canker," and "scurfy canker." Previous investigators have considered it to be of a non-parasitic nature and of minor importance. It has been stated that it does not cause the death of the trees affected. This opinion, however, has been considerably modified as a result of recent investigations. The writer's studies seem to indicate that the various forms of measles hitherto described are not all manifestations of the same causative agent but are distinct diseases. One of these types of measles, a papular form, briefly reported here, has been proven to be caused by a parasitic fungus.

The disease first came to the attention of the writer in 1915, in the course of the application of an orchard dusting program in the Kanawha Valley, north of Charleston, West Virginia. Measles at that time was confined to a few Red Astrachan trees. The trunks and larger limbs presented a peculiar scurfy appearance while the younger twigs, especially the water sprouts, were covered with small, well-defined papules. Attempts to isolate an organism from these papules always resulted in sterile plates. Subsequent attempts in later years yielded the same results.

Frequent visits to this orchard each season, since the disease was first observed, have enabled the writer to observe its spread from the Astrachans, which constitute only a very small percentage of the planting, to Rome, the predominating variety. Interplantings of Gano, Transparent, Chenango, Pound Royal and Summer Queen, remained free from measles. Two years ago the orchard was abandoned because the disease had practically killed 16,000 trees. In the meantime numerous specimens of apple twigs affected with this type of measles have been obtained from adjoining counties in central and southern West Virginia.

In 1929, an active study of the disease was undertaken at this station. The work was conducted in the Kanawha orchard, where the papular type of measles was most prevalent. Small Red Astrachan and Stark's Delicious trees were planted near large Red Astrachan trees infected with measles. Both varieties became heavily infected with the papular form the first season. Attempts to isolate the causal organism again ended in failure. In 1930, the writer was stationed in the orchard throughout the growing season in order to keep the development of the disease under close and constant observation. However, due to the unprecedented drought very little infection took place. A few rains occurred late in the summer and a total of only 44 papules of new infection were located in the entire orchard, all on Red Astrachan, which seems to be the variety most susceptible to this form of measles. *Thirty-four of these yielded pure cultures of a peculiar, slow-growing fungus.* Sporulation of this fungus can be obtained by growing it on oatmeal or malt-extract agar.

Successful artificial inoculations were obtained on young Red Astrachan trees in the greenhouse during the past winter and the fungus was readily reisolated from the lesions produced. Diseased apple twigs collected in the Kanawha orchard on June 20, 1931, were placed in a moist chamber for 24 hours. Spores were obtained by scraping the surface of the older lesions. By studying free-hand sections of the diseased spots it was found that the fungus is a *Hyphomycete* and apparently belongs to the genus *Clasterosporium,* the species being yet undetermined.

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BIOLOGICAL ABSTRACTS—A DISCUSSION

THE value of such a comprehensive abstracting system as Biological Abstracts is well recognized by all workers in biological sciences, and is very well summarized in several articles published recently in SCIENCE.[1] In spite of the value of such a journal to subscribers, there are certain admitted drawbacks to it among which are the delay in publication, the cost of such an undertaking, and the time consumed by 6,000 abstractors and one hundred or more editors. If this were a temporary matter we might all be willing to help by personal effort or subscription, but it is a perpetual matter and as already shown will demand more time, effort and money as the years go by. It would therefore appear worthwhile to see if some method could not be devised to simplify this enormous undertaking.

As I understand the present system used by Biological Abstracts, an editorial and clerical staff first reviews the entire biological literature of 55,000 articles (yearly), and then decides who should abstract each of these articles (55,000 decisions). The well-known yellow abstract requests must then be mailed, asking for abstracts (55,000 letters). Many of these need second requests, inquiries, change of abstractor, etc. After this 6,000 men and women abstract these 55,000 articles which if done conscientiously is a difficult and tedious matter; many of us have seen young men struggling over an article in a foreign language which they very imperfectly understand. After these abstracts are made they are mailed to Biological Abstracts, who then collect, and remail to section editors, who in turn edit these collected abstracts in their field and return to Biological Abstracts where they are finally printed. Such a procedure is

