ONE-MAN AUTHORITY CITATIONS

THE recent agitation on the subject of citation of authorities in botanical nomenclature[1] is being so prolonged that it seems advisable to review the various attacks on the existing system along the line of a comparison of the present degree of efficiency with that which might be expected from the various proposals.

Clausen's very clear reply[2] to Peattie's argument indicates that the principle of authority omission is not attractive to the practicing taxonomist. The subsequent papers by Jacot and by Baily, though agreeing with Peattie in the proposal to dispense, totally or in part, with authority citation, do not agree on the method or system to be substituted. Apparently no one is able to suggest a system sufficiently attractive to win agreement from his fellow critics of the existing method.

Dr. Samuel Johnson's oft-quoted remark is called to mind: "Every other author may aspire to praise, the lexicographer can only hope to escape reproach." The same is true of taxonomists working in any field of biology. If they are too conservative and too ready to allow variations to creep into their concept of this species or that, they are speedily made aware of the fact by the non-systematic biologist for whom they are engaged in making identifications. If, on the other hand, their species concepts are narrow and result in more numerous and less readily recognized species (no matter how sound taxonomically), they are again assailed. In short, the work of taxonomists is a service rendered to the general field of biology and as such is subject to attack from all sides, and the taxonomists must regard their productions as tools in the hands of other workers and fashion them accordingly.

On the other hand, the general field seems not to realize the urgent need in the field of taxonomy for an unfailing system of bibliographic citation, nor to appreciate the difficulties of setting in order an exceedingly complex group which has been dabbled in by a dozen taxonomists in the past two centuries and subjected to as many species concepts. (Though perhaps not in the case of this controversy, the objections to authority citation on any ground whatsoever usually have come from biologists other than taxonomists.)

Peattie (*loc. cit.*, p. 128) cited some very excellent arguments *against* his own proposal of omission of authorities, and his rebuttal of these arguments can hardly be regarded as complete. They need further examination:

(1) "The original author is deprived of credit." Of this Peattie says the purpose of authorities is not to give credit but to lead the reader to the original description. With that statement every botanist would agree; it constitutes strong argument in favor of retaining authority citations. It makes little difference to any of us if, a hundred years from now, our names remain attached to our new species and combinations, but for some reason it matters greatly whether or not those species are recognizable to the next several generations.

(2) "The one-man citation might encourage name-jugglers to attach their names to everything." Peattie points out the "remarkable activities" in this field of Kuntze and Greene in spite of two-man citation. The fact that two-man citation allows as much juggling as one-man citation is hardly an argument for the superiority of one-man citation. It is unbelievable that any botanist would fail to transfer a species from one genus to another if it obviously fit better by being changed. So long as there remain species in the wrong genera, they need to be changed, no matter whose name is attached. Actually, taxonomists are highly appreciative of the drudgery which Kuntze and Greene performed in making new combinations for the sake of accuracy.

(3) One-man citations "conceal the history of the species." Peattie wants to know "why, except in elaborate taxonomic work, should it be revealed?" It is doubtful that any biologist would admit that his work need be less accurate than that of taxonomists. If it is objectionable to a worker to reveal the history of the species he cites, he can not care much if his species names are recognizable in the next century. The history of a species often shows clearly whether one or another interpretation of the name is meant. In any study, such as host-parasite relations, ecology, physiology and genetics, in which exact identity of species and varieties is of extreme importance, complete citation of authorities facilitates subsequent identification.

The efforts of taxonomists to meet the demands of biology with a workable classification of the thousands of existing species have resulted in the building up amongst most workers of the type concept for reference purposes. That this practice is not only practical but essential is readily demonstrated in the genus *Quercus*. Even by means of modern lengthy and detailed descriptions it is in many cases quite impossible so to characterize a species that it can be recognized by subsequent workers. Linnaeus described *Quercus rubra* in the eastern United States. Du Roi misunderstood the description and applied the name to what is now known as *Q. maxima* (Marshall) Ashe. He was followed in that by numerous authors. When subsequently it was discovered that Linnaeus' name had been meant to apply to what had been known as *Q. falcata* Michaux, an attempt was made to apply the name correctly. However, so many authors were using the name to designate the more northern *Q. maxima* that

[1] SCIENCE, 88: 128, August 5, 1938; 240, September 9, 1938; 474, November 18, 1938.

