TRANSACTIONS

OF THE

PERTHSHIRE SOCIETY OF NATURAL SCIENCE.

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OF THE

PERTHSHIRE SOCIETY OF NATURAL SCIENCE.

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PROCEEDINGS

OF THE

PERTHSHIRE SOCIETY OF NATURAL SCIENCE.

WINTER SESSION, 1886-87.

11th November, 1886.

F. Buchanan White, M.D., F.L.S., F.E.S., President, in the Chair.

The following donations were intimated :—

Museum—Perthshire Collection.—One of Don's original specimens of the grass he found on Ben Lawers, and which he called *Triticum alpinum*—from Mr. John Knox, Forfar. Dried plants—from Dr. Buchanan White, Col. Drummond Hay, and Messrs. Wm. Barclay, R. H. Meldrum, and J. M'Bryde. Log of bog oak—from the Duke of Athole, per Mr. J. M'Gregor, Ladywell. Sandstone, showing dendroid markings—from Dr. Robertson, Errol.

The President delivered the following Opening Address :—

Gentlemen,—Up to last year it had not been a custom in this Society for the President to open the winter session by giving an address, and I think it may be left to the discretion of my successors in office whether the practice is continued or not, as possibly they may think it preferable to restrict themselves to the presidential address at the annual meeting.

Some arguments, however, can be advanced in favour of opening the winter session by an address, since in it the work done by the Society during the past summer can be advantageously passed under review, work for the coming winter be suggested, and various matters discussed which might not perhaps be so conveniently taken up at any other time.

The work of the Society in summer is of course principally in the way of exploration and investigation in the open air, in the gathering together of specimens and information, in the amassing of material which can be elaborated during the winter. Of the official—as they may be termed—excursions of the Society, reports will be found in

the "Proceedings," which will be soon issued, so that it is unnecessary to go into details of them. I wish, however, to allude to one feature of the excursions of last summer, which, although not altogether novel, was yet on a more extensive scale than hitherto attempted. This was the association of other Societies in our excursions—a scheme which, though perhaps, from one reason or another, not so successful as it might have been, yet was sufficiently fruitful as to merit another trial. The Societies which, either practically or theoretically, joined our excursions were the Dundee, Largo, Kirkcaldy, Newburgh, and Stirling. Of the advantages that ought to result from such combinations of forces it seems unnecessary to speak. Before leaving the subject of the excursions, it is desirable to take this opportunity of expressing the gratitude of the Society to all those proprietors of land and others who, as usual, kindly gave assistance.

I have said that reports will soon be issued. To this there is one exception, and as it is the report of the most ambitious excursion yet undertaken by the Society, a short account of it now may not be out of place.

It has been our custom to have—every year, if possible—at least one mountain excursion, but hitherto it has been restricted to one day. This year we so arranged that, whilst those members who could give one day only should have a good excursion of this kind, others who had more time at their disposal should be able to profitably spend several days. Thus, making Killin our headquarters, the better part of a week was passed in exploring the neighbouring hills, with eminently successful results. There is something peculiarly enjoyable in alpine naturalizing. The freshness of the air, the large scale on which the scenery is built, and the boundless freedom of the hills, all combine to make such explorations very entrancing. The penalty to be paid is that, after a run on the mountains, lowland excursions seem very dull. But the delights of the hills are not to be attained without labour. There is the "long, long pull" up the lower slopes, often very steep, and "baking fornent the sun." And these slopes are not as a rule very prolific in a great variety of interesting plants and animals, or at least with the prospect of what is ahead they do not seem so, to the perspiring, panting climber. But when, after a walk of four or five miles, an altitude of over 2000 feet above sea-level has been attained, and the line of rugged precipices that guard the higher summits has been reached, then comes the reward. Flowers of glowing colours adorn the grassy ledges, and thrill the heart of the botanist with delight; insects, less brilliant in hue, but exquisite in their soft blendings of colour, flit from rock to rock; while the scream of the peregrine falcon, the croak of the raven or ptarmigan, and the twitter of the mountain finch, break a silence that is otherwise made more intense by the plashing of the burns through the rocky ravines.

But, to get on with an account of our doings. Our party varied in number from day to day, as some arrived and others departed. It also varied in its constituents, for some were "old hands," while for others everything had the beauty of novelty. One of the latter, indeed, was

so overpowered with the plethora of riches in plant life that he found all around him, that, fearing for the safety of the treasures he had collected, he was obliged to retreat to the lowlands. Then the equipment of the members was equally varied. One enthusiastic cleric (to whom any form of plant life—flower, lichen, or moss—seemed equally acceptable) carried two vasculums; one gallant member, who heretofore had contented himself with a basket, was furnished with a vasculum whose gigantic size struck awe into the soul of every beholder; while yet another, whose object was exploration rather than the acquisition of specimens, marched free from any impedimenta.

The first day was devoted to the exploration of Craig-na-Caillich and adjacent hills. In the annals of Scottish alpine botany Craig-na-Caillich is a classical hill. In Lightfoot's *Flora Scotica* it is frequently mentioned, no doubt because Stuart, the minister of Killin, to whom Lightfoot expresses himself indebted for so much, frequently visited it. It is probable, therefore, that on it many of our alpine plants were first gathered in Scotland. It has always seemed to me curious that, while Stuart explored so many of the hills near Killin, he seems scarcely, if ever, to have gone to Ben Lawers, the richest of all our hills, and not so far away as some of the hills that appear to have been favourites of his. Indeed, the mention of Ben Lawers as a locality is not frequent till near the end of the eighteenth century. The rarest plant noticed on this day was the lovely and very rare *Gentiana nivalis*, with flowers of the most intense blue, at the well-known locality for it on Catjaghiaman.

The next day was spent, in driving mist and rain, on Ben Lawers —a day of darkness and cold, but not unprofitable so far as plants were concerned. On the summit of Ben Lawers, in a spot of barren desolation, with scarcely another plant to keep it company, dwells the little *Saxifraga cernua*, in its only British locality. Unlike many other of the Ben Lawers rarities, it does not seem to be diminishing very much in quantity, though, unless botanists are very careful, it may be easily exterminated. Many other Ben Lawers plants are, I am sorry to say, becoming very rare.

Larig-an-Lochan and the Cam Creag range of hills formed the field of another day's labours. One of the chief rarities of the Larig is *Woodsia hyperborea*. Unfortunately, too many fern collectors know of this locality, and hence the plant has been reported as extinct there; but those who know where to look for it, can always, and probably will always be able to, find it. I need not say that we were very careful not to make it rarer.

Amongst a number of interesting plants got on this day, two species may be specially mentioned. One is a willow, *Salix lanata*, whose headquarters in Britain are Glen Callater and Caenlochan. In Perthshire a single bush of it was long ago reported to grow on one of the Glenlochay hills, but of late years special search for this bush has been unsuccessful, and I was beginning to make up my mind that it must be omitted from the Perthshire list. The discovery, however, on this day of two or three bushes on the Cam Creag hills permits us to retain this very interest-

ing species in our list. The other plant is a variety of *Rhinanthus minor*, the common Yellow Rattle of the low country. Years ago I had noticed on Ben Lawers, at an elevation of over 3000 feet, a colony of this plant, and had been particularly impressed by it, since the species does not usually attain a high altitude above sea-level. Except in their small stature, these specimens did not apparently show any difference from their lowland comrades. On more carefully examining dried specimens in our Herbarium not very long ago, I found that the calyx is shortly pubescent all over, a character which no lowland specimen that I have seen shows, but which pubescence of the calyx is characteristic of some other species of the genus. Except this pubescence, I can find no other essential mark of distinction between these alpine examples and lowland specimens, but this character seems so constant that the mountain form seems to deserve a name. I have therefore distinguished it as a variety, and called it after our fellow-worker, Colonel Drummond Hay. I may mention that it has now been observed, not only on several of our own hills, but also in Aberdeenshire and Inverness-shire. My chief object, however, in alluding to it just now is to point out how important it is to examine carefully all plants met with. Many botanists have doubtless seen this alpine *Rhinanthus*, and thought it the same as the lowland one—in fact, I have seen botanists, who knew of the variety, gather specimens, and, because they did not apply their lenses to the calyx, fail to distinguish it. In dried specimens the difference is certainly more marked.

The fourth day we went further afield, and paid a visit to Ben Heasgarnich, near the head of Glenlochay. Ben Heasgarnich is, I think, identical with the Ben Teskerney of Lightfoot and Stuart, and seems to have been rather a favourite of the latter—at least, it is not unfrequently mentioned. Since Stuart's time Ben Teskerney appears to have dropped out of remembrance; but last year Ben Heasgarnich suddenly became important, for on it Mr. Brebner gathered the long-lost *Carex ustulata*—long-lost, that is, to Britain, for, since Don first disovered it in 1810, British specimens had not been found, although his locality is the much-explored Ben Lawers. For this reason many botanists have refused to admit the species into the British list. It is a question whether Don got his specimens on Ben Lawers, or whether he used the name "Ben Lawers" to indicate the range of hills rather than the individual mountain, in the same way as he speaks of the "Clova Mountains" for all the hills that lie about Glen Isla, Glen Callater, and Clova proper. If this is the case, Don may have been actuated by the desire to conceal the exact locality, or perhaps he may not have known on what hill he got the specimens, for it is likely that he did not know the name of the species when he found it, and put down Ben Lawers as being the chief hill visited during that excursion. At any rate, the re-discovery of *Carex ustulata* in Breadalbane is another fact in Don's favour.

Guided by Mr. Brebner, we had the great pleasure of seeing *Carex ustulata* "at home," and near it we found another interesting species, *Carex rupestris*. This sedge, though long ago recorded as having been found on Ben Lawers, has not apparently for many

years been seen on that hill, and is therefore almost as good as a species new to Perthshire.

Our last day was spent on Craig Mhor, another hill at the head of Glenlochay, which also yielded a number of interesting plants, *Juncus castaneus* being particularly abundant on it. We purposed having another day on Ben Lawers, but the weather turned out so bad that we had reluctantly to give up the idea. Amongst the species observed during the excursion, I may enumerate the following:—*Draba rupestris*, *Arenaria verna* (a very rare species in Perthshire), *A. sulcata*, *Sagina nivalis*, *Dryas octopetala*, *Saxifraga cernua*, *S. nivalis*, *Galium sylvestre*, *Gentiana nivalis*, *Myosotis alpestris*, *Veronica saxatilis*, *Bartsia alpina*, *Salix phylicifolia*, *S. nigricans*, *S. lanata*, *S. lapponum*, *S. Arbuscula*, *S. myrsinites*, *S. reticulata*, and probably *S. spuria*, *Juncus trifidus*, *J. castaneus*, and *J. biglumis* (seen in large quantities on several hills), *Carex rupestris*, *C. atrata*, *C. limosa*, *C. vaginata*, *C. ustulata*, and *C. pulla* (in great abundance), *Kobresia caricina*, *Sesleria cœrulea*, *Woodsia hyperborea*, *Cystopteris montana* (on several of the hills—this plant, which is often rather difficult to find, seems to occur on almost all the Breadalbane hills where the conditions are suitable, though it has not been recorded for several of them), *Equisetum pratense*, and *E. variegatum*. A number of interesting mosses and some fungi were also gathered, but I will not touch on them just now.

Some of the results of other excursions—official and private—I had intended to at least touch upon, but I find that I have dwelt so long upon the Breadalbane excursion that it will be better to omit doing so, as there are some other matters on which I must speak. For the same reason, I shall not go into details of several very interesting additions that have been made to the Museum. Besides, it is perhaps just as well that something should be left as subjects for short notes at our other meetings. Our tendency has been too much in the direction of having one or two long papers at each meeting, whereas much that is both of interest and value can be communicated in the form of short notes, which need not necessarily find a place in the printed syllabus, but which we shall always be glad to get.

One very important matter, for which I must ask your attention to-night, is that of the publications of the Society. As you will have learnt from the minutes, this is a subject that has engaged the serious consideration of the Council, since it has been found necessary to make arrangements, other than those heretofore in force, for the printing of our *Proceedings*. That it is necessary that some plan be adopted, the following extract from a Report drawn up by the Editor will show:—

"It seems to be perfectly necessary, if we are to maintain our position as a scientific society, to publish the results of our work in some permanent form. This is recognised by the British Association in making it a *sine quâ non* that no society shall be associated with it which does not do so. If, therefore, we discontinued the publication of *Proceedings*, we should cease to be correspondents of the British Association. The main reason of our existence as a society is, or should be, the promotion of the cause of science, and after that, as a

union or secondary object, the spread of scientific knowledge. But, if we do not issue any publication, the first end is to a large extent defeated, as, if the result of our work is not placed on record in some way, it is not available for reference, and can therefore be of no permanent value. On the other hand, the publication of *Transactions* should act as a stimulus to members to bring forward communications which are of more than passing utility. Then, again, publication is the only means we have of communication with the outside scientific world, and with other societies, so that without any record being kept of our work, the Society would be apt to degenerate into a mere 'Mutual Improvement Association,' and nothing more. At the same time, it would not be necessary, or desirable, to publish *all* papers communicated to the Society. There are many interesting and instructive papers which fulfil the second function of our Society to which I have alluded—namely, the Educational,—and the object of these would seem to be accomplished when they are read before the Society. It should therefore be distinctly understood that only papers of a certain class would be chosen for publication, and that no disparagement was implied to the authors of papers not so chosen. For this purpose it would be necessary to appoint a Publishing Committee, whose duty it would be to make the selection, and whose decision would be final. Certain definite rules would be laid down for their guidance, as, for instance, that only those papers were to be published which contained the result of at least some original research, and that all communications bearing on the Natural History of Perthshire and the basin of the Tay were to have preference. The papers thus selected would form the *Transactions*. At the end of the part or volume might be printed a brief form of *Proceedings*. These latter would embrace a summary of the business done at each meeting, giving all the titles of all papers read, names of members elected, and list of donations intimated. The Annual Reports, Abstract of Accounts, list of Office-bearers, and short notices of Excursions might also be given in the *Proceedings*."

Your Council admitting (as all must) the force of these arguments, agreed to recommend that *Transactions* and *Proceedings* should be published on the lines suggested by the Editor. At the same time it is evident—from the estimates of expense submitted to the Council—that it will be impossible to print a yearly part and issue it free of charge to members, as has been hitherto done with the *Proceedings*, if the annual subscription is to remain as it is; and the Council does not see its way to recommend that the subscription should be increased. We must therefore be content with having—however objectionable this may be—our *Transactions* issued at irregular periods, unless members choose to start or maintain a publication fund, to supplement the small portion of the annual subscriptions that alone can be devoted to publication expenses. I cannot help fearing that such irregular publication will not be without a bad effect on the quality of the papers communicated to our meetings, and also upon our position as a Society. While admitting that the Council is probably justified in abstaining from recommending an increase in the amount of the annual subscription, I must say that I think that, con-

sidering the advantages offered—if members choose to avail themselves of them—and the necessary yearly outlay, the annual subscription is much too low—unjustifiably low if we consider what we offer in comparison with other societies whose subscription is the same or even greater. We ought to remember that there has been no material increase in the subscription since the time when we did not publish, when we had no reading-room, no library to speak of, no laboratory, and no museum,—when, in fact, our rooms were open only for the monthly meetings. Now we offer to members a comfortable reading-room, open on five days of the week, and furnished with periodical literature, a reference library of very valuable books, and an extensive series of books that are lent out; we offer to them the use of a laboratory—heated and lighted when required—furnished with a good microscope and all necessary appliances; we have hitherto been able to give them a yearly part of *Proceedings;* and the Museum, with all its varied stores, is always at their service, heated and lighted. Whether individual members do or do not take advantage of what is offered to them has, I submit, nothing to do with the case. The expense is the same whether one or one hundred members frequent the building. Considering all these things, I am not at all sure whether it would not be desirable that steps should be taken to ascertain if an increase of the subscription is feasible or not.

In conclusion, there are two matters to which I wish to allude, for although they are not properly within the field of the Society's work, yet they are not beyond its serious attention. In the first place, I would most earnestly appeal to the ladies, and especially to those who honour us by being members of this Society, for their sympathy on behalf of the birds of the world. Fashion-makers, regardless of the bitter suffering which it must entail, have decreed that birds should form an important feature of the decoration of dress. If ladies would only take the trouble to think for a moment, I am sure that they would set their all-powerful influence against this cruel fashion. I might multiply instances where hundreds and thousands of one species of bird have been slain to fill the order of a single dealer, but I will give one or two cases only. Thirty-two thousand humming-birds! Thirty thousand sea-birds! Three hundred thousand pairs of wings. Just think of these humming-birds killed probably in the nesting season, and the nestlings left to die of hunger! As some one has written:—

"Think what a price to pay,
Faces so bright and gay,
Just for a hat!
Flowers unvisited, mornings unsung,
Sea-ranges bare of the wings that o'erswung—
Bared just for that!

"Think of the others, too,
Others and mothers, too,
Bright-eyes in hat!
Hear you no mother-groan floating in air,
Hear you no little moan—birdlings' despair—
Somewhere, for that?

"Caught 'mid some mother work,
Torn by a hunter Turk,
Just for your hat!
Plenty of mother hearts yet in the world:
All the more wings to tear, carefully twirled—
Women want that!

"Oh, but the shame of it,
Oh, but the blame of it,
Price of a hat!
Just for a jauntiness brightening the street!
This is your halo, O faces so sweet—
Death: and for that!"

The other subject on which I wish to say a very few words, since it is one on which we, as members of a scientific society, should not be altogether silent, is that very much debated matter, that *quaestio vexata*—the water supply of Perth.

With regard to the amount of the supply we have at present nothing to say, although we have not always been silent on that point: nor have we any concern with the engineering aspects of the subject. But since it would appear, from the discussions on the matter that have been reported, that various schemes for extending the supply have been, and I suppose still are, under consideration, the quality of the liquid supplied, or to be supplied, ought to have our attention. It seems to be true that the supply from the present filter-bed is, so far as chemical analysis goes, all that it should be. But is chemical analysis a sufficient guarantee that water, drawn from a source which is contaminated by sewage, will be always innocuous? Is any filter-bed, however good, impenetrable by the almost infinitely minute specific germs which produce disease? These are questions which deserve very serious consideration, and to which satisfactory answers can be given only by scientific experts. For my own part I believe that there is more than a sentimental (as I think I have seen it termed) reason for deprecating the derival of the water snpply of Perth from that portion of the river which is frequently nothing else than dilute sewage.

Dr. Buchanan White gave his Report as Delegate to the Meetings of the East of Scotland Union of Naturalists' Societies, held at Aberdeen in August, 1886.

The following paper was read:—

"*Mnium riparium* in Scotland." By R. H. Meldrum. (See *Trans.*, Vol. I., p. 15.)

2nd December, 1886.

JOHN THOMAS, Esq., Sheriff-Clerk, in the Chair.

Miss Millicent Thomas, George A. Miller, W.S., William Cormack, M.A., and R. Clough, were elected Ordinary Members.

The following donations were intimated :—

Museum—Perthshire Collection.—Specimens of the Mole—from Captain Smythe, yr. of Methven, Mr. T. Boston, Comrie, and Mr. J. S. Grant, Ballinluig. Redpoll—from Dr. Robertson, Errol. Common Coot—from Mr. H. C. Leslie, Butterglen. Rat—from Mr. T. Marshall, Stanley. Rabbit—from Mr. Athole MacGregor, Dunkeld.

Library.—"The United States Geological Survey Report," 1883-84—from the Department of the Interior. "Report of the Smithsonian Institution," 1884, Part I.—from the Institution. "Climate and Time," by Dr. James Croll, late of H.M. Geological Survey of Scotland; and "Climate and Cosmology," by the same—from the Author. "What I Believe," by Leon Tolstoi—from the Author.

The following paper was read :—

"The Challenger Expedition, and some of its Results." By R. Brown, C.E., R.N.

6th January, 1887.

RUFUS D. PULLAR, F.C.S., Vice-President, in the Chair.

The following donation was intimated :—

Museum—Perthshire Collection.—Fawn coloured Rabbit—from Mr. Athole MacGregor, Dunkeld.

The following paper was read :—

"The Fossil Spores of the Coal Formation." By R. Kidston, F.G.S., F.R.S.E. Numerous sections were exhibited under the microscope in illustration of the paper.

3rd February, 1887.

F. BUCHANAN WHITE, M.D., F.L.S., President, in the Chair.

The following donations were intimated :—

Museum—Perthshire Collection.—Pheasant—from Viscount Stormont, Scone Palace. *Index Collection*—Fossil from Coal Formation—from Mr. Peter Wilson. Satin Spar—from Mr. J. Calderwood. Cone of Sugar Pine—from Mr. Peter Campbell. Exotic Lepidoptera—from Mr. Law.

The following papers were read :—

1. "Some Localities for Perthshire Plants." By R. H. Meldrum. (See *Trans.*, Vol. I., p. 18.)

2. "The Anatomy of a Bird." By James Stewart, L.D.S.

3rd March, 1887.

TWENTIETH ANNUAL MEETING.

F. Buchanan White, M.D., F.L.S., F.E.S., President, in the Chair.

Miss Rose Morison was elected an Ordinary Member.

The following donations were intimated :—

Museum—Perthshire Collection.—Grayling, caught in the Tay—from Mr. John Carmichael, Stanley. Stoat—from Mr. John M'Niven, Edinchip.

Library.—"Modern Agriculture," by James Donaldson (4 vols.); "Palæontology of Ontario," by Prof. H. A. Nicholson (2 vols.); "The Weather of the British Islands," by Geo. Mackenzie; and "British Flora," by R. J. Thornton (5 vols.)—from Dr. Buchanan White.

The following Annual Reports were read and adopted :—

REPORT OF COUNCIL.

In presenting its Annual Report, the Council is pleased to be able to state that the work of the Society continues to be as active as formerly, and that the attendance at the monthly meetings shows a slight increase. They cannot, however, but regret that, owing to death and other causes, the membership this year shows a decrease of about 20. The Council, therefore, hopes that every member will make strenuous efforts to increase the number of ordinary members, so that the funds may be maintained adequate to the growing requirements of the Society.

During the past session seven meetings have been held, and ten papers read. The average attendance was 36—the greatest number being 60, on 6th January, 1887, and the least 25, on 4th March, 1886. 13 new members have been admitted during the year, making a membership of 304, including 2 honorary members, 9 corresponding members, and 10 associates. During the summer months seven excursions were held, and the Council takes this opportunity of thanking the various gentlemen who so readily afforded the Society facilities to carry out these excursions.

As formerly, the Council granted the use of the Lecture-Room to various local associations for meetings and courses of lectures.

During the year the Museum was visited by about 4,350 persons, making a total since the opening of 20,300.

REPORT OF TREASURER.

(See Balance-Sheet on page xi.)

BALANCE-SHEET of the PERTHSHIRE SOCIETY OF NATURAL SCIENCE for the Year ended 28th February, 1887.

INCOME.

To Balance in Savings Bank at 1st March, 1886, ...	£13	16	5			
,, Balance in Treasurer's hands at 1st March, 1886, ...	1	5	2			
				£15	1	7
,, Annual Subscriptions and Entrance Fees, ...				73	15	6
,, Sale of *Proceedings*, &c., ...				0	13	5
,, Interest on Bank Account, ...				0	6	10
				£89	17	4

EXPENDITURE.

By Janitor's Salary, ...				£20	0	0
,, Feu-Duty, ...				7	2	7
,, Property Tax, ...				0	4	11
,, Fire Insurance, ...				1	17	6
,, Repairs and Furnishings, ...				5	0	6
,, Fuel and Gas, ...				7	7	2½
,, Printing and Postages, ...				4	11	5
,, Books and Magazines, ...				10	18	1½
,, Bird Stuffing, ...				7	11	0
,, Subscription to the East of Scotland Union of Naturalists' Societies, ...				4	0	6
,, Incidental Expenses, ...				2	19	0
,, Balance in Savings Bank at 28th February, 1887, ...	£17	3	3			
,, Balance in Treasurer's hands at 28th February, 1887, ...	1	1	4			
				18	4	7
				£89	17	4

PERTH, 3rd March, 1887.—Audited and found correct. { JOHN M'GREGOR. / A. H. LUMSDEN.

REPORT OF LIBRARIAN.

The Library remains in a necessarily all but stationary condition, both as regards the number of volumes and of readers, and there is consequently but little to report. With the exception of a very few books which, forming part of a series, have already been subscribed for, no additions have been made by purchase. Lack of funds renders this impossible; and it has also been found necessary, with a view to economy, to curtail the number of the less important periodicals. Although the selection of works is less varied than it might be made, still the election of new members from year to year allows the number of readers to be maintained at a fair point; but there is no doubt that it would become largely increased with an adequate supply of fresh literature.

REPORT OF EDITOR.

The part of the *Proceedings* which was issued during the past year forms the sixth and concluding annual part of the series. These parts, as you are aware, were to a large extent reprinted from the *Perthshire Constitutional;* and, for enabling us to do this, we are indebted to the reporters for publishing such full reports of the meetings. After due consideration, however, the Council has resolved to discontinue this plan of publication. In the future, therefore, the Society will issue *Transactions* and *Proceedings*, specially printed, and containing those papers which are selected by a Publication Committee as most suited for publication. This Committee will be guided in its selection by certain rules, those papers having the preference which contain the results of original scientific research, and especially those bearing on subjects connected with local Natural History. The amount of material published in the *Transactions* will depend on the funds at the disposal of the Council for this purpose.

In the part of the *Proceedings* just issued will be found complete Index and List of Contributors, &c., to the volume.

The following Office-bearers were elected:—

President—F. Buchanan White, M.D., F.L.S., F.E.S.

Vice-Presidents—R. De Bruce Trotter, M.D., L.R.C.P.E., John Young, C.E., R. Brown, C.E., R.N., and William Barclay.

Secretary—S. T. Ellison.

Treasurer—John Stewart.

Curator—Colonel H. M. Drummond Hay, C.M.Z.S.

Librarian—James Coates.

Editor—Henry Coates, F.R.P.S.

Councillors—William Ellison, Captain D. M. Smythe, yr. of Methven, and R. H. Meldrum.

Dr. Buchanan White, R. Pullar, Col. H. M. Drummond Hay, and S. T. Ellison were appointed Delegates to the meetings of the East of Scotland Union of Naturalists' Societies.

The President delivered the following Address :—

Gentlemen,—From the Reports which you have just heard read you will have perceived that, though during the past year the history of the Society has not been very eventful, it has on the whole been not unprosperous. The average attendance at our meetings has increased, showing, I hope, an increasing interest amongst our members in the affairs of the Society. It may be mentioned that the attendance at the meetings, although it is small in proportion to the number of our members, is, however, up to the average attendance at the meetings of similar societies, and very probably surpasses those of many of them. An increasing interest is also, I think, shown in our excursions, not so much, perhaps, in an increase in the number of those attending them, but that those who do attend take a more active part in the work of the excursions. In addition to the official excursions of the Society—those which find a place in the Syllabus—many other excursions have been made by members, which is a good sign of vitality. On the other hand, it is to be deplored that our annual returns show a slight decrease in the number of our members during the past year. Death has deprived us of several, while the names of others have had to be removed from the list on account of failure to pay the annual subscription. Though, of course, it is our desire that all members of the Society should take a part in its work, we are far from making this imperative. In fact, if it was not for the pecuniary support derived from the subscriptions of those who join the Society without having any active interest in its labours, we should be under the necessity of shutting up the Museum and Library. Any decrease, therefore, in the number of subscribing members is hurtful, not only to the interests of the Society, but of the public generally, who have not been slow to take advantages presented by a free Museum. It is to be hoped, therefore, that during the year which begins to-day there will be an increase in the number of those who will not grudge the small sum of five shillings and sixpence a-year in support of an institution, which, I think, we do not claim too much in terming one of public utility.

The number of visitors to the Museum has been about the average of former years. Since it was opened to the public, three years and two months ago, upwards of 20,000 persons have been admitted to it without charge. While throughout the year there is a good attendance, it is of course chiefly on the public holidays that the majority of visitors come. Thus, on last New Year's Day and Handsel Monday upwards of 3000 persons inspected the Museum, and when are remembered the small facilities that Perth affords for profitably, or at least harmlessly, spending a holiday—especially in winter—free of expense, we ought to feel gratified at thus being able to do some benefit to our fellow-citizens. On these grounds it has been suggested that we have some claim to a share of the support that will probably be given by Perth to some object of public utility in this Jubilee year. I think, however, that, while we do not deny our claims, it would be prejudicial to our interests to accept any support of this kind if it were offered, and for the following reason. Any money thus bestowed would almost necessarily be administered by a committee of trustees,

who would thereby acquire a right to interfere in our affairs, which would not only be extremely undesirable but very injurious. Instead, therefore, of bringing forward—perhaps ineffectually—any claim that we suppose ourselves to have, it will be much better to wait till private beneficence puts us in unhampered possession of the funds which we so much need for the increase of our Museum space and for an endowment in the support of the Museum. I may be pardoned if I here recapitulate some of the statements I made in former addresses on the subject of the Museum. These are briefly: that some of the departments of the Museum are so full that no more specimens can be exhibited, and that hence some desirable specimens have had for the present to be placed out of sight; that behind the Museum we have ample room for extension; that a building to meet all future requirements could be erected and, partly at least, furnished for about £1700; that the building could be put up and furnished so far as to relieve the strain on our present resources for about £1000.

That the money will be eventually obtained I am sanguine enough to expect. In the meantime, though we cannot exhibit all our specimens, we should not relax our endeavours to increase and make perfect our collections, and thus be prepared to make a good display when the happy day arrives when we shall have the necessary accommodation.

While, as I have said, the past year has not been very eventful, yet some matters have occurred in it which deserve a few remarks.

Amongst other things, the fact has been strikingly emphasised that a great deal yet remains to be done in elucidating the Natural History of Perthshire. I refer more especially to certain botanical discoveries, to which attention has been called at some of our late meetings. Now, the study of Botany is no new thing in Perthshire, as it was begun very nearly two centuries ago, since which time much labour has been expended in investigating the local Flora. It is true that the county presents a very wide area for exploration; but if there are any two parts of it that ought to be better known than others, they are the district round Perth and that which includes the more accessible of the Breadalbane hills. And yet the past year has shown that we cannot claim to have attained a complete knowledge of even their conspicuous plants. If this is the case in districts that have been well searched, we may expect that other discoveries will be made when the less explored tracts of the county come to be examined, and this ought to be an incentive to our resident botanists to work with increased energy. In connection with this subject I may mention that there is some prospect that before very long the Flora of Perthshire will be published, although, in view of the discoveries that have been made during the past years, botanists will probably agree with me in thinking that there has been some gain in the delay that has occurred in the preparation of this work.

Before quitting the subject of the local Flora, I desire to point out that there is one branch of it which has scarcely been attended to, and which would probably repay investigation. It is that of the local lowland Perthshire names of plants. Of these names we scarcely know anything, or at least not nearly so much as we ought

to know. It is true that such a knowledge does not strictly form a part of botanical science; but, at the same time, it is one that has at least some connection with botany, and which should not be neglected by local botanists. Moreover, if information on the subject is to be acquired, it is probable that no time should be lost, since the common or local names of plants are, from various causes, becoming obsolete, and being rapidly forgotten. For one thing, many of the plants which have, or had, common names—I mean in Perthshire—were used for their real or supposed medicinal or other qualities, but their places have now been taken by the more efficacious and certain drugs supplied by the shops. Thus they have in many places fallen into disuse, and their names and virtues are passing from remembrance, and in another generation, or less, will probably be quite forgotten.

Though it is, perhaps, more especially the work of local botanists to rescue these old names from utter oblivion, others than botanists may take part in the work. In the case of these latter it is imperative that a morsel of the plant to which the name is applied should be secured, in order that its proper scientific appellation should be certainly known. In writing down the common name, the usual spelling should be employed, and no attempt made to correct the orthography. It is also important that any uses to which the plant has been put should be ascertained and recorded, as these will, in many cases, throw light upon the origin of the name. In former times, what was called the "doctrine of signatures" was considered to be of great importance in the cure of diseases. If the leaf or other part of a plant resembled, however vaguely, some portion of the body, it was supposed—according to the doctrine of signatures—to have qualities specially adapted for the cure of diseases of that part. Thus we have Lung-wort, Liver-wort, Spleen-wort, &c. Or it may be that the colour of the plant resembles the colour of some disease, and hence it was imagined to be a cure for it. For example, the Barberry, having yellow flowers and yellow inner bark, was used for the Jaundice; and Herb Robert (*Geranium Robertianum*), which has not only reddish flowers, but whose stem and leaves often become red, has been used in Perthshire as a cure for Erysipelas, and as that disease is vulgarly called Rose, the plant is called the Rose Herb. On the other hand, some names are corruptions of older names. The not uncommon, but only naturalised, plant, *Matricaria Parthenium*, is commonly called Feather-folly, which seems to be a corruption of Fever-few, a name derived from its reputed qualities as a febrifuge, Feather (suggested, doubtless, by the shape of the leaf) replacing "Fever." Part of the name has come recently into general use in connection with the yellow-leafed variety of the plant commonly cultivated in gardens, and known as "Golden Feather." Another corruption from an old name is "Shillagy," for the Colt's Foot, *Tussilago*, an intermediate corruption being "Dishallagy." Another example may be found in the name of the handsomest of our indigenous plants, the Fox-glove. This has no connection—as the name would imply—with Foxes, for the word "Fox" is really a corruption of Folks—that is, the "Good Folks" or "Fairies." A local name for the plant is "Witches' Thimbles."

Before leaving this subject, I may say that I will be very glad to receive any information—however little—about local names and uses.

During the past summer we endeavoured to carry out more extensively than we have hitherto done the scheme of inviting the neighbouring Societies to take part in our excursions, and, though our attempt was not so successful as it might have been, yet it received sufficient support as to encourage us to repeat it another year. All the invitations we extended to the neighbouring Societies were cordially accepted, but it sometimes happened that the other Societies were not very numerously represented at the excursions. Curiously enough, the largest attendance was given by a Society which had not been invited, for the very good reason that we did not know of its existence, but whose members—chiefly ladies—were not the less welcome on that account, and whom I trust we may meet on another occasion. In adopting this plan of joint-excursions we are only trying to put in practice the principles which led us to take part in forming the Union of the Natural History Societies of the East of Scotland. The bond which binds these Societies together is the maxim that in Union is Strength. That is to say, that much more good and effective work can be done if the Societies united in some joint system of labour than if each went its own way regardless of what is being done by the others. As the Union is to hold its Annual Meeting in Perth this year, a few words about its present position will not be amiss.

The East of Scotland Union of Naturalists' Societies embraces the counties of Fife, Perth, Forfar, Kincardine, and Aberdeen, and, with very few exceptions, all the Scientific Societies in these counties have joined it. The object of the Union is not only to promote a friendly intercourse amongst the Societies, but, more especially, to direct the energies of the members into a common channel, and by a division of the work to prevent a waste of labour. The subject which the Union has at present in hand is the thorough elucidation of the Natural History of the district over which it extends. At the first Annual Meeting (which was held at Dundee in 1884) a number of reports on the present state of our knowledge of the Zoology, Botany, Geology, &c., of the district were submitted by various members, and since then more detailed, but still preliminary, lists of the species of some of the Zoological and Botanical classes have been published. These include the Birds, by Col. Drummond Hay; Fishes, by Dr. Howden; &c. Other lists dealing with the other branches are in preparation, and, with these to guide them, the members of the Union will be able in course of time to publish an exhaustive account of the Natural History of the district. I may mention that each Society receives a number of copies of each year's reports. Those that we have received have not been *issued* to our members, but any member who wishes to have a copy will receive it on application to our Librarian. We have adopted this plan in order that the copies should not be wasted, but be available for future workers. The business of the Union is conducted by a council of delegates, each Society being represented by two or more in proportion to the

number of members on its roll. The annual meetings are held at the headquarters of each Society in rotation, the localities which have been already visited being Dundee, Kirkcaldy, and Aberdeen. At the Annual Meeting the programme usually extends over two days, and includes, necessarily, a meeting of the council, a business meeting (at which reports are received and papers read), and one or more short excursions; but, in addition, the Society of the place where the meeting is held usually gives a Conversazione or other entertainment to the members of the Union, and to this custom we purpose adhering when the Union meets here. We also propose having a longer excursion—extending over several days—after the business of the meeting is over. As the Union was founded in Perth, and as each member of this Society is a member of the Union, I have no doubt but that each and all will use their best endeavours to make the meeting a thorough success.

13th April, 1887.

F. Buchanan White, M.D., F.L.S., President, in the Chair.

James M'Donald was elected an Ordinary Member.

The following donations were intimated :—

Museum—Perthshire Collection.—Perthshire Lepidoptera—from Mr. S. T. Ellison. *Index Collection.*—Fossil from Fife Limestone—from Mr. W. Muir, Jeanfield.

Library.—"Report of Geological Survey of Canada" for 1885—from the Department. "Report of the Smithsonian Institution," 1884, Part II.—from the Institution. "Schools of Forestry in Germany;" "School of Forest Engineers in Spain;" "Modern Forest Economy;" "French Forest Ordinance of 1669;" "Forests of England in Bygone Times;" "Forestry in Norway;" "Forests and Forestry of Finland;" "Forests and Forestry of Northern Russia;" "Forestry in the Ural Mountains;" "Forests and Forestry in Poland;" "Pine Plantations on the Sand Wastes of France;" "Reboisement of France;" "Hydrology of South Africa;" "Water Supply of South Africa;" and "Forests and Moisture," all by Rev. Dr. J. C. Brown, Haddington—from the Author. Photographic Groups, taken during Excursions of the Society—from Mr. H. Coates.

