Sammlungen.

Die Herren Paul Richter in Leipzig und Dr. Ferdin. Hauck in Triest beabsichtigen in Kürze eine Phycotheca universalis herauszugeben, in der fortlaufende Sammlungen aller Algen, namentlich aber der Meeresalgen und Bacillariaceen gebracht werden sollen. Die Exsiccaten erscheinen jährlich in 2 Fascikeln, und zwar die Herbariumausgabe in Mappe mit losen Blättern zu 16 Mark, die Buchformausgabe zu 18 Mark für das Fascikel. Bestellungen nehmen die Herausgeber oder die Verlagshandlung von Ed. Kummer in Leipzig an.

Gelehrte Gesellschaften.

Bericht über die Jahres-Versammlung der k. k. zoolog.-botan. Gesellschaft in Wien am 1. April 1885.

Nach den Berichten über das abgelaufene Vereinsjahr, vorgetragen von den Herren Hofrath Brunner, den Secretären Dr. Beck und Dr. Wettstein, sowie dem Rechnungsleger Herrn J. Kaufmann, hielt Herr **Hugo Zukal** einen Vortrag über neue Pilze aus Nieder-Oesterreich. Die Namen derselben sind: Trichia nana, Amaurochaete speciosa, Bacterium tortuosum, Erythrocarpon microstomum, Sporormia immersa, Melanospora ornata, M. Solani. — Custos **Rogenhofer** zeigte von einem Cordyceps befallene Raupen von Arctia aulica vor. Dieser um Wien seltene Pilz trat im heurigen Frühjahre in der Brühl bei Wien massenhaft auf.

Royal Horticultural Society London.

Sitzung vom 10. März 1885.

Diseased Leaves of Mormodes.

Mr. **Michael** reported as follows on the leaves of Mormodes submitted by Mr. Smee at the previous meeting:

I have to report that I have examined the injured leaves of Mormodes received from Mr. Smee. I was not able to detect any creature within the gall-like swellings, but I found on the undersurface of each affected leaf a number of extremely minute Acari, in all stages of development, except adult males. The Acari were usually in the affected parts; they all belonged to the same species, and are very difficult to discover, being minute, colourless creatures, about $^1/_{200}$ inch long, and narrow in proportion to their length. In spite of their small size, I believe them to be the cause of the injury. They belong to the genus Tarsonemus, which was originally described by Professors

Canestrini and Fanzago, of Padua, in 1876, under the generic name of Chizonemus (Atti. Soc. Veneto-Trentina di Sci. Nat., vol. V., fasc. I). The authors subsequently discovered that the name had been used by Cuvier for a genus of fishes, and accordingly changed the name to Tarsonemus (ibid.). Dr. Kramer, of Schleusingen, subsequently found the same creature, and described it independently under the name of Dendroptus (Archiv. für Naturgesch., 1876, p. 197).

The species appears to be identical with Tarsonemus Buxi, which Professor Canestrini found in 1884 in great quantities on the Box trees at Venice and Padua, and which he says nearly destroyed the foliage of the trees of Buxus sempervirens in the Botanic Gardens at Padua. Professor Canestrini states that the mite burrows in between the upper and lower cuticles of the leaf, and eats out the whole of the parenchyma.

In the instances of the Mormodes leaves the injury appears to have been chiefly affected from the exterior, and the leaf to have swollen after the wound, so as to form a gall-like body. The Italian Professor states that the Acari most readily attack leaves which have already been injured by insects. I did not find any trace of this with the Mormodes leaves. It appears to me that the original injury to these plants had probably been effected while the leaves were quite young, but showed more as they grew older.

I found a species of the same genus in the Midland Counties of England last year, in considerable numbers, burrowing under the cuticle of the common Burdock.

Sclerotioids of Potato Disease.

Communications on this subject were read from Mr. Greenwood-Pim, Prof. Trail, and Mr. Wilson. A further communication, with sketch, was sent by Mr. Worthington Smith, but by some mishap did not arrive till after the close of the meeting; but to make the record complete, Mr. Smith's communication, of which a copy was also forwarded to us with the woodcut, is printed in another column. Mr. Pim says that he has seeu nothing to confirm Mr. Murray's contention that the protoplasm is outside the bodies. The „plasm" seems to correspond exactly with the original body in size and shape. Mr. Pim, however, doubts whether the bodies have any connection with the disease.

Professor **Trail** writes:

It is satisfactory to find that Mr. Murray no longer adheres, as in the report published in the Journal of Botany in December, 1883, to the view that no trace of a plasmodium was left after the action of nitric acid; but that, on the contrary, the protoplasmic substance found by others to remain after isolated ‚sclerotiets' were treated with nitric acid was found by him without difficulty and stained easily. But he continues: — ‚I failed entirely and absolutely to find the smallest evidence that the substance was contained in the body. The statement that it is so contained is the merest assertion. Obviously, if it were the case, it would suit Mr. Wilson's theory.

If the protoplasm were outside it is equally obvious it would bear out my interpretation. I can prove that this is so'.

