the capsule and attached at its other end to the under surface of a cork fitting the phials containing the reagents. The wire should be of such a length as to just permit the flow of the reagent through the two holes in the capsule when the cork is tightly fitted into the phial. To place the objects to be imbedded in their shellac-gelatine container I take a glass rod drawn out to a desirably fine point and dip it into a celloidin solution of gelatinous consistency (12 per cent. celloidin in 80 per cent. alcohol). A little of the celloidin will cling to the point of the rod, which is then allowed to come in contact with the stock of material to be dehydrated, in my case sea urchin eggs. A number of these eggs will cling to the sticky mass, which can be easily washed into the bottom of the prepared capsule. Then it is a simple matter to run the eggs through the reagents. One only has to transfer them by taking the cork from one phial and carrying it over to the next. They may first be washed in water and weak alcohol as the outside coating of shellac is insoluble in water and weak alcohol and hence prevents the dissolving of the gelatine. By the time 95 per cent. alcohol has been reached the shellac has dissolved away, but in this medium the gelatine is insoluble and so the objects are safely retained. They can be cleared in xylol and left in melted paraffin to permit thorough infiltration. When ready for the final imbedding one can easily hold the capsule out of the phial by means of the cork to which it is attached, and slowly drop melted paraffin into the mouth of the capsule with a pipette, all the time blowing on the capsule to hasten cooling. The paraffin will cool quickly and plug up the two drain holes and form a solid cylinder. Then one may detach the capsule from the wire and place it in water where the gelatine soon dissolves, leaving a solid form of paraffin with the eggs imbedded in the end of it. To assure being able to see the eggs one may place the capsule during the dehydration process for a few minutes in borax carmine, which will stain the objects red and thus enable one to see them through the rest of the process. After being sectioned the carmine may be decolorized with acid alcohol.

This method removes the danger of losing the objects when transferring them from the various solutions with a pipette. The drop of celloidin assures their being held in a compact mass and in most cases raises the bodies far enough from the floor of the capsule so that the rounded end may be sliced off without cutting away the objects and thus give a flat surface to section from. To be absolutely sure of this one may prepare his capsules with flat bottoms before imbedding. This is done by cutting off the round end and attaching a flat sheet over the bottom with liquefied gelatine and cementing it with shellac. Or again after the objects are imbedded in the round end of the capsule they may be sliced out and reimbedded in a Lefevre watch glass as suggested by Metcalf.[4]

This method will, I am sure, prove useful to any one having much imbedding to do, of minute objects. It has the advantages of being extremely simple, rapid and reliable.

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SOME REASONS FOR SAVING THE GENUS

As there seems to be something of a lull at present in the vexatious controversies over zoological and botanical nomenclature, I fear that I run the risk of being branded as a wanton mischiefmaker if I seek to reopen the subject in these columns. However, no one can say that the evils complained of are likely to diminish much in the near future. And furthermore, it has always seemed to me that one of the most flagrant of these evils has scarcely been *complained of* at all, at least in the public discussions regarding nomenclature. Complaint has been made, bitterly enough at times, of the constant changing of specific names, resulting from a rigid enforcement of the law of priority. In reply, it is contended, and with some plausibility, that such changes will cease automatically when the antiquarian has finally accomplished his task.

But there is another perennial source of

[4] *Loc. cit.*

confusion which has not received adequate attention. Apparently it is regarded as quite unavoidable, or perhaps it is not commonly thought of as a difficulty of *nomenclature* at all. I refer to the continual changing of names that results from the subdivision of genera. Who has not experienced the peculiar feeling of mingled dismay and exasperation which follows the discovery that some long-familiar genus, whose species are to most of us scarcely distinguishable *as species,* has been split over night into a half dozen new genera? In place of the familiar collective group—*Jonesia,* let us say—we now have *Neojonesia, Eujonesia, Pseudojonesia, Megajonesia, Microjonesia* and *Heterojonesia,* or perhaps a set of names that no longer even suggest the former unit. And if we look for the distinctions upon which these subdivisions are based, we commonly find that the differences are very trifling indeed in comparison with the many and detailed points of resemblance between these various groups.

