ical analysis. Much experimental material follows under the titles of attention, apprehension and perception, while the need for the special understanding of the immediate meaning of these words is recognized and met. Clinical methods have had a relatively large share in the development of experiment along these lines. As in other cases, the chapter on memory leaves the reader with a decided *sentimental d'incomplétude,* but the clinician should find very convenient the samples of material for the different sorts of memory tests. The work of Kent and Rosanoff has due recognition in the chapter on association, though not the work of the Zurich school, which is the opposite of the usual case. Some simple material which can be used for calculation tests is also presented. Under the "Time of Mental Processes" are discussed various forms of sorting tests, also of the *A*-test, these latter apparently all of Franz's own devising, though several other forms are extant. The remaining chapters are of an observational rather than experimental bearing, but are very useful in their present relation, especially the scheme of general examination, which is an excellent groundwork. In closing, there are described the elementary statistical procedures which the clinical observer might have occasion to use.

It is evident that to adequately write a book of this sort one must have the clinical viewpoint continually in mind and keep it continually in the reader's mind; the author has accomplished this better than other writers of similar books who have been physicians. The commentaries, both general and on the special tests presented, should be an exceedingly useful complement to the meager training in psychology which the younger physicians in our mental hospitals have usually received; it is for their hands that the book seems intended, and for whom it should perform its most useful work. The reference lists, however, are ill-proportioned and too condensed. The book is clear and very practical within certain limits, but it is not as good a book as its author should have written. F. L. W.

Building Stones and Clay-Products: A Handbook for Architects. By HEINRICH RIES. New York, John Wiley & Sons; London, Chapman and Hall, Limited.

THE work under the above title, comprising upwards of 400 pages, is acknowledgedly an attempt to prepare an elementary treatise on the subjects mentioned for the benefit of the students in the College of Architecture of Cornell University and for architects in general.

The first 250 pages of the work are devoted to building stones, the remainder to clay and clay-products. In attempting to cover so much ground within a limited number of pages much has to be omitted, and the question naturally arises if the subject does not suffer by such condensation to the extent of largely losing its value. The portion devoted to stone contains nothing that is not to be found in other easily available works and its usefulness must depend largely upon the method of arrangement of the subject material. The second portion is little more than an abbreviation of what the author has already included in his well-known work on "Clays, Their Occurrence, Properties and Uses." The subject is one on which the writer is acknowledgedly an authority.

The numerous illustrations are for the most part well selected and executed. A very good bibliography, glossary and index accompany the work.

A few minor errors are observed, as in the credit to Merrill on page 49, and to Watson on page 50. These are, however, comparatively immaterial matters.

GEO. P. MERRILL

SPECIAL ARTICLES

THE RELATIONSHIPS OF THE CHESTNUT BLIGHT FUNGUS

THE writer was the first to question the identity of the chestnut blight fungus, *Diaporthe parasitica* Murrill. In the 1908 Report of the Connecticut Agricultural Experiment Station he said:

We are not yet sure that *Diaporthe parasitica* has not been collected before under some other

name. Professor Farlow calls our attention to the fact that "it comes more naturally under the genus *Endothia*, and is closely related to *E. gyrosa.*" In de Thümen's "Myc. Uni.," No. 769, is a specimen under this name on *Castanea vesca* collected by Saccardo in Italy in 1876, whose Cytospora stage (the only stage showing in our specimen) seems quite like that of our chestnut fungus.

Ever since writing the above the writer has been endeavoring to gain additional evidence along this line. Since so-called *Endothia gyrosa* had been reported by Ellis and others on *Quercus* in this country, we made a special search on that host in Connecticut for this and similar fungi. It was not, however, until a field trip was made to Rock Creek Park, Washington, D. C., during the American Association for the Advancement of Science meeting of 1912, that we ran across the object of our search. Here we found, besides *Diaporthe parasitica* in its asco-stage on chestnut, a very similar fungus, also in the asco-stage, on two species of oak. A careful microscopic examination of the fungus on the oaks showed that it differed slightly from that on the chestnuts through its slightly narrower ascospores.