As I had no theory either to defend or to combat, I sought simply to determine the nature of the bodies by independent and reliable tests, and these have led me to the conclusion formerly stated by me, that the protoplasm forms a mass within the oxalate of lime, though probably the latter is partially embedded in, and not merely adherent to, the surface of the protoplasm. This conclusion is based upon the following reasons: — The protoplasmic residuum is so considerable after removal of the oxalate, that if it formed a coat outside the latter, as Mr. Murray supposes it does, it would be visible along the edges of the body without requiring the use of iodine. Again, were it merely part of the contents of the Potato-leaf cell, accidentally adhering to the mineral mass, we could scarcely suppose that the outline of such protoplasm would continue so definite, not showing any tendency to dissolve in the surrounding fluid; and, were the protoplasm such a mere coat, it would surely be possible, after solution of the oxalate, to detect the cavity in which the latter lay; but in the numerous bodies that I have examined carefully under varied conditions no such appearance has ever presented itself. The changes produced by nitric acid, and the appearance of the body after it has ceased to act, are admirably exhibited in Mr. W. G. Smith's figures published last year in the Gardeners' Chronicle, Dec. 13, 1884.

In reference to Mr. Murray's experiment of using iodine to demonstrate the external protoplasm on a ‚sclerotiet' which has been isolated merely, without solution of the oxalate, it is only what might be expected, that a ‚delicate colouring' should be observed, due in part probably to the protoplasm imbedding the inner ends of the particles of the oxalate, and in part, it may be, to a little of the contents of leaf-cells (of which many are necessarily torn in dissecting out the bodies) adhering to the surface.

As to the internal structure of the uninjured ‚sclerotiet' and its behaviour with iodine internally I am ignorant, simply because the bodies are absolutely opaque while uninjured, except along the extremely narrow margin. I cannot see that Mr. Murray's test in any way throws light in the direction indicated by him. There seems no cause for regret that the nature of the ‚sclerotiets' is being fully discussed, even were it the case that ‚a deal of trouble might have been saved, but for the assertion that the oxalate of lime contained a central mass of protoplasm'. In regard to what may be called the historical side of Mr. Murray's report it is undoubtedly of interest to those even who do not find themselves able to accept it as decisive. Before it could be held that ‚sclerotiets' are ‚intrinsic products of the Potato plant' it must surely be proved that they are of still greater constancy than any evidence yet warrants us to assume. Systematic and extended inquiries by Mr. Murray and others, so situated as to be able like him to pursue them, cannot fail to be of much value. Another line of investigation worth working, would be the examination of Tomatos and any other plants attacked by Phytophthora infestans,

to learn whether ‚sclerotiets' are found in them also, and the conditions under which they occur.

Mr. **Stephen Wilson** writes:

I have critically examined nearly a hundred of these bodies, and have seen nothing to suggest the inference that the lime is in the interior of the ball. I have run in iodine, as Mr. Murray has done, and its contact with the body reveals nothing whatever which is not equally well seen without it. But the lime being in the condition of crystals, necessarily presents a rugged outline. Where the crystals are not seen superposed, they are partly translucent, and this translucency, along with the rugged outlines, presents a border which is optically clearer than the more opaque interior of the field, and this clearer border has somewhat the appearance of plasm. But when the process of solution is watched closely, the points of the crystals and the outer crystals themselves, are seen dissolving, before the ‚clear definite outline' of the plasmoidal body emerges from the eclipse. The lime is seen beyond the ‚clear definite outline', but the ‚clear definite outline' is not seen beyond the lime. The definite outline is seen without any reagent after solution of the lime; and if it is outside the lime it should be equally seen before solution, without iodine or any other reagent, which it certainly is not.

The measures given in my first paper show that the lime ball is larger than the plasmoidal ball.

By focussing with a high power, while the crystals are dissolving, it is seen that the vanishing fragments in the centre of the field are nearer to the eye than the optical edges of the definite outline, and therefore upon the outside of the ball. Mr. Smith and I have given independent drawings exactly corresponding (Gardeners' Chronicle, December 13, 1884, p. 757). Has Mr. Murray given any?

Mr. Murray makes the inference that the plasmoidal ball is ‚the remains of the original cell-contents of the Potato leaf in which the oxalate of lime body was formed, adhering to it over the surface'.

These bodies are not formed in the cells of the Potato leaf, but lie in the intercellular passages, through which their mycelium runs on germination. Others have called these bodies protoplasm, but my own observations seem to me to justify the inference that they consist of fungoid plasm and short lines of mycelium. I have seen some of these lines extending nearly a fourth part across the ball. Then Mr. Murray wants to take the conceit out of me as to priority of discovery. He quotes Dean Buckland, as asking Robert Brown regarding certain Potato leaves, whether the ‚affection' they showed was that of the Potato disease. I have always contended that these parasitic balls were to be found in the undiseased tissues, where they lie in a state of incubation. Along with the host plant they furnish a good example of symbiosis. Now, if Robert Brown referred to these bodies at all, he suspected that they were foreign to the real tissues of the plant, and in some way connected with the Potato disease. And if he did not refer to them, where is the relevancy of this reference? That Mr. Murray has found these bodies in ancient Potato plants from the herbarium of Sir Hans Sloane was what I

should have predicted. Mr. Thiselton Dyer is of opinion that the disease has always been ‚hanging about' the Potato. Mr. Baker, a member of this Committee, is of opinion that ‚Any plant brought to the tuber-bearing state is in a diseased unhealthy condition'. But perhaps it may be found that this is simply putting the cart before the horse; and that in the case of the Potato plant we should have no tubers at all except for the inroad into its tissues of the Peronospora infestans.