Mr. A. H. Lumsden, Superintendent of Fisheries, exhibited and described some Salmon Fry, 50 days old, from Dupplin Hatchery.

The following papers were read :—

1. "Origin of the Interbedded and Intrusive Volcanic Rocks of Kinnoull Hill." By H. Coates, F.R.P.S. (See *Trans.*, Vol. I., p. 24).

2. "Remarks on Perthshire Willows." By F. Buchanan White, M.D., F.L.S. (This paper, in an extended form, will appear in a future part of the *Transactions*).

5th May, 1887.

F. BUCHANAN WHITE, M.D., F.L.S., President, in the Chair.

Mrs. J. F. Pullar, Miss Pullar, Miss Mary Pullar, Herbert Pullar, David Cuthbert, and David M. Barker were elected Ordinary Members.

The following donations were intimated :—

Museum—Perthshire Collection.—Geological Specimens—from Mr. R. S. Trotter.

Dr. Buchanan White exhibited a specimen of the fungus *Gyromitra esculenta*, from the Woody Island.

The following papers were read :—

1. "The Flora of the Woody Island." By William Barclay. (See *Trans.*, Vol. I., p. 30).

2. "Notes on the Native Races of Perthshire." By R. de Bruce Trotter, M.D., L.R.C.P.E. (This paper was illustrated by numerous photographs prepared by Dr. Trotter).

SUMMER SESSION, 1887.

The following Excursions were made :—

1. May 26.—To the bank of the Tay, from Errol to Glencarse.

2. June 11.—To the Den of Pitroddie and Arnbathie (jointly with the Dundee Naturalists' Society).

3. June 25.—To the west bank of the Tay, from Dalguise to Ballinluig.

4. July 2.—To Dr. Buchanan White's "Rock Garden" at Annat Lodge.

5. July 13.—To Moncreiffe Hill (jointly with the East of Scotland Union of Naturalists' Societies).

6. July 14.—To the Breadalbane Hills (jointly with the East of Scotland Union of Naturalists' Societies). This Excursion lasted for a week.

7. July 30.—To the Loch of the Lowes.

8. August 6.—To Loch Lubnaig and the Pass of Lenny (jointly with the Stirling Natural History Society).

9. August 20.—To the banks of the Garry, from Struan to Blair-Athole.

[NOTE.—Details of these Excursions will be given by the President in his Opening Address to the Society in November, 1887, which will be published in the next part of the *Proceedings*.—ED.]

WINTER SESSION, 1887-88.

10th November, 1887.

F. Buchanan White, M.D., F.L.S., F.E.S., President, in the Chair.

Dr. Buchanan White exhibited a number of flowering plants, and Mr. T. M. M'Gregor a fine example of *Sphinx convolvuli* caught in Tay Street.

The following donations were intimated:—

Museum—Perthshire Collection.—Geological specimens—from Mr. J. Durham, F.G.S. Wasps' nests—from Mr. David Dow, Balmanno. *Plecotus auritus*—from Col. Drummond Hay. Rat with deformed teeth—from Sir James S. Richardson, Bart. Flycatcher—from Mr. Clark, Rannoch Lodge. *Index Collection.*—Dragon Flies—from Mr. C. A. Cormick, London. Plants and Insects from Singapore—from Mrs. Menzies, Craigie. Alligator and Cobra—from Mr. Reddie.

Library.—"Report of the Smithsonian Institution," 1885, Part I.—from the Institution. "Report of the British Association," 1886—from the Association. "Report of the United States Geological Survey," 1884-5—from the Department. "Catalogue of the Manchester Exhibition," 1887—from Mr. R. Pullar. "The Reign of Law" and "Primeval Man," by the Duke of Argyle—from Dr. Andrew Wilson, Edinburgh.

Mr. R. Pullar, F.R.S.E., gave, as Delegate of the Society, a report of the Meeting of the British Association at Manchester.

[N.B.—As the Meetings of the East of Scotland Union of Naturalists' Societies were held in Perth on 12th and 13th July, 1887, no Report of them was given on this occasion.]

The President delivered the following Opening Address:—

Gentlemen,—Continuing the practice of the past two years, I purpose inaugurating the winter work of the Society by giving a short *résumé* of the results of the labours of the members during the summer. It will, of course, be within the option of my successor in the presidential chair next year whether the practice shall be continued. In my opinion it would be for the advantage of the Society that it should.

In March next the Society comes of age, as it will then complete the twenty-first year of its existence. Looking back along this vista of twenty-one years, the continued progression that has been made by the Society, from the day of its humble and unambitious origin in 1867, seems to me little less than wonderful; and, since it has been my privilege to have served the Society in one office or another from its commencement, I think I may claim, without any boasting,

to know more of the history of the Society than does any other member.

Though the history of the Society has been one of progression, the progression has not always been at an equal rate, but at certain times it has gone forward more rapidly. That this, the twenty-first year of the Society, should be one of these periods seems but appropriate. I will therefore ask you to consider in what direction we should endeavour to make an advance. We might, for example, endeavour to celebrate this year by raising a fund whose interest would suffice to defray the expenses of the Museum, without entrenching on the income of the Society; or we might endeavour to extend our Museum accommodation, the need for which is clamant. But these are matters which, it is to be feared, must be left to the dim and distant future, and in the meantime we must rest content—and very well content—with our present resources, and with the handsome accommodation which the generosity of some of our members has been mainly instrumental in providing. There is, however, another direction in which advance *may* be made, and in which—if we are to maintain our reputation—advance *must* be made. I mean our publications. Our members and friends in Perthshire and its vicinity have an opportunity of judging of the work of the Society by its meetings and excursions, by its Museum and its Library. But these are beyond the ken of the great scientific world, and if we are to take a place in that commonwealth, and make ourselves known, it must be by our publications.

Before proceeding to consider what should be aimed at in this direction, let me briefly review what has been done in this way during the past twenty-one years. In 1870 we published a small volume of the Reports of the meetings for the year, but this was not continued till 1881, when somewhat similar Reports were begun and published yearly till 1886. The objection to these was that they were too evidently reprints from the columns of the newspapers; and as the newspapers necessarily publish only what is called "popular" matter, it necessarily followed that our *Proceedings* contained for the most part only "popular" addresses—interesting and valuable enough, no doubt, in their way, but not calculated to advance the scientific reputation of the Society. But the evil did not end there. As popular papers, for the most part, were the only ones that were sure of publication, there was no inducement to the members to communicate to the Society papers of original research if such happened to be "dry." Hence there was a risk in the character of our papers deteriorating.

In addition to the *Proceedings*, the Society published for a number of years a magazine—*The Scottish Naturalist*—which, beginning in 1871, is still in existence, and, though no longer in connection with the Society, some of its regular contributors are to be found amongst our members. Possibly it might still have been the Society's had the members at large continued to give it greater support. Perhaps, too, the editor got tired after twelve years' unremitting labour on its behalf.

Now, what are we to do in future? Last session we resolved, as

you will remember, to print and publish in future a work to be called the *Transactions* of the Society, and I am glad to hear from our present Editor that good progress is being made with the first part. It is important that you should know—in order that you may assist in carrying to perfection our scheme—what is to be the nature of these *Transactions*. And, to make that clear, let us inquire as to what should be the character of the meetings of the Society, as it is upon them that the *Transactions* depend. Putting aside consideration of the routine business of the meetings, let us pass at once to the papers that are, or should be, brought forward. It is a matter not altogether free from difficulty, since we have at one and the same time to try and hit two targets. On the one hand, the papers must be sufficiently popular to be intelligible and interesting to an audience the majority of which has not had a scientific training. On the other hand, we must have papers of sufficient originality to enable them to have a place in the *Transactions* if these are to take a position in scientific literature. I think the difficulty may be got over by the plan adopted by your Council when considering the scheme. To make the meetings sufficiently interesting to the general body of members, we should endeavour to have at each meeting one popular address or lecture, of which the title only shall appear in the publications of the Society. At the same meeting we ought to have what I may call, for the sake of distinction, one or more scientific papers, which need not be read in full, or even at all, but be merely presented to the Society with a view to publication, the Publishing Committee deciding afterwards when such papers shall be printed. In this way, and with the assistance of the members, the difficulty of making the meetings popular, and at the same time maintaining and enhancing the scientific reputation of the Society, may be overcome. Above all things, do not let the Society sink to the level of a "Literary Association."

One word as to the time of appearance of the *Transactions*. This must necessarily be irregular. In the first place, it must depend on the supply of material—*i.e.*, on the amount of suitable papers; and, in the second place, on the funds available for the expenses of publication. The Council decided that each member should receive a copy free of charge, and hence there is no fund available beyond what remains after the other necessary expenses of the Society have been defrayed. For these reasons it may happen—we cannot say yet—that a part of the *Transactions* may extend over two years; or, on the other hand, that two parts may be published in one year. Members must not therefore be surprised at any irregularities in the time of publication. As I am writing an idea has occurred to me. While, by economy in our ordinary expenses, we may hope to have funds for the printing of the *Transactions*, we cannot expect, with our small annual subscription, to have any money available for purposes of illustration. In some other scientific societies there is a special fund —raised by donation—for this purpose. Why should we not try and follow this example? I need not dilate upon the advantage to the *Transactions* that an occasional illustration would be.

Returning now for a moment to the beginning of this argument, and summing up what has been brought forward, I would urge that

this, our twenty-first year, should be distinguished as the year in which was begun the first of a series of *Transactions* which shall bring reputation to the Society as a record of the good and lasting work accomplished by its members. But to achieve this every member must co-operate to the best of his ability.

I now purpose laying before you some account of the summer work of the Society. During the past six years the reports of the excursions have formed a special part of our *Proceedings;* but, as we are now adopting a different mode of publication, it will be better that in future a general report on the excursions should be given at the first meeting of the winter session.

Of official excursions nine were planned, and were all successfully carried out. Of unofficial excursions (that is, excursions got up from time to time, but which were not mentioned in the Syllabus) a considerable number took place. These were mainly botanical in their character; and here I may remark that it is a gratifying circumstance to note that the number of botanists connected with the Society is increasing, and will, I hope, continue to increase.

Of the official excursions the first was on the Queen's Birthday, when we went to Errol, and proceeded up the banks of the Tay to Glencarse. This excursion was notable as being the first at which any of our lady members made an appearance, and the lady who honoured us with her company was fortunate enough to find the most interesting plant of the day, *Luzula albida.* Later in the season some of us went over the same ground, and found new localities for *Œnanthe fistulosa* and *Butomus umbellatus*, as well as other less rare plants.

On the 11th June we visited the Den of Pitroddie, going by Glencarse and returning by the Muir of Durdie. In this excursion we were joined by a large party (chiefly ladies) under the leadership of Mr. Brebner, Rector of the Harris Academy, Dundee. Many interesting plants were observed, but none that were previously unknown to us.

On 25th June the west bank of the Tay, from Dalguise to Ballinluig, was explored with good results.

The afternoon of 4th July is a date mentioned in the Syllabus, but the proceedings on that day were scarcely of the nature of an excursion, as the members did not require to leave Perth to examine my rock-garden. From the dryness of the season it unfortunately happened that many of the plants therein were past flowering, so that the members who honoured me with a visit were not able to see all that I had hoped to have had the pleasure of showing them.

The 12th July was the day of the short excursion in connection with the East of Scotland Union Meeting, and a large party courageously ventured through the rain to Moncreiffe, and were rewarded by getting after all a fine day and seeing various interesting plants.

On the 14th July, and following days, the long excursion in connection with the Union Meeting was made to Breadalbane Hills. An account of this has been published in the report of that meeting.

On the 30th of the same month we went to the Loch of the Lowes, near Dunkeld, and, while not expecting to discover any

addition to the Perthshire Flora in a locality that has been often previously examined, a very notable new Perthshire species was found, namely, *Rhamnus Frangula*. This and some other new Perthshire plants will be particularly noticed presently.

Loch Lubnaig and the Pass of Leny were visited on 6th August, which day was notable as being the only persistently wet one of all the excursions. On this occasion also a new Perthshire species was found, *Isöetes echinospora*.

The last of the official excursions was on the 20th of August, when we went to Struan Station, and thence down the Garry to Blair-Athole. This excursion resulted in the completion of the discovery of a new British plant, *Juncus alpinus*.

Before leaving the subject of these official excursions, I would suggest that the Society accord a hearty vote of thanks to those proprietors who, as usual, kindly gave permission to explore their estates.

As has been already mentioned, the unofficial excursions were numerous. A number of these were to the Woody Island, of whose botany you will remember Mr. Barclay gave us an interesting account last May. Without forestalling that gentleman's report of the Island, which will appear in the *Transactions*, I wish to point out a lesson to the learner from our explorations, namely, how difficult it is to completely ascertain the Flora of even a limited space of ground. The Woody Island extends to not more than about eight or nine acres, and yet no excursion that we made there failed to produce one or more species that we had not noticed previously.

In conclusion, I will briefly notice some of the more remarkable plants observed during the season in addition to those already named. *Trifolium fragiferum*, found, for the first time in Perthshire, by Mr. W. Barclay and myself between Invergowrie and Longforgan; *Carex pendula*, near Stanley, by Mr. W. Dow; *Carum verticillatum*, in Glen Falloch; *Cratægus oxyacanthoides*, near Aberuthven, by Mr. W. Martin; and *Polygonum maculatum*, in several places near Perth.

8th December, 1887.

Dr. F. Buchanan White, M.D., F.L.S., F.E.S., President, in the Chair.

Miss Martin, the Rev. Canon Farquhar, A. M'Kinnon, Chas. Scott, and J. Hill Thomas were elected Ordinary Members.

The following papers were read:—

1. "An August Ramble on the Forfarshire Coast of the Tay." By William Barclay. (See *Trans.*, Vol. I., p. 45.)

2. "The Geology of the Breadalbane District of Perthshire." By P. Macnair. (See *Trans.*, Vol. I., p. 52.)

12th January, 1888.

F. Buchanan White, M.D., F.L.S., F.E.S., President, in the Chair.

P. Macnair was elected an Ordinary Member.

Mr. H. Coates exhibited a specimen of the Butterfly *Vanessa urticæ*, found alive at Pitcullen on 11th January.

The following donations were intimated :—

Museum—Perthshire Collection.—Specimen of *Sphinx convolvuli* taken at the gardens of Moncreiffe House—from Mr. Bissett. *Index Collection.*—Skeleton of *Dinornis* from New Zealand—from Miss Alice P. Miller.

Library.—Eighteen works on Chemistry and Photography—from Mr. Rufus D. Pullar.

The following papers were read :—

1. "Notes on Zoo-geography—I. The Facts." By James Coates.

2. "Notes on the Aculeate Hymenoptera, with a list of the Wild Bees and Wasps collected in Perthshire in 1887." By T. M. M'Gregor. (See *Trans.*, Vol. I., p. 65.)

9th February, 1888.

F. Buchanan White, M.D., F.L.S., F.E.S., President, in the Chair.

Robert Shand, James Walker, and David Taylor were elected Ordinary Members.

The following donations were intimated :—

Museum—Perthshire Collection.—Curlew's eggs from Loch Broom —from Mr. C. J. Stratton. Perthshire Bees and Wasps—from Messrs. T. M. M'Gregor and D. Cuthbert. *Index Collection.*—Balls found in the stomach of a Sheep—from Mr. M'Kendrick. Silk Moths and Cocoons (exhibited at the Manchester Exhibition)—from Mr. Robert Pullar.

Col. H. M. Drummond Hay, C.M.Z.S., communicated a note on the Desert Wheatear. (See *Trans.*, Vol. I., p. 90).

The following papers were read :—

1. "Meteorological Peculiarities of 1887." By Rev. A. Campbell.

2. "Notes on Zoo-geography—II. The Problems." By James Coates.

8th March, 1888.

TWENTY-FIRST ANNUAL MEETING.

F. Buchanan White, M.D., F.L.S., F.E.S., President, in the Chair.

Miss E. G. Macnaughton, Miss E. S. Macnaughton, and D. M. Gibb were elected Ordinary Members.

The following donations were intimated :—

Museum—Perthshire Collection.—Specimen of *Oxytropis campestris*, found at Loch Loch on 14th July, 1887—from the Rev. J. Fergusson, Fern.

Library.—Diagram Map of the World, showing the Zoological Provinces—from Mr. James Coates. Various Pamphlets and Reports —from Dr. R. H. Mill, Edinburgh.

The following Annual Reports were read and adopted :—

REPORT OF COUNCIL.

The Council, in presenting this their Twenty-first Annual Report, congratulates the members on the attainment of the majority of the Society. Much has been accomplished in the past, and we are glad to think that the work of the Society gives signs of continued growth and vitality.

The papers read during the year have been of a high order, and the attendance at the meetings is again somewhat improved, showing, in fact, the highest average yet attained. The only matter your Council has to regret is that the membership does not show as large an increase as we could desire. One feature, and not the least important, of the work of a society such as this is the diffusion, especially amongst the younger portion of the community, of an interest in the objects of nature, which, while affording a pleasant and profitable exercise for leisure moments, is also a safeguard from many of the evils to which spare time too often opens the way. Your Council is therefore sorry to see amongst those who have during the past few years resigned their connection with the Society the names of many who ought to be interested in questions of this nature, and upon whose support your Council thought they could have relied. It is therefore to be hoped that the members will do their utmost to recruit our ranks, from which too many have recently fallen away.

In July the Annual Meetings of the East of Scotland Union of Naturalists' Societies were held in Perth, and proved in every way a great success.

During the past year 7 monthly meetings have been held and 12 papers read. Average attendance, 41—the greatest number being 57, on 9th February, 1888; and the least 22, on 8th December, 1887. 18 new members have been admitted, showing a net gain of 5 —the total membership being 309, including 2 honorary and 9 corresponding members and 9 associates.

Eight excursions were held during the summer, and the Council begs to thank the various Proprietors whose consent was required for so readily granting the permission necessary.

The Council has again granted the use of the Lecture-Room to various local associations; and it is very pleased to hear that the lectures in connection with the University Extension Scheme, which have been held in our Lecture-Room, have proved so successful.

During the year the Museum has been visited by over 3000 people, bringing up the total number since the opening to nearly 22,000.

REPORT OF TREASURER.

(See Balance-Sheet on page xxxiii).

REPORT OF LIBRARIAN.

The number of volumes in the Library amounts now to over 550, of which about 25 have been added since last Report. Of these only the regular publications of the Ray Society and of the International Scientific Series have been purchased; the rest are presentation works, and for these the Society have again to record their thanks to the Smithsonian Institution (Washington), to the Geological Survey of the United States, and to the other friends whose donations have been acknowledged from time to time at the monthly meetings.

Since the Annual Meeting of 1887, 43 members have taken advantage of the Library, the number of works taken out by each varying from 1 to 22. This number of readers is an increase on last season, and it is probable that the improvement is in part the result of the interest in recent educational schemes, which have owed their success largely to the facilities afforded them by our Society.

REPORT OF EDITOR.

During the past session the Society has published the first part of the *Transactions and Proceedings*, prepared on the plan indicated in the Editor's Report last year. These, instead of being reprinted from the newspaper reports as formerly, have been specially printed for the Society, and in this way a much more suitable selection and arrangement of the matter has been possible. As already stated, it is intended that only papers relating to local Natural History, or containing the results of original research, shall be included in the *Transactions*, the selection resting with a special Publication Committee. The *Proceedings* will contain an abstract report of all that is done at the meetings, and also of the excursions.

The following Office-bearers were elected :—

President—F. Buchanan White, M.D., F.L.S., F.E.S.

Vice-Presidents—R. Brown, C.E., R.N.; William Barclay; Captain D. M. Smythe, yr. of Methven; and William Ellison.

Secretary—S. T. Ellison.

Treasurer—John Stewart.
Curator—Colonel H. M. Drummond Hay, C.M.Z.S.
Librarian—James Coates.
Editor—Henry Coates, F.R.P.S.
Councillors—R. H. Meldrum, John Thomas, and J. Clacher.

The President delivered the following Address:—

Gentlemen,—On this, the Twenty-first Annual Meeting of the Society—the day on which it may be said to come of age,—it will be profitable to devote a few minutes to a retrospect of the past history of the Society, and to the consideration of its present position.

The Society was founded on the 28th of February, 1867. On that day a meeting was held in a back room in Charlotte Street, to "institute a Society for the practical study of Natural History in Perth, by the exhibition and preservation of specimens, the reading of communications, by lectures, excursions, and the formation of a library and museum." To what extent this programme has been carried out we shall presently consider. First of all, however, a word or two concerning the founders of the Society. As founders, or "original members," the names of fourteen gentlemen are given in the minute-book. Of these five only appear now in the roll of the Society. Some are still alive, but have severed their connection, and six have joined the majority. As no obituary notices of the latter have, I think, been given, it will be but fitting on this occasion to briefly allude to them. I take them in the order in which they appear in our list. George Stewart, whose name is third on the roll, was a member of the first Council, but died within a few years of the formation of the Society. While interested in scientific matters, he was not, I think, a working naturalist himself, but always ready to assist in promoting the objects of the Society. The next name is that of John Bruce, who was with us till last year. He was Treasurer from the foundation up to 1869, and was at one time, though not, I think, so much latterly, an active and enthusiastic entomologist. Some specimens presented by him are in our collection of insects. Hugh Thomson, who died a few years ago, was not a naturalist himself, but took an active interest in the Society for many years. Daniel Brown was a birdstuffer in Perth, and hence was necessarily connected with the objects of the Society; but I am not aware that during the time he resided in Perth that he was able to do very much for us. John Drummond, who died at an early period of the Society's history, was not, I think, a naturalist himself. James Trotter, whose name concludes the list, was one of the first Vice-Presidents. He was one of the older generation of Perth naturalists, and was very enthusiastic, especially in entomology, at a time when there was not so much encouragement for these studies as there is at the present day. He removed to Edinburgh several years ago, and died there.

Having paid this brief tribute to our predecessors, let us now continue the history of the Society.

At first the Society had no home of its own, but met in the

Glovers' Hall in George Street, which was kindly granted for the purpose. Under the circumstances it was impossible to carry out the programme initiated at the beginning, of establishing a Library and Museum. In the third year, therefore, a room was secured at the Kirkside, to be used as a store-room and library. In the fourth year, finding itself strong enough, the Society hired a meeting-room in St. Ann's Lane, which it continued to occupy till we obtained possession of the present building. In Kirkside a commencement, though on a very small scale, was made to form a Library and Museum; but in reality not much was done till we moved to Tay Street in 1881.

Turning back now to the programme for which the founders established the Society in 1867, let us see how it has been carried out.

Of monthly meetings—held for "the reading of communications"—there have been 155, the present meeting being the 156th. When the Society was first established, it was purposed to have a meeting every month of the year, and in the third year no less than 13 meetings were held. Soon, however, it was found that this was too ambitious an aim, and the meetings dropped to 7, which has been the average since, though in the tenth year there were only 4. At the meetings 200 papers, in addition to shorter communications, have been read, while several courses of lectures have also been promoted. Of papers the greatest number in one year was 18, and the least 4, and the yearly average 9—the average during the past three years being, however, above 12, the sixth to the eighteenth years being below the average.

Of excursions we have made 86—or rather that is the number of programmed excursions which have come off. In addition to these, many other excursions, which were not officially arranged, have taken place. So far as the minute-book shows, there were no excursions during three years, and the average has been higher for the later years than it was in the earlier.

Including the original members, about 610 persons have been admitted to the membership of the Society, the greatest number elected in one year being 78, and the least 5. As the present number of members is 309, there has been a loss, by death or other causes, of 301 members. As will have been gathered, however, from the Report read by the Secretary, the loss in the membership is not to be attributed to death or to removal from the locality, but rather, I fear, to a backsliding on the part of those who were once members.

The Secretary is, I think it will be admitted, one of, if not *the*, most important officers of the Society. During our twenty-one years we have had six Secretaries, viz. :—in the first and second years, Mr. John Stewart, an original member, and now our valued Treasurer; in the third year, Mr. James M'Farlane, also an original member, but who, having left Perth many years ago, is not now a member; in the fourth and fifth years, Mr. A. T. Scott; in the sixth and seventh years, myself; for the long period of eleven years—*i.e.*, from the eighth to the eighteenth,—Mr. J. Young; and since then Mr. S. T. Ellison, who, I trust, will long occupy the post. Of the Treasurers, a scarcely less important position, and in some ways more

important, there have been nine, viz. :—for the first two years, Mr. John Bruce; followed by Messrs. John Henderson, James Henderson, R. Thomson, and R. Keay, who each held office for one year; then Messrs. Melville Jameson, junr., and James Duncan, who each acted for two years; followed for seven years by Mr. John M'Gregor, who was succeeded by our present Treasurer, Mr. John Stewart, who, we hope, will, like our Secretary, long continue to act. To all these gentlemen, both Secretaries and Treasurers, the Society owes a deep debt of gratitude. The Presidents have not been so numerous, numbering only four. Up to the fifth year, and again since the eighteenth, I have had the honour to fill the chair; in the sixth and seventh and sixteenth and seventeenth years, Colonel Drummond Hay was President; from the eighth to the thirteenth, Sir T. Moncreiffe; and in the fourteenth and fifteenth, Professor James Geikie.

To conclude the numerical statistics, our Museum now contains about 20,000 specimens, and our Library nearly 600 volumes, so that the resolution adopted in 1867 of forming a Library and Museum has been well carried out.

It makes rather an interesting study to trace the gradual development of the aims and objects of the Society, for it must be remembered that not even the most ambitious or imaginative of the founders anticipated for it the position it now occupies. In fact, the Society as the "Perthshire Society of Natural Science," very nearly never came into existence at all, since at some of the preliminary meetings there was a discussion as to whether the name should not be the "Perth Naturalists' Field Club," or some such title, and the programme limited to meetings and excursions. Though, however, the more aspiring name and scheme were adopted, for the first year or two the Society was not much more than a Field Club, holding meetings and excursions, but having no home of its own. The first decided development was the taking of a room in the Kirkside for a library—a queer, cold little room it was, heated, or rather attempted to be heated, by a gas stove, which on one occasion was accidentally left burning for, I think, a month. From this circumstance you may see that the library was not much frequented. The fourth year (1870-71) saw another development, for we then took a lease of the rooms in St. Ann's Lane that served for our home for eleven years. When we had fitted these rooms up with shelves, and put some cases in it, we were very proud of ourselves and well satisfied, little thinking what the future had in store for us. In 1871 one of the most ambitious steps that the Society has ever taken was made—namely, the institution of a Magazine, not limited to its own district, but for all Scotland. Looking back now at the position we then occupied, I cannot help wondering at our audacity, and still more at the success which crowned it. Though the *Scottish Naturalist* passed out of the possession of the Society in 1878, it still continues to exist, and is widely known. Whilst the views and aims of the Society continued gradually to enlarge, no further striking development took place till about the ninth year, when the members began to think seriously that more commodious premises should be obtained. Not

yet, however, had the idea arisen of actually building a place for ourselves, and all attempts to obtain more suitable rooms failed—fortunately, since the failure only led to greater success. In this year, too, the Society was in a great degree instrumental in founding another scientific association—the Cryptogamic Society of Scotland, whose first meeting and great fungus show was held in Perth. Another event of the year, and a more important one, both for Perth and for the Society, was the meeting of the Society at which the subject of the water supply of the town was discussed, and which resulted in a great extension of the supply. Some people were very angry at the Society's taking up such a subject, and said that we had no business to interfere with anything but bugs and beetles!

In the tenth year—which, in respect to the meetings, excursions, &c., was not a very successful one—the germs of the scheme which resulted in the acquisition of the present building were first sown. In his Presidential Address, on 1st March, 1877, Sir Thomas Moncreiffe, after pointing out that the Council of the Society, after consideration of several schemes which would have given us better accommodation, had "come to the conclusion that they were all selfishly small and unprogressible," boldly advocated the scheme by which not only did the Society get this building, but Perth got its New Public Hall. It is unnecessary to trace just now the steps by which Sir Thomas' plan was eventually carried out, but, to show how wide and far-seeing his views were, let me give a short extract from the address in question. "We want to help to educate the masses, and also to give them opportunities of educating themselves during their leisure hours in those subjects which would be of use to them in their different professions, as well as the subjects of natural interest to those who live in a beautiful world like this—subjects that would elevate and refresh their minds after their daily toil. . . . . Were such a building provided, a good museum and a series of interesting and instructive lectures would soon be forthcoming."

The ideas thus suggested were subsequently enlarged and developed, not only by Sir Thomas Moncreiffe himself, but, after his lamented death, by Professor Geikie and others of his successors in the presidential chair, the gist of the argument being that the Society was no longer to confine itself entirely to its original programme, but to promote scientific and other higher branches of education, not only by its own work in the Lecture-Room and Museum, but by encouraging and giving facilities to other educational movements.

This brings us to the second part of this address—the consideration of our present position, a position which I want you to consider from the point of view just indicated. Have we been successful in fulfilling Sir Thomas Moncreiffe's educational scheme? to which may be joined another question, Has the Society had any influence in stimulating the mental activity of Perth? The latter is perhaps a difficult question to answer, because we cannot tell what would have happened had the Society never existed. At the same time, looking at the movements with which the Society has been connected, the courses of lectures which have been given under its auspices, and more especially to the much greater mental activity displayed in

Perth now than there was a few years ago, and of which in a great measure this building is the centre, I think the question must be answered in the affirmative. To the other question I think we can also answer yes. Our Museum, especially by the plan on which it is arranged, is an educational force in itself, and we are happy to think that so many of our fellow-citizens use it either for instruction or pleasure. We may claim too that our lectures and our library assist in the good work, and that as regards our meetings the average attendance is increasing. It is impossible to say definitely what influence the meetings and excursions have on scientific education, but this we do know, that the number of practical students of Natural Science is increasing in Perth. So much for our work. A word as to the facilities and encouragement given to other educational movements. The most important of these is the recently founded Perth University Education Society, whose successful career, I think, we can honestly claim to have had a share in promoting, or at least we have been able to give that association facilities which it would not otherwise have had. This we have done in our capacity as a Society; as individual members of the Society many of us have taken a still more active part.

As in a way promoting the work of other bodies I may mention the use of our lecture room by the Perthshire Medical Association and the Literary Branch of the Royal Horticultural Society of Perthshire. Thus has been in a measure fulfilled Sir T. Moncreiffe's idea, that the Society's building would become a centre for the promotion of various kinds of education.

In considering our present position I might touch upon other subjects, such as, for example, the Union of the East of Scotland Naturalists' Societies, in which we had no little share, but I think I have said enough just now.

As for the future I need say little beyond this, that we must not remain content, but strive to do more. The lesson of the past has been that steady perseverance in our objects has been crowned with success, and that, moreover, as we go on, there is a gradual—and, in many cases, unforeseen—development in our aims. What, therefore, we should aim at in the future—beyond the increase of our Museum space, and consequent increase of our educational powers—the future will disclose. Let us hope that when our jubilee year comes there will be as good an account to render of our stewardship as has been given on the day of our majority.

12th April, 1888.

F. Buchanan White, M.D., F.L.S., F.E.S., President, in the Chair.

Andrew Hill was elected an Ordinary Member.

The following donations were intimated :—

Museum—Perthshire Collection.—Perthshire Lepidoptera—from Mr. S. T. Ellison. Nest of the Long-tailed Tit—from Mr. C. L.

Wood of Freeland. *Index Collection.*—Microscopic Slides illustrating the Anatomy of the Blow-Fly—from Mr. James Stewart.

Library.—Clock and Self-registering Barometer—from Mr. C. L. Wood of Freeland.

Mr. Taylor, Errol, exhibited a Case illustrating the Life-history of the Hessian Fly, and also a Stem of a Currant Bush showing buds deformed by galls.

The following papers were read :—

1. "The Great Movements of the Sea (other than Currents)." By R. Brown, C.E., R.N.

2. "The Anatomy of the Blow-Fly." By James Stewart, L.D.S. (Illustrated by Micro-Photographs shown by the Lantern.)

10th May, 1888.

R. Brown, C.E., R.N., Vice-President, in the Chair.

The Rev. F. Smith and George Fell were elected Ordinary Members.

The following donation was intimated :—

Museum—Index Collection.—Collection of Algæ—from Lieut.-Col. Sherwill.

The following papers were read :—

1. "Enemies of the Horticulturist." By Dr. R. Robertson, Errol.

2. "The Gall-making Hymenoptera of Scotland (excluding those on Oaks)." By Professor J. W. H. Traill, A.M., M.D., F.L.S., Aberdeen. (See *Trans.*, Vol. I., p. 72.)

SUMMER SESSION, 1888.

The following Excursions were arranged :—

1. May 24.—To Kinnaird Castle.

2. June 9.—To Balinbreich Castle and the Southern Shore of the Tay.

3. June 23.—To Spout Begg and Spout Barvick.

4. July 7.—To Loch Voil and Balquhidder.

5. July 28.—To Am Binnein.

6. August 4.—To the Lake of Monteith and Glenny.

7. August 18.—To the mouth of the River Eden.

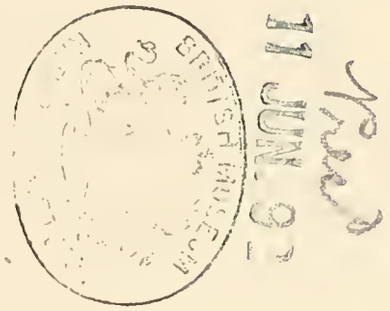
BALANCE-SHEET of the PERTHSHIRE SOCIETY OF NATURAL SCIENCE for the Year ended 29th February, 1888.

INCOME.

To Balance in Savings Bank at 28th February, 1887, ...	£17	3	3			
,, Balance in Treasurer's hands, ...	1	1	4			
				£18	4	7
,, Annual Subscriptions and Entrance Fees, ...				73	15	0
,, Sale of *Scottish Naturalist*, *Transactions*, and Guides, ...				1	5	9
,, Contributions towards Expense of Coal and Gas, ...				0	10	6
,, Interest on Bank Account, ...				0	8	11
				£94	4	9

EXPENDITURE.

By Janitor's Salary, ...				£20	0	0
,, Feu-Duty, ...				7	7	6
,, Property Tax, ...				0	4	3
,, Fire Insurance, ...				1	17	6
,, Repairs and Furnishings, ...				1	3	9
,, Fuel and Gas, ...				5	3	0
,, Printing, Postages, and Stationery, ...				34	12	0
,, Books and Magazines, ...				6	7	10½
,, Bookbinding, ...				1	3	0
,, Birdstuffing, ...				0	4	6
,, Incidental Expenses, ...				2	10	8
,, Balance in Savings Bank at 29th February, 1888, ...	£11	12	2			
,, Balance in Treasurer's hands, ...	1	18	6½			
				13	10	8½
				£94	4	9



PERTH, 29th February, 1888.—Examined and found correct.

JOHN M'GREGOR,
A. H. LUMSDEN, } *Auditors.*

WINTER SESSION, 1888-89.

8th November, 1888.

F. Buchanan White, M.D., F.L.S., F.E.S., President, in the Chair.

The following donations were intimated :—

Museum—Perthshire Collection.—Bat—from Mr. J. Smart. Two young Oyster Catchers—from Mr. Athole MacGregor. Nest and Eggs of Pochard and Nest and Eggs of Tufted Duck—from Captain D. M. Smythe. Nest and Eggs of Reed Bunting—from Mr. G. Alexander. Rabbit's Head, with malformed teeth—from Mr. Adam Steel, Blackpark. Fungus *(Polyporus)*—from Mr. Routledge, Freeland. Nests of Bees and Wasps and Parasites on Bees—from Mr. T. M. M'Gregor.

Mr. R. Pullar, F.R.S.E., Delegate of the Society to the East of Scotland Union of Naturalists' Societies, gave a report of the Meetings of the Union at Largo.

Mr. R. Brown, F.E., R.N., Delegate of the Society to the British Association for the Advancement of Science, gave a report of the Meetings of the Association at Bath.

The President delivered the following Opening Address :—

Gentlemen,—In seeking a subject for the address from the chair on the occasion of the opening of the Winter Session of the Society, it was soon apparent that, beyond the work which has been done since we met here in May last, there was not much of great importance to be discussed. The address, therefore, will be—as, I venture to think, it should be—almost confined to an account of the summer's work of the Society.

In May last seven official excursions were arranged, and of these five were carried out. Through various causes the excursions this year were not so strikingly successful as those of the previous summer—that is to say, they did not result, for one thing, in the discovery of so many additions to the local Flora and Fauna. This, perhaps, was not to be expected; but it must be confessed that on the whole the localities selected for exploration were not so replete with attractions as they might have been. Though the area within which our explorations can be conducted is very large, embracing, as it does, about 2500 square miles, it must be kept in mind that, from the situation of Perth, a large part of the district is beyond our reach for a single day's excursion. It must also be remembered that, though the area is large, many a square mile of it is but a repetition of many another square mile, neither particularly productive nor attractive. Thirdly, I must remind you that the localities within reach which experience has proved to be the richest have been visited over and over again, and hence were, perhaps unwisely, passed over in drawing up the programme, when we, like the old Athenians, were desirous

of something new. Lastly, as will be seen, we were very unfortunate, on several occasions, in our experience with the weather.

