new forest. The purchase approved in the Green Mountain unit in Vermont is the first in that unit, which eventually will be a national forest. The commission also discussed establishment of three new purchase units in Wisconsin, but no action was taken on them.

DISCUSSION

ERRONEOUS CITATIONS AND TITLES OF SCIENTIFIC PAPERS

EXPERIENCES in connection with the editorial supervision of scientific papers sent in for publication in standard journals, and in connection with the use of literature lists published in other journals, have revealed and emphasized two weaknesses on the part of investigators, which should be considered seriously by every author who attempts to publish an account of his work, and by every editor responsible to the public for the kind of service he renders.

The most discouraging feature of manuscripts, just as they are received from the authors, is the lack of accuracy in citation of pertinent literature, caused by a common failure to check up the citations with the original papers. *It is never safe to copy a citation from some other author's literature list.* Without casting reflections upon any author in particular, I wish to cite a couple specific cases to illustrate this point. Here is a paper by S. S. ZILVA, on "The Action of Ultra-Violet Rays on the Accessory Food Factors," published in the Biochem. Jour. **13**: 164–171. 1919. ZILVA cites STEENBOCK, BOUTWELL and KENT as Jour. Biol. Chem. **36**: 577. 1918. On looking up this citation, I found myself in the midst of a paper by HARDEN and YOUNG on "Action of Enzymes on Human Placenta." The correct citation for the STEENBOCK paper is Jour. Biol. Chem. **35**: 517–526. 1918.

Another example may be chosen from the Biochemical Journal, but might be duplicated from any journal. WEBSTER and HILL, in a paper on "The Supposed Influence of Irradiated Air on Growth," Biochem. Jour. **18**: 340–346. 1924, cite STEENBOCK and NELSON as Jour. Biol. Chem. **61**: 355. 1923. On going to this journal, I found a paper by Petrén on "Low Nitrogen Metabolism with Low Carbohydrate Diet in Diabetes." The STEENBOCK and NELSON article was finally located in volume **56**: 355–373. 1923, after searching the indices of five volumes.

These are not isolated cases. Everyone who attempts to examine the literature cited in scientific papers will almost immediately run into aggravating difficulties because of the lack of care of authors who are too anxious to publish to take proper time with this indispensable adjunct to a good paper—the literature cited. As an editor with some years of experience in handling publication of papers, I have found it necessary to check up on *all authors*. There is seldom a paper handed in that is free of erroneous citations. In some few cases the citations have been 100 per cent. in error, *even when the author was citing his own work!* To give more concrete quantitative data concerning this evil, a check has been made on a series of papers handled during 1930. The batting average for whole numbers of a publication is approximately 54 per cent. in the cases examined. Forty-six per cent. of the citations needed correction in some way or other. The errors are of numerous kinds, including misspelled names of authors, wrong initials of authors, omission of parts of titles, or substitution of words in titles, change of singular to plural or *vice versa,* omission of umlauts in German titles and of accents in French, failure to capitalize German nouns, capitalization of German adjectives, errors in name of journal, errors in volume number, omission or errors in page limits, error in or omission of year of publication, etc., etc. Every conceivable error that can be made is being made daily by authors, and most of them seem to be utterly unconscious of bad technique in this connection. Or perhaps they think: What's the use of having an editor, if not to do these chores?

Since very few editors take the time and trouble to check up on these errors of citation before publication, the literature lists published during recent years are full of erroneous citations, and it is for this reason that it is never safe to copy a citation from such a list. Nothing but consultation of the original source can insure accuracy, and every author who cites literature should take enough pride in his work to insure accuracy in the literature citations.

The other point of weakness which needs to be considered by authors of papers is the advertising of series of papers through double titles. Turning to a recent literature list in Plant Physiology, we find the following: "Some influences of the development of higher plants upon the microorganisms in the soil. III. Influence of the stage of plant growth upon some activities of the organism." And from the Annals of Botany comes this title: "Observations on the anatomy of teratological seedlings. I. On the anatomy of some polycotylous seedlings of *Cheiranthes cheiri.*" Occasionally authors write in asking to change a perfectly good simple but adequate title to one of these long double titles that require three lines to cite, whereas the simple one requires but one. One wonders why an author should desire these long titles, with constant duplication of the first half. Does he imagine that it is impressive of his prolific authorship

to place XVIII in the midst of a title, and that it would be still more impressive if it reached LXXXVIII? Or will the list of titles not occupy enough space in the 70th year Festschrift unless they are made of double length?

