must endure and as an encouragement to careful and thorough collecting. This would be the only exception to the worker-name rule, but it should be done only as a reward of real merit.)

The problem, then, is to eliminate vanity. There is no simpler way to bring this about than to outlaw the quotation of the author after a generic, specific, subspecific, varietal or mutational name. As a systematist, who has the privilege of inscribing his name after I do not know how many such scientific names, I would suggest to the International Committee on Zoological Nomenclature that they adopt a rule to the effect that the author's name shall appear only in synonymic catalogues or papers of rectification. Unfortunately for the adoption of radical ideas, the International Committee is composed, for the most part, of elderly systematists. If Professor Needham sees reason in the present suggestions, will he join me in the anti-authority crusade by omitting all authorities in his papers and encouraging others to do likewise? Editors should then be encouraged to drop from submitted manuscripts all scientific name authorities.

Some one will immediately raise objection on the grounds that one will be unable to tell to which of two species a paper refers: as *B. lata* of Smith (from England) or *B. lata* of Wang from China, at first thought to be identical, later found to be distinct. Such difficulties can always be raised by die-hards, but the intelligent, adaptable scientist is able to find a solution. In this particular example, as is well known to all taxonomists, *B. lata* Wang is renamed (not *B. wangi*), and ever after *B. lata* Wang needs not be referred to again, except in a catalogue of synonyms.

Here then we come to the morgue. Every family of plants and animals, on account of still-births, illegitimates and other anomalous and useless offspring of hasty or ignoble taxonomists, should have a synonymic catalogue for the reception of its useless progeny. To this catalogue all vain systematists may turn to count up their dead offspring or check up on the parent of legitimate, well-born children. Further, in a comprehensive systematic paper or report, it would be legitimate to quote the original description and two or three cardinal synonyms (as is done anyway), in six-point type, under the authorityless specific name. But why place the authority after the name and then in the synonymy or literary reference immediately beneath, except to gratify one's sense of vanity?

Coldly considered there is perhaps no more illogical procedure in our scientific nomenclature than this author notation. For usually on turning to the author's work, instead of finding a detailed description, a detailed set of figures and comparative data, one finds a few lines in Latin which might fit one of many species, or a fairly long description which dodges the differential characters. Far more valuable would be a reference to a monograph embodying enough data for ready identification or a figure which will give the reader a clear concept of the species in question without much expenditure of time. The old system undoubtedly had its place, but is it not time to break an old habit and adapt ourselves to a more rational, practical and less dangerous technique?

As a transitional step, after each scientific name one might place a numeral which refers to the paper of original description in the bibliography. And right here we come upon another of science's mooted points,[2] namely, what system of bibliographic reference shall be used, the numerical or egocentral? As scientists (impersonal beings) we can only use the numerical. Would this not tend to discourage the writing of too many papers? At least it would help to eliminate the personal element from our scientific contributions.

I fully sympathize with Professor Needham in his desire to simplify scientific nomenclature for the student, but to have to later introduce an advanced student to a vicious "fundamental" system of nomenclature is hardly satisfactory, while to remove the spice of vanity from the hyperconsciousness of some "scientists" would be striking at the root of the evil, with a little kick.

Perhaps there is no more vicious system than that of the botanist where two authorities appear or, worse yet, where the only authority is that of the upsetter of stability. As at present practiced, the authority of a plant name is not (or rarely) the original describer, but he who can, by any stretch of the systematists' art, place the species (or lower denomination) in a different genus. The result is an enormous increase in generic assignments, chiefly through the erection of new generic names. Thank God this system is foreign to the zoologist!

