*Hydra viridis* during Regeneration' stating that it seems probable that the new cells are formed by division of the old cells throughout the entire piece. There are numerous good reviews of recent biological literature.

*The Plant World* for June contains 'How Shall our Wild Flowers be Preserved?' by A. J. Grout, being the third of the prize essays on that subject; 'The Yellow Water Lily of Florida,' by A. H. Curtiss who notes that this rare species is likely to be extirpated by the water hyacinth; and 'Habits of the Deep-set Bulbs of *Erythronium*' by Grace Stoddard Niles. Among the briefer articles is the report of the Secretary of the Wild Flower Preservation Society. The Supplement on the Families of Flowering Plants concludes the treatment of the order Gentianales and commences that of the Polemoniales.

*The Wilson Bulletin* for June contains a good article by Lynds Jones on the winter birds of Lorain Co., Ohio, and the same writer notes *Mareca penelope,* taken on the Licking Reservoir in March as 'A Bird New to Ohio.' Besides other articles the number contains a 'List of the Birds of Yokima County, Washington,' by Wm. Leon Dawson.

## *DISCUSSION AND CORRESPONDENCE.*

### SO-CALLED SPECIES AND SUBSPECIES.*

PERHAPS no discussions in zoology are as uninteresting and apparently profitless, to persons not engaged directly in them, as are those concerning the status of so-called species and subspecies. But a discussion may be uninteresting and apparently unprofitable, and still involve questions of great import, and these two ornithological papers which have just appeared from the Government press, cannot fail to raise serious questions in the mind of the average reader. Both papers deal with diversities of size and color in some of our common birds, and ten new trinomial names are added to our already overburdened nomenclature. For what do these names stand? Do they represent anything real and tangible? Is the phase of systematic ornithology exploited by these authors contributing anything of value to science, or is it simply making 'confusion worse confounded'?

Mr. Oberholser's pamphlet represents a very large amount of painstaking work, as 2,150 specimens of horned larks were carefully examined and compared in the attempt to make as complete and satisfactory a revision of the genus *Otocoris* as possible. The results are worth examination, but not so much for their intrinsic value, as for the revelation to an unusual degree of a zoological tendency, characteristic of the present day, and especially marked among ornithologists, the worth of which demands careful estimation. The author divides the horned larks into six species, although he admits that possibly two of these may be reduced to subspecific rank, ultimately. Of these six species, one well-marked form, of which little is known, comes from South Africa, while the others are confined to the northern hemisphere. Only one of the five species occurs in North America, but as 2,122 of the specimens examined represented that species, it will not be unfair to confine our attention to it, *Otocoris alpestris.* Although originally described by Catesby from the coast of the Carolinas, it is found not only throughout North America (except the extreme southeast) and southward into Colombia, but also in northern Europe and Asia. It therefore inhabits a wide range of greatly diversified country, and would naturally be expected to exhibit considerable variety in color and size. The important question which this monograph raises is how far is it desirable to recognize these varieties by name? Or better, are the diversities of size and color in a specified geographical area, sufficiently constant to warrant recognition as subspecies?

* 'A Review of the Larks of the Genus *Otocoris.*' By Harry C. Oberholser, Assistant Ornithologist, Department of Agriculture. From the Proceedings of the United States National Museum, Vol. XXIV., pp. 801–884 (with Plates XLIII.–XLIX.) [No. 1271]. Washington, Government Printing Office. 1902.

'Descriptions of Three New Birds from the Southern United States.' By Edgar A. Mearns, Major and Surgeon, U. S. Army. From the Proceedings of the United States National Museum, Vol. XXIV., pp. 915–926 [No. 1274]. Washington, Government Printing Office. 1902.

To many persons it would seem to be almost an axiom that a character which can not be stated in language or in figures of any sort is not sufficiently conspicuous to bear the weight of a name. But Mr. Oberholser, holding a point of view occupied by many ornithologists and mammalogists (and perhaps other zoologists) which is adding to current zoological literature hundreds, if not thousands, of trinomials every year, thinks differently; he says (page 803): "Various more or less perfect intermediates are very perplexing, and no means of determination can possibly be of value except the actual comparison of specimens, coupled with an accurate knowledge of the relative value of the proper differential characters. Satisfactorily to present such information in printed diagnoses is manifestly out of the question, for characters that will serve to identify even typical examples of some of the more closely allied forms are frequently almost impossible to express intelligibly on paper." Notice especially the contention that even the actual comparison of specimens is not itself sufficient for the identification of a bird unless such comparison is made by an expert. If this is so, systematic ornithology is in a bad way, for if the expert can not express the distinguishing characters 'intelligibly on paper,' what are we going to do when he dies? Of what possible use is it to attempt to maintain distinctions so fine that even a well-trained ornithologist can not tell upon what form his observations are made? Such distinctions might be of value if they had any geographical meaning, but even this is denied them in the case of *Otocoris,* for in Kansas the student must distinguish between four possibilities, and in northwestern Mexico near the international boundary line, he may come upon any one of *seven* of Mr. Oberholser's 'subspecies.' Nor will the season of the year help him much, for in Kansas at least three forms occur in winter, and in northwestern Mexico near the 'Line,' unless the larks keep very strictly to the limits laid down for them, no less than half a dozen forms may breed.

Another rule which to the layman would seem to be axiomatic is that characters which can not be recognized regardless of the locality where the specimens are collected are worthless. But Mr. Oberholser says (page 803) that 'the identification of specimens without regard to geography is, to say the least, liable to be difficult.' No one can read the paper carefully and not realize the magnitude of the difficulty. An illustration may be taken from the subspecies *chrysolæma,* which is given as resident in Mexico. Speaking of some specimens from Puebla and Vera Cruz, this statement is made (page 844): "If comparison be instituted between these specimens and typical *actia* from California, however, it will be at once seen that they are exceedingly similar, and, to say the least, difficult to distinguish, forming another of those perplexing cases of forms reduplicated by apparent intergradation of two or more others." In other words, these birds are *O. a. chrysolæma* in Mexico, but if taken in southern California, they would be *O. a. actia!*

Another point which will be a great surprise to many unsophisticated persons is the recognition given to very slight differences in size. Many examples might be given, but the following will suffice.

*O. a. enthymia* is said to be 'decidedly smaller' than *O. a. arcticola,* but the latter has the wing (total lengths are not given) averaging only 6.7 mm. longer than the former, the tail 0.3 mm. and the exposed culmen is the same in both forms. Even the apparent difference in the length of wing is not really so great, for only fifteen specimens of each form were measured, and the difference between the maximum and minimum wing measurement of the two is just 1 mm. Again the subspecies *peregrina* is based on a single specimen (from Colombia), which is distinguished from *insularis* (from the Santa Barbara Islands) only by size. It is said to be 'very much smaller.' As a matter of fact, the wing is only 5 mm. shorter than the average *insularis,* the tail 1.4 mm. shorter and the culmen .08 mm., and, moreover, the tail is 3 mm. *longer* than the minimum *insularis,* and the bill, tarsus and middle toe are each half a mm. *longer* than the minimum for that species. Clearly we have here an exaggerated idea of the length of a millimeter; the 'inch on the end of a man's

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.

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## 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