The first excursion was to Kinnaird Castle, on 24th May. Starting from Inchture we walked to Kinnaird Castle, and thence by Fingask. In the fields near Inchture *Veronica Buxbaumii* was very abundant, and *Lamium hybridum* also occurred. In a plantation near Ballindean *Doronicum plantagineum* and *Myrrhis Odorata*, and a little further on *Anchusa sempervirens* and *Malva sylvestris*, were found as naturalised plants. Near Kinnaird Castle a good bed of *Fumaria pallidiflora*, abundance of *Mentha sylvestris*, and specimens of *Chelidonium majus*, *Arabis hirsuta*, and an *Allium* (not in flower, but probably *A. oleraceum)* were seen. The great abundance of *Primula veris* was very noticeable. Near Fingask peach-coloured varieties of *Orchis mascula* and reddish-flowered forms of *Primula veris* were discovered. *Cynoglossum montanum* was also gathered, and *Chelidonium majus* seen again. On the Minister's Haugh, a bank a little beyond Fingask, *Reseda lutea*, *Lepidium campestre*, and *Potentilla reptans* occurred. The ground traversed during the day was comparatively well known, and, though several rare plants were got, nothing new was obtained.

On the 9th of June we opened, as it were, new ground, and explored part of the right bank of the Tay, from Newburgh downwards. This, though not in Perthshire, but in Fifeshire, is of course within the basin of the Tay. The result of our explorations, which were cut short by a thunderstorm, was not remarkable. At Balinbreich Castle, an interesting old ruin about three miles below Newburgh, we expected to find several naturalised plants, but the only one seen was *Doronicum Pardalianches.* On the shore here *Honcheneja peploides* occurred, and is noticeable because it does not appear to grow on any part of the opposite shore of the Tay within the boundaries of Perthshire. There are, it is true, not many spots where the nature of the soil would suit, but there are a few, and its absence is rather curious. At Balinbreich we turned back to Newburgh, finding in several places on the road *Equisetum pratense*, and at Newburgh Station *Cerastium glomeratum* var. *apetalum.*

On 23rd June we went to Crieff to visit Spout Barvick and the Falls of the Turrit. Between Crieff and the Barvick Burn several plants of some interest were found, as *Solanum Dulcamara*, *Melica uniflora*, *Geranium sylvaticum* (with rose-coloured flowers, and also with very small flowers), *Trollius*, and *Geum intermedium.* Up the Barvick Burn the plants chiefly noticed were *Melica uniflora*, in great abundance, *Stellaria nemorum*, *Alchemilla alpina*, *Saxifraga hypnoides*, *Sedum villosum*, *Habenaria albida*, *Equisetum pratense*, *Geranium sylvaticum* (with white flowers), *Kœleria cristata*, &c. Crossing thence to the Falls of the Turrit, where not much was got, we made our way to Monzievaird or Ochtertyre Loch, and thence to the banks of the Earn, where *Rumex alpinus*, *Carum carui*, *Lepidium Smithii*, &c., were found. The excursion was a pleasant one, but not particularly remunerative in the way of plants.

On 7th July we visited Loch Voil. Starting from Kingshouse, we went—joined by some of the Stirling naturalists—by Balquhidder,

where we visited Rob Roy's grave, to Stronvar, and thence for some miles up the south side of Loch Voil. We then ascended a burn, went round a hill, and returned to Kingshouse. Whilst we did not discover all the rarities we expected, our labours were not entirely unproductive. The best plants noticed included *Orchis incarnata*, *Corydalis claviculata*, *Carex vesicaria*, *C. aquatilis*, *C. pauciflora*, *Scirpus pauciflorus*, *Hymenophyllum unilaterale*, and *Hypericum dubium*.

The 28th of July was a memorable day of disappointments. On that day we had determined to scale Am Binnein, one of the peaks of Ben More, and to hold there a meeting of the Mountain Club. For good work on the hills it is imperative that the weather should be good, since in rain and mist it is impossible to search effectually for alpine plants. When we left Perth at an early hour the weather looked decidedly gloomy. At Dunblane, where we had to change trains, there was a gentle but persistent rain falling. At the base of Ben More, things looked very bad indeed; and, when we got up to a height of 3000 feet, it was only to find ourselves enveloped in mist, drenched with rain, and chilled to the bone by a bitterly cold wind! By arrangement with the railway company, the train was stopped for us at Ben More Farm-house, and we began the ascent. Here we unexpectedly met an Edinburgh botanist, Mr. Symington Grieve, who was residing at the farm-house, and who, not only very kindly volunteered his services as guide to the mountain, but offered us hospitality. Thus reinforced we trudged up the hill, trying to look as cheerful as possible. When we got near the *col* between Ben More and Am Binnein alpine plants began to appear in some abundance, the rarest being *Carex pulla*, which was very common in marshy places. On the *col* itself the weather was so bad that a council of war was held, with the result that the party divided, some returning by the way by which they had come, the others pushing onwards and upwards. At the proper elevation on the hill a meeting of the Mountain Club was held. As the proceedings of this Club can be known by the initiated only, an account of them cannot be given, but it may be said that it was only with great difficulty that the meeting could be held. One of the newly admitted members had a photographic apparatus with him, and attempted, though unfortunately without success, to take a view of the party. Had he succeeded, the photograph would have shown a group of very wet botanists, crouched together in a small hollow, and surrounded by bare grey boulders, half hidden, half seen, in the driving mist. Under these circumstances, the following poem, written, according to the rule of the Club, for the meeting, sounds rather ironical:—

PERTHSHIRE MOUNTAIN CLUB.

AM BINNEIN, 28/7/88.

"Rest ye no more!" our Mountain Chieftain cried;
"No more!" the echoes of the hills replied;
From rock to rock, from far away and near,
Now soft, now loud, but always plain and clear,
The distant echoes of the hills rolled on

Till all the heights in sunlit glory shone,
And, like the music of the spheres, was heard
On every side our Chief's awakening word.
Each from his drowsy couch the warriors sprung,
Our Cairn Master stern, our Poet—brave John Young,—
The lovers of the beasts in earth and air,
The lovers of the flowers—they all were there ;
Whilst silently, with lowering brow, and heart
Filled with revenge, dark Morpheus stood apart,
Cursing the word that broke his spell too soon,
And woke each warrior six good hours from noon.
All hurrying to and fro, some few near late ;
"Get breakfast ready—quick ! we cannot wait !"
While sleepy wives turn round, and hate the hour
Which calls their husbands to the mountain bower
To serve the altar of the hill-top flower.
They (not the husbands, but the wives I mean)
Were never asked to climb the hill, I ween.
But breakfast must be ready, and the cup
With sparkling mountain dew be filléd up,
And rest must be forsaken till the men
Haste to the train and seek the mountain glen.

The hot sun floodeth all the treeless track,
From which long since hath soared the sweet-voiced lark,
To plunge into the splendour of the sky
And swim in ether, or untired to fly
Up to the mansions where all musics dwell,
And, listening, learn in fuller notes to swell
Her next day's song. All hot, but still untrod
Half of the weary way, and tired heads nod,
And Morpheus smiles. "Rest not !" our Chieftain cries.
"Quit ye like men, away with childish sighs !"
One draught of mountain dew—like a new man
Steps out each warrior of the mountain clan,
Till, in a silence deep, the warriors stop,
For now, at last, they've reached the mountain top !

Upon the cairn grey the Cairn Master sat,
Whilst each man there stood silent 'neath his hat,
And eyed with wistful eyes the well-stored cup
Which was with mountain dew fresh filléd up.
They eyed the cup, the Master eyed his men ;
He held the Quaich, he paused a little—then
A shout of manly voices rent the air
And echoed down the hillside stern and bare !

Not for bright colour, gaudy hue,
Nor scarlet 'broidery, deepest blue,
Nor sweetest scent, we worship you.
Salix herbacea floreat !

Not where fair ladies crowd the street,
Trimming a hat or jacket neat,
In fashion never thee we meet.
Salix herbacea floreat !

But high above earth's noisy ways,
Living, not seeking human praise,
Thine emerald hues to heav'n you raise.
Salix herbacea floreat !

Bidding us look not here below
For mortal fame ; bidding us grow,
And in our turn good seed to sow.
Salix herbacea floreat !

Not thinking that our work is done,
Not thinking rest can here be won,
Till sinks for aye our summer's sun.
Salix herbacea floreat !

Bidding us look beyond, to where
Many have passed from sin and care,
Giving us hope to meet them there.
Salix herbacea floreat !

Toast we to thee, then, mountain queen,
Wearing for us Hope's emerald sheen;
For ever we will wear the green !
Salix herbacea floreat !

Toast we to them who, gone before,
Await us on a clearer shore,
Where all unsealed is Nature's lore.
Salix herbacea floreat !

Toast we ourselves; may this year bring
Fresh knowledge on its rushing wing,
Till, once again, up here we sing,
Salix herbacea floreat !

Having finished the Club business the exploration was continued. In a large marsh below the col *Carex aquatilis* was found to be abundant. This is a plant which, though widely spread in Perthshire, is very local, and occurs only at low levels, though in Forfar and Aberdeen shires it ascends the hills ; hence its occurrence on Am Binnein is interesting. From this marsh a descent was made on Luib Station, from which in due course home was reached, and, for a wonder, the day resulted in no immediate bad effect on the health of any of the party.

There were two more official excursions on the programme, but, so far as shown, they did not come off.

Of unofficial excursions, several successful ones were made by various members of the Society. Of a few of them an account may be given.

One, in the beginning of July, was to Loch Loch in Athole. Near Loch Loch *Oxytropis campestris* was discovered last year by Rev. J. Fergusson, and it was to see this plant that Messrs. Barclay and Meldrum and I went by train one midnight to Killiecrankie Station. Arriving there between two and three A.M., we set forth across the moors to Loch Loch, about ten miles or more distant.

After we had got about half-way the sun rose and ushered in a

beautiful day. On the way various interesting plants were met with. For example, the turf of some fields seemed to be chiefly composed of one of the alpine sedges, *Carex capillaris*. At the base of Ben Vuroch *Kobresia caricina* was seen in some abundance, and *Juncus alpinus* was also found. At last we got into the head of Glen Fernate and could get a glimpse of Glen Loch, at the end of which appeared the Cairngorm Mountains, white from top to bottom with freshly-fallen snow, a striking spectacle in July in Scotland. Reaching Loch Loch we examined the rocks and soon found the *Oxytropis* in abundance. Though, as usual, its flowers were mostly yellowish in colour, some specimens were found with purplish-pink flowers. The other plants on the rocks were not of great interest, though some were not very common species. At eleven A.M. our botanical work was completed, and at noon we set off on our return to Killiecrankie, whence we returned to Perth well pleased, but rather sleepy. It may be mentioned that, on the preceding day, Mr. Meldrum gathered the other British *Oxytropis*, *O. uralensis*, thus gathering both species within 36 hours, a feat probably never accomplished in Britain before.

Another excursion of interest was made at the end of July and beginning of August to the Killin district. As the botany of this has been so often described I need not give a detailed account of it. One day was spent on Ben Lawers, and almost all special plants of that rich hill seen. In addition, one plant of a very rare and interesting species was found. This is a *Triticum*, which was first found on Ben Lawers by George Don about the beginning of the century, and described by him as a new species, which he called *Triticum alpinum*. After Don's time no one appears to have found the plant for many years, and latterly it had come to be considered as only *T. repens*. Some time ago, however, Mr. Cosmo Melvill found a *Triticum* on Ben Lawers, which, however, had not much attention paid to it till a year or two ago, when it was discovered to be probably the same as the Norwegian *T. violaceum*. Till this year it had not been re-found till as mentioned above, when, searching in Mr. Melvill's locality, I found one plant.

Amongst other plants seen at the Killin excursion may be mentioned *Phleum alpinum*, a grass which is very rare in Perthshire, and practically new in the county, and *Hieracium aggregatum*, a very rare Hawkweed, new in this county.

I have now, in conclusion, to mention one or two plants which have been added to the Perthshire list this year. The most important is *Epilobium collinum*, a species new to the British list, which, though found several years ago near Loch Tay by Mr. G. C. Druce, was only determined this year. In searching, I suppose, for it this year, Mr. Druce found near Loch Tay another very interesting plant, *Calamagrostis borealis*, Læst., a grass new to Britain. Mr. Druce has kindly given me specimens, which I have pleasure in presenting to the Herbarium.

Besides these, several—perhaps half-a-dozen—*Hieracia* have been identified as growing in the county, some of them being probably new species. Of these and of some new willows I will give a report here-

after. It will thus be seen that, though the official excursions of the Society were not so successful as they might have been, yet as regards the exploration of Perthshire the season has not been unprofitable, and that it has shown that the Flora of the county is not yet exhausted.

[NOTE.—Since this remark on the Ben Lawers *Agropyrum* was written, the plant of it, which I have in cultivation, having grown strong and flowered, proves that it is a species distinct both from *A. violaceum* and *A. repens*, though apparently somewhat intermediate between the two. At the same time it is identical with *Triticum alpinum*, Don MS., of which an original specimen is before me. Since Don's name for the species is a manuscript one only, and has, moreover, been variously allotted, I propose to call the Ben Lawers grass *Agropyrum Donianum*, thus associating with Don's name a flowering plant of the Scottish hills.

From *A. violaceum A. Donianum* may be distinguished by the root which produces creeping stolons, by the longer and narrower glumes and lower pale, and the more acute upper pale whose ribs are less strongly, but more closely, pectinate-ciliate, and are produced into short projecting scabrid awns (best seen in fruiting specimens). In *A. violaceum*, so far as I have seen, the ribs gradually vanish on each side of the tip of the pale, and do not form awns even in fruiting specimens.

A. repens differs from *A. Donianum* in having less rigid and less scabrous leaves, in having the upper pale emarginate at the tip, and the ribs not forming awns, &c. *A. caninum* is still more remote. In it the upper pale is acute, but the ribs are not produced into awns.—F. BUCHANAN WHITE.]

The following paper was read :—

"Notes on some Additions to the Birds and Nests recently placed in the Museum." By Colonel H. M. Drummond Hay, C.M.Z.S., B.O.U., Hon. Curator of the Museum. (See *Trans.*, Vol. I., p. 91.)

13th December, 1888.

F. BUCHANAN WHITE, M.D., F.L.S., F.E.S., President, in the Chair.

Miss Lizzie Malloch, Mrs. James Sherwill, and John Henderson were elected Ordinary Members.

The following papers were read :—

1. "Geological Notes on Loch Carron and West Ross-shire." By R. Dow. (See *Trans.*, Vol. I., p. 98.)

2. "Additions to the Flora of the Woody Island in 1888." By William Barclay. (See *Trans.*, Vol. I., p. 102.)

10th January, 1889.

F. Buchanan White, M.D., F.L.S., F.E.S., President, in the Chair.

Colonel Stirling of Gargunnoch, Captain Norman Macleod of Dalvey, T. Crawford, and T. Osborne were elected Ordinary Members.

The following donations were intimated :—

Museum—Perthshire Collection.—Plaster Casts of Fishes—from Mr. James Stewart, L.D.S. *Index Collection.*—Skeleton of a Cat—from the same.

The following papers were read :—

1. "A Visit to the Yosemite Valley and Yellowstone Park." By P. Campbell.

2. "A List of Additional Aculeate Hymenoptera collected in Perthshire during 1888." By T. M. M'Gregor. (See *Trans.*, Vol. I., p. 104.)

14th February, 1889.

CONVERSAZIONE IN THE SOCIETY'S ROOMS AND THE WORKING BOYS' AND GIRLS' HALL.

Dr. F. Buchanan White, President, in the Chair.

Addresses were delivered by Professor James Geikie, LL.D., Edinburgh, and Professor D'Arcy W. Thompson, B.A., Dundee.

Electrical Appliances were exhibited by Mr. A. E. Pullar, and Biological Specimens by various members.

14th March, 1889.

TWENTY-SECOND ANNUAL MEETING.

F. Buchanan White, M.D., F.L.S., F.E.S., President, in the Chair.

Mr. James Coates exhibited a specimen of the Leaf Butterfly *(Kallima Inachis)*, brought from India by Mr. James Sherwill.

The following donations were intimated :—

Museum—Perthshire Collection.—Rat—from Mr. J. S. Grant, Ballinluig. *Index Collection.*—Geological Specimens—from Colonel Wedderburn Ogilvie of Rannagulzion.

Library.—Large framed Photograph of the late Sir Thomas Moncreiffe, Bart.—from Mr. John Henderson.

On the motion of Mr. R. Dow, it was agreed that a Photographic Section of the Society be formed, under the conditions recommended by the Council—namely, that each member of the Section shall pay an annual subscription of two shillings, in addition to the ordinary subscription of the Society.

The following Reports were read and adopted :—

REPORT OF COUNCIL.

The return of the month of March imposes upon your Council the duty of reviewing the past year, and it is glad to be able to state, in this its Twenty-second Annual Report, that the work of the Society continues to make progress, slower, possibly, than some of us care to see, but still in a right direction. The laws of growth in societies, as in nature, are usually most active during youth, and as maturer years come on the progress made is always slower, but often more stable. Your Council therefore hopes that, having as a Society attained to years of maturity, though our progress may not be as rapid as in some former years, still in some measure we may be able to show from year to year that development is not arrested.

During the past year 6 monthly meetings were held and 9 papers read. The average attendance was 37—the greatest number being 45, on 10th January, 1889; and the least 22, on 8th March, 1888. This shows a slight falling off from last year. Twelve new members have been admitted during the year, showing a net gain of 9 and a present membership of 318, including 2 honorary and 9 corresponding members and 9 associates.

In addition to the monthly meetings, 4 extra lectures were given during November by the Rev. F. Smith, which were very well attended, and the Council has to thank Mr. Smith for his kindness in offering that course, and trusts that the lectures may, on some future occasion, be continued. Seven Excursions were arranged for the summer months, but, owing to the weather, only five of the places were visited. The Council heartily thanks the various landlords and tenants who so readily gave their permission to admit of these excursions being carried out. The use of the Lecture-room has again been granted to the University Extension, the Horticultural, and the Medical Societies.

The Museum has during the year been visited by 2,200 persons, bringing the total up to over 24,000.

REPORT OF TREASURER.

(See Balance-Sheet, page liv.)

REPORT OF LIBRARIAN.

No fresh occurrences during the past session fall to be reported in connection with the Library.

The number of readers continues at about the same point as during the previous session, and any increase is not to be looked for as long as the financial barriers exist, which preclude any material additions to the number of volumes.

REPORT OF EDITOR.

The only publication issued during the past year was the second part (new series) of the *Transactions and Proceedings*.

The following Office-bearers were elected :—

President—F. Buchanan White, M.D., F.L.S., F.E.S.

Vice-Presidents—Captain D. M. Smythe, yr. of Methven; William Ellison, R. H. Meldrum, and John Thomas.

Secretary—S. T. Ellison.

Treasurer—John Stewart.

Curator—Colonel H. M. Drummond Hay, C.M.Z.S.

Librarian—James Coates.

Editor—Henry Coates, F.R.P.S.

Councillors—J. Clacher, James Stewart, L.D.S., and T. M. M'Gregor.

The President delivered the following Address :—

Gentlemen,—There is at least one drawback to the honour which you conferred upon me last year of re-electing me to the office of President, namely, that with each succeeding year it is more difficult to find for the Annual Address a subject which will combine the two essentials of novelty and general interest.

On this occasion I shall have, in part at least, to fall back upon a subject that has been already treated of—the extension of the Museum accommodation.

At a previous Annual Meeting I laid before you a scheme and plans for this necessary extension, and if I bring it forward again it is only because my views have been somewhat modified by circumstances. When I spoke of the subject before, the objection was made that I wished the Society to launch forth into an expenditure that it could not meet. On this occasion, therefore, I hope it will be clearly understood that, in laying a scheme before you, I wish simply to point out an object that the Society must keep in view if it is to progress in the future as it has done in the past. It will, too probably, be years before we are in a position to go on with the extension; but, if it is ever to be done, it is not too soon to consider in what way it should be carried out. It is unnecessary to repeat in great detail the reasons why more space is necessary. In one or two departments—as, *e.g.*, the entomological and botanical of the Perthshire collection—we are not yet pressed for room, but in all the others the reverse is the case. Look, for example, at one of the most interesting collections in the Museum, that of the nest and eggs of Perthshire birds. There not only are the specimens so crushed together that their characteristics are often partly concealed, but a number of examples cannot be exhibited at all. The latter is also the case with the collection of fishes, with the geological collection, and, in fact, with most of the other collections, not excepting the index. Having no room to exhibit all the specimens we have, there

is a reluctance to expend energy in completing the collections, and, except for the acquisition of a rarity now and then, the work of forming the Museum is in most departments at a standstill. If the members wish it to be so, we have nothing to say, but believing that at some time, however distant, the extension will be carried out, I offer, as I offered before, a few suggestions as to the plan on which it should be done.

You will, perhaps, remember that the former scheme consisted of a larger building on the vacant site which we possess at the back of the present one. The details of that I need not repeat, since almost the only modification which I have to propose is the conversion of the hall on the ground floor into a lecture-room, and the utilisation of this, our present lecture-room, for the index collection.

This alteration in the plans has been suggested to me by the great success which has attended the courses of lectures conducted by the Perth University Education Society. That Association, while of course independent of ours in the sense that it is a separate Society, is at the same time so intimately connected in many ways —with objects, in part at least, of a similar character, and its leading members energetic members of our Society—that if we can help it we may in a measure be said to be helping ourselves. Now, whilst on most occasions our lecture-room has been sufficient for our needs, yet for several of the courses of lectures of the other Society it has been deficient, both in accommodation and ventilation. A new lecture-room, with raised seats and desks, should therefore be included in any scheme for the enlargement of our premises, and, by enlisting the interest of the University Society in our plan of extension, we would, I expect, not lose anything. One word as to the expense. When I spoke on the subject before I mentioned £850 as the probable amount necessary for putting up, but not furnishing, the building. Putting aside the question of cases for after consideration, we might, in the meantime, restrict our aspirations to the building only, with the equipment of the lecture-room, and a sum of £1000 would be more than ample to meet the expense of this. But, as I have already said, I am concerned at present merely to point out what is necessary, and can offer no suggestions as to the means of raising the money, more especially as the present income of our Society is scarcely sufficient to meet the current expenses.

As you may have seen from the newspapers, there has been a suggestion made recently for a course of lectures on botany, under the auspices of the already mentioned University Education Society, and no doubt many of our members will take advantage of this course if it comes off. The possibility of such being the case has reminded me of a scheme, which was suggested some years ago, for the establishment in Perth of a botanic garden on a miniature scale. The originator of the idea was Professor Geddes. I remember that he and I, several years ago, made a perambulation of the town and its vicinity looking for a suitable site. At that time the scheme advanced no further, but it has not been lost sight of, and a few words on the subject may not be out of place.

The leading features of the scheme is the laying out and planting

of a small plot of ground in such a manner as to exhibit, by living and growing plants, the chief natural orders—and their relations to each other—into which the vegetable kingdom is divided. Since most of the plants could be obtained free of charge—that, I think, I could promise to see carried out,—and, as the annual expenditure for upkeep should be very small, the only expenses, apart from the site, would be the first laying out of the ground. The site should be centrally accessible to all students of botany, since the scheme is not for the benefit of members of the Society only, but for the teachers and scholars of those schools in which botany is taught, and even for those of the inhabitants of Perth who wish to learn something of the science. When Moncreiffe Island was being acquired by the city, there was some talk of part of it being utilised for working men's gardens, &c., and of an access being made to the island. If this is ever done, an effort should be made, I think, to obtain there a site for the botanic garden, and, since it would be for the educational benefit of the community, such a site should be given free—rather, I should say, not given but allocated, and, after having been laid out and planted, remain under the charge and care of the municipal authorities.

One other suggestion I have to make in connection with this garden. Whilst necessarily some of the natural orders would have to be represented by plants which are not natives of this district, it would be very desirable to have growing in it as many of the Perthshire species as possible, since in this way a knowledge of our own Flora would be made accessible to all interested; and who is there who is not, or should be, interested in the plants of our own woods and hills! Of course labels to every specimen would convey as much information as possible. Nowadays, when we hear so much of Ruskin Societies and Kyrle Societies, and similar Associations in our towns, why should Perth not be doing something to bring the beauties of nature home to its citizens?

I have now, in conclusion, to say a word or two about some of the present work of the Society in relation to the Museum. Though, from want of space for the collection of the larger animals, a great influx of specimens would be inconvenient just now, still we can always find room for—and are still getting from time to time—specimens of the rarer species; but for the smaller animals, such as insects, and for plants, we have yet plenty space, and I think that more might be done in the way of getting specimens. As has been pointed out on former occasions, Perthshire has a wide area, and it is desirable that our collections should have examples from every part of the district. Collectors doubtless think that the more uncommon species are the only ones worth giving; but this is a great mistake. We wish to illustrate in our collections the distribution of even the very commonest and most abundant. In looking over some of our plants lately I was surprised by the meagre way in which some of the common species are represented. What is required is that, not only should all the species of the thirteen districts into which Perthshire is divided be represented by specimens in the Herbarium, but the various parts of these districts. It would, in fact, be a good

plan to have a perfect collection of the plants of each parish, and, as example is better than precept, I will, in the course of the coming summer, undertake the parish of Kinnoull, if other botanists in the Society will promise to do the same for other parishes.

In connection with the investigation, not only of our Flora, but also of the Fauna, I have long been of opinion that a better method of exploring the less accessible hills is much needed. To reach the base even of some of these hills requires a long journey on foot, which has to be repeated in the evening. Consequently the investigation is often a superficial one, and we know from experience in such limited areas as the Woody Island, Kinnoull Hill, &c., how plants escape notice even under more favourable circumstances. What is required for the more careful and minute investigation of the hills is some means by which fatigue can be lessened and time saved, and I think it would be well if the Society, in planning its excursions, could devise some arrangement by which a small party could camp out for some days in some well-selected spot. I am confident that the result would be beneficial both to our knowledge of the Flora and Fauna and to our collections in the Museum.

11th April, 1889.

F. Buchanan White, M.D., F.L.S., F.E.S., President, in the Chair.

Miss Stewart Sandeman, Stanley; Edward Campbell; John Wood, junior; Thomas Mill, New Scone; J. Chisholm, LL.B., Edinburgh; Alexander Taylor; J. D. Lumsden, Huntingtower; A. Ferguson, Coupar-Angus; J. L. Stirling; T. Bourke; A. Hodge; W. Frew; R. C. Ferguson; Dr. B. Laing, Bridge of Earn; J. Robertson; W. Boyd; A. Boyd: R. Gillespie; W. Macdonald, senior, and W. Macdonald, junior, Woodlands, were elected Ordinary Members.

The following donations were intimated:—

Museum—Perthshire Collection.—Perthshire Plants—from Mr. R. H. Meldrum.

The following papers were read:—

1. "On the Arrangement of the Perthshire Geological Collection in the Museum"—

   (1) "The Rock Specimens." By H. Coates, F.R.P.S. (See *Trans.*, Vol. I., p. 105.)

   (2) "The Minerals." By P. Macnair. (See *Trans.*, Vol. I., p. 110.)

2. "Sea Waves and Drift." By R. Brown, F.E., R.N.

9th May, 1889.

F. Buchanan White, M.D., F.L.S., F.E.S., President, in the Chair.

J. Stewart, Kinfauns; Miss Chisholm; R. B. Belfrage, C.E., Bridge of Earn; Mrs. Brown, R. Strawbridge, P. Dow, and H. Jameson were elected Ordinary Members.

The following donation was intimated :—

Museum—Perthshire Collection.—Golden Eagle—from The Earl of Mansfield.

Dr. Buchanan White read the following Notes :—

Golden-Eye *(Clangula glaucion).*—For about a year a Golden-Eye Drake has been inhabiting the Tay, below Perth Bridge, and is no doubt known to many of you. Since this species is a winter visitant only to this country, the presence on the Tay of one during the whole year is of interest, though in this case the bird does not remain here voluntarily, but from inability to fly on account of a broken wing.

The Golden-Eye is one of the diving ducks, and visits our coasts and estuaries, and also inland lakes, from October to April, feeding on small aquatic animals, such as mollusks, &c. In its distribution it is circumpolar, and never leaves its northern home so long as there is any piece of water unfrozen, since it seems able to withstand a greater amount of cold than most other species. Its nest is said to have been found in Sutherlandshire, but the record is very doubtful. In Norway and Lapland, where (and in other northern regions) it breeds, it makes its nests in holes in trees, often 12 or 15 feet from the ground, and is said to carry its young to the water by holding them between its bill and its neck. The Laplanders place boxes in the trees for the ducks to lay in, and though the eggs are repeatedly taken the birds go on laying. As an article of food the Golden-Eye is worthless. Our friend at the bridge spends a good deal of his time in company with the gulls at the outlet of the lade, where he seems to pick up a living sufficient to keep him in good condition. When the water is sufficiently clear, and he is near enough the bridge, his agility in diving and his actions under water are interesting to watch. When not on the outlook for food he often rests on some of the gravel banks, or paddles gently along the shore of the island. At other times he may be seen lying lazily on one side on the water in places where there is not much current, keeping himself in position by paddling with one foot. Though usually not far from the bridge, he occasionally makes excursions as far down as the County Buildings, but never, I think, ventures up above the bridge. Where our friend sleeps I am not sure; perhaps on some of the gravel banks, or possibly on the water. When the river was in spate, and the island covered, he disappeared altogether; but one day, when the island was beginning to reappear, I saw him making a desperate effort to reach it from the east bank, but the current was too strong, and after

nearly attaining his object he was swept down again. Like others of his species, he is very wary, and keeps a sharp look-out for the stones which, I am sorry to say, are sometimes thrown at him. Though he has hitherto escaped injury, such may not always be the case, and I hope that the inhabitants of Perth will give protection to an interesting bird who has sought their hospitality.

Swallow.—The arrival of the Swallow is a very general object of interest, and is frequently chronicled in the newspaper. Casual observers, however, do not distinguish between the three kinds of swallows which visit us, and, like the primrose to the well-known Mr. Bell, any kind of a swallow is *the* Swallow. The three kinds, however, arrive at rather different periods, and ought to be distinguished. The first to arrive is the Sand Martin, which may be known by its brownish-black plumage and squarish tail; the next is the House Martin, easily recognised by the white patch on its back; and the last is the true, or Chimney Swallow, with glossy purple-black plumage and conspicuously forked tail.

Some true Swallows nest in my garden, and for some years I have kept a note of the day on which they have been first observed. From 1879 to 1887 the dates were May 4, May 20 (?), May 6, April 23, April 28, May 6, April 28, May 6, May 5, and this year May 5. These dates do not represent, of course, the earliest arrivals in the district.

Swift.—The Swift—at one time supposed to belong to the same family as the Swallow, but now placed in a different position—is another of our summer visitors, whose time of arrival is of interest. I have noted for some years the day on which I have first seen them at the bridge. Since, however, they are not always flying about, it is possible that they may sometimes arrive a day or two before I see them. The dates from 1878 to 1887 are as follows:—May 3, May 14, May 14, May 8, May 7, May 12, May 6, May 1, May 4, May 4, and this year May 5.

I may take this opportunity of mentioning that the nest and eggs of the Swift are much required for the Perthshire collection in the Museum.

Power of Plants to resist Drought.—A few years ago I put the seeds of two plants—*Erinus alpinus* and *Corydalis lutea*—on a wall which faces the south, and which is too dry to support even mosses, except a few tufts of *Tortula muralis*. The seeds were sown in winter, and germinated in early spring. The following summer (1887) was, as you know, for sometime, at least, very hot and dry, no rain falling for several weeks. Nothwithstanding this the plants did well, and the *Erinus* flowered. Now the *Erinus* is a small plant, with small roots and no reserve of moisture, and in its native habitat in the mountains is accustomed to abundance of damp, and the fact of its doing well in such a situation as the wall in question is rather remarkable. On damp mossy walls it grows readily, but on this one it was not only baked in the sun, but got no water at all for many weeks. The *Corydalis* is more succulent, and hence it does not afford so marked a case as the *Erinus*.

Sedum Album.—Some plants of the White Stone-crop (*Sedum*

album) grow on a rock on the Dundee Road at Barnhill. I removed, several years ago, a small piece and planted it on the top of the cliff on Kinnoull Hill. Here it soon spread and covered several square yards, but was still confined to a small space. Last autumn, in exploring the base of the cliffs, I was astonished to find that for a considerable distance every ledge from top to bottom (a height of perhaps 160 feet or more) was covered with the Stone-crop, which formed quite a conspicuous feature. Whilst the Stone-crops have unusual facilities for spreading, since every little piece will grow, still the extent to which this one has propagated itself in a comparatively short time seems worthy of record.

The following paper was read :—

"On the occurrence of supposed Annelid Tubes in the Quartzites of Perthshire." By P. Macnair. (See *Trans.*, Vol. I., p. 116.)

17th May, 1889.

SPECIAL GENERAL MEETING.

Dr. F. Buchanan White, President, in the Chair.

On the motion of Mr. R. Dow, it was agreed that the following Revised Constitution, drawn up by the Council, be adopted, viz. :—

LAWS.

1.—The Society shall be denominated "The Perthshire Society of Natural Science."

2.—The object of the Society shall be the study of Natural Science, by means of Periodical Meetings for the Reading of Communications and Exhibition of Specimens, Publications, Lectures, Excursions, and the formation of a Library and a Museum.

3.—The Society shall consist of Honorary, Ordinary, and Corresponding Members, and of Associates. Honorary Members shall be persons who have attained eminence in Science, or who are otherwise deemed worthy. Corresponding Members shall be persons, not resident in the County, who assist the Society in the promotion of its objects. Associates shall be persons, resident in the County, who, not wishing to become Ordinary Members, shall have acquired a claim upon the Society by assisting it in its objects. Only Ordinary Members shall take part in the management of the Society, and be eligible for election as Office-Bearers, and from them alone shall the Annual Subscription be required.

4.—All Candidates for admission as Ordinary Members must be proposed by Two Members. After having been proposed, the names of the Candidate and of the Proposer and Seconder shall be placed on the Notice Board in the Library, and shall remain there till the next Meeting, when, unless a Ballot has been demanded, the Candi-

date shall be declared to have been elected. It shall be in the power of any Member to demand a Ballot, in which case one negative vote in seven shall be sufficient for the rejection of the Candidate. Honorary and Corresponding Members and Associates shall be proposed by the Council only, but otherwise be elected in the same manner as Ordinary Members.

5.—Ordinary Members shall, on election, pay to the funds of the Society Eight Shillings, and thereafter annually, within One Month from March 1st, the sum of Five Shillings and Sixpence, which sum may at any time be compounded for by One Payment of Five Guineas.

6.—The business of the Society shall be conducted by the following Officers, constituting, together with the Trustees, the Council, viz. :—A President, Four Vice-Presidents, a Secretary, a Treasurer, a Curator, an Editor, and Four Councillors, all of whom shall be elected annually, but shall be eligible for re-election, with the exception of the Two Senior Vice-Presidents and the Two Senior Councillors, who shall not be eligible till the expiry of one year from their term of Office. Three Members of the Council shall form a quorum. The Officers of the Society shall be nominated by the Council at the ordinary Meeting next before the Annual Meeting, and their names posted on the Notice Board in the Library. It shall be within the power of any Two Members to propose another Member in place of any of those nominated by the Council; but such proposition must be intimated to the Secretary not less than Ten Days before the Annual Meeting, and posted by him at once on the Notice Board. In the case of a contested Election the vote shall be taken by ballot.

7.—The whole Property presently belonging to, or which may be afterwards acquired by, the Society, whether by donation, or by purchase, or in any other way, shall presently vest in, and be held for behoof of the Society by, a body of Trustees, four in number. The Trustees shall continue in office as long as they shall remain Members of the Society, and, in the event of a vacancy occurring in the body, it shall immediately be filled up by the Society. The Trustees shall have the sole control and management of the present and future Furniture, Scientific Specimens, Books, and other Articles, which belong or may belong to the Society. The Trustees shall be *ex-officio* Members of Council.

8.—In the event of any surplus arising from the Annual Voluntary Contributions, Subscriptions, Donations, or other Income, or Funds of the Society, the same shall be applied in furtherance of the objects of the Society, as above stated, and no part thereof shall be applied in making any dividend, gift, division, or bonus in money unto, between, or among any of the Members of the Society.

9.—The Ordinary Meetings of the Society shall be held once a month from November to May inclusive. Five Members shall form a quorum. At these Meetings the order of business shall be as follows :—1st, Minutes of preceding Meeting and of any Meetings of Council read, and, if approved of, signed by the Chairman. 2nd,

Donations announced and thanks voted. 3rd, Exhibition of Specimens. 4th, Proposal and Election of Candidates for Membership. 5th, Communications and Papers read.

10.—The Annual Meeting shall be held in March. At the Annual Meeting the Executive Officers shall give written Reports of the past year's proceedings in their respective departments; the President shall deliver an Address; and the Council for the ensuing year shall be elected.

11.—The Council may at any time call an Extraordinary Meeting of the Society if it shall seem expedient, or the Secretary shall call such Meeting upon the receipt of a written requisition signed by Five Members, designating the purpose for which it is required. Intimation of an Extraordinary Meeting, and of the business for which it is convened, must be sent to every Ordinary Member not less than Three Days prior to such Meeting, and no business shall be brought forward but that which has been so notified.

