come through the efforts of another writer who "interprets"—by rewriting in more understandable form, that is, in more straightforward English—his predecessor's work.

Rhetoric, or artistic discourse, plays a vital rôle in reconstructing technical papers. How else can the heavy style of the scientist be translated into forceful, gracious prose if not through the application of the principles of composition? Unfortunately the scientist rarely realizes that there are rhetorical methods for securing force, rapidity, emphasis, life and the other desirable qualities of good writing. It may even be that more practiced writers also are somewhat ignorant on this subject.

Wide reading of the classics and of the best modern writing is a necessary supplement to a study of grammar and rhetoric. From such reading the budding writer derives not only a feeling for the best in literary style, but also the knowledge of human nature essential to a broad discussion of contemporary events and trends. He is then able to integrate in his compositions the experience of centuries of history. The benefits of extensive reading are apparent in the works of the masters of scientific literature, some of whose writings deserve high rank among the classics of all time.

A good translation of a scientific paper is a work of art. It is at once elevated and popular; it manifests to all that which is recondite. Science describes her accomplishments abstractly in technical language. Art reveals these facts, not aridly, but concretely, addressing itself not only to the understanding, but still more to the sentiments of the ordinary man. Like every artist, every man who writes successfully must catch the spirit of the ensemble before him. He must therefore have interested perception and enthusiasm for things scientific.

The treatment accorded scientific progress in magazine articles is generally measured and dignified, but newspaper technique is occasionally open to question. We do not mean to disparage in any way the ability and sincerity of the news reporter, but we believe it sometimes happens that his actuating enthusiasm in his object—the emphasis of the sensational and novel—leads him to exaggerate and even wrest partly out of shape, although without real intent, the main facts of technical discoveries. On the other hand, the editorial writer, skilled in sublimating news, adept at crystallizing events, has developed traits that peculiarly qualify him for the popularization of science. The broad field that he may cover, the greater time that he can devote to writing and the disinterested point of view from which he writes all tend to result in articles of accuracy, dignity and authority that are gratifying to the scientist. The feature or special writer, who is in some respects comparable with the editorial writer, may be equally successful as a popularizer of science. Finally, the usual excellence of syndicated articles should not be overlooked; the time assigned for the preparation of such material generally makes it possible for the author to obtain the constructive criticism of the scientist whose work is discussed.

A happy condition seldom realized is the literary collaboration between writer and man of science. Every newspaper interested in scientific news should have reliable sources of information who may be consulted for authoritative criticism. The statement is often made that any good writer can make of a technical paper an excellent popular article. This mistaken conception ignores the obscurity often found in scientific writing and the nice balance required by different phases of the subject. An unhappy juxtaposition of ideas, an unthinking distribution of emphasis, can do much to void the accuracy of the translation. Even the popular writer with a broad knowledge of science will not regret submitting to the judgment of the technical specialist.

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## THE ZODIACAL LIGHT

ONE of the problems undertaken by the Harvard Eclipse Expedition to Malaya last May was that of the photography of the zodiacal light in connection with the photography of the corona. By standardized measures of the photometric brightness it was hoped to test for a possible connection between the illumination of the outer corona and that of the zodiacal glow.

On account of clouds in the western skies every evening while at our station it was impossible to obtain the zodiacal light photographs anticipated.

Visual observations of the zodiacal light were made, however, on shipboard while crossing the Indian Ocean. These revealed so surely a fluctuation in its brightness over a period of two or three minutes that some publication of the observation seems important. These fluctuations were corroborated by my colleague, Mr. Weld Arnold, and we checked satisfactorily the extent of its visibility from time to time by comparison with neighboring stars.

The recent issues of *Popular Astronomy* contain references to a similar observation by Chaplain George Jones, U. S. N., in 1854, and by other observers at various times, appearing to confirm the reality of the phenomenon. The rapidity of the fluctuation that we observed in 1929 suggests that we may be dealing with an atmospheric or gaseous affair excited by solar activity. Perhaps it is not without significance that the fluctuations observed this year are concomitant with solar activity, as indeed is the general appearance of the corona itself.

