nose' is as nothing in comparison to the millimeter on the end of a lark's tail! If the phrases in reference to color, such as 'much darker,' 'decidedly paler,' 'much more yellowish,' etc., indicate as trivial differences as the statements regarding size, it is no wonder it was impossible to express them 'intelligibly on paper.'

Turning now to Mr. Mearns' paper, we find the same evidence of ability to distinguish differences, which, while of course worthy of note, are altogether too trivial to be in any degree constant. The 'new' subspecies of grasshopper sparrow is said to be 'smaller' than *C. s. passerinus,* yet the differences are so slight that it is an exaggeration to say they are two per cent. of the measurements. The 'new' martin is also said to be 'smaller' than the typical form, though the figures given belie the statement. And finally the 'new' Rocky Mountain nut-hatch is boldly characterized as the 'largest known form of *Sitta carolinensis,*' although by the measurements given it averages 1 mm. *shorter* than the typical form, and the wing averages less than 3 mm. longer. Let us hope that the statements in regard to color mean more than those in regard to size.

These two papers are not exceptional. One cannot be at all familiar with American ornithological and mammalogical literature and not recall numerous cases of similar recognition of utterly trivial differences. The chief value of systematic zoology lies in its service as a basis for progress in knowledge of the laws of distribution, variation and evolution. Recognition of well-defined subspecies is essential to accurate knowledge, but bestowing names upon all sorts of individual diversities and inconstant trivialities is the very worst extreme. In Mr. Oberholser's paper, his first paragraph closes with these sensible words (page 801): 'But the manner and degree of variation must be properly set forth before the full significance of these facts can be appreciated, and this should be the ultimate aim of systematic research—not, as seems only too often to be considered, the mere facilitation of the determination of specimens in the cabinet'; but can degrees of variation be properly set forth if they cannot be 'intelligibly expressed on paper'? One can only feel that were Mr. Oberholser as quick to see resemblances as he is to detect differences, and as eager to unify and reduce as he is to subdivide and magnify, the result of his review of the horned larks would have been very different, much more acceptable and, I venture to think, much nearer the truth.

HUBERT LYMAN CLARK.

LELAND STANFORD JUNIOR UNIVERSITY.

A SUGGESTION.

THE able and interesting address on 'The Universities in Relation to Research,' by President James Loudon which was published in SCIENCE, June 27, 1902, constrains me to venture a suggestion that I have had in my mind for several months.

At the outset may I assure my readers that I make no pretension to a knowledge of all the local conditions? I write merely as a casual traveler, but one who is greatly impressed with the prospects of California from a non-material point of view.

When I paid a hurried visit to Palo Alto last November, I felt what a splendid opportunity there was for a new departure in the history of universities. Nicely situated in a beautiful country enjoying a fine climate, with buildings of an interesting style of architecture and with a princely endowment, the possibilities are very great. The well-equipped university near the largest city of the state, which is only some thirty miles distant, is quite capable of supplying the academic needs of the State for some time. There does not appear to be, therefore, any pressing need for the foundation of a new university on similar lines to that of the State University.

Supposing the university authorities resolved not to do any ordinary university teaching, say for fifty years, but decided on making it a home for all kinds of research, what might not be the benefit to learning in general and to the state in particular? If the most able investigators and scholars were enticed to make Palo Alto the center of their labors, there is no knowing what good might result.

Research first and foremost should be its watchword, and students should be trained solely for research, whether in the humanities

or in science. The geographical position of California suggests some of the main lines of research—all that is in or around the Pacific Ocean. As the greater part of the researches could be conducted most profitably at various spots within this area, so the course of instruction, or rather the direction of the research, in any subject would be undertaken wherever the professor happened to be. For example, the professors of geology, botany, zoology and anthropology, with their students, might be for one year in some island in the Pacific. The professor of comparative religions and his students might make investigations from Kamchatka to Australia.

The ordinary European academic mind would stand aghast at the upsetting of traditional methods and would say promptly that, even supposing such a scheme were in any way desirable, it would be unworkable. Personally I believe it would prove most stimulating and valuable and I have no doubt that American wits could devise a working scheme.

Alfred C. Haddon.

Cambridge, England, July 10, 1902.

SHORTER ARTICLES.

STRATIGRAPHY VERSUS PALEONTOLOGY IN NOVA SCOTIA.

The recent discussion of the Upper Paleozoic formations in the region of the Bay of Fundy brings the value of fossils as means of age determination, even as between two major time divisions, somewhat acutely in question. Beds which on stratigraphical grounds have been classed as Middle Devonian appear on the evidence of floras and faunas to be Carboniferous.

Certain fossiliferous terranes at Riversdale and on the Harrington River, Nova Scotia, are referred by Dr. R. W. Ells and Mr. Hugh Fletcher, statigraphers, to the Middle Devonian, and are correlated with the 'fern ledges' (Little River group) at St. John, which were regarded by Sir William Dawson also as Middle Devonian. The correlation of the Nova Scotia beds with the St. John 'fern ledges' is agreed to by Mr. Robert Kidston, the foremost British authority on Paleozoic Plants, and the writer; but each of us, quite independently and without knowledge of the other's views, unhesitatingly referred the plant beds, both at St. John and at the Nova Scotian localities, to the Caribonferous. The St. John flora, which is more complete, is regarded by the writer as probably of Upper Pottsville age and by Mr. Kidston as belonging to the Lower Coal Measures, the latter in Great Britain appearing to closely correspond paleobotanically to the uppermost Pottsville of the northern Appalachian district.

The gist of our conclusions has been given by the Nova Scotian geologists; but the paleontological evidence has been published only in part. Mr. Kidston submitted a report from which extracts have been made by Dr. Ami, who is personally not responsible for silence in regard to the rest of it. The evidence in the writers hands, which concerns the detailed study of the species and their geographical and vertical range in other portions of this continent, cannot properly be presented in full in advance of the publication of his monograph of the floras of the Pottsville formations, but an examination of the material from St. John described by Sir William Dawson and a comparison of it with the Paleozoic floras as yet made known in other regions of the world is in itself sufficient to prove the Carboniferous age of the beds to most paleobotanists.

The paleontological data for the age determination are not, however, confined to fossil plants. The beds in question contain vertebrates, crustacea, insects, pelecypods, ostracods and annelids. Collections of these fossils have been made and forwarded to various specialists, but of the results of the examinations by the faunal experts and of the conclusions communicated very little indeed has been made public, though reports seem long ago to have been submitted. From a short unofficial article* published by Dr. H. M. Ami, we learn that the ostracods were submitted to Professor T. Rupert Jones, and the crustacea to Dr. H. Woodward; and that *Hylopus Logani, Sauropus Dawsoni, Bellinurus grandævus, Prestwichia* sp., *Leaia tricari-*

* *Proc. N. S. Inst. Sci.*, Vol. X., pt. 2, pp. 162–178, 1900.