12.—Notice of motions affecting the Constitution of the Society must be given at the Meeting previous to the one at which they are to be discussed, and three-fourths of the votes of the Members present and voting shall be necessary to carry such motions.

13.—The Council shall of itself, or on a requisition signed by Five Members, call an Extraordinary Meeting to consider the case of any Member whose conduct has been such as to render it expedient that he should cease to be a Member; and if at such Meeting three-fourths of the Members present and voting shall declare for the expulsion of the Member whose case is under consideration, that Member shall, *ipso facto*, cease to be a Member and to have any right in the property of the Society. The votes shall be taken by ballot.

14.—The Council shall have the power of making such Bye-Laws as may be expedient for the welfare of the Society.

BYE-LAWS.

1.—The Secretary shall within One Week after the election of a Member send him notice of his election and a copy of the Laws of the Society.

2.—If any Member shall omit to pay his Annual Subscription within Three Months after it has become due, the Treasurer shall send him notice of such arrears, and if, after this notice, he fails to pay before the expiry of One Month, he shall cease to be a Member, and not be eligible for re-admission, unless he can show sufficient reason for the non-payment, when the Council shall have power to re-admit him upon payment of the arrears due. A Member can at any time withdraw from the Society upon giving notice to the Secretary and paying up all arrears, and in such a case shall be eligible for re-admission by being proposed as an Ordinary Member.

3.—No business relative to the Management of the Society, or the conduct of its Officers, shall be brought forward at any of the Ordinary Meetings.

4.—To all Ordinary Members who are not in arrears with their Subscriptions a copy of the Society's *Transactions* for the year shall be sent free of charge.

In addition to the Ordinary Monthly Meetings, a special course of Four Lectures was delivered by the Rev. F. Smith on 15th, 22nd, and 29th November and 6th December, 1888, on "The Functions and Phenomena of Rivers (particularly of the Earn and Tay)."

The following was the Synopsis of the Lectures :—

LECTURES I. and II.—What the Rivers are now Doing.

I.—The Earn as a type—Its situation and character—What it is now doing—The material with which it works—Its *modus operandi*—The rate with which its work is done—The valley terraces.

II.—The Tay—It is doing the same work as the Earn, but in more dignified proportion—Its terraces are higher, in accordance with its greater flooding power—Why it is becoming shallower—A history of the origin of the site of Perth.

LECTURES III. and IV.—What the Rivers have done in the Past.

III.—The Forty-feet Terrace—Its clayey nature—The origin of its clays—The ancient extended estuary—Dr. Milroy's "Names of Places and Physical Phenomena"—A magnificent (triple) parallel ; historical, geographical, and geological—The descent of the Rivers upon the old estuary floor.

IV.—The Devon Valley Flood—Its phenomena, and the light such phenomena throw upon the history of the Rivers in the past—ACCUMULATIVE and DISPERSIVE periods of River work—The result as now exhibited in the Tay Valley.

SUMMER SESSION, 1889.

The following Excursions were arranged :—

1. May 23.—To Linn of Campsie and Banks of Tay.

2. June 8.—To West Bank of Tay, from Murthly to Birnam, and back by the East Bank.

3. June 22.—To Laird's Loch, Coupar-Angus, and by Dunsinane to Errol.

4. July 6.—To Luncarty, by Bankfoot and Glengarry, and thence to Birnam.

5. July 20.—To Meal-Chuirn (3007 feet).

6. August 3.—To North Bank of Tay, from Kenmore to Aberfeldy.

7. August 17.—To East Bank of Tay, from Dunkeld to Dalguise, and back by West Bank.

8. August 29.—To Machany Burn, Muthill.

BALANCE-SHEET of THE PERTHSHIRE SOCIETY OF NATURAL SCIENCE for the Year ended 28th February, 1889.

INCOME.

To Balance in Savings Bank at 29th February, 1888,	£11	12	2
,, Balance in Treasurer's hands,	1	18	6½
	£13	10	8½
,, Annual Subscription and Entrance Fees,	69	11	6
,, Contributions towards Expense of Coal and Gas,	10	0	0
,, Sale of Society's Publications,	1	3	8
,, Interest on Bank Account,	0	6	8
	£94	12	6½

EXPENDITURE.

By Janitor's Salary,	£20	6	7½
,, Feu-Duty,	7	7	6
,, Property Tax,	0	3	8
,, Fire Insurance,	1	17	6
,, Repairs and Furnishings,	0	6	6
,, Fuel and Gas,	11	6	9
,, Printing, Postages, and Stationery,	11	19	6
,, Books and Magazines,	7	3	7
,, Birdstuffing,	9	0	0
,, Subscription to the East of Scotland Union of Naturalists' Societies,	4	2	6
,, Incidental Expenses,	2	6	0
,, Balance in Savings Bank at 28th February, 1889, £16 18 10			
,, Balance in Treasurer's hands, 1 13 7			
	18	12	5
	£94	12	6½

PERTH, 28th February, 1889.—We, the undersigned Auditors appointed by the Society, having examined the foregoing, and compared the same with the relative Vouchers, find it correctly stated and properly vouched—the sum in the Bank at the credit of the Society being £16 18s 10d, and in the Treasurer's hands £1 13s 7d.

(Signed) JOHN DAWSON, } *Auditors.*
A. T. SCOTT, }

WINTER SESSION, 1889-90.

14th November, 1889.

F. Buchanan White, M.D., F.L.S., F.E.S., President, in the Chair.

The following donations were intimated :—

Museum—Perthshire Collection.—Black-throated Thrush—from Mr. Robert Gloag. Nest and Eggs of Pied Wagtail, and Nest and Eggs of Garden Warbler—from Mr. J. Young. Three Ptarmigan—from Mr. Athole M'Gregor, Eastwood, Dunkeld. Pied Partridge—from Mr J. Stewart. Parrot Crossbill—from Lieutenant Millais, Birnam Hall. Stock Dove—from Mr. Steel of Blackpark. Perthshire Rock Specimens—from Mr. Donald Cameron, Paisley. Perthshire Plants—from Dr. F. Buchanan White.

Library.—Greville's "Scottish Cryptogamic Flora" (4 vols.)—from Mr. T. G. Murray of Stenton.

Mr. R. Brown, F.E., R.N., Delegate of the Society to the East of Scotland Union of Naturalists' Societies, gave a report of the Meeting of the Union at Alford.

The President delivered the following Opening Address :—

Gentlemen,—In accordance with my usual custom, I purpose devoting this address to a short account of the work done by the Society as a body, and by some of the individual members, since we last met.

The first of the official excursions took place, as usual, on the Queen's Birthday, 23rd May. Going to Stanley by rail, we proceeded to the Linn of Campsie, and thence worked down the west bank of the river to Stanley Mills, which, by the kindness of Col. Sandeman, we inspected. We then crossed to the east bank below Hell's Hole, worked that bank down to Waukmill Ferry, crossed again to the west bank, and investigated it down to Perth.

On the sandy ground near the Linn of Campsie, a number of interesting plants grow, but, at this time of the year, many were not yet visible. Amongst the more special plants noticed were *Carex aquatilis*, a new locality; *Myosotis collina*, on the trap-dyke which forms the Linn; and *Lupinus perennis*. Though, perhaps, not absolutely confined in Perthshire to trap rocks, *Myosotis collina* is certainly more frequent on such rocks. The Lupin is an American plant, which is now thoroughly established on the banks of the Tay from above Aberfeldy to below Perth, and should have—what it has not yet obtained—a place in our floras. It occurs on the banks of other Scottish rivers as well as the Tay.

On the wooded bank between Burnmouth Ferry and Stanley House *Veronica montana* and *Stellaria nemorum* occurred as native, and *Anchusa sempervirens* and *Doronicum Pardalianches* as naturalised,

plants. One plant also of what appears to be *Myosotis sylvatica* was found, but can be regarded as an escape from cultivation only. Whilst occasionally occurring in this condition, this pretty Forget-me-not has not become naturalised, nor has it been found wild in Perthshire. *Campanula glomerata* was seen in Don's old station, but of course not in flower at this early season.

On the opposite bank of the river, on the wooded and precipitous slopes—"*facilis descensus Averni*"—above Hell's Hole, *Neottia nidus-avis* and *Adoxa moschatellina* were observed. It may be remarked that the *Adoxa* has been noticed this year in quite a number of places on the banks of the Tay, and seems to be a commoner plant in Perthshire than has hitherto been supposed.

Valeriana pyrenaica was found—naturalised only, of course—on the side of the Stormontfield Lade, but no other species worthy of special mention was seen till the river had been recrossed, when *Luzula albida* was discovered in a new station. The way in which this plant occurs in Perthshire is rather puzzling. It is constantly being found in new places, but these are not so sufficiently wild as to suggest that the *Luzula* is a native, and yet are wild enough to make the origin of a plant, which is not likely to have been introduced for any use or beauty that it possesses, rather mysterious. Further down the river the finding of a bed of *Allium oleraceum* completed the discoveries of the day.

On the 8th of June we went to Murthly Station by rail, ascended the west bank of the Tay through Murthly Castle grounds to Dunkeld, and descended the east bank to Caputh Bridge, and thence back to Murthly Station. On the roadside between the station and the bridge some local plants occurred, including *Cerastium arvense*, *Anthemis arvensis*, and *Lepidium Smithii*.

In passing through Murthly we kept chiefly to the bank of the river, but made a detour to inspect the magnificent avenues of various Conifers, for which this beautiful place has long been celebrated. One of these avenues consists entirely of large Araucarias, some of them bearing male and others female flowers. The masses of Rhododendrons, of various kinds, in full flower, formed also a sight to be remembered.

In the Meadow Bog some interesting aquatics were found, such as *Carex vesicaria*, *Pilularia globulifera*, *Peplis Portula*, &c. On the river bank *Equisetum pratense* was common, and *Geranium sylvaticum* occurred with rose-coloured flowers. There were also several naturalised plants, including *Valeriana pyrenaica*, *Astrantia major*, *Polygonum Bistorta*, *Aconitum* sp., *Aquilegia columbinum* (common), &c.

Near Dunkeld two others were observed, viz., the wide-spread (in Perthshire) *Luzula albida*, and *Poa sylvatica (sudetica)*.

On the east bank of the river near Dunkeld a patch of *Clematis Vitalba*—an escape only, of course,—which has existed there for many years, was seen to be still holding its own, and on the wall near it *Sedum rupestre* and *S. acre* were noticed. At the slate quarries *Lepidium Smithii*, *Anagallis arvensis*, *Erodium cicutarium*, &c., were plants interesting for the locality, while in marshy places on the river

side *Lysimachia Nummularia* was detected. Whether this plant has any claim to be considered a native in Perthshire is a moot point. In many marshes on and near the Tay it is certainly very common, but is possibly only a garden escape, though it is not now often seen in gardens.

At Craig Tronaich some local species were seen, such as *Corydalis claviculata*, *Geranium sanguineum*, *Arabis hirsuta*, and *Malva moschata*.

On arriving at Stenton the party was hospitably welcomed by Mr. and Mrs. Murray, and, though the weather had unfortunately become wet, spent a short time in inspecting several interesting plants in the garden. Mr. Murray reported that the ferns for which Stenton Rock used to be celebrated, namely, *Asplenium germanicum* and *A. septentrionale*, had been extirpated by the rapacity of fern-collectors, some of whom had actually swung themselves by ropes over the rock. An island near Stenton was seen to be covered to a great extent with *Lupinus perennis*. This naturalised plant seems very partial to islands, a reason for which was given by Mr. Murray, who says that on the mainland it is kept down, to a great extent, by rabbits.

On the wooded banks below Stenton *Carex muricata* and *Melica uniflora* were found, and *Anchusa sempervirens*—naturalised—was in great abundance. Between this and Murthly Station no plants which require mention were observed.

On 22nd June we made rather a long excursion. From Coupar-Angus we followed the Dundee road to where it touches the boundary of Perthshire at Lochindores. Here *Meum athamanticum*, not apparently recorded for any part of the Perthshire Sidlaws, was found. Leaving the road we next proceeded to the pond called Laird's Loch, which formerly produced some local plants, but which, from the growth of rank vegetation, seems rather to have deteriorated in that respect. *Carex teretiuscula*, *Scirpus acicularis*, and the orchid usually called *Orchis incarnata*, were amongst the species found. Skirting Ballo Hill we next visited the rocks on Gask Hill, which did not prove remarkably rich, but produced *Saxifraga hypnoides*, a plant otherwise nearly confined, in Perthshire, to the Highland area of the county.

Passing along the base of King's Seat, and reluctantly compelled from want of time to leave unexplored the Black Hill, we crossed to Hoole, where the marshes produced some interesting species, such as *Eriophorum latifolium*, *Carex filiformis*, *C. teretiuscula*, and *Saxifraga aizoides*. The latter is a rare plant in lowland Perthshire, except where it has been brought down by streams from the Highlands, where it abounds. At Hoole and a few other places it has not been so introduced, but remains as a relic of the times when the Highland flora overspread the Lowlands.

The most important plant at Hoole, however, is a white-flowered orchid, about whose name there is some dispute. It is closely allied to the flesh-coloured species which we have been in the habit of calling *Orchis incarnata*, but which some authorities say is not the true *incarnata*. According to some botanists, the white orchid at

Hoole is a variety of *O. latifolia*, and according to others a variety of *O. maculata.* Though closely allied to these, I think its identity with either of them has yet to be proved.

After exploring a wood without much profit we arrived at Woodburnhead, where a large bed of the introduced species *Rumex alpinus* attracted attention. Hence we passed on to Kinnaird Castle, but had no time to linger further than to secure some specimens of *Mentha sylvestris*, which is common beside a stream. Between Kinnaird and Inchture the abundant occurrence of the Common Reed *(Phragmites)* in the corn-fields indicates very plainly the former condition of this part of the Carse of Gowrie. These reeds stop abruptly where the slopes of the hills rise from the level ground—that is to say, more than three miles from the present course of the river. We arrived at Inchture just in time to catch the train for Perth, and thus ended a long and not particularly productive excursion.

The next excursion on the list was on the 6th of July, and the place to be visited was Glengarry, near Bankfoot. By common consent, however, we determined to visit Ben Laoigh, near Tyndrum, instead. The usual way of going to Ben Laoigh is to start from Tyndrum, but by arrangement with the railway company the train was stopped about eight miles beyond Tyndrum, on the west or Argyleshire side of the hill. We were rather unfortunate in weather, the hill being clothed in mist, which made it difficult to find the most productive line of rocks.

Ben Laoigh is a hill for which I have a particular regard since it was discovered—in a botanical sense—by Colonel Drummond Hay and myself many years ago. Since then it has often been visited by botanists.

One of the best accounts of its botany—taken in relation to the geology—is by Mr. G. C. Druce in a recent number of the Journal of Botany. As this is in the library I need only notice some of the more interesting plants observed by us during the excursion.

One of the most charming features of this excursion was the abundance in flower of certain rare and beautiful Perthshire plants. Of these the most notable was *Pyrola rotundifolia*—a species not gathered before by any of us—whose spikes of handsome flowers adorned the rocks in many places. But the most beautiful sight was afforded by *Dryas octopetala*—a creeping shrub with large white blossoms—which is very common on Ben Laoigh. In several spots the precipices were richly clothed with this lovely plant in full flower, with here and there clusters of the *Pyrola* rising through it, or masses of the yellow Globe Flower, making the whiteness of the *Dryas* more white by the contrast—the whole half hidden half revealed in the shifting mists.

Amongst other plants obtained were *Arabis petræa* (the only Perthshire locality for it), *Pyrola secunda*, *Kobresia caricina*, *Carex pulla*, *C. vaginata*, &c. A feature of the botany of the hill is the abundance of the pretty alpine willow *Salix Arbuscula.*

On the 20th of July we were favoured with very good weather for the Mountain Club excursion. The place selected was Meall Chuirn, a hill, 3,007 feet in height, in the range dividing Glen Dochart from

Glen Lochay. Starting from Luib station we worked our way up to some high rocks called Sgiath Chrom, but found that they were hard and not productive. Thence by a more gradual ascent we reached the summit, where a meeting of the Club was held in due form. After initiation of several new members and transaction of other business, the following poem—written, as customary, for the occasion —was read :—

Apollo smiles. The sun shines o'er the hills,
Lighting with quiv'ring darts the silver rills,
Whilst round the altar of the morning god
Swift-footed fauns are dancing on the sod;
White-throated nymphs are chanting sweet and low,
All happy in the sunshine and the glow
Of tangled light among the branches green.
The birds are singing in their leafy screen—
One strain the aspiring lark, the gentle dove—
Hymning the birth-hour of a new day's love.
Gay-coloured butterflies in thousand hue,
White, crimson, brown, purple, and pink, and blue,
Hover in mystic maze around the throne
Of her, that's Mother and that's Queen, they own.
Shout out, O fauns! He comes, our lord, our king!
Ye darling nymphs, your best and sweetest sing!
Apollo comes! See, round his footsteps trail
Long love-lit streamers, crimson passing pale,
His golden robes are floating in the breeze,
His scented breath now moves the bending trees;
The heather rustles as he wanders by,
The weeping willow stays her half-heaved sigh,
The bluebells peal their very gayest chime,
Too happy, each, to keep in perfect time;
The hills are ringing with the morning hymn—
Apollo comes! All shout to welcome him.

This hill was sacred to the nymphs and fays:
Here were they driven in the bygone days
When men had banished them from off the earth,
Making them subjects but for jokes and mirth,
Because they could not class them, specify, or name,
"Therefore to being they could have no claim,"
Argued the wise.
And so the fays went forth
And found a dwelling in the tender north,
And this high hill they made their chief abode,
The temple and the altar of their god.
Seldom the foot of man had trodden there
Upon the hillside rugged, steep, and bare,
Yet up the slopes now comes a laughing band
Unto the summits of the sacred land,
And, halting there, around the altar stand.
The nymphs have fled away: no friends are those,
Their long-unseen but ne'er forgotten foes.

The butterflies and moths, alas! they lie
In nets and boxes, doomed too soon to die;
The bright-winged messengers of Nature's Queen,
Labelled, and named, and pinned, may now be seen.
Apollo frowns! The blue skies weep in rain,
The bluebells toll "With man comes woe and pain!"

Weary, and hot, and tired, down sits each man
Of the far-seeking, earnest, mountain clan,
And lo! instead of hillside bleak and bare,
They view a scene mysterious, passing fair—
A crowd of blushing nymphs, with smiling eyes
Bluer and brighter than are Naples' skies,
Stand round the Mother Queen, who thus begins—
"Wherefore, fair sirs, would ye increase your sins
By slaying those that better are than ye?
Poor innocents, all happy, bright, and free
An hour ago. Give them their lives again
You cannot—no, you cannot! Yet you take
That which you never did, and cannot, make.
Begone! lest in my wrath and pain I slay
Ye who have murdered those I love this day."
Then spake the Master of the mōuntain clan,
And nods assent to him each weary man—
"Yea, Mother Nature, but we too are thine;
Thy kind indulgence, too, I claim as mine!
Do thy poor innocents not murder too?
Give us as well as them our lawful due;
They kill to live, but we that we may know
Why such things be—why such a flower may grow
Where others can't. We love not to destroy,
But rather to promote all creatures' joy.
Give us thy hand to-day, and let all see
Nature and Science can in love agree.
Aid us to solve thy wonders, and then we
Shall by our knowledge aid and forward thee."
Then smiled our Mother Nature as she said—
"I do accept and claim your promised aid,
And, for my part, I shall do all I can
To help to wisdom the true mountain clan."

They pledged the oath in quaighs of mountain dew,
Nature and men, they vowed they would be true.
Then each a nymph led forth, and, hand in hand,
Around Apollo's altar ringed they stand
Until the the Chief gives signal. Off they go,
Faster and faster, hands and faces glow;
Surely each member of the mountain clan,
Be he an older or a younger man,
Never so danced in all his life before
As they dance now upon the mountain floor;
And as they dance they sing, and this the strain,
Which the wild hills take up and sing again:—

Pledge we here, O Nature Queen!
Ne'er to be as we have been,
This the badge for us, we ween—
Salix herbacea floreat!

Oreads! take from us, we pray,
As remembrance of this day,
But one simple mountain spray.
Salix herbacea floreat!

Give us now from each fair hand,
As memento of this land,
As you would our zeal command,
Salix herbacea floreat!

Fast and faster round we go,
Ah! the world moves far too slow,
Far too soon we old must grow.
Salix herbacea floreat!

Farewell, nymphs! the day is done,
In the red west sets the sun,
Strife is ended, peace is won.
Salix herbacea floreat!

Darkness reigns before the light,
Blindness ends in fullest sight,
All things live by one great Might.
Salix herbacea floreat!

Fauns and fays may be a dream,
Yet things *are* not as they seem,
They are wise whom fools we deem.
Salix herbacea floreat!

Children of one Mother we,
Taught about one loving knee,
Knowing hardly what we see.
Salix herbacea floreat!

Time shall clear the clouds away,
And our night shall end in day,
Wisdom will herself display.
Salix herbacea floreat!

Clasp we hands and say good-bye
Till another year goes by,
And the echoing hills reply
Salix herbacea floreat!

M. B. W.

The meeting of the Club having been adjourned to next year, the work of exploration was resumed, and the rocks facing Glen Lochay, at the head of Allt Innis Choarach, examined. These were found tolerably rich, producing *Juncus castaneus*, *J. biglumis*, *Saussurea*, *Dryas*, &c. The abundance of willows on them was a noticeable

feature, some of them being very rare hybrid forms, such as the pretty *Salix Stephania*, a cross between *Salix herbacea* (floreat!) and *S. lanata*, one of the rarest of our mountain species.

Recrossing the ridge, a rapid descent was made upon Luib, the rare *Juncus alpinus* being found on the way.

At the foot of the hill we found that Highland hospitality was not yet a thing of the past, since Mr. M'Niven, the tenant of Innischewan—or rather, in his absence across the river, Mrs. M'Niven—pressed us to partake of a most welcome cup of tea.

The sixth official excursion was to have been to Kenmore, and thence by the banks of the Tay to Aberfeldy, but, though several attempts were made to carry it out, Jupiter Pluvius was determined that these should be in vain.

The next excursion was also to the banks of the Tay. Starting from Dunkeld, we ascended the east bank as far as Dalguise Railway Bridge, and descended the west bank to Birnam. In Dunkeld grounds Mr. Fairgrieve, the gardener, acted as our guide, and pointed out many objects of horticultural and arboricultural interest.

A little above Dunkeld a few plants of interest were observed, the most important being *Rosa hibernica*, which is very rare in Perthshire, and of restricted distribution elsewhere. Other less important species were *Equisetum pratense*, *Stellaria nemorum*, *Mentha viridis*, &c. On the roadside near Guay *Agrimonia odorata* in some abundance was observed. It had been our intention to examine some islands in this part of the river, but the water was too high, and prevented access.

On the Dalguise side of the river a few interesting plants were noticed, including *Anthemis arvensis* and *Trifolium agrarium*, the latter naturalised. *Polygonatum verticillatum* was seen in its old station, but in less quantity than it used to be.

Near Inver we met a member of the Society, Mr. C. M'Intosh, who gave us the interesting information that the king-fisher had recently nested in the district, and that by his exertions the birds had been protected.

The last of the official excursions was to Machany Burn. Going to Muthill Station, we ascended the Machany to above Culdees, thence we visited Benniebeg Pond, the Pond of Drummond, and Balloch Loch, and finally reached Crieff. Except the Machany, the ground was not new to all of us. Beside the Machany we got *Agrimonia odorata* and *Glyceria aquatica*, but not much else of interest. Benniebeg Pond is a narrow strip of water whose shores are very rich. The most conspicuous plants here are *Lythrum Salicaria*, which grows in very large masses, and which a few weeks earlier must have made a fine show from its large spikes of purple-red flowers; the very handsome Great Water Duck (*Rumex Hydrolapathum*), which also abounds; *Epilobium hirsutum; Typha latifolia; Eleocharis acicularis* in great abundance; *Nasturtium terrestre;* and *Polygonum minus*—a third Perthshire station for this plant. Near the pond we also got *Poa palustris*, about which I shall have more to say presently.

At the Pond of Drummond not so much was found, as the sides

are so overgrown with sedges that they are not productive of much else. In the woods *Symphytum officinale* var. *patens* was common, and near the pond *Lythrum Salicaria* and *Rumex Hydrolapathum* grew. We measured the blade of one leaf of the latter, and found it to be more than three feet long. (Beside the Machany, I may say, we found *Petasites vulgaris* with leaves, including the stalks, over seven feet high).

On the trap-dyke, which forms so conspicuous a feature at Benniebeg Pond, where it stands up like a wall, thence skirts the Pond of Drummond and runs towards Torlum Hill, *Sedum anglicum* was seen.

At Balloch Loch we added some species to the day's list, including *Carex vesicaria* and *Callitriche autumnalis.*

On our way to Crieff we found *Chelidorium majus*—naturalised—abundant under a hedge.

The unofficial excursions were numerous and profitable, but they need not be described in detail, though some of the results must be noticed. Of these the most important was the discovery of *Poa palustris* (L.) Rth. as a British plant. The honour of this discovery fell to Mr. Barclay, who found the plant in the course of his explorations of the west bank of the Tay below Perth. A few weeks afterwards we again found it near Benniebeg Pond. *Poa palustris*, or as it used to be called *P. serotina*, is a plant of wide distribution in Europe, and occurs also in North America. Hence it is not surprising that it should occur in Britain. In 1879 it was found on the banks of the Thames, near London, but the finder considered it to be naturalised only. After full consideration, we think that in Perthshire it has claims to be considered native.

Another addition to the Perthshire flora is *Spiræa Filipendula*, which is locally abundant on the bank of the Tay, near Kinclaven. One fact with regard to this "find" is instructive, as showing how easily a local plant may escape notice. Some years ago I went over nearly the same ground; but just before coming to the spot I left the river bank and went inland to examine a marsh, coming back to the river-side a little further up. By doing so I just managed to avoid the place where the *Spiræa* grows.

Another excursion was made to the neighbourhood of Tenandry Church. There is above the church a rocky hill which is rather profitable botanising ground, producing, amongst other things, the handsome *Lychnis Viscaria.* On the rocks we saw, but could not reach, several shrubs of the White Beam (*Pyrus Aria*), a species which has not been recorded as a native of Perthshire. Since there are several distinct varieties or sub-species of this plant, it is much to be regretted that specimens could not be secured, but we hope to make another attempt.

I have not tried to give an exhaustive account of all the work which has been done, but merely to show that some members, at least, of the Society have not been idle.

Other work in other departments has been accomplished both in the Museum and out-of-doors, and bears testimony to the satisfactory activity of the Society. Some of the records which I have given to-

night show that Perthshire as a field for investigation is not yet exhausted, nor will probably be so for a long time to come. In our rambles of exploration we, however, need not hope nor fear to meet with anything so curious as the organism described in the following "clipping" (from a paper called the "Christian Herald"), which deserves preservation as a gem of "popular botany":—

A Tree of Death has been Discovered in Mexico by a botanist who found it growing on an inaccessible rock on the Sierra Madre Mountains. As examined through a field-glass its trunk appeared thick and scaly, and about twenty feet high. A few feet from the ground branches resembling those of the weeping-willow shot out, but the long, drooping, whip-like limbs had the power of erecting and coiling themselves with a motion like sentient life. The botanist's curiosity was intensely excited, and after a day's search he discovered a passage through the rocks, through which he crawled and came out near the tree. As he looked at it a bird alighted upon it. The branches instantly twisted like snakes around the bird, and drew it down until he lost sight of it. In a short time the flattened carcase—only feathers and bones—dropped to the ground. He saw other birds alight, and in each case the branches held them until they were crushed and drained of blood. At last he ventured to touch a branch with his finger. It was seized instantly and held so tightly that, in withdrawing the finger, it was stripped of skin. Looking closely at the branches, he found that they were covered with small suckers like those of the devil-fish, some of which were stained with the blood of the birds. Professor Wordenhaupt, of Heidelberg University, to whom the botanist sent a description of the tree, says it is the *Arbor Diaboli*, or devil-tree, of which only two other specimens are known—one on the peak of the Himalayas, and the other on the island of Sumatra.

12th December, 1889.

F. Buchanan White, M.D., F.L.S., F.E.S., President, in the Chair.

The following donation was intimated:—

Museum Extension Fund.—£2—from Mr. Everett Gray, London.

Mr. John M'Murray, Mr. Robert Dunsmore, Mr. Ferguson, and Mr. J. Masterson were elected Ordinary Members.

Mr. R. Brown, F.E., R.N., Delegate of the Society to the British Association, gave a report of the Meetings of the Association at Newcastle.

The following papers were read:—

1. "Remarks on the Black-throated Thrush and its occurrence in Scotland." By Colonel H. M. Drummond Hay, C.M.Z.S. (See *Trans.*, Vol. I., p. 135.)

2. "Colour." By R. Clough.

9th January, 1890.

A Conversazione was held, conjointly with the Perth University Education Society, in the Society's Rooms and the Working Boys' and Girls' Hall.

Lord Provost Whittet in the Chair.

A Lecture was given by Dr. R. H. Mill, F.R.S.E., on "Rivers of the Ocean," illustrated by Models and Diagrams; and another by Professor G. Baldwin Brown, on "The Building of the Great Cathedrals," illustrated by Lime-Light Views.

A large number of Photographs, &c., under the charge of the Photographic Section, were exhibited in the Lecture-Room and Library.

13th February, 1890.

F. Buchanan White, M.D., F.L.S., F.E.S., President, in the Chair.

The following donations were intimated:—

Museum—Perthshire Collection.—Pair of Wood Pigeons—from Mr. Davidson, Kinfauns. Fieldfare—from Mr. J. S. Cruickshank. Long-tailed Duck—from Mr. Taylor, Daleally. *Index Collection.*—Fossil Shark's Tooth (*Carcharoden megalodon*, Agassiz)—from Mr. Everett Gray, London.

Miss M. S. Morison, Hasland, Dr. R. Stirling, Mr. J. B. Dobbie, and Mr. A. King were elected Ordinary Members.

The following papers were read:—

1. "Pre-Historic Man—The animals which furnished his food, and the minerals and metals which furnished his tools, as seen in the Museum of Northern Antiquities in Copenhagen." By the Rev. A. Milroy, D.D.

2. "A Geological Sketch of East Fife." By R. Dow. (See *Trans.*, Vol. I., p. 139.

14th March, 1890.

TWENTY-THIRD ANNUAL MEETING.

F. Buchanan White, M.D., F.L.S., F.E.S., President, in the Chair.

The following donation was intimated:—

Museum—Perthshire Collection.—Giant Puff-Ball (*Lycoperdon giganteum*)—from Lord Stormont.

The following Reports were read and adopted :—

REPORT OF COUNCIL.

In presenting the Twenty-third Annual Report, your Council is glad to be able to record a continued interest in the meetings of the Society. During the year 6 meetings have been held, with an average attendance of 29—the greatest number being 35, on 13th February, 1890, and the least 20, on 14th November, 1889. At these meetings 11 papers were read. Thirty-five new members have been admitted during the year, making a present membership of 314, including 2 honorary members, 8 corresponding members, and 9 associates.

During the late summer there were 8 excursions, but the Council regrets that the excursions are not taken advantage of by the members to the same extent as formerly, and trusts to see some improvement during the coming summer. Your Council takes this opportunity of again thanking the various proprietors and tenants who granted liberty for these excursions to be carried out.

A photographic section has been formed during the year, and it is hoped will be successful and prove useful. It is your Council's desire that the Society may be large enough to embrace all kinds of scientific work, and that their building may be a point where all such operations may centre.

The use of the Lecture-Room has again been granted to various local Educational organisations.

During the past year the Museum has been visited by over 2,600 persons, bringing up the total to over 26,000. The various valuable proofs of appreciation of its arrangements and utility which have recently been received, and the continual addition of specimens, which cannot at present be exhibited, lead your Council to hope that the day is not now far distant when additional accommodation may be found.

REPORT OF TREASURER.

(See Balance-Sheet, page lxxxv).

REPORT OF CURATOR.

As Curator, I have to report that the Museum is in general good order, and that the interest taken in it by the public is still well maintained, as shown by the Visitors' Book.

In the Geological department, the representation of the Minerals and Rocks of the Perthshire collection (Centre Case II.) has lately been re-arranged most admirably by Messrs. Henry Coates and P. Macnair, according to classification.

In the Zoological department, the Nests and Eggs, which have of late been much increased, have also been re-arranged; but, though it was not possible to do so systematically, owing to the very small space available, they have for the present been thrown, as much as can be done, into groups of families. Even this could not be carried out properly for want of room, which has necessitated placing, or rather cramming, a great many of the smaller nests, *pro tem.*, into

the upright Wall Case No. 9 of the Botanical department—certainly not to the advantage of either, nor to the appearance of the Museum. With regard to the birds themselves, these have been all carefully gone over, as has been the annual custom, and the cases dusted inside, as, I am sorry to say, some of them are not impervious to that very insidious ingredient. This refers more especially to Wall Case No. 6, at both ends, and it should, if possible, be rectified. Several valuable ornithological additions have been made since my last report; but as these have been recently brought under the notice of the Society in various papers that have been read on the subject, I will not go further than to say that, in some of the compartments of the bird-cases, the specimens are becoming so much crowded as to preclude any further increase to their numbers, greatly to the prejudice of the collection at large. The same may be said of nearly all the other sections of this department—the Mammals, as also the Fishes. It is therefore to be hoped that an effort may be made soon to try and obviate the present difficulty, and to prevent the work, so successfully commenced, coming altogether to a standstill, after the encomiums passed on our good beginning by such authorities as Prof. Flower, of the British Museum, Dr. Tristram, of ornithological fame, and many other eminent naturalists, who have visited the Museum, and so thoroughly approved of our local system. It would indeed be sad were the original plan not to be carried out in its entirety, and the Museum not eventually become, as it ought to be, worthy of the important district which it represents. But then, to make it so, we not only want space, but also the co-operation of all, far and near, in making liberal contributions, representative of the several localities in which they live. This might be done in many ways—one especially. For instance, in the Zoological section, much help might be given by the donation, or even the loan, of many a specimen, now, perhaps, occupying some dark passage or back stair "out of sight, out of mind." There are still, no doubt, extant in the county many such specimens, not of much value to the owner, but infinitely so to a local museum such as ours—as, for example, the Wild Cat, the Marten Cat, Polecat, Fishing Eagle, Osprey, Blue Hawk, or Hen Harrier (male), and many others, mostly now extinct or nearly so, and otherwise unprocurable. The specimens may be bad, but, by the careful manipulation of an experienced taxidermist, might be so restored as to be of the greatest service to the Society in enabling them to carry out the original idea of the representation of a complete Fauna of the district, both of the present and the past.

REPORT OF LIBRARIAN.

The Library continues to be only fairly well taken advantage of by the Society. The number of readers during the past session has been 40, out of a membership of 300.

The number of volumes now in the Library amounts to 600, of which 176 belong to the Reference Library.

REPORT OF EDITOR.

The Third Part (Vol. I., new series) of the *Transactions and*

Proceedings is the only publication which has been issued by the Society during the past session.

The following Office-bearers were elected :—

President—F. Buchanan White, M.D., F.L.S., F.E.S.

Vice-Presidents—R. H. Meldrum, John Thomas, J. Clacher, and James Stewart, L.D.S.

Secretary—S. T. Ellison.

Treasurer—John Stewart.

Curator—Colonel H. M. Drummond Hay, C.M.Z.S.

Librarian—James Coates.

Editor—Henry Coates.

Councillors—T. M. M'Gregor, R. Dow, Rev. F. Smith, and James Morison.

The President delivered the following Address :—

GENTLEMEN,—Since it is the duty of your President to give at the Annual Meeting an address which, if it has no other merit, must at least possess that of being on a subject of interest common to all members, I was rather in a quandary when casting about for a subject for this, the Eleventh Annual Address, which I have had the honour to give you.

On previous occasions the Museum has afforded a subject which is of paramount interest to all members of the Society; but since it has been treated of from every possible point of view—past, present, and future,—that is a subject which just now is well-nigh exhausted. I have therefore selected another on which to discourse, but, after all, I find that I must make a very few remarks upon the Museum.

In our Curator's Report, the "old, old story" of need of space is reiterated; and if this need of room is felt by Colonel Drummond Hay, whose special department occupies by far the larger portion of the available space, it is felt a great deal more by those to whose departments the area allocated is quite inadequate. For example, consider the meagre space allotted to the Perthshire Geological Collection. That the arrangers (Mr. Henry Coates and Mr. Macnair) have been able to make such an excellent show reflects great credit upon their ingenuity and skill; but can the geology of a district embracing more than 2,000 square miles in extent be adequately illustrated in a case only 13 feet long by 8 feet high and 9 inches wide? It is not only absurd to think so, but it is to be regretted that the skill and thought expended in making the most of such scanty space could not have been devoted to the arrangement of a properly representative collection in sufficiently large cases.