Mr. **Worthington Smith's** communication (which was not read at the meeting, for reasons before stated), is as follows:

When Mr. A. S. Wilson published his paper in the Gardeners Chronicle for October 7, 1872, I wrote at once (October 28) to say that the bodies he had described ‚had been familiar to me for many years'. At that time I thought I had myself seen Peronospora infestans arising from bodies similar to Mr. Wilson's in autumn.

The chief point of interest does not centre in the presence of oxalate of lime, which is not invariably present. The question is, ‚Does the Potato fungus ever really and truly arise from the bodies described by Mr. Wilson'? Mr. Wilson has stated in the most detailed and emphatic manner that it does, and I acknowledge that Mr. Wilson's view has support from what I have myself seen.

The accompanying drawing (fig. 64) is from a mounted microscopic preparation given to me in 1882 by Mr. Wilson. It shows, enlarged 100 diameters, one of the plasmodium-like bodies, A, naturally divested of its oxalate of lime. Springing from this body is an excessively attenuated mycelial thread, which rapidly increases in diameter at H to ten times its first diameter as seen near the ball of protoplasm. This basal part of the preparation is further enlarged to 400 diameters at B, to show the extreme tenuity of the mycelial thread and a fold in the feeble cell wall of the ball of protoplasm. The nature of this first mycelial growth, A, H, C, may be compared with the familiar pro-mycelium, and from it at D, E, F, G, numerous conidiophores of Peronospora infestans arise.

The example is in fluid, and the whole basal part moves freely too and fro from the elbow at H, but constant movement has had no effect in detaching the ball.

The explanation of this growth may be that in the autumn the tubers belonging to diseased Potato plants contain the plasma of Peronospora infestans in a free state, or in the state so familiar to us in zoospores. It is there resting, and in this resting condition it is carried up into the stems and leaves of the Potato plant in the process of the Potato plant's growth. The presence of the fungus plasma excites the production of oxalate of lime in the cells of the Potato plant. When the next autumn arrives the plasma, which till then had been resting, renews its vitality, bursts through the coating of oxalate of lime (when there is one) and reproduces the Peronospora.

Martius in his Die Kartoffel-Epidemie, 1842, pl. iii., figs. 19, 23, and 24, has illustrated a peculiar growth in Potatos similar as I think

with Mr. Wilson's so-called encrusted plasmodia. Martius has shown these bodies in a germinating state. I have said in the Gardeners' Chronicle that Martius' spurious Protomyces may be similar with Mr. Wilson's bodies. Mr. Plowright has expressed the same opinion. I regret therefore to notice that Mr. Murray has stated in the current number of the Journal of Botany, that I originally determined Mr. Wilson's bodies to belong to Protomyces. I did nothing of the sort.

As Peronospora infestans is known to be a South American fungus which preys upon the Potato plant in Chili, the home of the Potato, no one need feel surprised in finding evidence of its presence in old herbarium examples of Potato foliage.

Mr. Murray expressed his gratification that Prof. Trail accepted his observations. Prof. Trail tenders no direct evidence, however, as to the existence of a protoplasmic body within the oxalate of lime. Mr. Murray respectfully pointed out that the onus of proving this lies with him as the author of the statement, and that satisfactory evidence can readily be obtained by cutting through the so-called „sclerotiet" and demonstrating the contents, if any.

Personalnachrichten.

Dr. **Giacomo Bizzozero,** Assistent am Botanischen Institute zu Padua und Verfasser der soeben erschienenen Flora Veneta Crittogamica, ist zu Padua gestorben. Die Publikation des 2. und letzten Bandes seiner Flora Veneta Crittogamica, für den das Material bereits vorgelegen hat, wird Herr Professor Dr. Saccardo besorgen.

Der Ober-Physicus **Johan Grész,** Verfasser einer Arbeit „De Potentillis Hungariae" etc., Pest 1837, ist am 19. Februar 1884 in Csáktornya, 72 Jahre alt, gestorben.

Haynald, Lajos, Emlékbeszéd Dr. Fenzl Edefölöss. (Denkrede.) 8°. p. 1—39. Mit Portrait. Budapest 1885.

[Eine sehr anziehend geschriebene Lebensbeschreibung des Verewigten, als ausländischen Mitgliedes der ungar. Akademie der Wissenschaften. Hier wird F. als voller Güte und als Musterbild eines Menschen, Gelehrten etc. geschildert, sein Wirken in weitem Kreise schätzend gewürdigt und seine Arbeiten werden p. 34—39 kritisch aufgezählt und besprochen. Dieselbe Denkrede erschien auch deutsch in der Ungar. Revue. 1885. No. 1.] v. Borbás (Budapest).
