in Geological Life Development by Mr. Weller. The usual courses in general and special geology will be given by Professor Salisbury during the first half of the summer quarter, followed by his field course during the second part.

MR. FRANCIS H. SCOTT writes us that the bill before the Legislature to change the name of the Michigan Mining School to the Michigan College of Mines became a law early in April, and the latter is now the proper name of the institution. The students and the people of the Upper Peninusula generally have accepted the new name gladly, considering it much more appropriate for the character of the work done in the institution. Another bill which has been pending for some time regarding the charging of tuition has been passed, fixing the rate at $25.00 for residents of Michigan, and not less than $50.00 or more than $200.00 for those residing outside of Michigan. The rate is under consideration and, in all probability, will be fixed at $150.00. This tuition fee will correspond with that charged by other first-grade technical schools in America, such as Columbia College School of Mines, the Rensselaer Polytechnic Institute, the Stevens Institute of Technology and the Massachusetts Institute of Technology. When the school was working out its policy, trying to solve its educational problems, it was thought wisest to charge no tuition, but to collect as wide a constituency as possible in order that there might be all possible chance to make the methods as broad and thorough as could be done. It was also deemed hardly just to the students educated here to demand tuition until the institution was much better equipped for its work than the appropriations granted during the first decade of its existence permitted. Now, that success has been attained in educating men for practical work, as is evidenced by the positions which its eighty-six graduates hold, as given in the last catalogue, the institution seems fully warranted in charging hereafter for its instruction. The new law goes into effect immediately after August 19, 1897, and will, therefore, not apply to students entering previous to that time. A prospectus will soon be issued by the College, giving the details of the regulations finally adopted by the Board of Control.

DISCUSSION AND CORRESPONDENCE.

DISTRIBUTION OF MARINE MAMMALS.

TO THE EDITOR OF SCIENCE: Without discussing the general questions treated in Dr. Sclater's paper in SCIENCE of May 14th, it may be well to call attention to some errors of detail.

Dr. Sclater credits the North Atlantic region (Arctatlantica) with the exclusive possession of the genera *Delphinapterus* and *Monodon* and the species *Balæna mysticetus*.

Monodon, though rare, occurs in the region of Bering Strait, while it is not known, as yet, to enter Bering Sea.

Delphinapterus is abundant in Bering Sea, often ascending the large rivers which fall into that sea. Specimens have been noted in the Yukon 600 miles from salt water.

Balæna mysticetus, though now nearly exterminated, was a short time ago the principal object of the whale fishery of the North Pacific, Bering and Okhotsk seas. During the early days of the whale fishery several well attested instances occurred of whales (*B. mysticetus*) struck in one ocean, as the Atlantic, being afterward killed in the North Pacific, and *vice versa*.

It may also be mentioned that less than ten years ago a herd of over 200 fur seal were noted on one of the Galapagos Islands and an expedition was fitted out to go there for the purpose of hunting them.

WM. H. DALL.

SMITHSONIAN INSTITUTION, WASHINGTON,
May 16, 1897.

A POSTSCRIPT ON THE TERMINOLOGY OF TYPES.

MR. LUCAS' remarks might have been more intelligible to me had they followed instead of preceded the lucid paper by Mr. Schuchert: 'What is a type in Natural History?' (SCIENCE, N. S., V., pp. 636–640, April, 1897.) To save further misapprehension, permit me to add that under 'type-specimens' I included 'holotypes,' and at all events the more important 'cotypes' and 'paratypes.'

This slight misunderstanding shows how necessary the definition of these terms has become. It also exemplifies a danger that needs constant guarding against, namely, the employment of a common word in a restricted or altered technical sense. The man in the street

knows the meaning of 'type' and 'typical,' but the meaning of those terms to the zoologist is something quite different. The scientific man is constantly hampered by the formalities of his science; and zoology is not advanced by the fact that the holotype, and perhaps the paratypes, of a species are often aberrant forms, *i. e.*, are *not* typical in the ordinary English sense. Of this no instances need be quoted.

Now while many individuals of a species may be typical (in the ordinary sense), we can conceive of one form, not necessarily existing, that represents a kind of central type, or, as I have expressed it elsewhere, a composite portrait of the species. It is this that is the 'type' of the man in the street. Instances of this are to be found in the statistical tables of Galton, Weldon, Bateson and others; a type-formula for *Ranunculus repens* was given by Pledge in *Natural Science* for May, 1897; but some of the most interesting are J. M. Clarke's studies of *Leptodesma* (*Amer Geol.*, April, 1894, and *Nat. Sci.*, June, 1894).

For this kind of type, far removed from a type-specimen, we want a name; and as the word type has been stolen from us it will save confusion to avoid it altogether. J. M. Clarke used 'fundamentum' as an alternative; but other American biologists attempted to use this as the equivalent of *Anlage*, while the fundament of man in the street is quite a different anatomical conception. Perhaps the word 'norm,' with its adjectival form 'normal,' would give the meaning most nearly, though 'normal has, of course, its more literal sense of 'at right angles to.' The norm of a species varies with locality or with horizon, becoming in the former case the norm of a subspecies, in the latter case the norm of a mutation. So also one can sometimes imagine the norm of a genus; and how very different a thing that would be from the type-species, at least of many genera! The genus-norm also may vary with locality. Thus the species of *Gissocrinus* in Gotland group themselves around *G. typus*, but those in England around *G. goniodactylus*.

This conception of the norm will probably be found at least as helpful as that of the 'hypoplastotype.' It would be of value if it did no more than draw our thoughts from the wearisome history of human error back to the facts of nature.

With reference to what Mr. Schuchert calls a 'plastotype,' but which I would as lief call a 'cast o'type,' or perhaps 'electr-o-type,' may I put to him the case of a cast made from a natural matrix which has subsequently been partly destroyed, in order to expose its inner recesses more fully or to admit of the extraction of the cast? Such a cast would preserve features that could never again be shown by the matrix, and might therefore find a place in the hierarchy labelled 'type material' by Mr. Schuchert.

Another question. When the holotype and paratypes of a species have gone the way of all flesh; when topotypes are impossible and metatypes unknown; when even its plastotypes are not to be had—then what are we to call the specimen selected for special description by the reviser and reestablisher of the species? Should it not be something distinct from the ordinary 'hypotype?' But this subject of hypotypes offers so wide a field for the neologist that prudence bids me cease.

F. A. Bather.
British Museum (Natural History).

'ORGANIC SELECTION.'

To the Editor of Science: In Science for April 23, 1897, J. Mark Baldwin submitted, in a paper headed 'Organic Selection,' an hypothesis which he implies to have originated 'in certain recent publications' by H. F. Osborn, C. Lloyd Morgan and himself in the year 1896. The hypothesis is based on the idea that characters acquired during the life of an individual are, to a considerable extent, those characters which cause the survival of that individual; or, in other words, that an organism which varies not only because of variations in the germ-cell, whence it evolves, but also because of the variety of forces acting on it while it is so evolving (especially after birth), and, on account of these variations, survives and reproduces at the expense of other organisms, must so survive partly on account of the one set of variations and partly on account of the other set. On this basis it is argued that, as connate characters in general persist, those particular connate characters which are identical with those acquired characters with which they coexist and to the virtue of which the survival of