Shortly after making these collections we received from Saccardo specimens of *Endothia gyrosa* in their asco-stage on both chestnut and oak from Italy, and a careful microscopic examination of these showed that they were not only identical with each other, but also with those collected on oaks at Washington. This led me to say in a paper read shortly after at the conference called by the Pennsylvania Chestnut Blight Commission:

> The writer has since made a careful hunt for *Endothia gyrosa,* and has specimens of it on two species of oak collected in [Connecticut? and] the District of Columbia. Cultures have been made from these and from *Diaporthe parasitica* on chestnut obtained from the same localities. Our studies of these cultures and specimens from various localities are not yet complete, but they have gone far enough to say definitely that *Diaporthe parasitica* belongs in the same genus with the *Endothia gyrosa* on oak, and is at least very closely related to it, though at present my opinion is that they are distinct species.

And further on we said:

> Now, if *Endothia gyrosa* has a variety of hosts, including chestnuts, in Europe, and prefers a southern habitat, what of its preferences in this country? . . . *Endothia gyrosa* has been found on as many hosts in this country as in Europe, and likewise chiefly from the south. Why may we not expect to find it there on the chestnut?

In fact, we were then on our way south with this purpose in view, and we succeeded in finding at all the places which we visited *Endothia gyrosa* on both chestnut and oak that in its asco-stage or otherwise could not be distinguished microscopically from the fungus on the oaks at Washington and on the oak and chestnut sent by Saccardo from Italy. This led us to add, as a footnote to our Harrisburg paper, the following statement:

> After the Harrisburg conference, the writer went south especially to see if *Endothia gyrosa* or *Diaporthe parasitica* occurred there on chestnut, as suggested in this paper, though never having been so reported. Stops were made at Roanoke and Blacksburg, Va., Bristol, Va. and Tenn., at Ashville and Tryon, N. C., and at Lynchburg, Va., and at each place the suspected fungus was found on both chestnut and oak, and more frequently on the former. This fungus occurred as a languishing parasite or as a saprophyte, usually at the base or on the roots of the trees, and was never found forming isolated cankers on the otherwise sound sprouts, as is *Diaporthe parasitica* in the north. Apparently this fungus is the same on both the oak and chestnut, and the same thing as the so-called *Endothia gyrosa* on the same hosts in Europe. What its exact relationship is to *Diaporthe parasitica* has not yet been fully determined. In gross appearance its fruiting pustules are scarcely different, except possibly slightly less luxuriant as a rule. Its pycnidial spores, Cytospora stage, are apparently identical with those of *D. parasitica,* but the ascospores are evidently as a whole less luxuriant; that is, they are somewhat smaller, and especially slightly narrower. Whether these differences are those of a strain, variety, or distinct species, is yet to be determined by cultures, inoculations and further study.

At the request of the writer, Professor Farlow also wrote a paper (which was read by the writer) for the Chestnut Blight Conference, presenting his studies as to the identity of the chestnut-blight fungus. Farlow had a

linear-spored *Endothia* on oak from America that he decided was related to but distinct from *Diaporthe parasitica,* and the European specimens of *Endothia gyrosa,* which latter, he stated, could not be distinguished morphologically from *D. parasitica.* It is quite evident, therefore, that Farlow was the first to call specific attention to the fact that in America there is a linear-spored *Endothia* on oak that is distinct both from *Diaporthe parasitica* of America and *Endothia gyrosa* of Europe; while the writer first called attention to the fact that there is a narrowly-oval spored form on both chestnut and oak in this country that is apparently distinct from *D. parasitica,* but identical with *Endothia gyrosa* on the same hosts in Europe.

Neither at this meeting, nor previously, had any other American botanist published on his own observations any statement of the relationship of *Diaporthe parasitica* to the genus *Endothia.* Rankin, however, in his paper presented at this conference, did say:

> The speaker has recently collected and examined a fungus indistinguishable from the chestnut canker disease on dead chestnut bark in several places in Virginia,

thus showing that he (and also Spaulding, as was learned later by discussion with him) had collected *Endothia gyrosa* without recognizing it. Some time before the Pennsylvania conference, however, von Höhnel, of Austria, and Saccardo, of Italy (in a letter to the writer), had compared specimens of *Diaporthe parasitica* from America with *Endothia gyrosa* from Europe, and, like Farlow, had come to the conclusion that morphologically they were identical. They knew nothing about the linear-spored *Endothia* and the real *Endothia gyrosa* in America.