Let me not be misunderstood. Differences, however slight, ought when constant to be recognized and in some way incorporated into the taxonomic structure. "Splitting," so far as it is based upon the detection of such differences, is a legitimate and indeed inevitable process, if systematic zoology is to progress. Why, then, should one object to the indefinite subdividing of genera? And is it not highly presumptuous for one who is not a taxonomist at all to be offering his opinions as to what constitutes a difference of generic value?

Taking up the first of these questions, it must be borne in mind that in the Linnæan system of binomial nomenclature the generic name plays two quite distinct rôles. One of these is to designate a taxonomic group, supposed to be intermediate between the family and the species. The other is *to form the first half of the "scientific" name of each species within that group.* It is for this reason that the changing of a generic name is so much more disconcerting than is changing that of a family or order. And this is why, in the writer's opinion, such splitting as we have just recognized to be inevitable should be done *within the limits of the genus,* either by the creation of "subgenera," or, if necessary, by the establishment of wholly new categories between the genus and the species.

As regards the second point above raised, I should indeed feel much diffidence in offering my opinion on this subject were there even an approach to unanimity in respect to what constitutes a character of generic value. It is frequently said that the genera of Linnæus are the families of to-day, while it is doubtless also true that some Linnæan species constitute present-day genera. Even now, the inclusiveness of the concept genus varies enormously in different groups of organisms. In general, those groups which have been studied most intensively by systematists are doubtless on the whole those in which the concept has acquired the most restricted meaning. This narrowing down of the inclusiveness of the genus is thus an evil which may seem to be progressive and incurable. Its logical outcome is the erection of a separate genus for each species, in which event the two categories will become identical. When that has come to pass, no further changes of nomenclature will be possible, and we shall have attained the much-desired stability. At the same time, all verbal clues to the nearer kinships between species will have been lost, and biology will be to that extent poorer.

Taxonomists are too prone to regard this whole question of nomenclature as one which is exclusively their own. The intrusion of an outsider into the fray is likely to be hotly resented. I remember venturing, several years ago, to express some of the above views in a letter to a well-known authority on one of the larger groups of invertebrate animals. No reply whatever was made to the line of reasoning set forth by me. I was merely "squelched" with the rejoinder that if I had sufficiently wide experience in describing species I would see things in a different light—a statement which is possibly true, though proving nothing as to the point at issue. Our taxonomic brethren have so long been treated

as "poor relations" by those who complacently believe their own studies to be concerned with *real* biology, that this sort of a "tu quoque" is now and then to be expected. But such "class consciousness" should be laid aside, and the question candidly considered whether the entire biological profession, or indeed society at large, does not have a proprietary interest in taxonomic names. A very little reflection will show that this is true. The case is not at all dissimilar to that of a coal or railway strike in which the rights of the public—the chief sufferers—are entirely ignored by the disputants. And we may say with equal justice that the chief sufferers from an unstable system of nomenclature are not the taxonomists—whether "splitters" or "lumpers"—but that host of unfortunates who are under the constant necessity of using these names, while having no share in their creation or transmutation.

Returning to the subject of generic names, it must not be supposed that the only evil resulting from this progressive "splitting" is the mere inconvenience of our having to learn new names as fast as the old ones are displaced by accredited authorities. This, indeed, is bad enough, but there is an even more harmful result which, I think, deserves further emphasis. I have spoken above of generic names as *verbal clues to the nearer kinships between species.* These clues lose their value in proportion as genera are made less and less inclusive. Let me illustrate. We have, on the coast of southern California, three common species of "ice-plant," which differ from one another strikingly in structure, appearance and habits of growth. When these three species of *Mesembryanthemum* have been assigned (as some day they will!) to the separate genera *Smithia, Johnsonia* and *Macarthyana,* those of us who are not systematic botanists may no longer think to look for the fundamental resemblances among these plants which appear to have so little in common. Again, I recently learned that a certain little straggling plant, with a yellow flower, which abounds along the beaches at La Jolla, is in reality an *Œnothera!* Who will say that I added nothing to my knowledge when I affiliated this little plant with that well-known genus? But how many such clues to relationship will be left when the genus-splitter has finished his work?

The question raises itself whether the detection of resemblances in nature is not as important as the detection of differences. Is it not largely this unity in variety—or variety in unity—which fascinates the true nature-lover, be he an amateur collector, a beginning student or a professional biologist? And it can hardly be denied that the extent of our recognition of such unity is greatly influenced by the *names* which we find applied to things.