Since I laid before you—four or five years ago—some ideas for an extended museum, circumstances have occurred which have led me to modify, in a slight degree, the scheme which I then proposed. The chief of these circumstances has been the success attending many of the courses of the University Extension Lectures. That these should be conducted in our premises is, I think, eminently

desirable, since many of them are upon scientific subjects. The lecture-room has for many of the courses proved inconveniently small, for, though the audience has been packed into it, the resulting atmosphere has afforded a too realistic demonstration of that experienced in the famous Black Hole of Calcutta. I would now therefore propose that, in any future scheme of extension of the museum, the present MUSEUM HALL should be used as the LECTURE-ROOM, and that this room should be made the Index Museum. The advantages of this alteration would be manifold. In the new lecture-room both ample room and ample ventilation would be secured, as well as a greater distance from noises in the street; whilst by having the Index Collection in a room distant from the Perthshire Collection, the confounding in the minds of visitors of the two quite distinct collections would be obviated. For the Perthshire Collections I would build accommodation in the vacant ground at the back, the new building being a hall, surrounded by four galleries, and affording ample room. As to when this is to be done, and how the money to do it is to be raised, I can offer no opinion, but must content myself with prophesying that it will be done some day, though perhaps a distant one.

Before proceeding with my address proper, I should like to say one word about the Library. *That* part of our establishment is, I regret, not being kept up to date. When we first acquired this building we were fortunate enough to have sufficient funds to enable us to lay the foundation of a good library of scientific works, but it is much to be deplored that since then we have not been able to make many additions thereto. The Photographic Section is more fortunate in one way, for by the liberality of Mr. R. D. Pullar it has the loan of an extensive series of books on its particular subject. But not only are we not able to add any—or at most, a very few—new works to our library, but there are no funds available for binding the books which require to be bound before they can be used. I have sometimes thought that it might be desirable to close the Museum for a few years, and expend the money thus saved upon the Library. I am certain that keeping the Museum open without charge to the public is a great tax on our limited resources. There can be no doubt, moreover, that our primary duty is not to the public, but the Society. Yet considering, as I pointed out in a former address, that the work done by the Society by means of its Museum is of a threefold nature—scientific, in that the local natural history is being carefully investigated; educational, by providing carefully classified and labelled specimens; and philanthropic, by affording that of which there is great need in Perth—a holiday resort free of charge, where, if the visitor is not instructed (and if he is not he has only himself to blame), he has at least harmless recreation—considering all this, and remembering that in the six years during which the Museum has been open, there have been upwards of 26,000 visitors to it, it would be nothing less than a misfortune if we were reluctantly compelled to close it. We must therefore, I suppose, wait as patiently as we can for the extension of both departments. Possibly if we could only make a beginning, there would not be much difficulty in going on.

In the address which I gave at the opening of this session I threw out the suggestion that possibly it might be advisable to add archæology—at least, in its prehistoric aspect—to the objects of our Society. More recently the Rev. Dr. Milroy, in the excellent paper which he gave us in January, suggested the addition of anthropology. In my address to-night I purpose taking up a subject which exhibits a combination of anthropology and botany—that is to say, an inquiry into what may be learnt of the nature, manners, customs, and train of thought of the ancient inhabitants of the Highland part of this country, from the names which they bestowed on and the uses to which they put the native plants.

As I will attempt to show, a considerable amount of information regarding the mode of life and the manners and customs of the old Highlanders may be derived from the study of the Gaelic names of plants. The names show clearly, not only the character of the individual man, and the circumstances and environment in which he lived, but demonstrate also the progress of the people from heathendom to Christianity, and from ignorance to knowledge. We can learn that the old Celt had eyes and knew how to use them—*i.e.* in the true scientific sense—far better than many of his modern descendants—that life for him was not all "cakes and ale," but that there were times of scarcity and times of plenteousness, and that he had to depend in a great measure on the resources of his own country. We can learn, further, what ailments he was liable to, what were his pleasures, and in what consisted his riches, his virtues and his vices, and the bent of his mind towards the supernatural.

Before, however, proceeding to discuss the names which I have selected to illustrate my argument, it will be expedient to indicate briefly the sources whence our knowledge of the old names have been derived.

The earliest *botanical* list of names appears in the first book which was devoted to a scientific account of the plants of Scotland, namely, Lightfoot's *Flora Scotica.*

It is rather humiliating to think that this work was undertaken by an Englishman and not a native of Scotland. Lightfoot was an English clergyman, who, in 1772, joined the traveller Pennant in his second tour in Scotland. At Killin (probably) he met a Scottish minister, Mr. Stuart, to whom, he says, "I am indebted for every assistance that ingenuity and friendship could yield. This young gentleman, a most accurate observer of Nature's works, critically versed in the *Erse* language, and the manners and customs of his country, I had the good fortune to have as a companion and fellow-traveller through the *Highlands* and *Hebrides;* and to him I am obliged for a great portion of the *Highland* botany, for *many* of the *medical* and *œconomical*, and *all* the *superstitious* uses of plants, which are interspersed in this work, and to him I owe the supply of their *Erse* or *Gaulic* names."

John Stuart, it may be mentioned, was the eldest son of the Rev. James Stuart, who was minister of Killin from 1737 to 1796, and was a man of great erudition. By him (*i.e.*, the father) the New Testament was first translated into Gaelic in 1767, a second edition being brought

out in 1796 under the superintendence of his son, the botanist. This translation of the New Testament directed attention to the study of the Gaelic language, and a correspondence which Stuart, sen., had with Samuel Johnson—who advocated the teaching of the language—helped greatly in the introduction of the teaching of Gaelic in the Schools of the Society in Scotland for Propagating Christian Knowledge. John Stuart, the son, was afterwards minister of Luss, in Dumbartonshire. To him is almost certainly due—though we have to a great extent forgotten his claim—the discovery of many of our alpine plants. Living at Killin, the rich Breadalbane hills were of easy access to him; and no doubt his energetic feet carried him to many a mountain cliff, where his were the first botanical eyes which saw with delight the lovely treasures which have since attracted botanists from all parts of the country. It has always been a puzzle to me that Ben Lawers—the richest hill of all—is not mentioned by name amongst the mountains visited by Stuart. Instead of exploring Ben Lawers—7 or 8 miles only from Killin—he seems to have been much enamoured of a hill which he calls Ben Teskerney, at the head of Glen Lochay. This seems to be the same as Ben Heasgarnich, a good hill, but not nearly equal to Ben Lawers. Its name, Teskerney, has possibly arisen from a mixing up of the name of the burn which descends from it to Glen Lyon, this burn being the Allt Heasgarnich. Possibly the "t" of the Allt was, in the spoken name, supposed to belong to the next word, Heasgarnich. At any rate, there is no Ben Teskerney mentioned in the map.

The list published by Lightfoot was the only botanical one until quite recently, when a small book, bringing together all that could be gathered on the subject, was published by Mr. John Cameron, Sunderland. I met Mr. Cameron in Braemar in 1873, and our conversation turning upon the Gaelic names of plants, I suggested to him the desirability of a work on the subject. He undertook it, and for nearly ten years collected information, the result of his labours appearing in 1883. I think we may have the honour of claiming Mr. Cameron as a Perthshire man, his father, if I am not mistaken, having been a Baptist minister on the north side of Loch Tay. In Mr. Cameron's book not only are the Gaelic names given, but other Celtic names, as the Irish and Welsh. No classification of the names is, however, attempted, the botanical arrangement being the one followed. As, however, we are, on this present occasion, not so much concerned with the botany of the subject as with the information to be deduced from the names, I purpose classifying the latter as follows:—

1. Names derived from the uses or qualities of the plants.
2. From the nature of the places where they grow.
3. From the colour of the flowers or other parts.
4. From peculiarities in the shape of the leaves, flowers, or other parts.
5. Plants named after persons.
6. Some names which cannot properly be placed in any of the above groups.

7. Dictionary names which are either corruptions of the English name or translations, and which cannot properly be called indigenous names.

1. Names derived from the Uses or Qualities.

Taking, in the first place, the names which have been given on account of the real or supposed qualities of the plants, or the uses to which they have been put, it will be found that a majority of them have been named on account of their medicinal qualities, real or imaginary. It was an article of belief that for every malady there existed not far off some plant that could cure it. The difficulty lay in knowing which was the beneficial plant; and so, in cases of emergency, all the kinds of plants in the locality were taken and used, in full belief that the right one must be amongst them! Another article of faith which was at one time firmly held—and which, perhaps, is not yet altogether consigned to oblivion—was that the shape or colour of parts of the plant indicated its use. Thus, a plant with a kidney-shaped leaf must be beneficial in cases of disease of the kidneys. This belief was founded on the "doctrine of signatures," because the shape of the plant signified its qualities. I rather think, however, that it was not so prevalent in the Highlands as elsewhere.

Let us now glance at some of the names.

The Red Wound Healer (*creachlach dearg*) is the Blood-coloured Geranium (*Geranium sanguineum*), and is said to be still esteemed for its astringent and vulnerary properties.

The Milk Wort (*lus a bhàine*) is supposed to increase the milk of cows which feed on it. Though the English name Milk Wort and the scientific name *Polygala* have the same meaning as the Gaelic, yet, as the plant is common and conspicuous, the Gaelic name is not improbably indigenous.

The Vetch (*Vicia sativa*) derives its Gaelic and Irish name, *fiatghal*, from the nutritious properties of its seeds (from *fiadh* or *biadh*, food).

The Sweet-Scented Bramble (*dris chubhraidh*) is the Sweet Briar (*Rosa rubiginosa*).

The Rowan or Mountain Ash (*Pyrus Aucuparia*) has several names in Gaelic. *Luis* (drink), because a very good spirit could be distilled from the fruit. *Craobh chaoran* (the berry tree), from the fruit. *Fuinseag coille* (the wood enchantress), or the wood ash. This was considered one of the most propitious of trees, and hence it was planted near every dwelling-house (for distilling!?). Its fruit gave long life to all who ate it; its wood was a sovereign protection against all enchantment, and so pieces were carried on the person, or fastened to the masts of the fishing boats and to the tails of the cows. Probably the resemblance of the leaves to those of the ash—a tree which, amongst the northern nations, had many legends attached to it—led to some of these beliefs.

The Ear Plant (*lus nan cluas*) is the House Leek (*Sempervivum*), whose juice was used as a remedy for the ear-ache.

The Plant of Gluttony (*lus a chraois*) is the Dwarf Cornel (*Cornus suecica*), whose berries were supposed to give a great appetite.

The Rennet Weed (*lus an leasaich*) is the Yellow Bedstraw (*Galium verum*), and is so called from its property of curdling milk, a property indicated also by the Latin name. The commoner Gaelic name is, however, *ruin* or *ruamh*, from *ruadh* (red), because the roots were used to produce a red dye.

The Colt's-foot (*Tussilago*) had several names, being a plant of some reputation. From the colour of the leaf it was called *gorm liath* (greyish green), and from the shape, *cluas liath* (the grey ear), but from its use it derived the name *duilliar spuing* (the tinder leaf), and also *fathan*, or *athan*, which means fire. The dried leaves were used as tobacco, and, dipped in saltpetre, made excellent tinder. Although used in the same way as tobacco, the use was medicinal, to alleviate coughs.

In common with other races, the Highlanders held the pretty little Eye-bright *(Euphrasia)* in much estimation for its supposed virtues as an eye medicine. It was called the Eye Cleaner *(glan ruis)*, Water for the Eye *(rein an ruisg)*, and That which Brightens the Eye *(soillse na sùl)*. An infusion of it in milk applied to the eyes with a feather was a certain cure it was supposed, and would, as old Culpepper says, "if it were as much used as it is neglected, half spoil the spectacle trade."

Like the Rennet-Weed or Yellow Bedstraw, the Butter Wort, Bog Violet or Cuckoo's Shoe (*Pinguicula*), was named, from its action on milk, the Butter-Mixer (*badan measgan*), and also *uachdar* (cream) and *lus a bhainne* (milk wort). In Lapland it is also used for curdling milk.

The Cleansing Wort (*lus ghlinne-bhracadail*) is the Wood Mercury (*Mercurialis*), once much used for curing wounds.

Corcar, which means purple, is the Cudbear (*Leconora tartarea*), a lichen which grows on stones, and furnishes a good purple dye.

The above are only a few of the names derived from the qualities and uses of the plants, and many more might be mentioned, but we must pass on to the next group.

2. Names derived from the nature of the Place of Growth.

The ancient Highlanders (and, for that matter, the ancient Lowlanders too) used their eyes and observed many things which their modern descendants never notice. Thus plants got names from the places where they grew, even though they had no reputed virtues to call attention to them. I need mention a few only.

The Candle of the Woods (*feada coillé*) is the conspicuous white flower of the Wood Sorrel (*Oxalis*)—a very poetical name.

The Corn Daisy (*buidheag an arbhair*) is the Mayweed (*Matricaria inodora*), a daisy-like flower, which grows in ploughed fields.

The Loch Flower (*plùr an lochain*) is the Water Lobelia (*Lobelia Dortmanna*), whose blue flowers arise in a spike from the surface of lakes.

The Bog or Peat Berry (*monog*) is the Cranberry (*Oxycoccos*), which is also called *muileag* (the little frog or frogberry), both from its place of growth.

The Beach Daisy (*neoinean chladaich*) is the Thrift (*Armeria*), which is also called the Red Top (*bar dearg*), from the colour of the flowers.

The River Leaf (*duiliasg na h'aibhne*) is a very appropriate name for the Floating Pond Weed (*Potamogeton natans*), whose leaves lie on the top of the water. It is also called *liobhag* from the smooth-polished texture.

The Dock of the Dam (*cor-chopaig*) is the Water Plantain (*Alisma Plantago*), whose big dock-like leaves are often conspicuous in ponds and mill-dams.

The Peat-grass (*moin-fheur*) is the Waved Hair-grass (*Aira flexuosa*), so abundant on peaty ground.

Finally, the common Polypody Fern (*Polypodium vulgare*) is called the Rock Fern (*raineach na crag*), and also *sgeamh na cloch*, which may mean either the reproach or the ornament of the stones.

3. Names derived from Colour.

The Yellow one (*buidheag*) is the Creeping Crow-foot or Buttercup (*Ranunculus repens*), and probably others of the genus.

The Yellow Plant of May (*lus bhuidhe bealtuinn*) is the Marsh Marigold. The month of May was called Beltane or Belteine, from the fires (*teine*) of Bel or Baal, the sun-god. Possibly the Marsh Marigold, like other yellow flowers, was supposed to be one of Baal's plants.

The Drowned White Leaf (*duileag bhaite bhan*) is the White Water Lily (*Castalia speciosa*), also called the Water Rose (*bior ros*).

The Large Yellow Weed (*lus bhuidhe mòr*) is the Weld (*Reseda Luteola*), but, though the plant is somewhat yellowish in colour, the name may be derived from its furnishing a yellow dye.

The Red Flower of the Woods (*corcan coille*) is an appropriate name for the Red Campion (*Lychnis diurna*), whose red flowers have probably also suggested the name Cockscomb (*cirean coileach*).

The Plant with the Black Seeds (*lus nan gràn dubh*) is Alexanders (*Smyrnium Olusatrum*).

The Blue Lad (*gille guirmein*) is the Field Scabious (*Knautia*), with its conspicuous heads of blue flowers. This name is also given to the Bluebottle (*Centaurea Cyanus*), sometimes called simply the Blue One (*gorman*).

From its black heads, the Knapweed is named the Black Top (*mullach dubh*), or the Black Knot (*cnapan dubh*).

The Little Yellow One (*buidheag*) is a Perthshire name for the Daisy (*Bellis*), which is also called the Noon-Flower (*nòinean*).

The Yellow Blossom (*bile buidhe*), or the Golden Flower (*an dithean oir*), is the Corn Marigold (*Chrysanthemum segetum*). Another name is the Stranger or Foreigner (*bileach choigreach*), which seems to suggest, what is probably the case, that the plant was introduced with seed corn.

The Grey Weed (*liath lus*) describes very well the general appearance of the Mugwort (*Artemisia vulgaris*), as does the Brindled or Red-streaked Plant (*lus riabhach*) that of the Red Rattle (*Pedicularis palustris*). The latter is also named the Red Modest One (*modhalan dearg*) and Goat's-Milk (*bainne gabhar*).

The Brown Wort (*doun-lus*) is the Fig Wort (*Scrophularia nodosa*), with its brown flowers.

The Yellow Bristly Plant (*an gath buidhe*) is the large-flowered Hemp Nettle (*Galeopsis versicolor*), whose spines have been troublesome to many a reaper.

The Golden Rose *(ros or)* commemorates the colour and shape of the flowers of the Wood Loosestrife *(Lysimachia nemorum)*, whilst, from its resemblance to the willow herbs, the common Loosestrife *(L. vulgaris)* is called the Yellow Willow Herb *(an sealeachan buidhe)*.

By Perthshire children the Ribgrass *(Plantago lanceolata)*, or rather the flower heads of it, are called Black Men *(bodaich dhubha)*. Another name is *deideag*, from the nipple-like appearance of the heads. A lowland name is Carldoddies. From its often bright red colour, the Sheep's Sorrel *(Rumex acetosella)* is called *runaidh* (the reddish coloured).

4. Names derived from Shape.

The Sporran *(an sporran)* is a name suggested by the capsule of the Shepherd's Purse *(Capsella)*. Another name for it is *lus na fola*, (the blood weed), possibly from its qualities.

The Dog Violet *(Viola sylvatica)* is called the Field Quaigh (*dail chuach*), or the Heeled Quaigh (*sail chuach*), from the spur to the flower.

The Round-leaved Sundew (*Drosera rotundifolia*) has several names in Gaelic—Dew of the Hill (*driuch na muine*); the Plant with Shields (*lus na fearnaich*); Very Red Dew (*geald ruidhe*); and Sun Rose (*rōs an l'solais*).

From its spiny nature the Whin (*Ulex*) is named *conasg*, since it is armed.

From the broad plaited leaves the Lady's Mantle (*Alchemilla vulgaris*) derives several names, such as the Princess's Plaited Garment (*cota preasach nighean an righ*); the Lion's Paw (*crubh leomhaimm*); and the Dew Cup (*copan an druichd*), which is very significant.

The Water Milfoil (*Myriophyllum*), with its very slender, much divided, and collapsing leaves, is the Drowned Thread or Filament (*suaithe bhatheadh*).

Also from the nature of its foliage, the Hemlock (*Conium*), which has smooth, much and finely divided leaves, is called the Soft Leaved (*minbhar*).

The Dark Plant which Seizes (*meacan-tobhach-dubh*) is the Burdock (*Arctium*), whose burs so readily attach themselves to any passing animal.

From the shape of its leaves the Melancholy Thistle (*Carduus*

heterophyllus) probably derives its name of Deer's Ear (*cluas an fheidh*).

The Old Man with the Skulls (*bodach na claiginn*) is a fanciful name for the Yellow Rattle (*Rhinanthus*), apparently derived from the appearance of the plant when in fruit.

That most handsome of native plants, the Foxglove (*Digitalis*) has more than one Gaelic name. Several of these are, like the English name, derived from the shape of the flowers. Thus, the Fairy Thimble (*meuran sith*), Dead Men's Thimbles (*meuran nan daoine marbh*), and Dead Women's Thimbles (*meuran nan caillich mharbha*), may be compared with the lowland name, Witches' Thimbles. The Skye name, *ciochan nan cailleachean marbha* (the Dead Old Women's Paps), is from a different similitude. A less significant name, and one not confined to it, is the Big Plant (*an lus mòr*), while at Aberfeldy it is sometimes called the Fox-weed (*lus a bhalgair*). This latter name is evidently founded on a misconception of the meaning of the English name, Foxglove, fox being a corruption of folks, *i.e.*, the fairies. Another name is the Fairy-Women's Plant (*lus nam ban sith*).

The Wake-Robin (*Arum*), which, though not a native plant in the Highlands, yet occurs, as at Finlarig, is the Soft Ear (*cluas chaoin*), from the shape of the spathe.

The Fairy-Women's Spindle (*cuigeal nam ban sith*) and the Black Tail (*bodan dubh*) refer to the spikes of the Mace Reed (*Typha*); and the white heads of the Cotton Grass (*Eriophorum*)—*canach*—are frequently taken as the symbol of purity and fair beauty—

"Her form was fairer than the down of Cana." (OSSIAN).

In Lochaber the Common Polypody is called *mearlag*, perhaps from the resemblance of the pinnules of the frond to fingers. Some fungi, such as *Boletus*, are called Toads' Bonnets (*bonaid an losgainn*), whilst, from its sponge-like texture, another fungus (*Polyporus*) is *spuing* or *spuinc* (sponge), whence, as it is used for tinder, the word "spunk," for a match, has, I suppose, been derived.

5. PERSONAL NAMES.

Names derived from persons are not very numerous. As in English and other languages, many of them refer to St. Mary and to other saints, testifying to the deep religious feeling which has always characterised the Highlanders. A few examples may be given.

The St. John's Wort (*Hypericum*) had in various nations a reputation as a holy plant. In England it was dedicated to St. John, and by the Welsh it is called the blessed plant. St. John was the saint of Iona's favourite evangelist, and this plant, in consequence, was his favourite flower, therefore its name was St. Columba's Flower (*caod aslachan Cholum chille*). It was also called St. Mary's Image (*allas Mhuire*). The old traveller Martin speaks of a man in Bernera who always wore a piece of the plant to prevent his seeing visions, and elsewhere in Scotland it was used as a charm against witchcraft and enchantment. Children say (or used to say) when they come across

the plant, "St. Columba's Wort, unsought, unasked, please God, I won't die to-night" (in Gaelic, of course).

The Kidney Vetch (*Anthyllis*) is St. Mary's Fingers (*meoir Mhuire*), a name similar to the English one of Lady's Fingers. The word "Lady," which appears in several English names of plants, such as Lady's Bedstraw, &c., was originally "Our Lady."

The Lady's Mantle (*Alchemilla*) is called in Gaelic St. Mary's Mantle (*falluing Mhuire*), and in Irish, St. Mary's Palm (*dhearna Mhuire*).

The Wood Loose-Strife (*Lysimachia nemorum*) is St. Mary's Gentle Grass or Plant (*seamhair Mhuire*).

The Crow Garlic (*Allium vineale*) is St. Mary's Garlic (*garleag Mhuire*).

The Lady Fern (*Athyrium*) is St. Mary's Fern (*raineach Mhuire*).

The Groundsel (*Senecio vulgaris*) is Grey Peter's Weed (*lus Phàra liath*).

Finally, the Wild Thyme (*Thymus*) is the Plant of the Son of the King of Britain (*lus mhic righ Bhreatainn*) and the King's Plant (*lus an righ*).

6. Other Names.

Many plants in English and other languages commemorate in their names the time of the year when the cry of the cuckoo, the herald of summer, has become familiar. The same idea is not absent from the Highlands, where a number of plant-names bear reference to the bird.

Amongst these cuckoo flowers the Lady's Smock (*Cardamine pratensis*) is pre-eminently the Cuckoo Flower (*plùr na cubhaig*), though it is also called *gleoran* (handsome) and *biolair-ghriagain* (the bright sunny dainty).

Another cuckoo flower (*plùr na cubhaig*) is the Ragged Robin (*Lychnis flos-cuculi*), also named the Cuckoo's Hood (*curachd na cubhaig*), and, from the red colour of the flowers and their place of growth, the Spark of the Marsh (*caorag leana*).

One of the Cuckoo's Shoes (*brog na cubhaig*) is the Corn Cockle (*Lychnis Githago*), a name also applied (as in English) to the Butterwort (*Pinguicula*).

The Corn Flower or Blue Bottle (*Centaurea Cyanus*) is the Cuckoo's Cap (*curachd chubhaig*), also, as already said, applied to the Ragged Robin.

Still another Cuckoo's Shoe (*bròg na cubhaig*) is the Hair-bell (*Campanula rotundifolia*), as is also the Cowslip (*Primula veris*) and the Wild Hyacinth (*Scilla nutans*), whilst the Cuckoo's Claw (*spog na cubhaig*) is the Wild Pansy (*Viola tricolor*).

To glance at some other names.

The Rock-Rose (*Helianthemum*) is the Sun-Rose (*grian ròs*) and Flower of the Sun (*plùr na greine*), both of which mean the same as the scientific name.

The Cross-leaved Heath (*Erica Tetralix*) is French Heath (*fraoch frangach*).

The Duckweed (*Lemna*) is the Son without a Father (*mac gun athair*). In Irish it is the Plant without Father or Mother.

Legends and Superstitions.

In conclusion, I shall notice some of the legends attached to plants. The Ash (*craobh uinnseann*) was frequently used for charms and enchantments. When a child was born the end of a green stick of ash was put into the fire and the juice which oozed from the other end was administered to the new-born babe. Serpents had a special horror of the leaves, for, as the old poem says, "The serpent will go through fire rather than through the leaves of the Ash." In connection with this reputed virtue of the Ash, we may remember that, in Scandinavian mythology, the Ash was a lightning tree, and sacred to Odin; that the court of the gods was held under the great ash Ygdrasil; and that from it the first man was made.

Perhaps because it somewhat resembled the Ash, the Rowan or Mountain-Ash (*Pyrus Aucuparia*), the Wood Enchantress (*fuinseag coille*), or Berry Tree (*craobh chaoran*), which, to the Scandinavians, was also a lightning tree, was full of power. Its uses against witchcraft have already been noticed. Its fruit conferred long life on him that ate it. In the Dean of Lismore's book is a very ancient poem, thus translated by Dr. M'Lauchlan:—

"A rowan tree stood on Loch Mai,
We see its shore there to the south;
Every quarter, every month,
It bore its fair, well-ripened fruit;
There stood the tree, alone, erect,
Its fruit than honey sweeter far—
That precious food, so richly red,
Did suffice for a man's nine meals;
A year it added to man's life."

Another tree of power was *cailtin*, the Hazel (*Corylus*), but it was generally thought to be unlucky. If, however, two nuts were found joined together (*cnò chomblaich*) good luck was certain.

Of the Elder or Bour Tree (*Sambucus nigra*), *ruis* (wood) or *druman* (tree), an old writer, dating from the Camp at Athole, June 30, 1651, says that the Highlanders "keep as a great secret in curing wounds the leaves of the Elder, which they have gathered the first day of April, for the purpose of disappointing the charms of witches. They affix them to their doors and windows." The Ivy (*Hedera*), *eidheann* (that which clings), was credited with similar powers.

Some superstitions are connected with cows and milk. Of the River Leaf (*duiliasg na h'aibhe*), *i.e.*, the Floating Pondweed (*Potamogeton natans*), "Nether Lochaber" writes that, particularly in the West Highlands, "it is gathered in small bundles in summer and autumn, and kept until New Year's Day (old style); it is then put for a time into a tub or other vessel of hot water, and the infusion is mixed with the first drink given to milch cows on New Year's Day morning. This is supposed to keep the cows from witchcraft and the evil eye for the remainder of the year! It is also supposed to increase the yield of milk."

But, if you wish to have a cheap supply of milk without keeping cows, you may try the plan of the old woman mentioned by Martin. She was found on a May morning at a spring well cutting the tops of Water Cresses (*dur-lus*—the Water Plant), muttering strange words and the names of certain cowkeepers, and saying, "*S'liomsa leath do choud sa*" (half thine is mine). She repeated these words as often as she cut a sprig, which personated the individual she intended to rob of his milk and cream. Martin is obliging enough to inform us, however, that "some women make use of the root of Groundsel as an amulet against such charms by putting it amongst the cream."

The Yarrow (*Achillea Millefolium*), *earr thalmhainn* (that which clothes the earth)—also called the plant that stops bleeding (*lus chosgadh na fola*),—was used for a different purpose. Young women cut it with a black-handled knife, by moonlight, repeating certain mystic words. The Yarrow is then brought home, put into the right stocking, and placed under the pillow, with the result that the maid will see in a dream her true love. If, however, she speaks after gathering the Yarrow the charm will be broken. An old Gaelic song says—

"I rose yesterday morning early,
And cut the yarrow according to my skill,
Expecting to see the beloved of my heart;
I saw him, but alas! his back was towards me."

Ferns were also frequently used in charms. A receipt for one was—

"Get nine branches of ferns
Cut with an axe,
And three old man's bones
Pulled from the grave;"

but for what purpose I know not. Fern seeds gathered on mid-summer eve were full of magical power.

I do not think that there are many legends connected with the Oak (*Quercus Robur*)—*darach*, the Tree, and *righ na coille*, the King of the Wood,—though it is frequently mentioned in old poetry Thus, Ossian—

"Silent and great was the prince,
Like an oak tree hoary on Lubar,
Stripped of its thick and aged boughs
By the keen lightning of the sky;
It bends across the stream from the hill,
Its moss sounds in the wind like hair."

Whilst regarding the age of the Oak, it was said that—

"Thrice dog's age, age of horse;
Thrice horse's age, age of man;
Thrice man's age, age of eagle;
Thrice eagle's age, age of oak;"

which would make about 630 years. With this estimate Dryden's may be compared—

"Three centuries he grows, and three he stays
Supreme in state, and in three more decays."

A firm belief in fairies was held by the Highlanders, and between the fairies and several plants there was a close connection. Certain plants, as the Fox-Glove (*meuran sithe*), the Cow Parsnip (*odhran*), and the Docken (*copagach*), could ward off or break the fairy spell or influence, whilst others, such as the Water-Lily (*rabhagach* and *buillite* —meaning beware, or warning), were on the side of the fairies.

A good harvest was as important then as now, as was also the desire of knowing the future. For the latter a peculiar divination was practised on the 2nd of February. The mistress and servants dress a sheaf of Oats (*coirc*) in women's apparel, place it, with a wooden club beside it, in a large basket, which is called Briid's bed. They then cry three times that Briid is come and is welcome, and in the morning they look in the ashes for the print of Briid's club. If it is there a prosperous year will follow.

In the Western Islands the harvest of sea-weed was very important, and, to ensure its being good, a sacrifice was made to the sea-god Shony (the Scandinavian Sjoni, whose worship was introduced by the Lochlannach or Norwegians). At Hallowtide the inhabitants of Lewis came to the church of St. Mulvay, and, selecting one of their number, sent him into the sea in the middle of the night. In his hand he carried a cup of ale, and, crying with a loud voice, "Shony, I give you this cup of ale, that you may send us plenty of sea-ware," tossed it into the sea. This combination of a Christian church and the invocation of a heathen deity is rather curious.

With some plants Christian legends are associated. The Aspen (*critheann*, trembling) has leaves that are always quivering, because from the wood of that tree the Cross was (they thought) made. The Spotted Knotgrass (*Polygonum Persicaria*) has a dark spot on the centre of each leaf. It grew at the foot of the Cross, and drops of blood fell on it, the mark of which it still retains. Hence it is called the Blood-Spot (*am boinne-fola*) and the Herb of the Tree of Crucifixion (*lus chrann ceusaidh*).

In conclusion, I submit to your consideration whether I have made out my case that, in a study of the Gaelic names of plants, much of the ways of life of the ancient Highlander may be learnt. We have seen that he had an observing eye—quick to detect differences of form and colour—for the plants around him. That, not possessing, as we of a later age possess, facilities for procuring articles from all parts of the world, he had to use those which nature had provided in his own neighbourhood, and by experiment to find out the qualities and uses of every plant. In the woods and on the moors, in the glens and on the hills, he found plants to feed him when he was hungry, to flavour his drink, to dye the garments with which he was clothed, to furnish weapons of war and of the chase, to heal his sicknesses and to cure his wounds, and to many of these he gave names indicative of their uses and qualities. That he was religious we have proof, not only in the plants dedicated to deities and saints, but from his belief in magic and divination, in the existence of supernatural beings, and in the connection of certain plants with these; that from being a heathen he, in the course of ages, became a Christian, is shown also by the names of the plants, when,

from being dedicated to Baal, they were assigned to some of the saints; and, finally, that he acquired learning we gather from the names which are not truly indigenous, but alterations from scientific or other alien names. Thus, if we had no other source of knowing what kind of a man the ancient Celt was, and how he lived, a study of the names of the plants would give us a very fair idea.

10th April, 1890.

F. Buchanan White, M.D., F.L.S., F.E.S., President, in the Chair.

The following donations were intimated :—

Museum—Perthshire Collection.—Redwing—from Mr. J. Young. *Index Collection.*—Frog, Beetles, &c., from Antigua—from Mr. Alexander Lamond, St. John's, Antigua. Shells from the Andaman Islands—from Mrs. Douglas Price, Charlotte Street, Perth.

Library.—"Home of a Naturalist"—from the Rev. B. Edmonston, Kincardine Manse.

The following papers were read :—

1. "The Measurement of the Earth." By R. Brown, F.E., R.N.

2. "On the Arrangement of the Geological Collections in the Museum."

(3) "The Index Collection of Rock Specimens." By H. Coates. (See *Trans.*, Vol. I., p. 143).

(4) The Index Collection of Minerals." By P. Macnair. (See *Trans.*, Vol. I., p. 145).

3. "Some New Perthshire Localities for Rare Mosses." By R. H. Meldrum. (See *Trans.*, Vol. I., p. 147).

8th May, 1890.

F. Buchanan White, M.D., F.L.S., F.E.S., President, in the Chair.

The following donations were intimated :—

Museum—Perthshire Collection.—Nest and Eggs of Shoveller—from Sir J. E. Millais, Bart.

Library.—Catalogues of British Hemiptera and British Hymenoptera (two copies of each)—from Mr. T. M. M'Gregor.

Mr. T. M. M'Gregor exhibited a piece of bark on which was a colony of small green beetles.

The following papers were read :—

1. "The probable Modification of Man by association with others." By R. de Bruce Trotter, M.D., L.R.C.P.E.

2. "The Geological and Geographical Evolution of Perthshire. Paper I.—Introductory." By P. Macnair.

3. "Additional Aculeate Hymenoptera for 1889." By T. M. M'Gregor. (See *Trans.*, Vol. I., p. 152).

4. "Catalogue of Perthshire Willows in the Museum Herbarium." By F. Buchanan White, M.D., F.L.S., F.E.S. (See *Trans.*, Vol. I., p. 155).

SUMMER SESSION, 1890.

The following Excursions were arranged :—

1. May 22.—To Glen Turret.
2. June 7.—To Damhead, by Loch Whir and Invermay.
3. June 21.—To Banks of Tummel, from Pitlochry to Logierait.
4. July 5.—To Killiecrankie and Pitlochry.
5. July 25.—To Cruach Ardran (3,250 feet), Crianlarich.
6. Aug. 9.—To North Bank of Tay, from Kenmore to Aberfeldy.

PHOTOGRAPHIC SECTION.

OFFICE-BEARERS.

Chairman—J. W. Munro, B.A.

Secretary—William Ellison.

Committee—Dr. A. R. Urquhart, R. D. Pullar, F.C.S., T. Bourke, A. Hodge.

SECRETARY'S REPORT FOR SESSION 1889-90.

In the beginning of the year 1889 a desire was expressed by several interested in Photography to try if something could not be done to draw all workers in the art in Perth and neighbourhood into closer contact with one another, so as to render mutual help and seek to advance the cause of Photography generally. After mature deliberation, it was decided to form a union, and, if possible, to affiliate it with the Perthshire Society of Natural Science. That Society was communicated with, and very kindly acceded to the request, and we became the Photographic Section of the Perthshire Society of Natural Science.

M. R. D. Pullar was appointed chairman, and all the members were congratulating themselves upon having secured such a good man for the post; but unfortunately Mr. Pullar could not see his way to continue in the office, and had to resign. We were, however, fortunate in having Mr. Munro to fall back upon, a gentleman in every way qualified for the post, and who has during the past year held the office with so much honour to himself and to the satisfaction of all concerned. Several excursions were arranged during the summer months, but the Committee regret the opportunities for visiting many interesting places were only taken advantage of by very few.

A series of lectures were given during the winter months, but these were not so well attended as they might have been. The Committee would urge upon all the necessity of continued effort, and they hope that greater interest will be taken in both the excursions and lectures which may be arranged during the year we are about to enter upon.

The thanks of the members are cordially given to those gentlemen who so very kindly read papers, shewed apparatus, and otherwise made the monthly meetings so edifying and pleasant.

The exhibition of Photographs in connection with the Conversazione on 9th January was a great success, the display being a very good one and highly appreciated. One of the special features of the exhibition was the album giving examples of the members' work.

The thanks of the members are specially due to Mr. R. D. Pullar for his great kindness in fitting up the dark room with blinds, lamps, and dishes, &c., and in providing all the necessary funds for carrying on the Section, and also for the very valuable loan collection of photographic literature.

The membership at present stands at 38.

It is hoped all will use their influence to increase the membership, and do everything they possibly can to help forward the Section in every way.

WINTER SESSION, 1889-90.

The following Meetings were held:—

31st October, 1889.

Opening Address by J. W. Munro, B.A., Chairman of the Section. Exhibition of Lantern Slides by Fry & Co. London.

28th November, 1889.

Paper on "The Latent Image." By Cosmo Innes Burton, B.Sc., F.C.S.

23rd January, 1890.

Paper on "The Conditions of Rapidity." By J. W. Munro, B.A.

1st March, 1890.

Paper on "Detective Cameras." By W. Frew, F.C.S.

27th March, 1890.

Paper on "Photography as applied to Engineering." By Thos. Reid, University College, Dundee.

SUMMER SESSION, 1890.

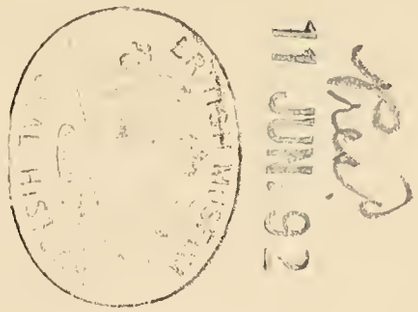
The following Excursions were arranged:—

1. May 22.—To Glen Turret.
2. June 7.—To the bank of the Tay, from Perth to Kinfauns.
3. June 21.—To Newburgh.
4. July 5.—To Killiecrankie.
5. July 19.—To Stanley.
6. August 2.—To Almondbank and Methven Loch.
7. August 16.—To Dunkeld.
8. August 28.—To Leven, Largo, Crail, and St. Andrews.