Shortly after the conference a paper by Shear appeared in the April number of *Phytopathology,* in which he says:

> Our early unpublished studies of the chestnut bark fungus, made in 1907, convinced us that it was most closely related to the genus *Endothia,* as that genus is at present interpreted by mycologists. This opinion was also reached by Dr. Farlow, as reported by Clinton in 1908.

He also remarks further on:

> It is still uncertain whether *Diaporthe parasitica* is an indigenous American fungus or not. It is also a question whether the fungus reported as *Endothia gyrosa* and *E. radicalis* in Europe is the same as that to which the same names are at present applied in this country, and the exact relation of this European fungus to *Diaporthe parasitica* is also somewhat doubtful. The writer is investigating these questions and hopes to discuss them more fully later. One point at least we believe to be definitely determined, and that is the specific distinction between *Diaporthe parasitica* Murrill and *Endothia radicalis* (Schw.).

This last point had already been pointed out by Farlow in his paper, since he and Shear both had reference to the linear-spored form of *Endothia,* as shown by specimens since received by the writer from both.

In SCIENCE (May 10, 1912) Farlow republished his Harrisburg conference paper with some additions. In this paper Farlow speaks for the first time of the specimens collected by the writer. He says:

> As far as one can distinguish species by their morphological, apart from their pathogenic, characters, *Diaporthe parasitica* seems to me to resemble the Italian *Endothia radicalis* so closely that they can not be separated specifically unless it be by some peculiarity not hitherto recorded. There is still another point which should be considered. Is the fungus of our chestnut blight ever found on other trees? I have received a series of interesting specimens collected by Professor G. P. Clinton, which will illustrate this point. In some the bark of chestnuts and in others the bark of oaks is infested with an *Endothia* which in general appearance and in microscopic structure seem to me to be the same species.

Farlow further states that these specimens are distinct from the linear-spored form on oak.

Yet, in spite of all these statements, there have recently appeared in the October number of *Phytopathology* a second article by Shear and another by P. J. and H. W. Anderson—two papers which ignore, probably unintentionally, the published statements of Farlow and the writer, thereby giving their readers

the impression that they are presenting certain facts for the first time. In his article Shear comes to the conclusion, after a trip to Europe, during which he collected specimens of *Endothia gyrosa* (*Endothia radicalis* of European authors, as he calls it) on chestnut, that this "is identical, morphologically, with *Diaporthe parasitica* Murrill, as found in America." This same conclusion, as we have shown, was previously made by von Höhnel, Farlow and Saccardo, but nevertheless is not quite correct, since our studies show that the ascospores of *Endothia gyrosa* from both Europe and America and on both oak and chestnut, are as a rule narrowly oval, while those of the true chestnut blight are broadly oval. However, since both forms have intergrading spores, the difference is very easily overlooked. Shear also apparently did not know that the real *Endothia gyrosa* of Europe also occurs as a native species in America, since he further states:

> As a result of our studies to date, we are of the opinion that *Diaporthe parasitica* Murrill is the same as *Endothia radicalis* of European authors, but not of Schweinitz, and that it was probably introduced into this country from Europe and has gradually spread from the original point of introduction, its spread being facilitated chiefly by borers or other animal agencies which produce wounds favorable for infection by the fungus.

The Andersons in their paper come to the conclusion that there are three species of *Endothia* in the United States, as follows:

> (1) *E. radicalis* (Schw.) Fr., (2) the true blight fungus—why not call it *Endothia parasitica?*—and (3) the Connellsville fungus, for which we propose the name *E. virginiana,* and for which we expect to write a description as soon as more of the European specimens have been examined.

