian crinoids of Germany, all the type-specimens described by Schultze in his 'Echinodermen des Eifler Kalkes' were locked up in dusty boxes in a store room at Harvard? As things are, the type-specimens of any group of animals or plants, whether a zoological group, a geographical group, or a stratigraphical group, will be found by the specialist scattered all over the world without reference to country or to facilities for study. And we museum curators go on adding to this confusion as hard as ever we can, with the aid of preliminary notices, and stretch miserly hands over specimens that are wanted most in some center of research 8,000 miles away. We advance our museums, but we retard science.

And yet there are some of us who are also students and lovers of science. We wish to use our powers for her advancement. This we think might be done partly by the collection of the type-specimens of a single group in a single museum, partly by the restoration of type-specimens to the country of their origin, provided that it possessed a museum capable of preserving them unharmed, partly by the withdrawal of type-specimens from small local museums where they 'waste their sweetness, etc.,' and are far from safe, to the larger museums with permanent endowment. We do not wish any museum to suffer; exchange is no robbery, and in this case might be as much gain to each contracting party as it would be to scientific investigators.

Another small point in Mr. Lucas' notice provokes an explanation. "On the question of loaning specimens," says he, "Mr. Bather dwells lightly, owing to his connection with the British Museum, whose policy in this respect is well known." This is Mr. Lucas' reason, not mine. My view is that type-specimens should not be lent (they should, if necessary, be exchanged); but other material should be lent freely to responsible workers. There is always a danger of loss; but, while the lost type-specimen can never be replaced, the gain to the museum and to science through the study and description of ordinary specimens more than counterbalance the occasional loss of one. This is not the policy of the British Museum, and no remarks of mine are likely to make it so. Similarly my opinions will not prevent me from borrowing type-specimens of crinoids from any museum rash enough to lend them to me.

F. A. BATHER.

BRITISH MUSEUM (NAT. HIST.), April 15, 1897.

THE QUATERNARY OF MISSOURI.

TO THE EDITOR OF SCIENCE: After reading the quite satisfactory review of my report on the Quaternary of Missouri, in your issue of April 9th, some unanswered questions were left in my mind. As the answers may be of interest to others I venture to offer them through your columns. Mr. Hershey suggests that the idea that the *loess* 'area deposited by broad semilacustrine stream floods,' 'would not have originated upon certain other areas, for instance, the upper Mississippi region.' Is not this virtually the origin conceived the most probable for the loess of the 'Driftless Area' by Chamberlin and Salisbury in the 6th Annual Report, U. S. Geol. Survey?

Mr. Hershey, if I understood rightly, suggests that the loess deposits of Missouri and of southern Illinois as well as of the upper Mississippi were formed in a vast lake or arm of the sea. If that be the case I would ask (1) why no traces of beach ridges have been preserved anywhere, and (2) how he would account for the absence of loess from surfaces along the Mississippi below the supposed 'barrier' much lower than the general level of the loess northwest of that 'barrier,' viz., the Osage Gasconade divide?

If I had been able to find beach ridges and been able to make the margin of the loess south of the Missouri river pass easily into that west