BALANCE-SHEET of THE PERTHSHIRE SOCIETY OF NATURAL SCIENCE for the Year ended 28th February, 1890.

INCOME.

To Balance in Savings Bank at 28th February, 1889, ...	£16	18	10
,, Balance in Treasurer's hands, ...	1	13	7
	£18	12	5
,, Annual Subscriptions and Entrance Fees, ...	76	16	0
,, Contributions towards Expense of Coal and Gas, ...	11	0	0
,, Sale of Society's Publications, ...	0	8	6
,, Interest on Bank Account, ...	0	7	7
	£107	4	6



EXPENDITURE.

By Janitor's Salary, ...				£20	0 0
,, Feu-Duty, ...				7	3 10
,, Property Tax, ...				0	3 8
,, Repairs and Furnishings, ...				7	1 9
,, Fuel and Gas, ...				7	3 4
,, Printing, Postages, and Stationery, ...				27	3 0
,, Books and Magazines, ...				5	2 0
,, Subscription to the East of Scotland Union of Naturalists' Societies, ...				4	3 0
,, Donation towards cost of Oxygen Bottle for Photographic Section, ...				2	0 0
,, Incidental Expenses, ...				1	10 0
,, Balance in Savings Bank at 28th February, 1890, ...	£23	6	5		
,, Balance in Treasurer's hands, ...	2	7	6		
				25	13 11
				£107	4 6

PERTH, 1st March, 1890.—We, the undersigned Auditors appointed by the Society, having examined the foregoing, and compared the same with the relative Vonchers, find them correctly stated and properly vouched—the sum in the Bank at the credit of the Society being £23 6s 5d, and in the Treasurer's hands £2 7s 6d.

(Signed) A. T. SCOTT, A. J. JAMIESON, } *Auditors.*

WINTER SESSION, 1890-91.

13th November, 1890.

F. Buchanan White, M.D., F.L.S., F.E.S., President, in the Chair.

The following donations were intimated :—

Museum—Perthshire Collection.—Nest and Eggs of Little Grebe —from Mr. Boath, Rohallion. *Index Collection.*—Geological Specimens—from Colonel Wedderburn Ogilvie of Rannagulzion.

Library.—Photographs of Plants—from Colonel Wedderburn Ogilvie of Rannagulzion. Three Photographs of Trap Dykes at Stanley—from Mr. Wm. Ellison. Frames for do.—from Mr. H. Coates. Two books—from Mr. John Stewart. 3 volumes of Reports of Smithsonian Institute—from the Institute. Report of the British Association—from the Association. 3 volumes of Reports of the United States Geological Survey—from the Department.

Dr. Andrew Thomson, F.R.S.E., F.C.S., F.I.C., was elected an Ordinary Member.

Mr. R. Brown, F.E., R.N., Delegate of the Society to the British Association, gave a report of the Meetings of the Association at Leeds.

Mr. R. Dow, Delegate of the Society to the East of Scotland Union of Naturalists' Societies, gave a Report of the Meetings of the Union at Montrose.

Mr. James Morison read Notes on the Science Courses held at Granton in the summer of 1890.

The President delivered the following Opening Address :—

In opening the winter session of the Society I purpose giving, as on former similar occasions, a brief account of the field-work done by members during the past summer. Whilst the excursions are open to all members of the Society, the attendance at them is not so large as might be expected or desired. The impossibility, except on rare occasions, of getting away from business no doubt accounts for the absence from the excursions of some enthusiastic and energetic members. But I think that there are other reasons which explain not only the apparent neglect of some other members to take part in our rambles, but also the character of the reports which I am about to submit to you. Whilst those who devote their attention to the flora of the districts visited are able to get over the ground at a tolerably rapid rate, those whose objects of study are zoological are tempted to linger in some productive spot, and hence must either desert the other members of the party or reluctantly leave their uncaptured treasures behind. It has thus come about that the Society's excursions are chiefly of a botanical nature, and that the following account will relate chiefly to the plants observed.

The first official excursion was, as usual, held on the Queen's Birthday; for an account of it I am indebted to Mr R. Dow, as I was unable to attend it myself. Since it was too early in the season for much botanising, the excursion was devoted chiefly to a study of the geological phenomena of the district visited, which was the lower part of Glen Turret. Guided by Mr. M'Nair, who had come specially all the way from Glasgow for the purpose, the party went some distance up the Barvick Burn, which cuts through huge masses of intrusive porphyritic rocks. Leaving the Barvick, the party crossed the bridge which separates it from the Turret, of which it is a tributary. On the descent into the Turret valley a fine section of the Old Red Sandstone was examined. The beds rise almost perpendicularly, being on the line of the Great Fault which crosses Scotland from Stonehaven to the Clyde. Further up the Turret the Highland Schists were met with. No special plants were noticed, but the great luxuriance with which *Luzula maxima* grows on both banks of the stream attracted attention. With regard to this plant, which is not uncommon and often abundant in suitable places throughout Scotland, it is curious that Lightfoot in "Flora Scotica" mentions two localities only, one near Edinburgh, the other at Killin. It is not for a moment credible that we have here an instance of what some plants (as, *e.g.*, *Veronica persica*) show, namely, a wonderful increase in the range of distribution. It is interesting only as an example of how a common and conspicuous plant can be overlooked.

The next excursion was on 7th June, and was the first occasion of several on which the new Glenfarg railway was utilised for botanical purposes. Starting from Glenfarg Station (or Damhead) we made our way to Loch Whir, a small lakelet on the Ochils to the west of Damhead. On the way thither great beds of the pretty *Viola lutea* attracted attention and admiration. Loch Whir itself was disappointing. It is almost choked up with the common *Carex rostrata*, but also contains a few patches of the local *Carex filiformis*. On the outcropping rocks in its neighbourhood *Sagina subulata* was common, as it is in many places throughout these hills where the rock comes to the surface. Leaving the Loch, we ascended a hill called on the Ordnance Map Cairn Geddes, but I have not been able to find out the origin of this name. The top of the hill is covered with irregular heaps of stones. We then turned westwards and descended through gorgeous masses of yellow whin (which, rising out of the brown heather, made a fine spectacle) to a little marsh which was found to be rather prolific. The most interesting flowering plants it contained were two local sedges, *Carex disticha* and *Carex teretiuscula*, but the chief find was a rare and beautiful moss—*Hypnum nitens*—not, I think, previously found in Perthshire. The honour of detecting it belongs to Mr. Meldrum. Near this spot also the nest and eggs of the Golden Plover were observed. A stretch of a mile or two across the hills brought us to the Kelty Burn—a tributary of the May. Descending this burn several noticeable plants were seen; *Carex disticha* was more abundant than we have seen it elsewhere in the county; *Avena pratensis* occurred, and both *Cratægus Oxyacantha* and *Ulmus montana* either in a wild or self-sown condition. *Salix*

nigricans grows here and there on the banks, and near the mouth of the burn *Salix acutifolia* has been planted. On reaching the river May several local plants, such as *Veronica montana*, were noted; but the chief find was what appears to be a rare variety of *Cardamine amara*. This plant, which, although not uncommon in Perthshire, is rather a local British plant, has white flowers, but nearly opposite the mouth of the Kelty Burn a large bed of it was found in which all the flowers were rose-coloured. In addition to this distinction of colour, the shape of the leaflets seems rather different from that of the type. On this grounds I have thought it worth separating under the varietal name *lilacina*. Nothing much worthy of note was seen till Invermay was reached. Here the interest of the beautiful walks that lead through the "Birks" is much enhanced to the botanist by the many local plants which adorn the banks. Amongst those seen on this occasion were *Adoxa Moschatellina*, *Veronica montana*, *Betonica officinalis*, and the curiously coloured and structured *Neottia Nidus-avis* and *Lathræa squamaria*—the former a saprophyte and the latter a parasite. The host-plant of *Lathræa* in Perthshire is chiefly elm (*Ulmus montana*), but in Invermay it grows on roots of plane (*Acer Pseudo-Platanus*), and also on roots of yew (*Taxus*). After leaving Invermay the only noticeable plant seen on this excursion was *Anthemis arvensis*, which grows near Forteviot Station, whence we returned to Perth.

On the 26th of June we went to Pitlochry with the intention of exploring the West Bank of the Tummel. On our way to Clunie Bridge we found that the garden wall of a recently-built house had been erected on the station for *Galium erectum*, and that this local plant has apparently ceased to grow there. After crossing the river by Clunie Bridge we proceeded down the stream, searching the rocky banks which add so much to the beauty of this portion of the river. Amongst the more noticeable plants seen here may be mentioned *Carex remota*, *C. pallescens*, *Rosa spinosissima*, *Astragalus hypoglottis*, and a *Symphytum*, which is apparently *S. officinale*. Nothing else of any great importance was observed till we got below Pitlochry, where, on the shingles and river bank, some very interesting plants were obtained. The most important of these is *Salix Doniana* Sm., a hybrid between *S. purpurea* and *S. repens*. *S. repens* is probably not rare along the course of the river, but one small patch only of *S. purpurea* was observed, and *S. Doniana* was growing in the midst of it. The interest attaching to *S. Doniana* is this, that it had not been gathered in Britain from the time when it is said to have been discovered by Don until this day. It seems not improbable that Don got it somewhere in Forfarshire or Perthshire, but its recorded history does not make this clear. At anyrate it can now be claimed as a British plant without any doubt. Next in importance to *S. Doniana* was the discovery of *Poterium Sanguisorba*. This is a very rare plant in Perthshire. It grows, or grew, near Moncreiffe Gardens, and on the railway bank near Abercairny Station, but in both of these places is very doubtfully indigenous. I have found it sparingly on the top of Balthayock Hill, where it seemed to be wild. On the shingle below Pitlochry it looks like a wild plant, but it is impossible to be

absolutely certain on this point. I am inclined to think that the form found is the var. *guestphalicum* Bugh., but, as I have not seen examples of that variety, I cannot be sure. On a wet bank, at about 300 feet elevation above sea level, *Saxifraga stellaris* was seen. Although another of the mountain saxifrages *(S. aizoides)* is frequently brought down by the streams from its home on the hills, I never before saw *S. stellaris* at so low an altitude. Our other finds included several forms of *Thalictrum minus*, as well as *Polygala vulgaris*, *Symphytum officinale*, and a naturalised bush of *Cornus sanguinea*—the latter being noteworthy as, though not unfrequently planted, we had not before seen it in a semi-wild condition.

A little time was devoted to an examination of Ballinluig Island, near Logierait. The island is mostly covered with fir trees, amongst which *Silene maritima* and *Alchemilla alpina* grow in some abundance —rather a curious-looking locality for these species, which, though common on the shingles, usually disappear when these become overgrown with trees and bushes.

The next excursion took place on July 5th. Starting from Killiecrankie Station, we crossed the river and explored some marshy ground near the head of the Pass. Here *Tofieldia palustris* is not uncommon, though the altitude is only about 600 feet, the lowest at which we have seen it. Amongst other plants here were *Saxifraga aizoides*, *Eriophorum latifolium*, the orchid we have been accustomed to call *Orchis incarnata*, and *Gymnadenia Conopsea* with white flowers —a state we had not noticed previously.*

Leaving the marsh, we turned our attention to the rocky slope of the hill which forms the western boundary of the Pass of Killiecrankie. These rocks we knew, from past experience, to be rather rich, producing, amongst other things, *Lychnis Viscaria* in some abundance.

* A list of the species of which white-flowered forms have been found in Perthshire may be of interest. Of course, plants which are normally white-flowered are not included. Additions to the list will be welcome.

Ajuga reptans.
Calluna vulgaris.
Campanula latifolia.
,, rotundifolia.
Centaurea nigra.
,, Scabiosa.
Cnicus arvensis.
,, lanceolatus.
,, palustris.
Cynoglossum officinale.
Dianthus deltoides.
Digitalis purpurea.
Epilobium montanum.
,, obscurum.
Erica cinerea.
,, Tetralix.
Erodium cicutarium.
Gentiana campestris.
Geranium molle.
,, Robertianum.
,, sylvaticum.
Geum rivale.
Gymnadenia Conopsea.
Lamium purpureum.
Lychnis diurna.
,, Flos-cuculi.
Melampyrum pratense.
Myosotis alpestris.
Ononis arvensis.
Orchis incarnata.
,, maculata.
Pedicularis palustris.
,, sylvatica.
Prunella vulgaris.
Scabiosa arvensis.
,, succisa.
Scilla nutans.
Silene acaulis.
Thymus Serpyllum.
Vaccinium Myrtillus.
Valeriana officinalis.
Veronica serpyllifolia.
Vicia Cracca.

Our chief object, however, was to try and obtain specimens of a shrub seen in an inaccessible place on a former occasion, which we believed to be *Pyrus Aria*. With some difficulty we got leaves, but could see no flowers—most of the bushes being out of reach. I am inclined to think that the *Pyrus* is native here, and if so, it is an interesting addition to the flora of Perthshire. Amongst other plants observed were *Geranium lucidum*, *Chrysosplenium alternifolium*, *Lychnis Viscaria*, *Populus tremula* var. *glabra*, and *Melica nutans*. A few molluscs, including the rather rare *Helix lamellata*, were also found. Recrossing the river, we ascended the bed of the Allt Girnaig, and found the local and rare *Polygonatum verticillatum* in small quantity. In some of the specimens the arrangement of the leaves departed from the verticillate type. Other plants included *Carex sylvatica*, with many of the female spikelets branched, *Carex muricata* (a new locality for this local sedge), *Festuca gigantea*, *Bromus asper*, *Campanula latifolia*, *Arabis hirsuta*, and an *Agrimonia* which seems to be *A. odorata*, but which was, unfortunately, not in flower. On the railway bank, near the station, a few plants of *Arabis perfoliata* were seen, and large beds of *Vicia sylvatica*, in full flower, and very beautiful. *Galium erectum* used to grow here, but, as we could not find it, has perhaps disappeared.

On August 2nd the Mountain Excursion took place. The hill selected on this occasion was Cruach Ardran, a few miles south of Crianlarich Station. The mountain is a very picturesque irregular rocky pyramid, the approach to which is by a wide and deep corrie, flanked by precipitous hills. After following the burn for about two miles, attention was directed to the rocks on the west side of the corrie, but these were found to be, on the whole, not very prolific. They were therefore abandoned, and the ridge of Cruach Ardran ascended. Here, at a spot where a magnificent view of Glen Falloch to the south and Glen Dochart to the north put an end to botanical pursuits for a short time, the Annual Meeting of the Mountain Club was held with the accustomed ceremonies. After the initiation of two new members, the following poem was read :—

Once more the dawning day breaks fair
O'er mountain, valley, glen,
And we are met fresh joys to share,
So onward ! now, as men
To whom all Nature opes an endless field
Where hopes once sown a laughing harvest yield.

What though we dig and delve full long
In many a darksome place,
Toiling in silence, while a song
Wells upward from the race
From those who deem that ignorance is bliss
If thereby they some pain and labour miss.

What though men laugh at us and jeer,
Calling us fools or mad,
We to God's greatest thoughts draw near,
And, in what they call bad,

Behold the workings of His wondrous hand
As in the open marvels of the land.

Each year we meet a glance to take
At labours past and done,
To laugh at each last-year's mistake,
To count the triumphs won,
Or to gain courage from each comrade true
'Fore facing of the year untried and new.

We gather round our chieftain here
Upon the hill's rough brow,
The winds sweep round us far and near,
We know not where nor how,
And hour by hour clearer we see to read
In nature's book God's wisdom and our need.

Through life we climb a mountain steep,
Nor hope to win the height
Till dark the evening shadows sweep,
Wrapping all things from sight,
Yet through death's dimness we can see a glow
As of great light we saw not here below.

And as we climb, lo ! here and there
Some comrade's tomb we find,
Who fell asleep 'mid noontide's glare,
But left his works behind.
We pause a moment there to weep and pray,
Then press again upon our upward way.

We may not reach the top at all—
Earth's twilight is not yet—
Others shall pass on where we fall,
And will us scarce regret ;
But we the flag of Truth can upward bear,
If but one step, and plant it firmly there !

So here upon this hill to-day,
Endued with hope, we stand,
Looking ahead where winds our way,
Hand firmly clasped in hand,
A little band of comrades old and new,
With eager wills and hearts both stout and true.

And once again the echoes ring,
We raise our watchword high,
"Salix herbacea"—thus we sing—
"Floreat !" We shall die
As we have lived, toiling for what we deem
A brave man's work, a poet's fitting theme.

M. B. W.

The exploration of the north face of the hill was then proceeded with. Here the usual plants of the Breadalbane hills were noticed,

but no special rarities were observed, with the exception of *Juncus castaneus*, which occurred in fair quantity.

The last of the official excursions was on August 9th, when the north bank of the Tay between Kenmore and Aberfeldy was examined. Near Kenmore the local *Carex muricata* was observed but nothing else of much consequence till the Lyon was reached. The Lyon was ascended as far as Comrie Castle, a little below which *Carex vesicaria* was gathered. On the north side of the Ferry, search was made for *Stellaria umbrosa* and a very few plants of it found. We then went down the Lyon to its junction with the Tay (where a very lovely bit of river scenery occurs) and then followed the Tay to Aberfeldy. Though a good number of the usual riverine plants were noticed they do not include any species that requires special notice, except perhaps *Lythrum Salicaria.* This was found a little above Aberfeldy but seems to be probably an introduction in this place.

Whilst this concludes the account of what I have termed the official excursions of the Society, several others were made which deserve to be recorded.

One day in June we went to Glenfarg Station and walked back through the glen, where the *Lychnis Viscaria*, with its bright rosy flowers, was a conspicuous feature on the steep banks. Amongst other plants observed were *Trifolium striatum*, *Anthemis arvensis*, *Lepidium Smithii*, and *Carex paludosa.* On emerging from the glen we turned westward and inspected *Sambucus Ebulus* beside the Wicks of Baiglie road, where it was detected a year ago by Mr. R. Dow. We then struck the great embankment of the new railway and examined one side of it as far as the Bridge of Earn. Near Dron a new section of the carboniferous formation which occurs in this neighbourhood was investigated and a few fossils found. Near the same spot Mr. Dow found a single specimen of a yellow-flowered boraginaceous plant which appears to be the South European *Alkanna lutea.* A little further on several species of *Fumaria* (which still await determination) were found, and a single specimen of *Anthemis Cotula.*

Taking advantage of the new railway facilities, we went to Dollar on 8th July with the intention of following the footsteps of four botanists, who, on 29th June, 1839, made an excursion from Dollar, and discovered the existence in the Ochils of several alpine plants. The botanists in question were Dr. J. H. Balfour, afterwards Professor of Botany in Glasgow and Edinburgh; Dr. Dewar of Dunfermline, a well-known local botanist, whose name is commemorated in "*Hieracium Dewari;*" Mr. J. T. Syme, afterwards Boswell Syme, and finally Boswell of Balmuto, and author of the 3rd edition of English Botany; and Mr. Campbell, who recorded the excursion. Following, then, the footsteps of those who fifty-one years previously—nearly to a day—had carried their vasculums up the same valley, we entered the Glen of Care and stormed (at the rate of 6d a head) the Castle of Gloom. The Glen of Care (otherwise known as Dollar Glen) is well worth a visit. It is a deep dark gorge through which flows the Water of Grief, and along whose densely wooded and precipitous sides paths have been skilfully led. In one spot the path is carried on iron bars let

into the sides of rocks which nearly meet overhead, whilst under the path a boiling torrent continually rushes. In the Glen itself we did not spend much time botanising, being anxious to get to the higher ground, and the chief plant of interest observed was *Milium effusum*. On the walls of the Castle of Gloom (otherwise Castle Campbell) *Parietaria officinalis* is abundant. Leaving the Castle, we followed upwards the course of the Burn of Sorrow, and, after having gone about halfway up, began to meet with some alpine plants. Most of the species observed were plants which on the Highland hills would not have attracted much attention, but as occurring on the Ochils, which possess scarcely an alpine flower, must be looked upon as rarities. Amongst the first to be found was *Saxifraga hypnoides*, which occurred in far greater abundance than I have seen it elsewhere. Soon afterwards *Saxifraga stellaris* made its appearance, and was joined by *Epilobium alsinefolium* and *E. anagallidifolium*, *Juncus triglumis*, &c. On the drier parts of the banks *Galium sylvestre* is not uncommon, and on the rocks *G. boreale* is in small quantity. Having arrived at the head of the burn, we made our way to Maddy Moss, a tract of peaty ground on the ridge of the hill. From this point we had a magnificent view both to the north and south—in the latter direction the gigantic cantilevers of the Forth Bridge, rising up like miniature hills, attracting attention. On the Moss we found *Carex rigida*, but could not discover *Saxifraga Hirculus*, which is said to have been found here. The botanists mentioned above record *Saxifraga aizoides* from the Burn of Sorrow; but we did not see that species either, and I doubt its occurrence in the Ochils. From Maddy Moss we struck in the direction of Ben Cleuch—the highest peak of the range—and in a burn found a rare and interesting willow herb which is a hybrid, probably between *Epilobium montanum* and *E. alsinefolium*. Skirting the flank of Ben Cleuch, we descended Tillicoultry Glen, gathering on the way *Sedum anglicum*. From Tillicoultry we took the road back to Dollar; on the way there *Neottia nidus-avis* and *Scirpus sylvaticus* were seen near Harvieston.

In August another visit was paid to the new railway embankment near Bridge of Earn, and added several additional plants to the former list, the most important being *Lepidium campestre*. After going nearly as far as Dron, we explored the narrow plantation called Paradise Wood, and found *Betonica officinalis* in some abundance. We then went by Pitkeathly to the river Earn, and followed the south bank up to Forgandenny, observing *Saponaria officinalis* and *Spiræa salicifolia* (both naturalised), *Nasturtium sylvestre*, and *Epipactis latifolia*. At the Boat of Forgan the best plant of the day was found—namely, *Stellaria palustris*,—which is practically a new Perthshire plant, though it just enters the county near Stirling in the basin of the Forth. Near Forgandenny Station *Potentilla reptans*, *Lepidium campestre*, and *Convolvulus arvensis* were obtained.

On 28th August we went further afield, and visited the shores of the river Forth below Alloa. On this occasion we had the valuable assistance, as guide, of the Rev. J. Couper, of Menstrie, who has worked up the botany of the district, and who met us at Alloa Station. Proceeding first to Clackmannan Pow, a coaling wharf

where there is a great heap of ballast, we found a number of curious and interesting plants, most of which have been naturalised there. On the way thither we gathered *Vicia tetrasperma* and *Nasturtium sylvestre*. At and near the ballast heaps *Pastinaca sativa* was seen in great abundance, and in full flower; then *Inula dysenterica* (in small quantity), *Diplotaxis tenuifolia* and *D. muralis*, *Sisymbrium Sophia*, *Saponaria officinalis*, *Cerastium arvense*, and *Potentilla reptans*. One plant of *Rumex maritimus*, which had not before been seen here, was detected by Mr. Couper. The extraordinary luxuriance of *Polygonum lapathifolium* was noticeable. Some of the plants were four feet high, and thick in proportion. From Clackmannan Pow we went to another ballast-heap at Kennetpans, about three miles farther down the river. Part of the best ground on this heap had, unfortunately, been recently covered by fresh ballast, and some of the interesting plants destroyed. We, however, found *Mercurialis annua*, *Geranium pusillum*, *Beta maritima*, *Viola cornuta*, *Malva rotundifolia*, *Lepidium ruderale*, *Senebiera Coronopus*, *Ballota nigra*, and various other interesting plants.

Proceeding down the river *Carex riparia* was noticed in a ditch, and in a wood near Tullieallan *Corydalis claviculata*. Passing through the quaint old town of Kincardine-on-Forth, we reached Longannet Point, where *Sagina maritima*, *Thalictrum minus*, and *Polygonum Roberti* were added to the day's list, after which we returned to Alloa.

In connection with this ballast-heap flora, I may mention that in the course of the summer we found in one of the old yards at Perth Harbour, where ballast had been deposited many years ago, an extraordinary collection of introduced plants. I need not enumerate these, since Mr. Barclay has done so in his paper on the West Side of the Tay below Perth, but I wish to call the attention of members to the importance of examining every bit of ground, however unpromising it may look. The yard in question had been passed time after time, and had we not gone into it merely to look at a comparatively common plant, which was visible through the fence, we would still have remained in ignorance of the curious aggregation of waifs and strays which occur there.

An account of one more excursion may wind up this record. Taking train to Forteviot, we made our way to Dupplin Loch. Here the most noteworthy plants were two species of *Utricularia*, *U. minor* and another, which may be a small form of *U. vulgaris*. We also found *Carex teretiuscula*, *Eleocharis acicularis*, *Potamogeton heterophyllus*, and *Peplis Portula*. From Dupplin Loch we struck across country to Methven Moss, getting on the way *Salix ambigua*, *Radiola linoides*, *Eriophorum latifolium*, *Orchis incarnata*, &c. On the Moss itself the chief species of interest was *Rhynchospora alba*, whose exceeding abundance gave quite a local colouring to the place.

Near Methven Station a single plant (an introduction, of course) of the pretty and interesting *Lathyrus Aphaca* was detected. *Convolvulus arvensis* was also found.

18th December, 1890.

F. Buchanan White, M.D., F.L.S., F.E.S., President, in the Chair.

The following donations were intimated :—

Museum—Perthshire Collection.—A Widgeon—from Mr. T. Richmond, Hilton. *Index Collection.*—Fossils from hill behind Cairo, and Flint Nodule from Tombs of the Kings, Egypt—from Mr. A. Shields, Summerbank.

Library.—Volumes of "Knowledge" and "The English Mechanic" —from Mr. A. Shields, Summerbank. "A Revision of the British Willows" by Dr. Buchanan White—from the Author.

The Very Rev. V. L. Rorison, M.A., Dean of St. Andrews, Mr. R. Kinloch, W.S., Major Thornhill, and Mr. W. Burnett, were elected Ordinary Members.

The following papers were read :—

1. "Shell Hunting in Cornwall and the Scilly Islands." By H. Coates.

2. "On Spiders, with a list of Perthshire species." By Professor J. W. H. Traill, M.A., M.D., F.L.S. (See *Trans.*, Vol. I., p. 207.)

8th January, 1891.

Mr. John Thomas, Vice-President, in the Chair.

Mr. James Macdonald and Mr. D. Robertson were elected Ordinary Members.

The following papers were read :—

1. "The Rocks of Highland Perthshire: their Origin, Plication, and Denudation." By H. Coates and P. Macnair. (See *Trans.* Vol. I., p. 221.)

2. "Explosives." By Andrew Thomson, D.Sc., F.R.S.E., F.C.S.

12th February, 1891.

F. Buchanan White, M.D., F.L.S., F.E.S., President, in the Chair.

The following donations were intimated :—

Museum—Perthshire Collection.—Goldfinch, Shoveller, Scaup, Red-Breasted Merganser, Black Scoter, Velvet Scoter, Grey Plover,

Sanderling, Richardson's Skua (white form), and Great Northern Diver—from Lieut. J. G. Millais, Seaforth Highlanders. Black-Headed Gull and Great Crested Grebe—from Mr. Roger Davidson, per Colonel Drummond Hay. Wasp's Nest—from Ex-Dean of Guild M'Arthur. Human Skull from St. John's Church—from Mr. Walker, Princes Street. Six specimens of *Crambus myellus*—from Mr. S. T. Ellison.

Library.—"The North American Fauna," Parts 3 and 4—from the United States Government.

A letter was read from Messrs. J. & J. Miller, W.S., intimating that the Duncan Trustees had granted a sum of Sixty Pounds to the Society, for the purchase of Standard Scientific Books for the Library. On the motion of the Chairman, a cordial vote of thanks was awarded to the Trustees for the Grant.

The following papers were read :—

1. "The Flora of the North Bank of the Tay, from Perth to Glencarse." By William Barclay. (This paper will be published in a future part of the Transactions.—Ed.)

2. "The Ordnance Survey of Great Britain." By R. Brown, F.E., R.N.

12th March, 1891.

TWENTY-FOURTH ANNUAL MEETING.

F. Buchanan White, M.D., F.L.S., F.E.S., President, in the Chair.

The following donation was intimated :—

Museum—Perthshire Collection.—Razorbill—from Mr. T. Marshall, Stanley.

Mr. Paterson, Almondbank, was elected an Ordinary Member.

The following Reports were read and adopted :—

REPORT OF COUNCIL.

At this, the Twenty-Fourth Annual Meeting, your Council is pleased to be able to report that the activity of the Society is not abated, and, though the increase of membership does not keep pace with the defections, from a variety of causes incident to all societies, they are glad to think that true progress is maintained. Seven meetings have been held during the past year, with an average attendance of 25; the greatest number being 50, on 18th December, 1890, and the least 17, on 10th April, 1891. At these meetings 14 papers were

read. Eight new members have been added during the year, making a total membership of 290, including 1 honorary member, 10 corresponding members, and 8 associates. Six excursions were held during the summer months, and the Council desires to tender to the various proprietors and tenants who granted the necessary liberty for these excursions its most hearty thanks. The Museum continues to attract even larger numbers than before—about 3,000 having visited it last year. The Lecture-Room has been granted, as formerly, to various local societies whose objects are of an educational nature. As the ordinary income of the Society is largely consumed by the maintenance of the Museum, and in keeping it open to the public free of charge, your Council has recently made an appeal for funds for the extension of the Library, so that it may be kept abreast of the age, and is pleased to be able to state that this appeal has been very generously responded to. Your Council therefore hopes very shortly to purchase such works as will add materially to the usefulness of the Library to workers in the various fields of scientific enquiry, and also to the members generally. It is with much regret that the Council has to record the death of two distinguished members, namely, Dr. Croll and Mr. T. G. Murray of Stenton. Dr. Croll, whose fame as a man of science is known to all, did honour to the Society by allowing himself to be enrolled as an honorary member. Mr. T. G. Murray, although not a naturalist himself, was a benefactor to the Society in several ways, having, in addition to being a subscriber to the Museum fund and a donor of valuable books to the Library, shown hospitality at Stenton on more than one occasion to the members of the Society.

REPORT OF TREASURER.

(See Balance-Sheet, page cxxi.)

REPORT OF CURATOR.

In making my report for the past year as your Curator, I have much pleasure in stating that the several collections are in thoroughly good order, and that the Museum still continues to merit the approbation of visitors and scientific men who have seen it. I may instance my going round it this summer with a Professor on the staff of the Museum at South Kensington, who expressed his high approval af the whole arrangement, adding that it was one of the best local Museums he had seen. He appeared to be particularly struck with the large series of nests and eggs now in the Society's possession. With regard to these, I may mention that we have had some valuable additions in this section made during the last spring, among others being the nest and full clutch of eggs of the Shoveller Duck, presented by Sir John Millais, Bart., and obtained by his head keeper at Murthly, Mr. Keay. This bird also breeds at Methven. It was only as lately as 1879 that the Shoveller was supposed to be only a rare and casual visitant to the district. Now it is known (though it is by no means numerous) to be pretty well dispersed throughout, remaining the whole season and rearing its broods.

Another good addition is the nest of the Dabchick, or Little Grebe, from Rohallion, which is interesting as being so constructed as to float on the surface and to be generally moored to some isolated clump of reeds or rushes, the eggs being carefully covered with water weeds by the bird each time she leaves the nest, effectually concealing them from observation. Among the birds there have also been several valuable additions, Mr. T. G. Millais, of the Seaforth Highlanders, as has been mentioned on a former occasion, having largely contributed. He very kindly, on his last visit to the Museum, made a note of such birds as he could spare, and which he found we wanted. These he has now supplied, amounting in all to ten species. These, though all represented in the Museum with the exception of one, the Goldfinch, are of great value, as now completing the series of sex or stage of plumage according to the season. These specimens are now being mounted, and will shortly be placed in the cases. Among others recently placed in the Museum, I may specially notice a singularly beautifully marked Duck, a hybrid between the common Wild Duck and the Pintail, shot on the Tay this winter near Seggieden. I will not take up your time further than merely to remark that, owing to want of space, some of the cases may appear unnecessarily crowded; but this is unavoidable without interfering with the classification, which in an educational Museum such as ours should be most scrupulously adhered to.

REPORT OF LIBRARIAN.

For many years past it has been the fate of the Librarian to bewail in his Annual Report the impossibility of keeping alive an interest in the Library, through lack of the funds necessary to refresh its shelves from time to time with new material. It is gratifying to be able this year to report that for the present, at least, this reproach is about to be removed. A generous grant of £60 from the trustees of the Duncan Bequest, for the purpose of purchasing new books, is now being supplemented by donations from the members themselves, and already the sums from all sources amount to upwards of £130. It now falls to the Council to lay out this money; but as its desire is that it should benefit as large as possible a section of the Society, it will do so neither rashly nor hurriedly. It will be necessary to include in the selection a few technical works of reference, and it must be remembered that these are generally of an expensive nature; but the interest of the general reader will by no means be forgotten, and if any members have suggestions to make as to the selection of works, the Council will gladly give these its careful consideration. The Librarian has once more to acknowledge, gratefully, works from the Smithsonian Institution, Washington, and other donors, which have been received since last Report.

REPORT OF EDITOR.

The Fourth Part (Vol. I., New Series) of the *Transactions and Proceedings* is the only publication which has been issued by the Society during the past session.

The following Office-bearers were elected :—

President—F. Buchanan White, M.D., F.L.S., F.E.S.

Vice-Presidents—J. Clacher, James Stewart, L.D.S., T. M. M'Gregor, and R. Dow.

Secretary—S. T. Ellison.

Treasurer—John Stewart.

Curator—Colonel H. M. Drummond Hay, C.M.Z.S.

Librarian—James Coates.

Editor—Henry Coates.

Councillors—James Morison; Dr. Andrew Thomson, F.R.S.E., F.C.S., F.I.C.; R. Brown, F.E., R.N.; and William Barclay.

The President delivered the following Address :—

In some of the botanical papers which have been communicated to the Society during the past two or three years, opinions have been expressed regarding the claims of certain of our plants to be considered what is called—for want of better terms—native or indigenous. I say for lack of better terms, since, as Mr. Barclay has pointed out in his last interesting communication, if indigenous means, as it really does, "aboriginal" or "autochthonous," we have no indigenous plants.

The paper in question is one of the series of valuable exhaustive reports on the botany of limited parts of our district with which the author has been enriching our *Transactions*, and, as it dealt with a portion of the county whose flora admittedly contains several foreign plants, the question required to be discussed.

Consequently the whole subject of the origin of the British Flora had to be considered, and the theories regarding that origin briefly reviewed. Mr. Barclay's paper is not before me, but I think I am not mistaken in assuming that what he said may be thus recapitulated. 1st, That the last great glacial period had destroyed, or nearly destroyed, the flora which had pre-existed in Britain. 2nd, That after the close of that glacial period an immigration of plants took place from Central and North Europe. 3rd, That it is convenient to consider all plants indigenous or native which have not been introduced by the agency of man.

Agreeing in the main with these statements, I think it will not be unprofitable to continue the discussion rather further than was possible, or at least expedient, in a paper which was necessarily restricted to a small part of Perthshire, and to pass under review all the species regarding whose origin there may be divergence of opinion. In short, I purpose devoting this address to a consideration of the origin of the Perthshire Flora.

At the climax of the great ice age the whole of the British Islands, except a very narrow strip of the extreme south of England, was covered by thick ice. This ice sheet extended across Europe a little to the north of the 50th parallel of latitude as far east as

the 24th degree of longitude east of Greenwich, beyond which it gradually withdrew to the north. At the same time the alpine regions south of the great ice sheet had more or less extensive local ice coverings.

Now, though the whole of Britain was not actually covered—so far as we know—by the ice sheet, yet the climatic conditions of the narrow strip which remained uncovered must probably have been such as to exclude the idea that any plants—unless it were those of the most arctic nature, and even that is doubtful—were able to survive. Consequently the whole British flora was practically destroyed, and when the ice sheet disappeared the country was, as it were, a bare field ready to receive and welcome all comers.

It must be remembered that in South Central and South Europe during the climax of the ice age the more tender temperate, as well as the strictly southern, plants could not have survived, but were driven southwards, and their places taken by an alpine, northern, and arctic flora.

These cold and icy conditions were not to last for ever. The climate became warmer, and the ice retreated northwards or up the hills, and as it retreated the plants pursued, following in the order in which their ability to resist cold permitted.

The fluctuations in the retreat of the ice, in the climatic conditions, and in the relative proportions of land and water, must all have exercised a powerful influence on the flora, but need not be considered, even if it were possible, in detail just now. The period with which we are concerned is that one in early postglacial times, which Professor Geikie calls the "First age of Forests." In this period the climate was mild and genial, and Britain had a land connection with continental Europe. All the North Sea was then dry land, which, beginning in the Arctic Ocean, extended far to the west of the present coast of Norway, had its coast-line to the north of the Shetlands, and stretched away southwards outside the west of Ireland and the south-west coast of France, and just reached the north of Spain. From the west of the Shetlands an irregular strip of land probably extended north-westwards, and included the Fœroes and Iceland, and possibly even reached Greenland. In this great land extension were several great lakes of fresh water, such as the Baltic, a deep trough between Denmark and Norway, and a long hollow in the Irish Sea.

