The results obtained from these experiments support the following conclusions:

1. Tip burn of the potato plant may be produced by the extract made from macerated nymph or adult, *E mali* Le B. and is transmissible by direct inoculation. This points to the existence of a "specific," either normal or extraneous, transmitted by the leaf hopper as the cause of the disease.

2. The active principle of this substance is most virulent in the nymphal stage of the leaf hopper.

3. This "specific" is present in diseased leaf tissue after infection by the leaf hopper and may be transmitted to healthy plants by reinoculation.

4. This substance is specific and the disease can not be simulated by inoculation with extracts from or by the feeding of insects other than *E. mali,* or by mechanical injury.

5. Sunlight is an important factor in the progress of the tip burn after its inception, but the absence of sunlight does not prevent the disease.

A more detailed account of the experiments supporting these conclusions will be published in the near future.

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SEPTEMBER 30, 1921

QUOTATIONS

ECONOMY IN PUBLICATION

THERE is no doubt that all our learned Societies are going through times of financial stress, owing to the war. Some of them are able to meet the difficulties by an increase of subscription, but others fear that this would diminish their membership, and thus compensate any estimated gain. Meanwhile, the increased cost of printing admits of no doubts at all, and Government help in mitigation is apparently not to be had—nor is it likely that private benefactions will come to the rescue. It seems eminently undesirable that scientific publication should be permanently diminished in amount, and minor economies in printing are apt to take up valuable time, which might be spent more profitably. We may hope that the cost of printing will not remain at the present high level, so that the future may bring less stress; but, meantime, we have to consider what is to be done *now.* With some hesitation I beg to put forward a suggestion for consideration in the special case of the Royal Astronomical Society, which is undoubtedly at the present moment in sore straits. The suggestion is that we should have an Economical Year as regards printing. For twelve months beginning either in January next (or, if that notice is too short, with the Annual Meeting in February next) let all the Fellows do their best to minimize the printing. There would be a vital difference between adopting this policy for one year and adopting it permanently, which, as already remarked, is strongly to be deprecated.

If the policy is publicly declared, the Society would probably find relief in many directions during the year; thus it could, without misunderstanding, discourage, or actually decline, papers which could be printed elsewhere, especially those coming from abroad. Usually these are more than welcome, but there would be no harm in asking our distinguished fellows and associates in other lands to publish elsewhere *for one year.* Of our own fellows many would welcome the opportunity to use one year rather for consolidating work already done than for pushing on new work. An exception should be made in the case of the younger astronomers, whose early fire should not be checked.

Again, I submit that, while the Annual Report of the Council is a document too valuable to lose permanently, there might be no serious disadvantage in cutting it down to very small proportions for one year—the thread could be readily picked up again in the following year. Here, again, some exceptions should obviously be made, especially the notices of Fellows deceased, a record which can not be intermitted. But observatory reports and most of the notes might be dropped.

The question arises how the meetings of the Society shall be adequately filled if the supply of papers is cut down? And this, of course, is a question which must be satisfactorily

answered if the suggested policy is to be successful. I venture to think that the answer is not difficult: astronomy has been progressing so rapidly of late years that there are many matters, great and small, at which we have only had the time to glance without subjecting them to satisfactory discussion. Important ideas have been laid before the Society and clearly explained, which were so new that the audience was scarcely ready with comments. As one illustration, let me take Mr. Jeans' suggestion that the stellar universe was formerly much more compact, and has since been expanding and scattering. This is an idea which alters profoundly views hitherto adopted and hitherto scarcely questioned. At the time of its suggestion the audience was almost silent, for the simple reason that it was too big a thought to take in at once; but since then time has elapsed and, moreover, Mr. Jeans has published a book. It would be strange if an interesting meeting could not be furnished by the discussion of this new idea.

There are other matters, not on this grand scale, which were passed over quickly, simply because one paper trod on the heels of another, but to which a return could now be made all the more profitably because they have appeared in print.

In further support of this policy I may quote the experience of the Geophysical Society, which has, for a few years past, been holding meetings in the rooms of the Royal Astronomical Society on the lines above indicated. The papers presented have, in general, not been original investigations, but rather accounts of work already published, and the amount of printing has been small.

Doubtless if this policy of an economical year—or, let us call it, without prejudice, a special year—were adopted, other ideas would be forthcoming to furnish the meetings: for instance, we have very rarely had anything of the nature of a conversazione; though the few experiences of this kind have all been most enjoyable. Again, we may remember that there will be a meeting of the Astronomical Union in April next. The April meeting of the R. A. S. might very appropriately be devoted to a preliminary discussion of the topics which will engage the attention of the Union; or the May meeting might be devoted to hearing from the returned delegates their experiences in Rome. We may hope, further, that this meeting of the Union will bring to Europe welcome guests from overseas, who will doubtless be able to interest the Society, as we have already had ample experience on former occasions.

In November or December we may hope for news from our eclipse expedition. Finally, if the cutting down of the Annual Report should leave a blank in the February (1922) meeting, perhaps the Fellows might like to fill it by a full discussion of the present suggestion, which is put forward very crudely in the hope that it may be fully and freely discussed.—From an Oxford Note-Book in *The Observatory*.

SCIENTIFIC BOOKS

Applied Entomology. An introductory text-book of insects in their relations to man. By H. T. FERNALD. First edition. New York: McGraw-Hill Book Company, 1921.

THE author recognizes a two-fold demand of the agricultural colleges in this country for a text-book of entomology which will give: (1) to those students who desire to specialize in entomology a thorough foundational training in the science; and (2) to those students who intend to engage in practical farming and fruit-growing a general knowledge of the kinds, life histories, habits, and control of insects that are of economic importance. He has succeeded in meeting these requirements to a surprising degree in a book of 386 pages. The author first discusses the position of insects in the animal kingdom, their structure, transformations, the losses caused by them, and the nature and kinds of insecticides in modern use in the control of these persistent pests. Necessarily the discussion of these topics is a brief one being included in less than sixty pages. It seems to us unfortunate that the author did not give in this part of the book a general, though brief, discussion of the nature and importance of the biological control of insects and of the vital and ex-