It is too bad that they did not first carefully examine these European specimens, since their new species is the same thing as *Endothia gyrosa.* However, like the writer, they distinguished the difference between the ascospores of their so-called new species and those of the true chestnut blight. Also their culture and inoculation work agree in the main with the unpublished results of the writer. With their interpretation of Schweinitz's original description of *Sphæria gyrosa* as belonging to an entirely different fungus (a species of *Nectria*) we can not agree, as we believe Schweinitz originally had our fungus when he wrote his description in "Syn. Fung. Car.," No. 24.

The writer has received specimens from Farlow of his linear-spored *Endothia,* from Shear of this same fungus, which he calls "*Endothia radicalis* (Schw.)," and also of his recent collections of "*Endothia radicalis* of European authors" on chestnut from Italy, and from Detwiler of the Connellsville fungus (*E. virginiana* Anders.). We have had a chance to compare all of these under the microscope and most of them in cultures with the specimens we have collected and with the European specimens previously mentioned as received from Saccardo. We have also examined the Ellis and other specimens under *Endothia gyrosa* in the herbarium of the New York Botanical Garden and the Schweinitz specimens of *Sphæria gyrosa* and *S. radicalis* in the Philadelphia Academy of Science. We have made cultural experiments with *Diaporthe parasitica* extending over four years, and with *Endothia gyrosa* for nearly a year. We have made numerous inoculation tests with these two forms during the past summer. We also have cultures of the linear-spored *Endothia.* From this work and a careful review of all the literature bearing even remotely on the subject, we are positive that there are three forms of *Endothia* in America, all of which we believe to be native, and that at least one of them also occurs in Europe. We shall briefly discuss these as (1) the linear, (2) the narrowly-oval and (3) the broadly-oval spored forms of *Endothia,* as follows:

1. *The Linear-spored Endothia, E. radicalis* (Schw.) Farl.—The specimen from Florida issued by Ellis in "N. A. Fungi" No. 1956 as *Endothia gyrosa* (Schw.) is apparently this species, though the specimen in our set shows only a few ascospores and no asci. Likewise, the specimens issued by Ravenel as *Sphæria gyrosa* Schw. in his "Fungi Car" No. 49, on *Liquidambar* and *Quercus,* belong here, as

shown by the ascospores present in certain of the specimens the writer has examined. Ellis, in his description, "N. A. Pyren.," p. 552, however, really describes the next species better than this, since his measurements of the ascospores fit that species very closely. Ellis apparently merely copied Winter's measurements of the ascospores of *Endothia gyrosa* of Europe. His references to American specimens apparently all relate to the linear-spored form, and Anderson, who made Ellis's drawings, gives a fairly good illustration of this (a little too broad), probably made from the exsiccati specimen cited above.

Shear and Anderson refer this linear-spored species to *Sphœria radicalis* of Schweinitz, and we are inclined, after careful study of both the Schweinitz and the Fries descriptions, to believe that they may have had reference to this particular fungus. None of the original specimens, however, show ascospores, as far as known. Farlow, and not Fries, was the first to consider this form as coming under *Endothia,* and the first to definitely mention that the ascospores were linear, so we give him as the second authority for the name. Schweinitz also described the Cytospora stage of this same fungus, on wood of *Liquidambar* from Salem, as a new species, *Peziza cinnabarina,* No. 840 of his "N. A. Fungi," as shown by microscopic examination of this material. This would to-day come under Saccardo's genus *Endothiella* of the imperfect fungi.

The ascospores of the specimens we have studied vary from linear to linear-oblong, are occasionally slightly curved, are provided with an indistinct septum which probably is often absent, and are chiefly 6–10 μ (rarely 12 μ) long by 1–2 μ wide. The fruiting pustules of this species in its Cytospora stage are very similar to or identical with those of the other two forms. This species, however, is sharply differentiated through its ascospores from the other two, and to our mind represents the primitive species from which the next developed.

Perhaps most of the specimens called *Endothia gyrosa* in American herbaria come under this species, though it is impossible to say so definitely, since most of them are represented only by the Cytospora stage. So far as we have seen ascospore specimens, these have come from the south, so that they give it a present known distribution from Mississippi and Florida up to North Carolina. It is not known from Europe, apparently, but the assumption is not unreasonable that it might be found there, especially in the extreme southern part.