It was during this land connection that the great bulk of our flora reached this country, crossing over the dry bed of the English Channel and North Sea. There is no difficulty in knowing which were the plants to arrive first. These were the northern and alpine species, and the reason for their being in the vanguard is to be looked for in the fact of their fitness to contend with the cold of the regions nearest the retreating ice. But there is another reason for supposing that they were amongst the first plants to reach this country. To attain the mountain ranges, where alone they now survive, they had to cross the lowland plains and valleys, and had these been clothed with their present vegetation the alpine species could never have reached the hills. This arises not so much from

any inability to resist the greater heat of the valleys, for experiment will show that in many cases, at least, that is not detrimental to them, but because in the valleys they are choked by the greater vigour of the lowland plants. That the commoner constituents of our mountain flora overran at one time the whole country is shown by their present distribution and occurrence in localities separated from each other by lowland areas. But although we have thus tolerably conclusive proof that the alpine flora, as a whole, was at first a lowland flora, which was in course of time to be driven up the hills, when we come to consider the present distribution of some of the component species, we are met by problems which are not easy of solution. Putting aside the species which are now, at least, if they were not always, local or rare in this country, there are some common species whose distribution is difficult to explain. Why, for example, should several very common alpines *(e.g., Alchemilla alpina* and *Saxifraga aizoides)* occur in north England, in a great part of Scotland, and in Ireland, and yet be absent from the Welsh mountains? On the other hand, why should another common alpine, *Epilobium anagallidifolium*, be found in north England and Scotland, and not in Wales nor Ireland; or *E. alsinefolium* in Wales, north of England, and Scotland, and not in Ireland? Possibly the explanation is that those which are absent from Wales, but are present in Ireland, reached the present British coast north-east of the latitude of Wales, and found a road open for them northwards but not southwards, and got to Ireland by way of Scotland. The origin and distribution of the western and south-western plants afford other problems. Mr. Barclay has cited various theories regarding the species of heath which are confined (in these islands) to Ireland and the extreme south-west of England. As, however, there was direct land communication with the north of Spain, the origin of these do not present such difficulties as there are, for example, in the case of *Eriocaulon septangulare.*

Before proceeding to the proper subject of this address, there is one other matter which may be briefly noticed. From the many constituents which our alpine flora has in common with the Norwegian one,—there being very few instances of a Scottish alpine plant not being also Scandinavian,—it is not uncommonly supposed that our mountain plants immigrated from the north. In a sense, no doubt, this is correct, but not if a *direct* immigration is meant. All the northern plants were driven south by the increasing ice sheet, and hence the flora of the plains of the southern part of Mid Europe was, at the period of the climax of the ice age, a mingled northern and alpine one. When these plants began to follow the retreating ice, some of the alpine species reached Britain, but did not get north to Scandinavia; and some of the northern plants came to Britain, but did not go to the alpine regions of Mid and South Europe. In this way we have in Britain alpine plants which are not arctic, and arctic plants which are not alpine; but all our hill plants, whether their original habitats were in the north or in the Alps, came, like the lowland flora, from the plains of Mid and South-Mid Europe.

The species, both lowland and alpine, which came into Britain at this period of land extension constitute the bulk of what may be

termed, for the sake of convenience, the "native" flora. Whether this native flora continued to receive accretions after the land connection with the Continent had been broken it is impossible to say, but it is not altogether improbable. Whether, however, that was the case or not, there is now in the flora a not inconsiderable number of plants the method of whose entrance into this country is not quite certain. These plants have been classified as "denizens" and "colonists," terms first applied to them by H. C. Watson. A *denizen* is a species which is suspected to have been introduced by man, but which maintains its habitat. A *colonist* is a species which occurs only in ground adapted by man for its growth and continuous maintenance. In addition to these we have "aliens," or plants which have presumably been introduced by human agency; "natives" being the species which have not been so introduced. But, however nice these names look upon paper, their correct application is, as Sir J. D. Hooker remarks, exceedingly difficult in many cases.

Plants have various contrivances by which the area they inhabit is extended. The seeds of some merely fall to the ground, and in these the progression by that means must necessarily be slow. Others have tall stems, which, when shaken by the wind, help to scatter the seed to a greater distance. Still others have their seeds or seed vessels so constructed that they may be carried to a considerable distance by the wind. In addition to these methods, there are other contrivances by which animals are utilised for the dispersion of seeds. Migrating birds may carry seeds in their stomachs or in hardened mud adhering to their feet. Many seed vessels have hooks by which they can cling to the fur of mammals or to the feathers of birds. To birds a narrow sea presents no obstacles, and hence in that way the immigration of plants may still be going on, and species so introduced (if there are such) at the present day can scarcely be considered to be less native than if they had been brought thousands of years ago. The deduction to be drawn from this is, I think, that a plant which suddenly makes its appearance in a district in which it was not known to occur previously must not necessarily be looked upon as an alien introduced by human agency. I have been speaking of the British flora and Britain, but with the object of attempting to show that what concerned these in remote ages may have a more modern application to the Perthshire flora and to Perthshire. The various contrivances for the dispersion of plants, to which we have alluded above, clearly indicate that the extension of the area of plants is for the benefit of the species. Perthshire is not cut off by the sea from the rest of Britain, therefore the methods by which the British flora reached Britain, when there was a land connection, may have always been, and still be, operative as regards Perthshire in relation to the rest of Britain, provided that climatic conditions are favourable, and that there is room. Consequently, if we find in Perthshire a species, for example, which is of common distribution farther south in Britain, but whose area of occurrence is separated from Perthshire by a more or less wide interval, we must not, therefore, necessarily look upon it as intro-

duced by human agency, directly or indirectly. Every plant must, however, be judged on its own merits.

Let us now examine in detail all the constituents of the Perthshire phanerogamous flora which are not unanimously admitted to be natives, excluding from our examination, of course, all those which are indubitably aliens. In selecting the species whose claims to a position as natives have to be considered, I have followed Watson in his various works on British plants, and Sir J. D. Hooker in the "Student's Flora," both of whom have given opinions on the subject. In addition, I have, however, included a number of species of whose right to be considered natives of Perthshire, Perthshire botanists are probably the best judges. In this way the list that I have compiled embraces no less than 143 species, which may be divided into the following classes or groups:—(1) casual aliens; (2) naturalized aliens; (3) probably introduced; (4) roadside and hedgebank plants; (5) colonists; (6) probably natives; (7) certainly natives.

1. Casual Aliens.

By "alien," in this and the following group, is meant a species which is an alien (*i.e.*, certainly or presumably introduced by the agency of man) in *Perthshire*, but not necessarily in *Britain*, since some of them are admittedly native in England. If all the aliens of our flora had been enumerated, a very long list might have been drawn up; as it is, those only are included regarding whose position there has been some uncertainty. A casual alien is a plant which only occurs sporadically, or is at the best a garden outcast which barely maintains its position. A ? after the name signifies that it is with some doubt that the species has been placed in this group. More details regarding the species in this and the following groups are given in the Appendix, in which, for the sake of convenience, the species are not grouped, but taken in their ordinal arrangement. (7)

Berberis vulgaris.
Brassica alba?
Malva sylvestris.
Melilotus altissima.
Anthemis Cotula.
Cichorium Intybus.
Arnoseris pusilla.

2. Naturalized Aliens.

Naturalized aliens are species which not only maintain their position, but spread, some of them to a considerable extent. Some of the plants in the list are not natives of Britain, but have been included because doubt has been expressed as regards their naturalization even. (14)

Chelidonium majus.
Cheiranthus Cheiri.
Hesperis matronalis.
Geranium perenne.
Carum Carui.
Sambucus Ebulus.
Chrysanthemum Parthenium.
Senecio viscosus.
Carduus nutans.
Lactuca muralis.
Chenopodium Bonus-Henricus.
Salix alba?
Arum maculatum.
Lemma trisulca.

3. Probably Introduced.

Regarding the intentional or accidental introduction into Perthshire, if not into Britain, at a remote period, of several of the species in this group there can be no doubt. As regards others there is more uncertainty, and possibly they ought to be placed in a higher group. Still, from the circumstances under which they occur, their proper position seems to be here. (19)

Barbarea vulgaris.
Arabis perfoliata.
Sedum Telephium.
Conium maculatum.
Ægopodium Podagraria.
Myrrhis Odorata.
Anthriscus vulgaris.
Artemisia vulgaris.
Symphytum tuberosum.
Mentha sylvestris.
Urtica urens.
,, dioica.
Allium Scorodoprasum.
,, carinatum.
Bromus sterilis.
,, racemosus.
Trisetum flavescens.
Poa compressa.
Lolium perenne.

4. Roadside and Hedgebank Plants.

There are a few species which are so restricted in their distribution to roadsides and hedgebanks that it is impossible to avoid the conclusion that they are now, at least, dependent on the operations of man for their existence as constituents of the flora. They can scarcely be classed as colonists, since they are not, in a strict sense, plants of cultivated ground. More likely they are old introductions, but neither is this certain. It is possible, though perhaps not probable, that they may be really natives which have been driven to the place where they now exist, and have adapted themselves to live there. Several of the colonists and some of the probably introduced plants are also roadside and hedgebank species, but the following six are specially such. (6)

Sisymbrium Alliaria.
,, officinale.
Lychnis alba.
Chærophyllum temulum.
Caucalis Anthriscus.
Lamium album.

5. Colonists.

Watson defines a "colonist" as a species "found only in ground adapted by man for its growth and continuous maintenance." Now, whilst there are a considerable number of plants which occur only in cultivated ground, there are others which, although most common in such ground, are not altogether restricted to it. Those which are confined to cultivated ground have their nature well expressed by the term "weeds of cultivation." While some of them have been certainly introduced with the seeds of cultivated plants, it is not impossible that others have existed from the time when the surface of the country was less clothed with vegetation, and have been driven to the cultivated land because they find there the conditions necessary for their growth. Some other species have been included in the list of colonists because, though they are not restricted to cultivated ground, they are much more abundant there than else-

where. They might, with equal propriety, perhaps, have been included in the list of natives (just as some of the natives might have been classed as colonists) but for the doubt as to whether they had spread to the wild spots from the cultivated ground, or *vice versâ*. (49)

Ranunculus Sardous.
,, arvensis.
Papaver dubium.
,, Rhœas.
,, Argemone.
Fumaria pallidiflora.
,, Boræi.
,, confusa.
,, officinalis.
,, densiflora.
Brassica campestris.
,, Sinapis.
Capsella Bursa-Pastoris.
Raphanus Raphanistrum.
Viola arvensis.
Spergula arvensis.
Scandix Pecten-Veneris.
Æthusa Cynapium.
Sherardia arvensis.
Valerianella dentata.
Anthemis arvensis.
Matricaria inodora.
Chrysanthemum segetum.
Senecio vulgaris.
Centaurea Cyanus.
Crepis virens.
Sonchus arvensis.
,, asper.
,, oleraceus.
Anagallis arvensis.
Lithospermum arvense.
Veronica persica.
,, agrestis.
,, polita.
,, hederæfolia.
Anchusa arvensis.
Stachys arvensis.
Galeopsis Ladanum.
,, Tetrahit.
,, speciosa.
Lamium purpureum.
,, intermedium.
,, amplexicaule.
Chenopodium album.
Atriplex patula.
Polygonum Convolvulus.
Euphorbia Helioscopia.
,, Peplus.
,, exigua.

6. Probably Native.

There are certain plants about which it is very difficult to form an opinion, since so much can be said both for and against their being natives. A not inconsiderable number of them are undoubtedly introductions in some of the places in which they occur, a fact which makes it all the more difficult to decide whether they are really, as they seem to be, indigenous in their other stations. Under these circumstances, it has been thought expedient to place them in a group by themselves, and to give in the Appendix the reasons for or against their being considered native. (20)

Lepidium campestre.
Malva moschata.
Rhamnus Frangula.
Prunus Avium.
Rosa rubiginosa.
Pyrus Aria.
Ribes rubrum.
Daucus Carota.
Sambucus nigra.
Dipsacus sylvestris.
Tanacetum vulgare.
Lapsana communis.
Symphytum officinale.
Lithospermum officinale.
Verbascum Thapsus.
Linaria vulgaris.
Calamintha Acinos.
Salix triandra.
Typha latifolia.
Butomus umbellatus.

7. Natives.

To a Perthshire botanist it may seem unnecessary to have included in this group the names of certain species, since to him there has never been any doubt as to their being really indigenous. But since doubt has been cast upon them they had to be mentioned. Some other plants have been added because they cannot be classed as natives in all their stations. A few others might have been placed in the previous group but for the fact that the evidence in favour of their being native seems to preponderate. (28)

Reseda lutea.
„ Luteola.
Viola tricolor.
Lathyrus niger.
Spiræa Filipendula.
Potentilla anserina.
Alchenilla arvensis.
Pyrus acerba.
Cratægus Oxyacantha.
Lythrum Salicaria.
Epilobium angustifolium.
Valerianella olitoria.
Bidens tripartita.
Lactuca virosa.
Tragopogon pratensis.
Campanula glomerata.
Fraxinus excelsior.
Echium vulgare.
Cynoglossum montanum.
Polygonum Bistorta.
„ lapathifolium.
„ Persicaria.
„ aviculare.
Rumex Hydrolapathum.
Salix fragilis.
Polygonatum verticillatum.
Convallaria maialis.
Allium oleraceum.

In conclusion, I may say that I do not expect, nor indeed wish, that our local botanists should at once agree with all that I have suggested. It is not without hesitation that some of the species have been allocated to the groups in which I have placed them, since a good deal of evidence can be brought forward in favour of their being relegated to other groups. As, however, it is desirable that some arrangement of the species should be attempted, the scheme I have now laid before you may serve as a basis for a more thorough discussion of the position of our doubtfully native plants.

APPENDIX.

Ranunculus Sardous, Crantz.—This is admitted by Hooker without any qualifying remark. With us it has no higher rank than that of a weed of cultivation, and often not more than that of a sporadic casual.

[*Aquilegia vulgaris*, L.—At one time I thought that this had a slight claim to be considered wild in a few places, but now I have great doubt.]

Berberis vulgaris, L.—Hooker says naturalized in Scotland from Caithness southwards. In Perthshire it is scarcely naturalized, although I have seen one or two self-sown bushes.

Papaver Argemone, L.; *P. dubium*, L.; *P. Rhœsh.*—Weeds of cultivation only.

Chelidonium majus, L.—Hooker says "from Inverness southwards probably naturalized, elsewhere an escape." With us it is an established escape, keeping its place for many years, but scarcely spreading.

Fumaria.—All the species are called colonists. They are chiefly weeds of cultivation.

Cheiranthus Cheiri, L.—Watson calls this an alien, and so I suppose it must be considered, as most botanists agree with that opinion. Its great abundance, in its wild form, on some of our precipices of trap rock, where it must have existed for a considerable period, gives it a distinction above other aliens.

Barbarea vulgaris, Br.—Admitted as a native. From the situation in which it grows I am, however, rather doubtful whether it is not an old introduction.

Arabis perfoliata, Lamk.—Admitted as a native "from Perth southwards." With us it is local and rare, and occurs only in places which are very suspicious.

Sisymbrium Alliaria, Scop.—This is one of these hedgebank plants—of which there are several—that seem to me not to be above suspicion. Though it does occur away from hedge-sides, yet it is only in places to which it could easily have spread. I have never seen it in any very wild place.

S. officinale, Scop.—A plant of roadsides and uncrowded waste ground, which would probably disappear if man's occupation of the country ceased.

Hesperis matronalis, L.—"Meadows, plantations, &c., rarely even naturalized" *(Student's Flora)*. Here it is thoroughly established among the debris of the trap-rock precipices in several places, and is probably an old introduction.

Brassica campestris, L.—Usually a weed of cultivation only. In one place, on the rocks of Kinnoull Hill, it has, however, long been an established plant, and looks perfectly wild, though it is impossible to affirm positively that it is so.

B. Sinapis, Vis.—Although chiefly confined to cultivated ground, it is possible that this has higher rank than a colonist.

B. alba, Boiss.—Scarcely even a colonist with us.

Capsella Bursa-Pastoris, Mœnch.—Roadsides and garden ground, from which, as Hooker says, it would soon disappear if the human occupation of the country ceased.

Lepidium campestre, Br.—This is more frequently a plant of cultivated ground than *L. Smithii*, Hook., and, while often an introduction only, has also some claim to be considered native.

Raphanus Raphanistrum, L.—Seems to be a weed of cultivation only.

Reseda lutea, L.—Great doubt has been entertained as to whether this plant has any claim to be considered native in Scotland. Most usually it is not more than a casual, but in a few places it seems to

be really native. At Ardblair, near Blairgowrie, it grows in thoroughly wild ground, the whole aspect of which tends to support the opinion that the species cannot have been introduced. Another locality is near Rait, on the Braes of the Carse. Here it grows on a steep, dry, warm bank, which, though cultivated in places, yet produces several other local and rare plants, and the association of *R. lutea* with these seems to be an argument in favour of the plant being native.

R. Luteola, L.—From having been used as a dye-plant, this species might be looked on with some suspicion. It seems, however, to be considered as wild, and as such I am content to leave it.

Viola tricolor, L.—The books say that this is a plant of cultivated ground. It is, however, by no means confined to ground of that nature, and is a true native.

V. arvensis, Murray.—A weed of cultivation.

Lychnis alba, Mill.—Although no doubt has been cast upon this as a native, it is one of these hedge-bank and field plants which owe much to man as regards places suitable for their growth.

Spergula arvensis, L.—Mostly, and perhaps entirely, a weed of cultivation.

Malva sylvestris, L.—Watson doubts this being native in Scotland. With us it is never more than an outcast.

Malva moschata, L.—This is admitted to be native from Fife and Dumbarton southwards. In Perthshire it is perhaps doubtfully native, yet on the whole I am inclined to think that it may be wild in some places.

Geranium perenne, Huds.—Certainly an alien with us.

Rhamnus Frangula, L.—Although we as yet know of one plant only of this (near Loch of Lows), there seems to be no reason why it should not be native. The situation is a wild one, and the species is not likely to have been introduced into it purposely or accidentally.

Melilotus altissima, Thuill., is called a denizen by Watson. Here it is not more than a casual.

Lathyrus niger, Wimm.—Watson is doubtful about this being native, but for what reason I know not. Any one who has seen it in the Pass of Killiecrankie can entertain no doubt as to its being really wild.

Prunus Avium, L.—It is common enough as an unplanted tree, but whether it is more than a wanderer from cultivation, or whether in some cases, at least, it is native, is a problem difficult of solution.

Spiræa Filipendula, L.—Since this occurs at one spot only—on the banks of the Tay above Kinclaven—some botanists may have some suspicions about it. A double-flowered form is sometimes met with in gardens, but I have not seen the single-flowered plant—which is the Kinclaven form—cultivated. The plant is locally abundant and not near any garden; and since it occurs as a wild species as far

north as Caithness, I think we must admit it as a native of Perthshire.

Potentilla anserina, L.—Although this is a plant of roadsides and fields, and hence in a great measure dependent on man, it seems nevertheless to be really native, and has not been doubted to be such.

Alchemilla arvensis, Lamk.—Common as a weed of cultivation, but clearly a native.

Rosa rubiginosa, L.—"Probably not indigenous in Scotland" *(Student's Flora)*, yet it is common in many wild places, and looks as much a native as our other undoubtedly wild roses.

Pyrus acerba, D.C.—Undoubtedly wild in many places.

P. Aria, Sm.—Some bushes (mostly inaccessible) grow on the rocky hill to the west of Killiecrankie. I have not been able to get sufficient specimens by which to determine the variety or sub-species. I cannot positively say that the White Beam is native in this locality. The rocks are rather rich botanically, and are not very close to any garden ground. Moreover, no planted specimens of the tree were observed in the district. Although *P. Aria* is not uncommon in shrubberies, &c., in various parts of Perthshire, self-sown specimens are of very rare occurrence so far as my experience goes. On the whole I am inclined to consider that it is wild on the rocks in question.

Cratægus Oxyacantha, L.—Though probably often only an escape, by the agency of birds, from cultivation, it does occur as a native, since I have seen it in spots in which it could scarcely have been so introduced.

Ribes rubrum, L.—If the pubescence or glabrosity of the leaves is a sure mark of distinction between the wild and cultivated forms of the Red Currant, then the plant which is common on the banks of the Tay, &c., must be considered native. I am, however, not quite satisfied as to whether all or any of our specimens are really wild.

Sedum Telephium, L.—Usually a hedgebank plant, and not uncommon about Perth. I think that it is probably not native.

Lythrum Salicaria, L.—We have usually taken it for granted that the plants of this, which occur on the banks of the Tay below Perth, are all escapes, whilst we admit it as a native in several other parts of the county. That it does come down the Tay was demonstrated by a plant which stranded on a bank at the Woody Island. Whether all the Tay and Earn specimens are really escapes is perhaps a little doubtful, but I am inclined to think that they probably are, since, as a rule, they are mostly solitary.

Epilobium angustifolium, L.—Sometimes occurring as an escape, but usually wild.

Umbelliferæ.—In this order there are several species which seem to be undoubtedly old introductions, and some others which, from their restriction to roadsides, or to cultivated ground or its neighbour-

hood, must be regarded with suspicion. Since the order contains a number of well-known useful plants, it is not impossible that some species which have a footing amongst us were originally introduced on account of some supposed useful property.

[*Astrantia major*, L., is naturalized here and there on the banks of the Tay.]

Conium maculatum, L.—Rare and mostly sporadic with us. A very doubtful native.

Carum Carui, L.—Whilst this is not admitted as a native of Britain, it often occurs in waste places where "caraway seeds" have been accidentally dropped. But in some of the marshes of the Tay it forms quite a feature of the vegetation. This is rather curious, since, I believe, the natural habitat is dry and not wet places.

Ægopodium Podagraria, L.—Everywhere in Britain a doubtful native.

Myrrhis Odorata, Scop.—Watson calls this a denizen or alien. Though often abundant on the banks of rivers, it does not occur anywhere above the cultivated area, and is, I think, almost certainly an old introduction.

Scandix Pecten-veneris, L.—A weed of cultivation, but not common.

Chærophyllum temulum, L., and *Caucalis Anthriscus*, Huds.—These are two of these roadside and hedgebank plants which, if they did not altogether disappear, would certainly become much rarer if cultivation, hedges, and roads ceased to exist. Whilst some of the species which are restricted to places subject to human interference are certainly not true natives, it seems possible that others are really indigenous, but have been driven to such ground because in this latitude they cannot find room elsewhere.

Æthusa Cynapium, L.—A weed of cultivated and waste ground.

Daucus Carota, L.—Possibly native with us, but, from the situations in which it grows, rather doubtful.

Anthriscus vulgaris, Pers.—This grows near Perth in one spot only, and, although that is a wild enough place, the plant, having been formerly cultivated, must, like so many other Umbellifers, be regarded with suspicion.

Sambucus Ebulus, L.—Local and rare, and never in any place which is beyond suspicion.

S. nigra, L.—Watson calls this a denizen in Scotland. He is probably right, but it is impossible to say. In a few places it may have higher rank.

Sherardia arvensis, L.—Since this is confined to fields, it seems to be one of the plants dependent upon man.

Valerianella olitoria, Mœnch.—A salad plant, which Watson doubts being native. From its growth in wild rocky places, remote from gardens, it seems to be indigenous with us.

V. dentata, Poll.—A rare weed of cultivation.

Dipsacus sylvestris, L.—Since this is confined (except on ballast heaps) to Kinnoull Hill it is not above suspicion, especially since some plants which are regarded as aliens grow on that hill. On the other hand, the warm shelter afforded by the escarpments of trap rock present a suitable habitat for species attaining in this latitude their northern limit. Hence the Teasel is not necessarily to be classed as an introduction.

Bidens tripartita, L.—Whilst there is no reason for supposing this to be an introduction, as it is not a plant likely to be introduced by human agency, there are few, if any, places in Perthshire where one can go with any certainty of finding it two years in succession. Possibly its sporadic appearances may be due to a fruit or two being brought by water-fowl, or perhaps the seeds lie dormant and germinate irregularly.

Anthemis arvensis, L.—"A colonist" (Watson).

A. Cotula, L.—A rare casual.

Matricaria inodora, L.—Most frequently a weed of cultivation, but has some claim to be considered native. It is, of course, native on the sea-shore.

Chrysanthemum segetum, L.—A weed of cultivation.

C. Parthenium, Pers.—Watson calls this a denizen; and Hooker says, "probably naturalized only." With us it is certainly an introduction.

Tanacetum vulgare, L.—"Probably naturalized only" (Hooker). This is so abundant on the banks of the Tay, and some of its tributaries, that it is not quite clear that it may not be native. Whilst, on the one hand, it is a species which was formerly used for medicinal and culinary purposes, and is, moreover, a plant which spreads rapidly, on the other, it must be remembered that because a plant has useful qualities it is not therefore necessarily an introduction, and that the distribution of the species extends to Arctic Europe.

Artemisia vulgaris, L.—In hedgebanks and near houses, widely spread, but never very common. I entertain little doubt but that this is an introduction. It was formerly used to flavour drinks.

Senecio viscosus, L.—Near Perth this is a comparatively recent introduction with railway ballast. Possibly nearer the sea, as at Invergowrie, it may be native, but I think not.

S. vulgaris, L.—A weed of cultivation, and mostly in garden ground.

Centaurea Cyanus, L.—A weed of cultivation.

Carduus nutans, L.—In one field near Blairgowrie, where it must have been accidentally introduced.

Cichorium Intybus, L.—Only a rare casual.

Arnoseris pusilla, Gœrtn.—This has not been found for many years, and must have been a casual.

Lapsana communis, L.—One of these doubtful plants which occur only in or near cultivated ground. Though not used now, it was formerly eaten, but that is no argument against its being indigenous.

Crepis virens, L.—A weed of cultivation, and hence doubtfully indigenous.

Lactuca virosa, L., has, I think, been regarded by some local botanists as a possibe introduction on Kinnoull Hill and other places where it grows in the neighbourhood of Perth. It attains its northern limit here, but there are no grounds whatever, so far as I know, for supposing it not to be a native. It has been cultivated, but only, I think, long after it was known to occur in Perthshire.

Lactuca muralis, Fresen.—Perthshire is given, as a Scottish locality, in the Student's Flora without any qualifying remark. The only station I know for it is, however, on a wall near Crieff, and this cannot be looked upon as a probable locality for a native.

Sonchus arvensis, L., *S. oleraceus*, L., and *S. asper*, Hoffm.—Chiefly occurring as weeds of cultivation, but not entirely.

Tragopogon pratensis, L.—From the places in which this edible-rooted plant sometimes occurs it is not altogether above suspicion. Yet in other stations it seems wild enough, and as it is undoubtedly native both north and south of Perthshire, it is probably so here.

Campanula glomerata, L.—The distribution of this plant, being almost, if not entirely, confined to the sea-coast in this part of Scotland (although elsewhere it is not so restricted), makes it imperative that the question of its nativity on the banks of the Tay above Stanley should be considered. It has been known in that station for a very long period, and, although stragglers occasionally come down the river, it is practically confined to a comparatively short area on both banks. If it had been an introduction it is reasonable to suppose that it would have long ago spread all down the river. As it has not done so, and with due consideration of all the circumstances of its occurrence, I think that it must be included amongst the natives.

Anagallis arvensis, L.—A weed of cultivation.

Fraxinus excelsior, L.—Hooker says "generally planted." It is often self-sown from planted trees, but in some parts of Perthshire it is undoubtedly native.

Echium vulgare, L.—"An alien or colonist in Scotland" (Watson). It is certainly, however, independent of man for its continuance, and, I think, may be claimed as a native.

Symphytum officinale, L.—Watson calls this a denizen in North Britain. It is a plant that was formerly cultivated, and now occurs, with us, chiefly in the form of solitary plants on the banks of the Tay and other rivers. In these cases it seems most probably an escape only. In a wet wood near the Pond of Drummond the ochreous

flowered variety (*S. officinale* proper) is rather abundant, and is not impossibly native.

S. tuberosum, L.—Looking at the situations in which this occurs, often abundantly, with us, its claim to be considered a native is very doubtful.

Anchusa arvensis, Bieb.—A weed of cultivation.

Lithospermum officinale, L.—Perhaps wild on the shores of Loch Earn.

L. arvense, L.—A rather scarce weed of cultivation.

Cynoglossum montanum, Lamk.—This occurs in copses in three places in Perthshire, and has been known in one of these for about one hundred years. In England, where it is rare, its northern limit is Shropshire and Norfolk. Consequently it has been looked on as an introduction in our district. It has, however, no beauty, neither, so far as I am aware, any other qualities which would lead to its cultivation, nor is it, I think, recorded as an introduced plant elsewhere. Its occurrence, therefore, in Perthshire is rather puzzling, unless we consider it to be an instance of a plant with a native station separated by a wide interval from the metropolis of the species. That such intervals do occasionally occur every student of botanical geography is aware. Such intervals may have been bridged at one time by a more continuous distribution of that plant (which afterwards died out in the intermediate stations), or they may never have been bridged at all. In the case of this *Cynoglossum* (a species which is local and rare even in the districts of its more continuous distribution) it does not seem impossible that there were stations for it between mid England and Perthshire at a period when the climate was milder than it is now; and that being, if we may judge from its continental distribution, a somewhat tender plant, it has died out. On the other hand, there may never have been intermediate stations, and the plant may have been brought by some migrating bird to whose feathers a nutlet had become attached by its hooked spines, adapted for that very purpose.

Verbascum Thapsus, L.—Described as a "denizen in Scotland," which perhaps it is, as it is not clearly above suspicion.

Linaria vulgaris, Mill.—It is rather difficult to know how to place this species. It is a plant of waste and uncrowded ground, in which it comes and goes. On the whole, I think it must be regarded as a somewhat doubtful native.

Veronica persica, Poir.; *V. agrestis*, L.; *V. polita*, Fries; and *V. hederæfolia*, L.—Weeds of cultivation.

Mentha sylvestris, L.—I have never seen this in any place where it could be said to be above suspicion.

Calamintha Acinos, Clairv.—Hooker says, "indigenous (?) in Scotland." I do not know enough about it to offer a decided opinion, but am inclined to think that it is native.

Stachys arvensis, L.—This appears to be, now at least, a weed of cultivation.

[*Stachys Betonica*, Benth.—Watson makes some interesting comments on this species, pointing out that it is a good example of the thinning out and gradual disappearance in North Britain of plants which are plentiful and conspicuously characteristic in South Britain. In England its distribution is continuous from south to north. In Scotland it occurs in a few counties only, Perthshire being its northern limit. Although, as Hooker says, "formerly much used medicinally," few Scottish botanists have marked it as an introduced plant, an exception being Hennedy, for Lanarkshire. In Perthshire it is a local plant, and its distribution is somewhat peculiar, but there can be no doubt about its being indigenous. It thus affords a good example of how the continuous distribution of species may be interrupted, and a warning against supposing that because a local plant has been used medicinally it is therefore necessarily an introduction.]

Galeopsis Ladanum, L.—Watson calls this a colonist, which it probably is.

G. Tetrahit, L., and *G. speciosa*, Mill.—The latter is certainly a weed of cultivation, and the former mostly so.

Lamium purpureum, L., *L. intermedium*, Fr., and *L. amplexicaule*, L.—These seem to be all dependent more or less upon man.

L. album, L.—That this is native does not seem to have been questioned. With us it is only a roadside and hedgebank plant, and therefore I think that it must be regarded with some suspicion. *L. maculatum*, L., an undoubted alien, has been found in wilder places than *L. album*.

Chenopodium album, L.—Mostly, if not entirely, a weed of cultivation.

C. Bonus-Henricus, L.—"A native?" (Watson). With us it seems to have no claim to be considered indigenous.

Atriplex patula, L.—Mostly, if not entirely, a weed of cultivation.

Polygonum Bistorta, L.—A garden escape, except at the Lake of Monteith, where I think it is native.

P. lapathifolium, L., and *P. Persicaria*, L.—These are frequently weeds of cultivation, but I think may be claimed as natives.

P. aviculare, L.—Like the last two species, this plant is much indebted to the operations of man for its extended distribution and great increase in the number of individuals. At the same time it appears to be indigenous.

P. Convolvulus, L.—Only a weed of cultivation, I think.

Rumex Hydrolapathum, Huds.—Although Mr. Barclay, in the paper cited above, is inclined to throw doubt upon this dock being native in Perthshire, there do not seem to be any grounds for that opinion beyond the fact that the root is astringent and may therefore have been used in country medicine. While it is very local in its

Perthshire distribution, and in its Tay marsh station has as companions some undoubted aliens, yet in all three places in which it occurs it is associated with other rare and local plants which are admitted to be native. It seems to me, therefore, that there is more evidence in favour of the species being indigenous than there is for its being an introduction. It is widely distributed in Britain south of Perthshire, and is not marked in any list as being otherwise than native.

Euphorbia Helioscopia, L.—A weed of cultivation.

E. Peplus, L.—A weed of cultivation, confined almost to garden ground.

E. exigua, L.—A rare weed of cultivation.

Urtica urens, L.—Restricted to the neighbourhood of houses, and hence dependent in some manner upon man.

U. dioica, L.—Although this occurs in wild enough places, as, *e.g.*, high up on the mountains, it seems to be also a species dependent upon man. To the mountain ledges where it occurs it has probably been brought by sheep.

[*Populus alba*, L.—A doubtful native of Britain. With us it never occurs but as a planted tree. Doubt has been expressed as to whether it flowers in Scotland. It flowers regularly here.]

Salix triandra, L.—"Doubtfully native of Scotland" (Student's Flora). It is impossible to say whether this willow is native or not. Self-sown and wild-looking plants occur, and I think that it is probably indigenous.

S. alba, L.—"Always? planted" (Student's Flora). Possibly not indigenous, but self-sown trees are not unfrequent.

S. fragilis, L.—"? Native in Scotland" (Student's Flora). I think that we may claim this as probably native.

Polygonatum verticillatum, All.—Watson thought that this was an "uncertain native." It thus, like *Lathyrus niger*, affords an example of how an unquestionably indigenous species may be regarded with suspicion. Those who know it in its Perthshire habits can have no reason to believe that it is otherwise than thoroughly wild.

Convallaria maialis, L.—"Naturalized in Scotland" (Student's Flora). There is no doubt but that this is occasionally planted. At the same time it is evidently indigenous in several places, as in Methven Wood, about Pitlochry, and at Killiecrankie.

Allium Scorodoprasum, L.—The books admit this to be a native of Perthshire, while *A. carinatum*, L., is considered to be only naturalized. The British distribution of these two is very different, but, so far as I have seen them in Perthshire, they must both come in the same category, although *A. Scorodoprasum* is very scarce and *A. carinatum* very abundant on the banks of the Tay below Perth. If one is a naturalized plant, so, I think, is the other.

A. oleraceum, L.—This garlic may perhaps be also looked upon with suspicion. In some of its stations, however, it seems to be wild.

Typha latifolia, L.—It is difficult to know in what light we should regard this plant. There is probably little doubt about its having been planted in some of the places where it grows, but in some others there is reason to think that it is not impossibly indigenous. While the plant forms big patches, it does not, so far as I have seen, appear to extend its area by seeding or otherwise; and in some of the places where it grows it seems unlikely to have been planted, as these are remote from gardens and pleasure grounds. On the other hand, it is in some of its presumably native habitats associated with other species which in Perthshire are local and rare. I am inclined, therefore, to think that in some of these places it is indigenous.

Arum maculatum, L.—"? Wild in Scotland" (Student's Flora). In Perthshire it is certainly an alien.

Lemna trisulca, L.—This duck-weed affords a probable example of how a plant may be carried by water fowl. It is, or was, abundant in Moncreiffe Pond, which was for a long time our only station for it. Into this artificial sheet of water it is not unlikely that it was accidentally introduced with water plants. More recently, it has appeared in the pond known as the Dead Waters of the Earn, two miles west of Moncreiffe Pond, from which it was probably brought by swans or other birds.