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A NOTE ON THE LIFE HISTORY OF THE LARGE AMERICAN FLUKE, FASCIOLA MAGNA (BASSI)

IN the course of an investigation of liver flukes in sheep and cattle in the United States, especially as regards the life histories and the intermediate hosts of the flukes, the writer made a survey of the Western and Southern states during the period from the

[2] SCIENCE, n. s., 71: 38–39, January 10, 1930.

spring of 1929 to the spring of 1930. The most favorable area found for the study of the large liver fluke of cattle, *Fasciola magna,* was in the region of the swampy plains of southern Texas, and the writer spent part of the winter at Houston investigating the life history of this parasite. In this study he had the use of a laboratory and other facilities at the Rice Institute through the courtesy of Dr. Asa C. Chandler, of the institute faculty. The results of the investigation on the life history of *F. magna* may be summarized as follows.

F. magna, unlike *F. hepatica,* has nothing to do with the bile system of cattle, apparently, as it lives in the liver tissues, or sometimes as an erratic parasite in the lungs, enclosed in the liver in an encapsulated cyst which does not appear to have any connection with the bile ducts. The eggs of *F. magna* were never observed in the bile of a cow infested with that worm, as they would be in the case of *F. hepatica,* but they were found rather abundantly in cases of heavy infestations in the cysts and in the contents of the digestive tract. This suggests that the eggs of *F. magna* may use the blood system for getting out of the infested animal, but positive confirmation of this idea was not obtained.

Neither in size nor shape do the eggs of *F. magna* differ from those of *F. hepatica,* but they are furnished with an appendage, a sort of filament, by which they can be easily identified. Besides this, the eggs of *F. magna* develop much slower than do those of *F. hepatica;* the first miracidia begin to appear on the thirty-third day, while in the case of *F. hepatica,* under the same conditions, miracidia appear on the eleventh day.

The miracidium of *F. magna* is very like that of *F. hepatica,* but it can be distinguished from the latter by the peculiar shape of its head papilla, by the ratio of its body parts and by the size of its germ-cells. In the writer's experiments, the miracidia of *F. magna* readily attacked *Galba bulimoides techella* Hald., in which snails they developed successfully and produced their first generation of rediae. It was necessary to stop the experiments on the forty-fifth day of their development, and the cercariae had not appeared at that time, but the cercaria phase was studied in snails that were infested naturally, and in this case the redia, which differs from that of *F. hepatica,* made it possible to identify the species definitely.

The cercaria of *F. magna* is very much like that of *F. hepatica.* The specific characters by which it can be recognized are its size, about three fifths that of *F. hepatica,* and its excretory system; in *F. magna* the large excretory ducts are not yet fused in this stage to form a common stem or excretory vesicle as in the case of *F. hepatica.* Like the cercaria of *F. hepatica,* it encysts on everything that it happens to come in contact with while swimming around, and the cysts, superficially, do not differ from those of *F. hepatica.*

Galba bulimoides techella Hald. is a very common snail in the area investigated, and is also the only limnaeid species that is widely distributed there. It keeps to the muddy borders of ditches, pools or other collections of water, all of which are abundant in that part of Texas.

It is worth mention, in this connection, that *Galba bulimoides techella,* as was proved experimentally,[1] is also the intermediate host for the common liver fluke, *F. hepatica,* which is widely distributed through the Southern states. As for the Western states, where, save for the southern part of California, *Galba bulimoides techella* is absent, another snail, *Galba bulimoides* Lea, appears to be responsible for the spread of liver fluke disease, as was experimentally proved by Simms and Shaw for Oregon and by the writer for California.

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SCIENTIFIC BOOKS

Plant Hybridization Before Mendel. By H. F. ROBERTS, the University of Manitoba. Princeton University Press. $4.

THE growing recognition of the importance of hybridism in the breeding of plants and animals and in the races of men should receive a further impetus from the publication of this well-balanced, adequate and extraordinarily interesting book. The only inadequacy noted is in the title, for it would be difficult to find anywhere also such an excellent account (the reviewer knows of none) of the events and personalities connected with the recovery of Mendel's long unrecognized work, and the launching of that Mendelism which has so richly transformed biology and also the associated -ologies during the elapsed thirty years of our auspicious century.

The discussion begins with the earliest known cases of the cross fertilization of plants by hand, in the culture of dates, in that region wherein had been

[1] *Jour. of Parasitology,* October 20, 1928.