Fortunately, I am able to cite, in support of my present contention, the words of a high authority in the field of systematic zoology. W. H. Osgood,[1] in justifying his extensive use of subgenera, writes that those who object to this procedure "must necessarily recognize more and more groups as genera until the distinction between the genus and the species becomes so slight as to be of little taxonomic value, while at the same time the gap between the genus and the group of next higher rank is correspondingly increased." Such a tendency, he says, "actually operates to reduce the number of categories of classification between the subfamily and the species, and this results, not in an improved and more discriminating system of classification, but one with fewer groups and fewer possibilities for the indication of relationships." Again:

> The use of subgenera provides a means of adjusting the differences usually existing between the general zoologist and the specialist. The generic name answers all the purposes of the general zoologist while the specialist may use as many subgenera as he desires and meet all the requirements of discriminating classification. This also operates to conciliate the amateur, whose outcries against the continual changing of names by specialists will thereby be lessened. Although these protests are

[1] "Revision of the Mice of the American Genus *Peromyscus,*" U. S. Department of Agriculture, North American Fauna, No. 28, 1909 (citations from page 25).

often unreasonable, the specialist should remember that his scheme of nomenclature to be truly successful must answer the purposes of others as well as himself. If the specialist conservatively retains well-known and natural generic groups he may segregate subgenera indefinitely without retarding the progress of exact taxonomy, and, at the same time, without interfering with the less exacting needs of the general zoologist and the amateur. Moreover, further advantage is found in the fact that the percentage of legitimate changes of names that would confront the much-abused amateur would be greatly reduced; for changes of subgeneric names on account of preoccupation and other causes would in most cases concern only the specialist.

I could name at least one other leading mammalogist who heartily concurs in the views quoted. So the issue is not exactly one between the "general biologist" and the systematist, but is rather one between two different types of systematists. In this conflict the "general biologist" should, I think, lend his regard for the interests of the scientific public.

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THE PROBLEM OF THE PRIBILOF ISLANDS

THE U. S. Bureau of Fisheries has issued an elaborate and handsomely illustrated report on Alaskan conditions,[1] the work of Mr. E. Lester Jones, its deputy commissioner, embodying the results of his investigations during the past summer. The major portion of this work lies outside of the writer's field, but that portion which treats of the fur-seal islands suggests a few words of comment from one who has given much time and attention to their problems.

Mr. Jones thus sums up the Pribilof Islands problem:

> If moral, intellectual and general conditions are to be improved; if the business of the islands is to be carried on along business lines (and surely the proposition of these islands, including the fur-seal and the fox herds, is largely commercial), then the situation must be viewed from an entirely different standpoint than hitherto; for the returns the government is to receive from its investment warrant the expenditure of a sum of money large enough to give the officials of the government and the natives civilized surroundings, and to provide adequate means and necessary facilities to accomplish a proper administration of the affairs of these islands.

This summary follows the discussion of a long series of topics such as immorality and drunkenness among the natives; inadequate and unsanitary housing facilities; unsatisfactory schools; inadequate and ill-adjusted wage schedules; insufficient occupation for the natives; need of additional government agents; better facilities for unloading vessels; stricter landing regulations, etc., the conditions respecting these matters being found to be "deplorable." The keynote of the whole discussion is that the government officials and natives resident on the fur-seal islands are without civilized surroundings and that it is the duty of the government to relieve the situation.

In a residence on these islands for purposes of investigation of more than twelve months' duration distributed over five seasons and a period of seventeen years I failed to discover this lack of civilized comforts noted by Mr. Jones. On the contrary, I enjoyed such comforts to a marked degree, surpassing that which I have found possible at times in home communities of a much larger and more accessible type. I have been quartered in all of the government and company houses on each of the two islands, and there never was a time when I could not get a hot bath for the asking, and on St. Paul Island is the only place where I have ever experienced the delicate attention of having an attendant light a fire in my room before getting up in the morning. These things are specifically mentioned because Mr. Jones specifically notes the absence of bathing facilities and of janitorial service as among the deprivations to which the government officials are subjected.

Speaking of more important matters—morality, temperance, sanitation and personal cleanliness among the natives—if the summer of

[1] Report of Alaska Investigations in 1914; Department of Commerce, Bureau of Fisheries, by E. Lester Jones, Deputy Commissioner of Fisheries, December 31, 1914.