[2] SCIENCE, 88: 299, September 30, 1938.

complete misunderstanding resulted, so that Professor Rehder has recently moved to abandon the name *rubra* and allow both species to carry the names subsequently proposed for them. How much difficulty and misunderstanding might have been eliminated, had there been a type specimen to help du Roi avoid his initial error, one can only guess.

No one, it is hoped, would suggest that taxonomists abandon the type system. Yet, the system would be greatly hampered by the suggested omission of one or the other of the authority citations. Full citation tells a taxonomist at a glance that at least two treatments are available, and he invariably needs to study both, unless he wishes to run the risk of perpetuating the many errors which have not yet been weeded out of botanical nomenclature. The first citation in most cases aids to fix the type. The second reveals a critical study of the species, which may or may not be accurate. To omit either would be as serious an error as the omission of a citation from the card catalogue of the Congressional Library.

Jacot (*loc. cit.*, p. 240) places undue faith in existing monographs. His suggestion that the name of the monographer giving the fullest description be cited would result in the greatest confusion. With the adoption of such a rule one could imagine every describer of a new species writing descriptions so ample that each one would cover several pages. There still remain thousands of species which have not been fully described in any monograph but were recognized beyond doubt from their original descriptions and subsequently have been changed from one genus to another. Which authority would one cite under Jacot's proposal in such a case? Jacot's notion that the old original descriptions and the authorities for them are of no practical value but only of historic value is dangerous in extreme. Ecologists, morphologists, geneticists, etc., perhaps do not realize that each of the species with which they deal is painstakingly run through the mill of "ancient" descriptions by some modern taxonomist before he dares drop it into the lap of his biological public. Only so can he be sure that he is contributing to a reasonably sound nomenclature. It is not for nothing that each succeeding International Botanical Congress has carefully revised the code of nomenclature in an effort to guide its constituent membership to greater stability.

Baily (*loc. cit.*, p. 474) charges that authority citation "augments the confusion instead of diminishing it." He cites the example of Solander's species which were published in Dillwyn's catalogue. It is easy to add numerous other examples, such as Duval's species in A. De Candolle's Prodromus. The accepted method of citation under those circumstances is "Solander in Dillwyn," "Duval in A. De Candolle" or the proper abbreviations of those names. Either method permits ready reference to the original description, particularly with the aid of Index Kewensis.

Baily recognizes the prime importance of determining the original identity of a plant name and proposes setting up a periodical to function as a receptacle for the authority citations, synonyms, etc., which so many workers wish to omit from their writings. He does not state why the Index Kewensis and the Gray Herbarium Index do not amply fill our needs, and it is not at all apparent how any other form of index could be more helpful.

It would be interesting, however, to learn how the exponents of authority omission would propose to locate in any index some of the names they might encounter. For instance, *Quercus hypoleuca* might conceivably be recommended to our nurserymen as a desirable ornamental. Without further information the nurserymen would refer to Baily's proposed periodical, where they would find *Q. hypoleuca* Engelmann credited to the American Southwest. But there is also the earlier published and quite different *Q. hypoleuca* Miquel in southern Asia. The American species is known under the present system as *Q. hypoleucoides* A. Camus. Its synonym is cited as *Q. hypoleuca* Engelmann, not Miquel. How could this information be furnished without the use of authors' names?

Even under the present system too many errors and misunderstandings arise. These certainly can not be diminished by the adoption by taxonomists of a more lax system. In fact, in the interest of an ideal of accuracy, complete authority citation (and the citation of any other information which might be helpful in subsequent identification) should be practiced by non-taxonomic botanists as well. Unfortunately, an appalling proportion of these do not even bother to collect or preserve specimens for identification.

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SPRAYING WITH PLANT GROWTH SUBSTANCES TO PREVENT APPLE FRUIT DROPPING

ORCHARDISTS need no introduction to the subject of late fruit dropping, a trouble which occurs with many apple varieties and other fruits just prior to and during harvest time and which annually results in substantial losses. For those less familiar with the problems of apple growing, for instance, it may be stated that this tendency of the fruit to drop is, in general, a characteristic of early ripening varieties, but is also of frequent occurrence with a number of important midseason and late apples. As the fruit approaches the proper maturity and color for harvesting, the danger of loss from dropping becomes more and more acute. With varieties susceptible to this trouble, each day that the fruit is allowed to remain on the tree to attain these desirable market qualities