2. *The Narrowly-oval Spored Endothia, E. gyrosa* (Schw.) Fr.—The ascospores of this species vary from elliptical-oblong to narrowly oval, often tapering at one or both ends, have an evident septum, and are chiefly 6–9 μ long by 2–3.5 μ wide. Numerous comparative measurements of those taken from both oak and chestnut in Europe and America show no difference. When we compare the spores with those of the preceding species, however, the difference is quite evident to any one; when compared with those of the following form, the difference, while much less marked, is still sufficient for one with experience to distinguish the two by the slightly narrower spores of the species under consideration.

We believe that this is the fungus described by Schweinitz and by Fries as *Sphœria gyrosa,* and later made the basis of the genus *Endothia* by Fries. There is no doubt but that it is the European fungus called indifferently *Endothia gyrosa* or *E. radicalis,* which in its varied career has been placed under such other genera as *Valsa, Melogramma* and *Diatrype.* Streinz gives *Sphœria fluens* Sow. as a synonym, and Shear, after an examination of the specimen in the Kew Herbarium, thinks it the same, so far as can be told from the Cytospora stage. Other old-time names have been listed by botanists as synonyms, though probably not always correctly. Saccardo, having the Cytospora stage on wood instead of bark, created a new genus, *Endothiella,* with *E. gyrosa* as its type species. He knew its relationship to *Endothia gyrosa,* however. We are indebted to Saccardo for specimens of this type, and it is readily recognized as a stage similar to the small, simple, conical Cytospora fruiting pustules of *En-*

dothia gyrosa on wood in the southern part of this country. The true blight fungus also produces this modification on the wood of cut stumps in the north as does *E. radicalis* in the south. So far as the writer has seen, the asco-stage never develops later in these simple Cytospora fruiting pustules of *Endothiella.*

While some American botanists are ready enough to admit the identity of *Endothia gyrosa* of Europe, they question its relationship to *Sphæria gyrosa* of Schweinitz, upon whose specimens from North Carolina the species was originally founded. This doubt is brought about partly by the fact that, as in the case of *Sphæria radicalis* Schw., there are to-day no specimens of *Sphæria gyrosa* collected by Schweinitz that show the asco-stage, and this stage is necessary to properly identify any of these species. The writer thinks he has sufficient reasons, without the ascospores, to identify *Sphæria gyrosa* Schw. as the recognized *Endothia gyrosa* of Europe to-day. These are as follows:

1. While we have not looked for *Endothia gyrosa* at Salem, N. C. (the type locality of *Sphæria gyrosa*), we have no doubt that specimens of it can be found there to-day, since we collected it at points both north and south of that region.

2. Schweinitz gave the hosts as decaying bark of knots, also living bark of *Fagus* and *Juglans.* So far as the writer knows, neither *Endothia gyrosa* in Europe or this or a similar fungus in America has been found on either of these hosts. He has made a careful search on beech, butternut and walnut both north and south, during the past two years, without finding any suspicious fungus that he could connect with Schweinitz's *S. gyrosa.* Farlow has called attention to the question of error on the part of Schweinitz in determining hosts, as follows:

> Too much weight, however, should not be placed on the hosts given by Schweinitz, for an examination of fungi of different kinds collected by him shows that in his statements as to the hosts he was not always to be trusted.

This would be especially true of fungi collected on the exposed roots of trees, a common habitat of this fungus. Even if Schweinitz made no error in the determination of the hosts, we know that certain American botanists, as Marshall, about the time of Schweinitz's publication of his "Syn. Fung. Car." used the generic name *Fagus* to include the chestnut as well as the beech, and perhaps Schweinitz may have used it in this sense!