It is to be hoped that the publication of other possibly existing observations may add materially to the solution of the problem. It seems that we have in the zodiacal light a somewhat neglected field of unusual cosmic interest.

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## CRANBERRY FALSE-BLOSSOM DISEASE SPREAD BY A LEAFHOPPER

OBSERVATIONS and field experiments made during the summers of 1924, 1925 and 1926 brought evidence that the false-blossom disease of cranberries is spread by the leafhopper *Euscelis striatulus* Fallen.[1] Carefully controlled experiments carried out during the past three summers have confirmed the results of my earlier work and prove the ability of this insect to transmit the virus of false-blossom.

Cranberry seedlings were grown in a greenhouse kept free from insects by fumigation. Such seedlings have never shown any of the symptoms of false-blossom disease unless purposely exposed to *Euscelis striatulus.* Cultures of this leafhopper obtained from bogs in Massachusetts, Long Island and New Jersey were allowed to feed for various periods of time on diseased cranberry plants held in insect-proof cages. The leafhoppers were then transferred to healthy seedlings on which they were allowed to feed for about two weeks. Numerous seedlings so exposed have taken the false-blossom disease, while check seedlings of the same age and grown under the same conditions but kept free from insects have remained healthy. Under favorable conditions the plants show the first symptoms of false-blossom about one month after being exposed to virus-bearing leafhoppers. The disease is recognized in its early stages by small leaves, by an upright habit of growth and by the production of an abnormally large number of secondary shoots. One plant to which false-blossom was experimentally transmitted produced two typical false-blossom flowers. It is not known whether *Euscelis striatulus* is the only insect that spreads false-blossom, but several other cranberry insects that were tested failed to transmit the virus of this disease.

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[1] I. D. Dobroscky, "Insect Studies in Relation to Cranberry False-blossom Disease." Proc. 58th Ann. Meet. Amer. Cranberry Growers' Assoc., pp. 6–11, 1928.

## CELL FUSIONS IN FUNGOUS HYPHAE

THAT fusions between fungous cells have other interests than those associated with sex is shown in the vegetative mycelium of the common mushroom, *Psalliota campestris.* Cytological studies recently made on the mycelium have revealed the existence of numerous end-to-end as well as lateral fusions between adjoining hyphal cells. The walls between many of the hyphae of the developing strand begin to dissolve away at very early stages and the process is continuous to maturity. The mature strand consists for the most part of very large cells in the core region. Most of these are from five to six times the diameter of the original hyphal cells and about five times or more as long. The anastomoses as stated above begin very early, sometimes shortly after the hyphae emerge from the germ vesicle, and in some cases even the vesicles have been observed to fuse. The large cells of the strand have developed from the fusion of two or more hyphae of smaller diameters and may be looked upon as a composite formed by the fusion of smaller hyphae. The cells so formed serve without doubt in a vascular capacity and are perhaps an adaptive response for the conduction of food materials to the rapidly growing carpophore. The large capacity of many of the cells suggests also the possibility that they function as reservoirs for the storage of food materials to be supplied to the carpophores during their period of rapid growth. These studies will be reported in full in a forthcoming number of the *American Journal of Botany.*

ILLO HEIN

## INFORMATION CONCERNING CASTOROIDES

THE very recent discovery of a beautiful skull of *Castoroides ohioensis* Foster, the giant Pleistocene beaver, in Illinois has started the writer on an intensive study of the osteology of this interesting species. At the present time I am most anxious to ascertain the present location of any and all specimens or fragments of this species for use in a forthcoming paper. Search of the literature has yielded forty-two records of this form, but in only fifteen cases do I know where the specimens are at present deposited. For example, where is the perfect Clyde skull, and the fine skull found at Charleston, Illinois, and reported by Leidy in 1867? The undersigned would greatly appreciate it if the various colleges, museums and private collectors would mail him a list of what they have of *C. ohioensis,* together with data on where the material was found and the present catalogue number of the specimens. Full credit will be given for all information.

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