obtrude mandatory regulations in any present system for coping with them. Under it the relation between the inventor in the government service to the government itself is clearly established, and the inventor will be encouraged by the knowledge that he will not be deprived of credit for the work of his genius, and, in the event of his invention proving of actual public service, he will receive some material return therefrom. No question of ethics can arise to embarrass him and he will be relieved of all care and expense in the administration and disposal of his patents.

The government derives its advantage under this measure in the stimulation of inventive productiveness among its workers, in the control it obtains thereof, and in the valuable experience it gains in this field of practical economics, which will very probably be reflected in improvements in patent law.

The public reaps its benefit by having cleared away the obstacle heretofore existing between the inventor's genius and the full and proper industrial application thereof, thus liberating and giving impetus to invention, with consequent increase of productiveness, tending toward improvement of working conditions and general prosperity.

ANDREW STEWART

BUREAU OF MINES

THE USE AND ABUSE OF THE GENUS

I SHOULD hesitate to burden the readers of SCIENCE with another technical discussion on nomenclature but the question which I wish to bring to the consideration of systematists is not a technical one and has nothing to do with Codes nor with priority.

We are all painfully familiar with the changes that are continually taking place in generic names, both of animals and plants. Such changes fall, roughly speaking, into two categories:

(1) Cases where an older name for the same group is discovered in some overlooked work and is substituted for the one in general use.

(2) Cases where a generic group is subdivided, the old name being restricted to one of the subdivisions and new names given to all the others.

The first sort of change is necessary and is governed by a definite code of rules which is rapidly effecting international uniformity, so far as such cases are concerned. The second set of changes, however, is entirely dependent upon personal opinion, with no hope of uniformity or finality. Generic groups are separated from one another by all degrees of difference and there is no standard by which the amount of difference may be consistently measured. Consequently no two systematists will be in agreement as to how many groups may be recognized in any given family.

Ever since the time of Linnæus generic groups have been undergoing disintegration until in some families the ultimate condition has been reached of a generic group for every species. When this stage has been attained we have lost all trace, in the scientific names of any relationship whatever between the species. The binomial name in other words has become useless and we might just as well have a mononomial. The very object for which the generic name was proposed has been lost.

To illustrate the point further, suppose that we subdivide an old genus into three, and use three generic names where previously we used but one, we emphasize, it is true, that there are differences between these three groups, but by the very same act we obliterate the fact, formerly indicated by the single generic name, that there are resemblances which join these three groups together as compared with other groups in the same family. One of these facts would seem to be of quite as much importance as the other and by the creation of the new genera we lose quite as much as we gain. We should carefully guard against allowing our enthusiasm for the discovery of differences, to blind us to the fact that the real object of systematic research is the discovery of true relationship.

Now the whole trouble in this matter—and a vital flaw, to my mind, in our system of nomenclature—is that we try to make a double use of our system with the result that it is

gradually breaking down from the impossible burden.

A generic name as we use it to-day is made to serve two purposes. It is, (1) a term by which we indicate to others what we are talking or writing about, and (2) a term by which the systematist indicates what he regards as a recognizable phylogenetic group.

It is suicidal for any system of nomenclature that names for "things" should be constantly changed to fit our ever changing ideas of their relationships. Surely there should be some way of indicating the progress of our studies in the relationships of birds, for instance, without rendering unintelligible to all save a few specialists, the very names by which we refer to those birds.

We are already striving to find a solution of this problem, as is evidenced in the growing tendency to abandon the technical name entirely in semi-scientific publications in favor of the English name, and restricting the constantly increasing generic terms to systematic or phylogenetic discussions. It seems to me, however, that there is another way open. If we could be content to use the broader generic terms of a few years ago for *nomenclatural* purposes and use another term, call it subgenus or what you will, for further systematic refinements, without incorporating it in the name itself, we should accomplish our aim.

We make no effort to incorporate in the scientific name of an animal or plant its family relationship, and we arrange animals and plants according to geographical relationships without insisting upon modifying the name to indicate such relationship. Why then should we insist upon imparing our system of nomenclature by constantly changing the generic names every time we change our minds as to how many minutely different subdivisions we are going to recognize in the group?