There is surely no good reason for this double title vogue. It is a mischievous habit which should be consistently repressed, not by editors, but by the authors, themselves. Titles should be made as short as they can be made without concealing the nature of the work, in the interests of economy of publication. And every title should be distinct enough to prevent confusion. Occasionally identical titles are used for two different papers. Such papers are easily confused, and wrong citations may be given without authors being aware that they are in error. It is not a difficult matter to select concise and adequate titles of a few words in length. It saves much time in type setting, and much costly space, to make them brief.

As these problems have forced themselves to my attention repeatedly, they are mentioned in the hope that authors who prepare papers for the scientific press will make some effort to cooperate in a difficult situation. Formulation of short titles, and accuracy in citation, would lighten some of the burdens resting upon the publication department of scientific work.

C. A. SHULL

THE UNIVERSITY OF CHICAGO

A FURTHER COMMENT ON THE "PUMPING" HABIT OF PLANT LICE

HAD the writer of the article appearing in SCIENCE, 72: 560, November 8, 1930, entitled "Plant Lice Pumping in Unison," substituted the word "jumping" for "pumping" he would be more nearly correct in describing the synchronous movements of the members of certain aphid colonies. Instead of the described behavior, which has probably been observed with many species of aphids, on many plants by many entomologists, being explained as one of pumping action it is undoubtedly a response to external stimuli. It is a reaction to danger, to shake off or frighten away the small parasitic flies and wasps attempting to place an egg in or on the aphid's body. With the approach of danger or with slight mechanical stimuli, as jarring, the aphid is disturbed and twitches its body laterally or dorso-ventrally without withdrawing its mouthparts from the plant. The wave of twitching is observed to move along the stem as it is taken up by the other members of the colony. It is not a movement performed simultaneously by all members of the colony.

F. M. Webster and W. J. Phillips, in their treatise on the spring grain aphis (*Toxoptera graminum* Rond.) (U. S. Dept. Agr., Bureau of Entomology Bulletin 110, September, 1912), describe the activity of the parasite *Aphidius testaceipes* Cress. among colonies of this aphid. The parasite is said to show little or no fear while among young nymphs but if she is among a number of adult Toxoptera and they begin to kick up their abdomens, she often hurries away, apparently in alarm (p. 106). An aphid, after being pierced by the ovipositor of this parasite (p. 105) or by that of *Aphelinus nigritus* How. (p. 124), is observed to "kick up" her abdomen as if suffering pain and a droplet of liquid often appears at the point of puncture or at the ends of the cornicles. F. M. Wadley and J. A. Hyslop called attention to the above record on *T. graminum* and also kindly furnished notes on the habits of the following species of aphids. They found that mechanical irritation produced occasional jumping in *T. graminum* but did not observe such a response to similar stimuli among colonies of *Brevicoryne brassicae* L., *Aphis rumicis* L., *Rhopalosiphum prunifoliae* (Fitch), or *Illinoia pisi* (Kalt.). In addition these workers have substantiated the observations of the present writer in several instances where jumping has been noted among individuals in colonies of *Prociphilus imbricator* (Fitch) on beech, *Macrosiphum ambrosiae* (Thomas) on ragweed, *M. rudbeckiae* (Fitch) on golden glow, *M. pelargonii* (Kalt.) on cranesbill, *Aphis illinoiensis* (Shimer) on grape, *Macrosiphonella sanborni* (Gillette) on chrysanthemum, and *Aphis coreopsidis* (Thomas) on cosmos and beggar-tick. *Cerosipha rubifolii* (Thomas) on blackberry, and *Aphis rubicola* Oestlund (*A. rubiphila* Patch), *Amphorophora rubi* (Kalt.), and *A. sensoriata* Mason on raspberry, have not been observed to display this habit. From these observations it appears that this jumping habit is present in species of various habits and of various genera and is rare or absent in other species of the same habits and genera. It is apparently not essential to feeding, since representatives of both groups increase with approximately equal rapidity.

The present writer, in his studies on the feeding habits of certain Homoptera, leafhoppers and aphids, has failed to discern any external evidence of "pumping" of sap by any of the species with their beaks in place. The act of insertion of the mouthparts by an aphid or leafhopper into the plant tissues and the extraction of the plant sap calls into play delicate muscles located within the head. The external evidence of such muscular activity would be quite different from that violent action alluded to in the above mentioned article, from which it might be concluded that the aphid's body functioned as a bulb on an atomizer or hand syringe.

FLOYD F. SMITH

U. S. BUREAU OF ENTOMOLOGY