[1] W. C. Curtis, SCIENCE 73: 1898, 509, 1931; J. R. Schramm, SCIENCE 73: 1898, 512, 1931; C. E. McClung, SCIENCE 73: 1898, 517, 1931; F. R. Lillie, SCIENCE 73: 1899, 560, 1931.

obviously complicated, expensive, time consuming and needs besides the voluntary support of some 7,000 men yearly, an additional aid at present of more than $100,000, all of which will have to be increased in the future. Considering that Biological Abstracts is not a personal undertaking, but a program of interest to all biologists let us see whether there is any other practical alternative to the present method.

Let us consider a plan of obtaining the cooperation of all editors of biological journals in requiring that an abstract of each article be submitted by the author with the original manuscript (as is already the case in certain journals). Assuming for a moment that such a plan could be put in force, every article of biological nature would be abstracted even before publication. When an editor had a number of his journal made up, these abstracts could be simply mailed to Biological Abstracts and published at once. In this way there would be no delay in the appearance of abstracts. Authors would receive immediate recognition of their work. Investigators could obtain an immediate review of all biological literature, and several thousand voluntary abstractors and section editors would be relieved of their constant nonremunerative drudgery. The paid editorial and clerical staff as well as general expenses could be greatly reduced.

The first and almost unanimous comment obtained regarding such a plan from those whom I have consulted during the past four or five years is that "It will not work." This has however been said of many successful undertakings. The advantages of such a plan are obvious, and have been granted by numerous abstractors, section editors, editors of biological journals, and several of the best librarians of the country. Let us consider the possibilities of carrying out such a plan and some of the criticisms which have been raised.

(1) It is said that the editors of biological journals could not or would not obtain these author abstracts. It is probable that only a small percentage of these editors would agree to such a plan at first, but if the plan were supported by an influential group of editors, and their acceptance of it brought to the attention of others, many more would fall in line.

(2) The comment has been made that authors would not submit abstracts. This could be very simply taken care of by editors refusing to publish manuscripts not accompanied by abstracts.

(3) Another criticism is that authors are often unable to abstract clearly and concisely. This may equally well be said of voluntary abstractors. What is wanted in an abstract is the main points of the work stated correctly, not a critical review. Certainly authors should be able to do this more intelligently than anyone else.

Finally let us consider practical ways in which such a plan might be carried out. Obviously the editors of Biological Abstracts do not wish to be burdened with further projects. The success of such a plan as outlined, lies with the editors of the various biological journals. It is felt that the most likely way to interest them in adopting such a method would be for all authors, abstractors, section editors, etc., to write to the editors of those journals in which they are particularly interested, expressing their opinion of such a plan. Biological Abstracts could be helped directly by any editor guaranteeing them abstracts of his journal. If a few editors should adopt the system others might fall in line and gradually such a plan might be universally adopted. The author would be glad to receive any comments on this proposed plan or word from any editor putting such a plan in force in his journal, and to report at a later day any progress made.

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SCIENTIFIC APPARATUS AND LABORATORY METHODS

AN ADAPTATION OF THE BOX CAMERA TO PHOTOMICROGRAPHY

A BOX camera can be converted into a photomicrographic camera suitable for general routine work with a few minor changes. The camera used should be of metal construction and must have a removable front. Any of the Eastman Kodak Brownie cameras will serve the purpose though the larger models are to be preferred.

The first adjustment is to remove the front of the camera and enlarge the central aperture therein. Pry off the ferrule from about the hole and enlarge the hole with a round file until it will just admit the threaded portion of the eye lens of an ocular. Insert the eye lens into the hole from the inside surface of the front plate and screw the ocular tube in place, thus enclosing the camera front between the eye lens and tube of the ocular. Next remove the lens and shutter block from the camera, take out the lens and return the block to its former position.

To make the focusing apparatus, a tube of brass or stout cardboard between $\frac{5}{8}''$ and $\frac{7}{8}''$ in diameter is cut to a length ascertained as follows; remove the back of the camera and cut a piece of glass just large