It is very easy to ridicule my proposal to use broader generic terms for nomenclatural purposes by saying that we do not wish to return to the ideas of Linnæus, and place for example the Swallow, the Swift and the Pratincole in the same genus, or to have only one generic name for the sparrows and one for the warblers. This is very true and it is perfectly obvious that we must adopt some position midway between the two extremes, while at the same time we must frankly admit that such a position can only be reached by a purely arbitrary decision as to how many genera we are going to recognize. In any Check-list or monograph, however, we settle this matter by arbitrary decision anyway, as we have no criterion as to what constitutes a distinct genus. Therefore why not adopt an arbitrary set of genera *de convenience* so far as nomenclature is concerned and use subgeneric terms when we desire to call attention to more refined phylogenetic groups. At the present time we constantly make use of "group" names in discussing the relationships of different sets of species in a large genus without in any way interfering with the nomenclature and the practise could just as well be extended.

I do not propose any radical action in the way of lumping present-day genera. In birds, with which I am most concerned, the genera of the A. O. U. and B. O. U. Check-lists could be taken as a point of departure and with some slight alterations and adjustments be adopted. The main point would be to check the excessive generic subdivision which is to-day rampant in certain quarters. If some such reform be not inaugurated technical nomenclature will soon be—if it is not already—useless to anyone but a narrow specialist.

For example the botanist has long known of the differences between the so-called flowering dogwoods and those without involucral leaves, but what profit does he gain by changing the generic name of the former to *Conoxylon* compared to the loss that he inflicts upon the ornithologist, the entomologist, or the student of general scientific interests, who knew them under the name *Cornus* and who, unless they be Greek scholars—a rapidly expiring race by the way—have no conception of what sort of herb, shrub or tree a *Cynoxylon* may be. So too the unfortunate botanist who may have learned to know certain sparrows as species of *Ammodramus* fails utterly to recognize his old friends under the names *Thryospiza, Ammospiza* and *Passerherbulus*.

Is it small wonder that the majority of us are turning to the use of English names except in some group with which we happen to be familiar.

I am perfectly aware that the systematist who concerns himself only with questions of the number of species and genera and the names for the same, in a single branch of science in which he specializes, will regard my remarks as pure rubbish. We must all admit, however, that specialization makes us blind to the views of outsiders and to some of the broader aspects of our specialty. Things that seem to us from long association as necessary, may be found upon unbiased consideration, susceptible of very important modifications and the present problem seems to be one of these.

In presenting these ideas I do not wish to be misunderstood. I do not wish to be placed in the same category as the carping critic of all nomenclatural changes who, by the use of clever sarcasm, appeals to the multitude who know as little about the facts as he does himself. I am a staunch supporter of the International Code of Nomenclature and all of the changes which its enforcement requires. They are necessary for ultimate stability and are happily permanent. I would encourage the study of geographic variation in the species and the establishment of subspecies since no matter how many of the latter we may have, their relationship to specific groups is always clearly indicated by the accompanying specific name.

I would encourage, to the fullest, research into the relationship of species, with however as much consideration for their resemblances as for their differences, and I would endorse the establishment of as many groups as may be desired under subgeneric headings—or any other term that may be preferred—but let us not insist upon introducing our conclusions on this matter into the technical name with the result of seriously imparing the principal use of that name.

Let us be conservative in the number of generic names that we recognize, and let general utility have a voice in the matter, of equal weight with that of the splitter and the lumper, just as to-day in another field of discussion the public is becoming recognized as a third party on an equal footing with labor and capital.

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OSCAR A. RANDOLPH

DR. OSCAR A. RANDOLPH, associate professor of physics in the University of Colorado, lost his life in a snow storm on April 11, during a trip to the Arapohoe Peaks on the Continental Divide. He made the trip with one companion Mr. Ellett, also of the department of physics, for the purpose of photographing winter storm scenes. They ascended to an altitude of about 12,500 feet and then descended into what is known as the Hell Hole. On the trip Dr. Randolph became ill and was unable to overcome the handicap of a sudden heavy fall of snow accompanied by bitter cold. Mr. Ellett had assisted him on the return trip till they were both exhausted. Mr. Ellett then protected Dr. Randolph with all the means at his command and started for help at the cabin of two trappers who were living some five miles away. In his weakened and confused condition he wandered for several hours without making much progress in the deep snow. One of the trappers finally found him and learned of Dr. Randolph's condition. Dr. Randolph died however before the trapper could reach him. Owing to the fact that both men were experienced mountaineers and had often made trips to the peak their friends at the university did not become alarmed till noon on April 12, when a rescue party started for the scene. Mr. Ellett, though terribly exhausted and somewhat frozen, will recover.

O. C. LESTER

ALFRED J. MOSES, 1859–1920

BY the death, on February 27, of Alfred J. Moses, professor of mineralogy at Columbia University, the science of mineralogy has lost one of its most eminent and valued exponents. Professor Moses's work as a teacher, as a