3. Both Schweinitz and Fries, to whom Schweinitz sent specimens, recognized *Sphæria gyrosa* and *S. radicalis* as distinct species, but with a very similar aspect. Both made descriptions of each of these species, and Fries placed them in separate sections of the genus *Sphæria.* Doubt as to identity would seem to be entirely removed by Fries's later note on *S. gyrosa,* in "Elench. Fung.," p. 84, where he states:

> With new examples sent by Schweinitz, others sent from western France by Guepin, and perhaps also those from Levieux, agree in every way. These tubercles break forth regularly from the bark of *Quercus racemosa,* but on barked wood the same thing is present simple in all respects, crowded, subconfluent, punctiform, without a distinct stroma. . . .

The latter is a very good description of the *Endothiella* stage already referred to.

4. The only specimen of *Sphæria gyrosa* in the mounted Schweinitz collection at the Philadelphia Academy of Science is No. 1431, which is evidently not the type, but a specimen received years after the original description, sent by Torrey from New England. This has already been shown by Farlow, Shear and the Andersons to be something else, a *Nectria,* and its identification as *Sphæria gyrosa* seems to be an error on Schweinitz's part, since he apparently had lost his type specimen when he received this. However, Farlow has a specimen in the Curtis Herbarium at Harvard, of which he writes me:

> The Schweinitzian specimen of *S. gyrosa* in Herb. Curtis at the present time shows no asci or spores, but there is a sketch with the specimen made by Curtis, from which it may be inferred that he saw spores, and that they were like those of *Diaporthe parasitica.*

Taking all the evidence into consideration, we can not see why the *Sphæria gyrosa* of America discussed by Schweinitz does not as certainly relate to the present *Endothia gyrosa* of Europe and America as does the *Sphæria gyrosa* of Europe discussed by Fries, on which no one raises a question. From Schweinitz's description of *S. gyrosa* and *S. radicalis* we believe he either had both of the species now recognized here, or else he had the Cytospora (*Endothiella*) and the mature stages of one, and described these as two species. In the latter case the evidence, as shown by the Curtis drawing, is more in favor of these descriptions applying to the narrowly-oval than to the linear-spored form. We think, however, that the simplest and best solution, until positive proof to the contrary is presented, is to decide that Schweinitz had both species. From their indistinguishable Cytospora stage, which was the stage usually found, it was natural enough that in time European botanists should place *S. radicalis* and *S. gyrosa* together in one species, especially if the former does not occur in Europe.

Having established the identity of our narrowly-oval spored form, what about its appearance in cultures and its action when inoculated into living hosts? Cultures from various localities in the south, from both chestnut and oak, have been under observation for over nine months, and all of these present identical characters that distinguish them rather easily from the true chestnut blight fungus when grown under the same conditions. We give these distinguishing characters briefly under our discussion of the latter fungus.

Inoculation tests were likewise made on seedling and sprout growths of both oak and chestnut, from cultures of *Endothia gyrosa* from both oak and chestnut, and these uniformly gave different results from the true blight fungus when inoculated under similar conditions. In other words, in no case did we succeed in producing very evident cankers from this fungus, and in most cases the inoculations were absolute failures. Yet there were indications of a semi-parasitic nature with a few inoculations made under conditions rather unfavorable to the host. The fungus is evidently largely a saprophyte, but with slight parasitic tendencies.

This fungus has so far been found on chestnut and oak in this country from North Carolina to southern Pennsylvania. It also occurs on these hosts in France, Italy, Switzerland and apparently in several other European countries. Saccardo gives other hosts and a wider distribution, but an examination of asco-material is necessary to verify these.

3. *The Broadly-oval Spored Endothia, E. gyrosa* var. *parasitica* (Murr.).—This is the true chestnut blight of the northeastern United States. Originally described as a new species, *Diaporthe parasitica,* by Murrill, it has since been called *Valsonectria parasitica* by Rehm and *Endothia parasitica* by the Andersons. Other botanists already mentioned do not distinguish it from the *Endothia gyrosa* just discussed. All botanists who have recently made a thorough study of it, however, seem to agree that it belongs more properly under the genus *Endothia,* as first suggested by Farlow and the writer, than under *Diaporthe.* From our own study we can not agree with those who think it identical morphologically with *Endothia gyrosa,* yet we believe it agrees with that species so closely that it belongs under it as a variety rather than ranks as a distinct species, as considered by the Andersons. Hence the name given in the heading.

The ascospores vary from narrowly- to broadly-oval, sometimes tapering somewhat to one or both ends, have a distinct septum at which they are sometimes slightly constricted, and are chiefly 6–10 μ long by 2.75–5 μ wide. Those of *S. gyrosa,* as given above, are 6–9 μ long by 2–3.5 μ wide, thus showing the chief difference to be in their width. Cultures of this fungus as compared with those of *Endothia gyrosa* grown on potato, lima bean and oat agars, give certain constant differences most strikingly shown perhaps when young on the potato and when old on the oat agar. These differences, briefly pointed out, are as follows:

1. The true blight fungus fruits earlier and more abundantly and discharges the spore drops more conspicuously than *Endothia gyrosa.*

2. It has more numerous, but less evident, smaller and more embedded fruiting bodies than the latter, where they are often elevated, distinct pustules, less covered by the exuding spore drops.

3. It develops a much less luxuriant aerial mycelium than the latter, except possibly in potato agar, where the growth in both at first is largely embedded, and much more highly colored with the former.

4. Its aerial mycelium, at first white, in old cultures is finally much less uniformly and highly orange colored than that of the latter, especially on oat agar, where the difference in the luxuriance and color of the two is usually striking.

Inoculations proving the parasitic nature of the chestnut blight fungus have been made previously by Murrill and others. Our inoculations were nearly all with pure cultures from various sources. We have produced cankers on seedling trees and chestnut sprouts, but more readily on the latter. We have produced cankers on chestnuts with cultures obtained originally from oak as well as from chestnut. We have also produced cankers, but much less readily and less conspicuously, on oak sprouts with cultures originally obtained from both oak and chestnut. We have had some differences in results of inoculations, which may be due either to the age of the cultures, season of inoculation, condition of host, original virulence of material used, or to these factors combined. Most of our inoculations with chestnut blight were made with proper checks and with similar inoculations with *Endothia gyrosa.* Our checks have all remained free, and the differences between the true blight inoculations and those of *E. gyrosa* have usually been marked.

The true chestnut blight has been found from New Hampshire to Virginia on several species of chestnut and oak, though rarely on the latter. This variety seems to be the most northern of the forms as indicated by present known distribution. It has not been recognized as yet outside of the United States.

We have gone into this subject minutely because a foreign origin of the chestnut blight fungus is of vital importance to those who advocate its control by cutting down infected trees and destroying their bark. Recently Smith, in October *Outing,* has gone to the extreme in advocacy of this quarantine method of control by outlining a plan for the expenditure of over four and a half million dollars. If, as advocated by the writer, the fungus is a native species, which, because of weather conditions unfavorable to its hosts, thereby weakening their vitality, has suddenly assumed an unusual and widespread prominence, it may in time go back to its previous inconspicuous parasitism. If, on the other hand, it can be proved to be an imported enemy, there is at least some basis for the fight for control, upon the whole impracticable, originally advocated by Metcalf and now so strongly pushed by those in charge of the work in Pennsylvania.

G. P. Clinton

Connecticut Agricultural Experiment Station,
New Haven, Conn.,
November 22, 1912

THE CONVOCATION WEEK MEETING OF SCIENTIFIC SOCIETIES

The American Association for the Advancement of Science and the national scientific societies named below will meet at Cleveland, Ohio, during convocation week, beginning on December 30, 1912.

American Association for the Advancement of Science.—President, Professor Edward C. Pickering, Harvard College Observatory; retiring president, Professor Charles E. Bessey, University of Nebraska; permanent secretary, Dr. L. O. Howard, Smithsonian Institution, Washington, D. C.; general secretary, Professor H. E. Summers, State College, Ames, Ia.; secretary of the council, Professor H. W. Springsteen, Western Reserve University, Cleveland, Ohio.

Section A—Mathematics and Astronomy.—Vice-president, Professor E. B. Van Vleck, University of Wisconsin; secretary, Professor George A. Miller, University of Illinois, Urbana, Ill.