Butomus umbellatus, L.—A great deal may be said for and against this being native in Perthshire. In England it occurs from Durham and Yorkshire southwards. In Scotland it is recorded as "naturalized" in a few places south of Perthshire. In Perthshire it has been found in various places in the marshes on both sides of the Tay below Perth, and in an old backwater of the Tay near Guay. It also occurs in a marsh beside Loch Cluny, where it is said to have been planted by the Rev. Mr. M'Ritchie, who was minister of the parish at the end of last century. The question to be considered is, how did it come to the marshes of the Tay and to Guay? Taking, in the first place, the Tay marshes. Is it possible that it has got to them from Loch Cluny, whose waters reach the Tay? At Loch Cluny, so far as I can ascertain, its existence has always been precarious, and the plant has never been abundant. To reach the Tay a long stretch of lakes and slow-running streams would have to be traversed, with many suitable places for the naturalization of the *Butomus*. In none of these, however, has it been detected, and, from the observations of my friend, Mr. A. Bennet, in Surrey, it seems to be a species which is very slow of spreading. I think that, therefore, the Tay marshes have not been colonised by water communication from Loch Cluny. Is it likely to have been planted in or near these marshes? The only thing in favour of this being the case is that the flowers are handsome. Against it is the extreme unlikelihood of any ornamental plant being purposely introduced into the Tay marshes, and the fact that it does not seem to have ever been cultivated in any ornamental waters, either near the Tay or elsewhere in Perthshire, except, of course, Loch Cluny. May it not therefore have been brought to the Tay by natural means? The seeds are numerous and minute. The plant often grows in soft mud,

on which the seeds would fall, and might hence be readily transported on the feet of birds. In this way it may have been brought to the Tay from some part of southern Scotland in which it has been planted. But if from southern Scotland, why not from northern England, where it is admitted to be native? and if so introduced, even in comparatively recent times, is it therefore to be regarded as only naturalized? Looking, however, at the various plants—admitted to be native—which have their northern limit on or near the Tay, and to the fact that some of them have not an uninterrupted distribution from the south up to the Tay, is there any real reason for supposing that the *Butomus* is not a true native with us? It may be argued that, if it is indigenous, it would have been discovered long before Colonel Drummond Hay found it, twenty or thirty years ago. To those who know the Tay marshes there cannot be much force in this argument. Till quite recently they have not been subjected to anything like a thorough exploration, and many parts of them had probably never been visited by any botanist. Since they have been to a certain extent exhaustively examined, a number of species, whose occurrence was never suspected, have been found. Moreover, the *Butomus* is a plant which is not easily detected at a distance, except when it is in flower, and as a rule it grows in those places which are the least accessible, and hence, even when in flower, might readily escape observation. It must also be remembered that it occurs here and there over a considerable extent of the river—six or seven miles perhaps,—and that from Mr. Bennett's observations, as noted above, it is not naturally a fast-spreading species. It would therefore appear to be at least an old inhabitant of the Tay, even if it is not contemporaneous with the native plants; but the evidence is, I think, in favour of its being indigenous.

With regard to the habitat near Guay, the supposition of intentional introduction cannot, I think, be entertained for a moment; neither can any theory of escape from ornamental waters in the neighbourhood, for there are none. The stations on the lower Tay where the plant grows may possibly have been derived from the one at Guay, but that seems to be very improbable, and it is much more likely that the latter has been supplied from them. It seems just as probable, however, that at Guay we have the relics of a former more extended distribution of the species.

[Since the above was written I have heard that the *Butomus* is established in the Stormontfield Ponds, which are situated on the east bank of the Tay below Stanley. The history of the plant in this place is as follows:—Mr. Thomas Marshall, of Stanley, took a plant from Loch Cluny in 1861 or 1862, and grew it in his aquarium in Glasgow. In 1864 he brought the aquarium with him to the Ponds, where it shortly afterwards got broken. To save the *Butomus* he planted it at the Ponds, where it has since continued to flourish. Now, since the plant was not discovered in the Tay marshes till 1869, it is of course possible that it may have reached them from Stormontfield, but, looking at the whole circumstances of the case, I do not think that it is probable.]

[*Scheuchzeria palustris*, L.—I fear that this species is now lost as a Perthshire plant. Careful and repeated search for it has been all in vain. I only mention it here as it is an example of a plant whose distribution is not continuous, since it makes a jump from Yorkshire to Perthshire; and, if it did so, why not the more widely spread *Butomus?*]

Bromus sterilis, L.—Although no doubt has been expressed as to this grass being indigenous, it seems to me to be a very doubtful native with us. A similar suspicion is attached to *Bromus racemosus*, L., *Trisetum flavescens*, Beauv., and *Poa compressa*, L., and perhaps also *Lolium perenne*, L.

9th April, 1891.

F. Buchanan White, M.D., F.L.S., F.E.S., President, in the Chair.

The following donations were intimated—

Museum—Perthshire Collection.—Perthshire Plants—from Dr. Buchanan White. *Index Collection.*—British Plants—from Dr. Buchanan White. Shells and Crustaceans—from Mr. Alexander Lamond, Antigua, West Indies.

Mr. R. Dow exhibited specimens of Quartz from Corsie Hill Quarry.

Mr. James Macdonald was elected an Ordinary Member.

The following papers were read :—

1. "Tertiary Dykes of the Lower Tay Valley and district around Perth." By Robert Dow. (See *Trans.*, Vol. I., p. 226).

2. "Rare Perthshire Mosses." By R. H. Meldrum. (See *Trans.*, Vol. I., p. 232).

SUMMER SESSION, 1891.

The following Excursions were arranged :—

1. May 21.—To Muir of Durdie and Den of Pitroddie.
2. June 13.—To Cargill, by Meikleour and the Inch.
3. June 20.—Dunkeld to Dalguise, by Cally Loch and Banks of Tay.
4. July 4.—Dalguise to Ballinluig, by Loch Skiach.
5. July 18.—Ben Challum (3,354 feet).
6. August 1.—Strathbraan.
7. August 15.—Lochearnhead to Edinample and Shores of Loch Earn.
8. August 27.—Loch Lubnaig.

PHOTOGRAPHIC SECTION.

OFFICE-BEARERS.

Chairman—Dr. Andrew Thomson, F.R.S.E., F.C.S.

Secretary—William Ellison.

Committee—T. Bourke, A. Hodge, R. C. Ferguson, and James Stewart, L.D.S.

The following Meetings were held:—

27th November, 1890.

Opening Address, by Dr. A. Thomson.
Exhibition of Photographic Tools, by Dr. A. R. Urquhart.
Exhibition of Lantern Views of the Cathedrals of England, by Wm. Ellison and James Stewart.

18th December, 1890.

Paper on "The Carbon Process," illustrated by the development of some Prints. By J. Robertson.
Exhibition of Lantern Views of Cornwall and the Scilly Islands, by Wm. Ellison and H. Coates.

19th March, 1891.

Paper on "Development." By D. Ferrier.
Exhibition, by Wm. Ellison, of Swiss Views, taken by himself during the previous summer.

BALANCE-SHEET of THE PERTHSHIRE SOCIETY OF NATURAL SCIENCE for the Year ended 28th February, 1891.

INCOME.

To Balance in Savings Bank at 28th February, 1890, ...	£23	6	5
,, Balance in Treasurer's hands, ...	2	7	6
		£25	13 11
,, Annual Subscriptions and Entrance Fees, ...		67	10 0
,, Contributions towards Expense of Coal and Gas, ...		11	3 3
,, Interest on Bank Account, ...		0	10 9
		£104	17 11

EXPENDITURE.

By Janitor's Salary, ...		£20	0 0
,, Property Tax, ...		0	3 8
,, Repairs and Furnishings, ...		1	5 1½
,, Fuel and Gas, ...		7	14 7
,, Printing, Postages, and Stationery, ...		19	19 0
,, Books and Magazines, ...		12	18 3½
,, Subscription to the East of Scotland Union of Naturalists' Societies, ...		4	7 0
,, Insurance, ...		3	15 0
,, Bird Stuffing, ...		1	13 3
,, Incidental Expenses, ...		2	0 0
,, Balance in Savings Bank at 28th February, 1891, ...	£28 17 2		
,, Balance in Treasurer's hands, ...	2 4 10		
		31	2 0
		£104	17 11

PERTH, 1st March, 1891.—We, the undersigned Auditors appointed by the Society, having examined the foregoing, and compared the same with the relative Vouchers, find them correctly stated and properly vouched—the sum in the Bank at the credit of the Society being £28 17s 2d, and in the Treasurer's hands, £2 4s 10d.

(Signed) HENRY COATES, JAMES S. CRUICKSHANK, } *Auditors.*

WINTER SESSION, 1891-92.

12th November, 1891.

F. Buchanan White, M.D., F.L.S., F.E.S., President, in the Chair.

The following donations were intimated :—

Museum—Perthshire Collection.—Starling—from Mr. D. Dow, Balmanno. Blackbird—from Dr. Buchanan White. Black-throated Diver—from Mr. R. M'Intosh, jun., Grantully. Garden Warbler's Nest and Eggs—from Mr. F. H. White. Badger—from Mr. Athole Macgregor. Stock Dove—from Mr. Sydney Steel. Song Thrush—from Dr. F. I. White. Fox—from Mr. J. S. Grant, Ballinluig. Specimens of *Helix fusca* from Glenfarg—from Dr. Buchanan White. Perthshire Plants—from Mr. C. M'Intosh, Inver. Perthshire examples of *Carex alpina* and *Hieracium calenduliflorum*—from Messrs. Groves, London, through Dr. Buchanan White. Perthshire Minerals—from Dr. Buchanan White. *Index Collection.*—Rock Specimens from New Caledonia—from Rev. Mr. Downie, New Abbey, Dumfries.

Library.—Books—from Mr. W. Whitelaw, Bredisholme, and Mr. J. M'Gregor. Two Photographs—from Mr. W. Ellison; Frames for the same—from Mr. H. Coates.

The President delivered the following Opening Address :—

Gentlemen.—Another revolving year has brought round the day on which we once more gather in this room to hear what has been done by the Society since we last met together. Your delegates to the British Association for the Advancement of Science and to the East of Scotland Union of Naturalists' Societies will presently render an account of their stewardships; to me falls the duty of giving a report of the field work accomplished in our beloved Perthshire.

As in former years, the number of excursions made exceeded those set forth in the programme prepared in spring, and, though in previous addresses I have taken what may be called the official excursions first, to-night I think it will be better to describe our explorations in their chronological order. I may, first of all, remark, that on the whole there was a better attendance at the excursions than there has been during the past few years.

As usual, the first excursion was on the Queen's Birthday (21st May). Starting from Perth Bridge, we followed the Muirhall Road for about a mile and a half, and then followed the path which leads through the woods on the left side of the road. On the side of the road, about a mile from Perth, there is a small colony of *Geranium pyrenaicum*, which seems to be increasing. In the wood we inspected a thicket of *Prunus insititia*, which was in fine flower. We also found some curious hybrids between the primrose and the

cowslip. Passing Knowehead Farm, the Muir of Durdie was reached. On it *Lycopodium alpinum* was noticed, at probably the lowest altitude which it attains in Perthshire. In pools specimens of the curious *Volvox globator* were obtained. In due time the spot for which we were bound, viz., the Den of Pitroddie, came into view. Here we met with an unpleasant surprise, by discovering that a recent extention of the quarry in the Den has resulted in the destruction of one locality for two rare Perthshire plants, namely, *Astragalus glycyphyllos* and *Eupatorium cannabinum*. Along the side of the Den runs a large trap dyke, on and about which these plants grew, but which now presents the appearance shown in this photograph,* taken on this occasion by Mr. W. Ellison. Some of the other interesting plants of the Den are, however, likely to escape, and several of them were observed during our explorations. These included *Lychnis Viscaria*, *Viola hirta*, *Astragalus Hypoglottis*, *Myosotis collinum*, and *Allium vineale*. *Primula veris* was abundant, and fertile spikes of *Equisetum pratense* were seen in two distinct places. We searched in vain for *Asplenium Ceterach*, which has, I believe, been found in this Den. We returned home by the Muir of Durdie, Balcraig, and Gannochy, but without finding anything more worth recording.

On 13th June we proceeded from Cargill Station to Delvine. Near Meikleour Village a quarry or sandpit attracted considerable attention. Here, on the top of a section of Old Red Sandstone, is a considerable thickness of sand, perforated all over by the burrows of Sand Martins, of whom a perfect cloud were flitting to and fro in the quarry. Mr. W. Ellison, who has made a very interesting photograph* of the place, has counted the nnmber of burrows, and finds that there are not less than six hundred.

In a marsh near Meikleour some interesting plants were found, including *Typha latifolia*, *Ranunculus Lingua*, *Rumex Hydrolapathum*, *Carex disticha*, *C. paludosa*, *C. vesicaria*, and what looks like a hybrid between *C. vesicaria* and *C. ampullacea*, but which has yet to be studied. Passing on to Delvine Inch, we observed on or near it *Teesdalia nudicaulis*, a curiously pale form of *Anthyllis Vulneraria*, *Sedum rupestre*, *Astragalus glycyphyllos* (which seems to be increasing in quantity), *A. Hypoglottis*, and *Lupinus perennis*. Near Delvine Inch we were met by Sir A. M. Mackenzie, who had invited the Society to inspect the well-known Roman and Pictish Camps on Inch Tuthill. After having done so we resumed our botanical explorations. Near the "Pictish City" *Corydalis claviculata* is abundant, and *Equisetum pratense* on the river embankment. Further up the river *Vicia sylvatica* was noticed, and a new station for *Astragalus glycyphyllos*. Thence some of the party returned home, whilst others proceeded to Caputh Hill, from which a magnificent view was obtained, and a few more plants noticed, including *Echium vulgare*, *Anthemis arvensis*, *Verbascum Thapsus*, and *Arabis hirsuta*. *Veronica hederæfolia* was also seen upon the rocks —rather a curious locality for this plant.

On 20th June we went to Dunkeld, and visited the picturesque

* The photograph is now one of the series in the Lecture-Room.

Cally Loch, which was looking very beautiful. In the loch itself were great masses of the white flowers of the curious *Aponogeton distachyum*, a South African plant, which seems to be perfectly hardy here. Other plants observed were *Castalia speciosa* f. *minor*, *Pilularia globulifera*, and *Scirpus fluitans*. Near Hatton we were struck by the luxuriance and great size of the wild juniper bushes. Passing Dowally Loch and St. Colme Loch, neither of which proved to be very productive, we descended upon Dowally Church, where the "jougs" were tried upon one of the party. Near Guay *Agrimonia odorata* was observed in the same station where it was found a few years ago. Here we turned southwards and went down the River Tay to an island below Dalguise Bridge. On the shingles here the great abundance of *Silene maritima* was remarked, and on the island the luxuriance of *Thalictrum minus*. Returning to the mainland, where we saw *Verbascum Thapsus*, we arrived at another island, where a large bed of *Calamogrostis Epigeios* was found. In passing through Dunkeld Grounds *Equisetum pratense* was noticed, and on the top of the Cathedral a number of plants of the Common Broom —a curious place for such a plant.

The morning of 4th July found us at Dalguise Station, where *Anthemis arvensis* is abundant on the railway line, and is increasing. Passing Dalguise House, we examined the ravine of Kincraigie Burn, near Stewartfield, and then ascended the hill to Loch Skiach. This loch, which is about 1300 feet above sea level, seems to be admirably adapted for supplying Perth with water by gravitation. In it we noticed *Potamogeton prælongus* and *Isöetes lacustris*, and on its shores *Tofieldia palestris*. Passing over the watershed into the Breadalbane district, we descended by Balnamuir Burn, finding *Sedum villosum*, *Hippuris vulgaris*, *Utricularia intermedia*, and *U. minor*, *Carex pauciflora*, &c. Near Logierait *Salix ambigua* was noticed.

On 7th July we set off to explore a glen which I had often thought ought to be examined. This was Glen Garr, a narrow valley to the west of Bankfoot. Starting from that village we went up the Garry Burn till we reached the glen. Here we did not find very much to reward our exertions. In an old slate quarry *Allosorus crispus* and *Grimmia Doniana* were found. Although not confined to slate, these plants are very often—in Perthshire—associated with it. As we passed over the watershed to the glen which descends to Birnam the various shades of colour assumed by *Erica cinerea* were noticeable. In addition to plants of the ordinary hue (which were, of course, the most abundant), some with very bright pink and others with white flowers were observed. These rosy pink forms of this heath seem often associated with the slate rocks.

On 14th July we went to Dollar and up Dollar Glen, following for part of the way a different route from the one which we pursued in our excursion there last year. In Dollar Glen fine plants of *Scolopendrium vulgare* were noticed. As these are, fortunately, inaccessible, they are likely to escape the ravages of the fern-collector, though, for that matter, the ferns of the glen are to a certain degree protected. Passing Castle Campbell, we went up the Burn of

Sorrow about half-way, and then struck up a burn which descends by a very rugged and precipitous course from King's Seat Hill. Here some interesting plants occur, including *Epilobium alsinefolium*, *Galium sylvestre* and *G. boreale*, *Saxifraga stellaris* and *S. hypnoides*, *Hymenophyllum unilaterale*, *Hieracium Dewari*, &c. A moss of which I took a small piece has been identified by Mr. Meldrum as *Splachnum vasculosum*, a species as yet gathered in very few places, and which, except here, does not occur below an altitude of about 3000 feet, if I am not mistaken. In this place the altitude is about 1400 feet only. We also found a moth, *Larentia salicata*, which, although it is not uncommon in the Highlands, we did not expect to see here. After exploring Maddy Moss, and searching in vain for *Saxifraga Hirculus*, we went by Skythorn Hill to Blackford Station, and thence returned to Perth. I have omitted mentioning several of the plants observed, as they were recorded in the account of last year's excursion.

The 18th of July was the day fixed for the Mountain Club excursion, the hill selected being Ben Challum, near Tyndrum. When we got to Tyndrum Station we were an hour and a half late, and it was raining very heavily. We therefore decided to return to Perth by a train which left in about half-an-hour; but, as just before that train arrived, the weather showed signs of improvement, we determined to make an excursion somewhere, and selected the abandoned Lead Mines for our explorations. Sketches of sections of these mines are in the Perthshire Geological case in the Museum, so that I need not attempt to describe them; but any one who has an hour to spare at Tyndrum might do worse than pay them a visit. Various alpine plants occur in the gorge, of which the mines form one side, but none of any particular rarity, the most interesting being perhaps *Hymenophyllum unilaterale*. A very bright flowered form of *Vicia sepium* was also noticed. On the rocks a rather local subalpine moth, *Larentia flavicinctata*, was not uncommon, and in the grassy places on the hillside our only alpine butterfly, *Erebia Epiphron*. Crossing over the ridge of the hill, we descended into the Coninish Glen, where a not inconsiderable quantity of *Drosera anglica* was observed, and ascended to some rocks called Craig Bhocan, which, however, produced nothing very remarkable.

On the first of August the Mountain Club excursion came off, Ben Laoigh being the place selected instead of Ben Challum, the general look of which as seen during the previous excursion was not inviting. Although we left Perth at 7.45 A.M. it was 1 P.M. before we left the train about 8 miles west of Tyndrum and commenced to ascend the hill. Since the botany of Ben Laoigh has been described in the accounts of excursions of former years I need say no more than that most of the interesting and rare plants for which the hill is celebrated were observed. We were not fortunate in the weather, as most of the time we spent on the mountain was misty and rainy, with the result that some of us at least, when we got back to Perth, which was not until after midnight, were still wet through.

During the day the Annual Meeting of the Mountain Club was held. The following was the poem written for the occasion :—

This hill is as our life—steep after steep,
Climbed and surmounted, opens to our view
A nobler stretch of plain, more of the blue
Which overhead flows on from deep to deep.

The world and all its vanities grow small;
Who wants *its gold* when all about our way
My Lady's Bedstraw, Daisies, greet the day,
And Ragwort and St. John's Wort top them all?

Who wants *its silver* when the cliffs are white
With starry Dryas and Pyrola sweet,
And snowy Cress and Starwort kiss our feet—
Dear emblems of all purity and light?

Who lacks royal purple where the heathers throw
A regal mantle on the bare hillside?
Or who asks wine beside the smiling tide
Of yonder stream where bending grasses grow?

No! no! yon lark up singing thro' the air
Carries our hearts and longings up with it;
No sordid aims surround us as we sit—
All things about us perfect are and fair.

We are ourselves: not ants in piled ant-heap,
Not midges play'ng with pleasure for an hour,
Not butterflies flitting from flower to flower,
Not drops of water in a countless deep.

The soul has room to move and grow up here;
The Maker's voice comes sounding on the breeze,
Rustles with heather, moves in bending trees,
Fills us with love that awe inspires, not fear.

"God for us all, and each for one another;"
The world lies spread before us—we are kings
Of each bright weed, of every bird that sings—
We all are kings, yet each to each is brother.

We pledge ourselves in this free mountain air;
All knowledge lies before us—we shall win
More and more light, as grows the soul within!
Shout we aloud simply for lack of care.

Take up the song that other hills have heard;
Pass on the strain to coming future years;
Far in the west the monarch sun appears,
And coming night a slumbering breeze has stirred.

Fall soft, O evening light, on weary men,
Who are as children in the great God's hand,
Learning to spell, connect, and understand
Dame Nature's book. Wake, echo, in yon glen!

Floreat ! all that we have seen to-day ;
Floreat ! mountain flower and mountain way ;
Floreat ! sun that will not longer stay—
Salix herbacea floreat !

Floreant ! members of the mountain clan ;
Floreat ! each as individual man ;
Floreat ! he who dares do all he can—
Salix herbacea floreat !

Farewell ! O monarch of surrounding heights—
Keeper of many hope-inspiring sights ;
Farewell ! we leave thee wrapt in evening lights—
Salix herbacea floreat !

Is that the railway whistle that we hear ?
Farewell until another joyous year,
Until the swift days pass and draw us here—
Salix herbacea floreat !

Shoulder each vasculum and take the way ;
Shoulder your nets and cameras. Away !
Swift fall the shadows of departing day—
Salix herbacea floreat !

Floreat ! Floreat ! All, all, farewell !
The answering echoes slowly rise and swell,
And mingle with the distant station's bell—
Salix——herbacea——floreat !

M. B. W.

On 6th August we paid a visit to Invergowrie and worked up the side of the river to Longforgan. At Invergowrie station we got *Galium erectum* and *Linaria minor* (of which more anon). At Kingoodie Quarry *Sedum reflexum* is well established, but the pools in which *Ranunculus confusus* used to abound have dried up and that local plant has disappeared. Above Kingoodie *Trifolium fragiferum* was found to occupy a much larger area than we suppose to be the case. Possibly it is spreading, but more likely it had been overlooked in former years. At Longforgan we took train for Kinfauns and went up the side of the Tay to Perth, finding *Hypericum dubium* a little above Kinfauns, and in the quarry at Barnhill siding *Geranium pyrenaicum* and *Linaria minor*.

On 10th August we went to Birnam and walked up Strathbraan to Trochrie, examining the sides of the river. Near the Rumbling Bridge *Betonica officinalis* still grows, but not much else of interest was found till we got to the river banks rather farther up, when *Avena pubescens* and the commoner *A. pratensis* were noticed growing together. Crossing the river at Trochrie we descended the north bank to the Rumbling Bridge, near which *Equisetum pratense* and *Carex remota* were gathered. In the wild and almost inaccessible ravine below the bridge, the very local *Festuca sylvatica* is not uncommon. Near the Hermitage *Prunus Cerasus* occurs as a naturalised plant, and in

a little rivulet *Fontinalis antipyretica* in fruit was pointed out by Mr. C. M'Intosh. On the bridge at the Hermitage we also got *Encalypta streptocarpa* with capsules. Leaving the Braan we took a stroll along the bank of the Tay, where we had the pleasure of seeing a kingfisher —unfortunately too rare a sight now in Perthshire.

On the 15th of August we again turned our faces towards the west, and paid a visit to Lochearnhead. Here we first went to Edinample, gathering on the road *Salix ambigua*. At the picturesque Falls of the Ample *Festuca sylvatica* and *Carex remota* were found. After examining the shore of the loch to the east of Edinample, and finding it rather barren, we retraced our steps and went to the head of the lake, which seems to be ground that would repay examination earlier in the season. As it was, a number of interesting plants were observed, as well as the caterpillars of a rather local moth, *Clostera pigra*, which were feeding on the leaves of *Salix phylicifolia*. After examining the north shore for a little distance we ascended to a limestone quarry, where one plant of *Agrimonia odorata* was discovered. From near this quarry a very lovely view may be obtained. Five valleys, bounded by rugged hills, gorgeous with great masses of heather set in frames of every shade of green, stretch away in different directions.

On 22nd August we went to the Linn of Campsie, and up the west bank of the Tay as far as Cargill Bridge, whence we descended the east bank. At the Linn *Calamagrostis Epigeios* and two forms of *Thalictrum minus*—one glaucous, the other green—were the most noteworthy plants. Above the Linn a well-marked form of *Quercus sessiliflora* was found, and on the rocks on the east side of the Linn *Carex muricata*. Below Burnmouth Ferry *Campanula glomerata* was observed to be still in flower.

27th August found us again on the Callander and Oban Railway. Starting from King's House, we went down the Balvaig River to Strathyre, and thence to Loch Lubnaig. The river and loch were, unfortunately, flooded, so that, though we obtained a boat, we did not get some of the plants we expected. On the banks of the river *Hypericum quadrangulum* was found in abundance. *Lysimachia vulgaris* is also common beside the river and the loch. In the loch we got *Subularia aquatica*, *Pilularia globulifera*, and *Utricularia intermedia*. Near the loch some very large and fine trees of *Pinus sylvestris* grow, and have all the appearance of being indigenous.

On 5th September a visit was paid to Methven Bog. In the gravel pit opposite it *Ornithopus perpusillus* is common and *Cerastium arvense* grows. Methven Bog seems to be drying up, for, except at the east end, there was not much water to be seen in it. In the centre there are two large patches of *Typha latifolia*, which, I suppose, have been planted. At the east end *Cicuta virosa* is still abundant, as it is in Methven Loch. From Almondbank we went down the south side of the Almond. Near the village *Tragopogon pratensis* grows, and further down we found a few plants of *Allium carinatum*, a plant which abounds on the banks of the Tay below Perth, but which we have not observed elsewhere. Here, too, *Helianthus tuberosus* (the Jerusalem Artichoke) occurs as an escape.

The last excursion which I shall record took place on 12th September, when we paid a visit to Ben Vrackie. Near Moulin *Ribes alpinum* is abundant in a hedge, but has no pretentions to be considered wild. At the base of Ben Vrackie *Hippuris vulgaris* is common. On the Ben itself we were glad to see that the *Astragalus alpinus* and *Oxytropis uralensis* have not appreciably diminished in quantity. In connection with these rare plants it may be remarked that they seem to be confined to the neighbourhood of a trap dyke which bursts through the Highland schists on this hill. On the same dyke *Sagina subulata*, a plant which in Perthshire has a great fondness for trap rocks, occurs.

Although these are the chief excursions which have been made, they are not the only ones which have resulted in increasing our knowledge of the botany of Perthshire. In addition to what has been done by members of the Society, some of our English friends have accomplished good work in the exploration of our hills. Amongst the discoveries made by them the most interesting is the finding of *Carex alpina*—hitherto confined in Britain to one locality in Forfarshire and another in Aberdeenshire—by the Messrs. Groves in Glenlyon. In the same glen the Messrs. Linton have discovered a second locality for *Carex ustulata*, and increased our knowledge of the botany of several out-of-the-way hills.

I may here take the opportunity of calling attention to the fact that it is possible that *Eriophorum alpinum* may grow on or near Craig Cailleach. Mr. A. Bennet, of Croydon, sent for my inspection a specimen which is said to have been gathered there by Mr. Stansfield about twenty years ago, but which was not recognised at the time.

One feature of the year has been the sudden appearance in several parts of the county of *Linaria viscida (minor)*. A few years ago we found one or two plants of this *Linaria* at Invergowrie Station, but this season it has been observed not only at that place in abundance, but also at the following railway stations or sidings :—Barnhill, Methven, Strathord, and Stanley. By what means it spreads is at present a mystery.

Before concluding, I would like to call attention to a short but interesting address given at the opening of one of the numerous flower shows which are held all over the country every autumn. Part of the address in question was devoted to historical botany, the speaker alluding to the fact that some of our flowers were brought into this country long ago. Amongst the examples given are the following—"the honeysuckle which adorns our hedges and gardens was brought from China a couple of hundred years ago, and from the Cape a hundred years ago;" "the hawthorn crossed the Atlantic from America two hundred years ago, as did the snowdrop shortly before the American Revolution;" and "one would think that the foxglove was the product of our land also, but it came from the Canary Islands two hundred years ago." Now what are the facts? The honeysuckle "which adorns our hedges" must of course be the wild honeysuckle, *Lonicera Periclymenum*, and far from having been introduced from China, it does not occur in that country, being confined,

in its wild state, to Western Europe, including Britain. The hawthorn is not a native of America, although it exists there as an introduced plant, but is certainly native in Britain. The snowdrop, although it may be grown in America as a garden plant, is not a native of that country, but belongs to Europe and Western Asia, and is perhaps wild in some parts of England, though not in Scotland. The foxglove, perfectly wild in Britain, is confined to Western Europe, and its range does not extend to the Canary Islands. So much for popular historical Botany! We must at the same time give the speaker credit for an attempt to convey information on a subject too often neglected by horticulturists, although unfortunately his statements are erroneous. From what source he obtained his very remarkable statements it would be interesting to know.

Mr. R. Brown, F.E., R.N., one of the Delegates of the Society to the East of Scotland Union of Naturalists' Societies, gave a Report on the Meeting of the Union held at Arbroath.

10th December, 1891.

JAMES STEWART, L.D.S., Vice-President, in the Chair.

Mr. J. A. Harvie Brown, F.Z.S., Dunipace House, Larbert; Lieutenant-Colonel Duthie, R.A., Row, Doune; Mr. R. H. Moncrieff, W.S., Potterhill; Mr. A. S. Reid, M.A., F.G.S., Trinity College, Glenalmond; Mr. J. Brand; Mr. E. Nicol; Rev. J. Dunn, M.A., B.C.L.; Dr. Graham, and Mr. D. Ferrier, were elected Ordinary Members.

Mr. H. Coates, Delegate of the Society to the British Association for the Advancement of Science gave a Report of the Meeting of the Association at Cardiff.

The following paper was read:—

"The Old Red Sandstone Fishes." By P. Macnair.

14th January, 1892.

JAMES STEWART, L.D.S., Vice-President, in the Chair.

The following paper was read:—

"The Microscopic Structure of Igneous Rocks." By Rev. J. Dunn, M.A., B.C.L.

11th February, 1892.

F. BUCHANAN WHITE, M.D., F.L.S., F.E.S., President, in the Chair.

The following donations were intimated :—

Library.—Two photographs of "Earth Pyramids in the Tyrol"—from Mr. Sidney Keith, Edinburgh.

The following paper was read :—

"A Leaf as a Breathing and Feeding Organ." By W. Barclay.

10th March, 1892.

TWENTY-FIFTH ANNUAL MEETING.

F. BUCHANAN WHITE, M.D., F.L.S., F.E.S., President, in the Chair.

The following donations were intimated :—

Museum—Perthshire Collection.—Peregrine Falcon—from Mr. A. Nicol Simpson. *Index Collection.*—Egg of Red-throated Diver from North Uist—from Mr. M. Mahon.

Library.—Withering's "British Plants" (1818)—from Mr. C. M'Intosh, Inver.

The following Reports were read and adopted :—

REPORT OF COUNCIL.

In presenting its Twenty-fifth Annual Report your Council is pleased that the Society is in such a favourable position on the attainment of its Semi-Jubilee, and trusts that the members will increase their interest in and endeavour to extend the influence of the Society in every way, so that the future may be as successful as the past has been. The Council regrets that Dr. Buchanan White cannot in the meantime allow himself to accept of re-election to the presidentship, but takes this opportunity of recording its thanks to him for the valuable services he has rendered during the thirteen years he has presided over the Society with such ability and tact, and rejoices that, as he is still a member of Council, it will profit by his advice and experience. The Council congratulates the Society on obtaining for the office of President Mr. Henry Coates, who has taken so much interest in the Society for some time past, and who will, it feels assured, discharge the duties with honour to the Society and with credit to himself. During the past year 6 meetings have been held,

with an average attendance of 24—the largest being 38, on 12th March, 1891, and the least 12, on 10th December, 1891. At these meetings 5 papers were read, as well as the usual opening and presidential addresses by the President. Ten members have been elected during the year, making a total membership of 276, including 1 honorary and 10 corresponding members and 8 associates, this being a slight decrease on last year. During the summer 8 excursions were held, which were more numerously attended than the excursions have been for one or two years previously. These were most pleasant days, spent amidst some of the splendid and varied scenery of our county; and the Council begs to thank the various proprietors who kindly granted facilities for seeing everything of interest upon the portions of their estates visited. The Museum maintains its attractiveness, having been visited by about 3000 persons this last year. The Lecture-Room has again been granted free of charge to various local educational societies. The Council has once more to regret that death has greatly reduced the ranks of the Society. Amongst those whose loss it specially deplores, as having been long connected with the Society, and having each done much for its welfare, are Mr. C. T. C. Grant of Kilgraston, Dr. Thos. Miller, Mr. Magnus Jackson, and, more recently, Mr. John Dawson, one of the original members, and the one who presided at the inaugural meeting of the Society on 28th February, 1867.

REPORT OF TREASURER.

(See Balance-Sheet, page cxlv.)

REPORT OF CURATOR.

Though there is not much fresh matter to bring before you since the Report of last year, still your Curator is glad to be able to say that the Museum maintains its own in every respect, and that the several collections are in good order. A healthy interest continues to be taken by the public in all the departments, as may be instanced any day by the attentive manner in which here and there visitors are to be seen carefully studying the arrangement and classification, as well as the information contained on the labels—a state of things highly satisfactory. In the Bird department, of which I have more particular charge, I may mention that those specimens in skin, alluded to in last year's Report as kindly presented by Lieut. Millais, of the Seaforth Highlanders, have now been mounted and placed in the cases, and, notwithstanding the cramping of room, have by a little management been satisfactorily arranged, preserving the order of classification, though, as previously conjectured in last Report, some of the compartments may appear overcrowded—a circumstance which it is impossible to avoid on the introduction of fresh specimens, if the classification be strictly maintained as it ought to be. The presentations in this class during the past year, though somewhat important, have not been numerous, and are as follows:—A Black-throated

Diver (a very fine specimen), from Mr. R. M'Intosh, jun.; shot on Loch Kennard, Grandtully. A Pigmy Curlew (a very rare bird in this district), shot on the banks of the Tay opposite Mugdrum by Mr. Roger Davidson, Kinfauns, and presented by myself. By Lord Stormont, a Hybrid Pheasant, between the Golden and Common Pheasant—a very uncommon, if not quite an exceptional, cross. Lastly, a mounted specimen of a Peregrine Falcon, in the plumage of the first year, shot near Blairgowrie, and presented by Mr. A. Nicol Simpson of Mayfield, Arbroath, who, I may remark, has always taken much interest in the Perthshire Society's Museum, and especially in the birds of the Tay Basin. As also in this class, I may mention a very valuable addition made to the collection of Nests by Mr. Wood of Freeland, by the presentation of that of a Water Ouzel, or Dipper, built on the dead limb of an alder. This Mr. Wood was enabled to get sawn off at both ends, showing a portion of the wood with the nest on it, undisturbed, as it was found. The nest, which had three eggs in it (which were unfortunately broken), was on the limb of a very old alder, growing in a slanting position over the water of the River May, near Condie Wood-foot, having evidently suffered from the effects of some former high flood—the end of the limb having been broken off, together with what appears to have been a considerable-sized branch, leaving only the jagged stump on which the nest is constructed, the latter suspended about four feet above the water at its then low state, and at about mid-stream, or 12 feet each way from the banks, high on the one side on which the tree grew, and shelving on the other, both sides thickly covered with alder, and the stream shallow and rapid at the spot. Such a position is most unusual, if not unique, for though the Dipper is known occasionally to build on the moss-grown roots of a tree projecting from the banks of the stream, it seldom, if ever, makes its nest on the tree itself. The usual site is chiefly confined to rocks and precipitous places near waterfalls and other un-get-at-able spots. The only way of accounting for this very unusual nesting-place appears to be that, during a previous winter flood, some turfy matter, with long grass attached, became so firmly fixed and entangled on the stump as to have induced the birds to build on it, and, by way of deception, to artfully blend the materials into the nest, with some of the long grass hanging down, so as to give the general effect to any unsuspicious passer-by that the whole concern was only the remnants of some high spate, to which the May is very subject. More especially would this be the case, as the entrance of the nest is so skilfully arranged as not easily to be perceived except from underneath, and thus not likely to attract notice unless the birds were seen to enter, which no doubt they would be extremely cautious in doing.

REPORT OF LIBRARIAN.

The intended additions to the Library, through the generosity of the Duncan Trustees and other friends, which were announced in last year's Report, have now been carried out. A large and, it is

believed, judicious selection of scientific works, both technical and of popular interest, has now been placed on the shelves, and it remains with the members to show their appreciation of what has been done by largely taking advantage of the new books. It is hoped that, should funds admit, a complete new catalogue will now be printed and circulated amongst the members, and should be an important means of bringing the claims and privileges of the Society under more extended notice. The number of volumes in the Library is now about 850, of which number about 600 belong to the Lending Department. The readers during the year have numbered about 30, and about 100 books have been taken out. These figures ought certainly to be largely increased.

REPORT OF EDITOR.

The Fifth Part (Vol. I., New Series) of the *Transactions and Proceedings* is the only publication which has been issued by the Society during the past session.

The Council for 1892-93 was elected as follows :—

President—Henry Coates, F.R.S.E.

Vice-Presidents—T. M. M'Gregor, R. Dow, J. Morison, and Dr. A. Thomson, F.R.S.E., F.C.S.

Secretary—S. T. Ellison.

Treasurer—John Stewart.

Curator—Colonel H. M. Drummond-Hay, C.M.Z.S.

Librarian—James Coates.

Editor—F. Buchanan White, M.D., F.L.S.

Councillors—R. Brown, F.E., R.N.; W. Barclay; W. Ellison; and D. M. Barker.

The retiring President then gave the following valedictory address :—

Gentlemen,—In resigning to my successor the presidential chair which by your favour I have occupied so long, I desire to say a few words by way of a valedictory address.

Since to-day sees the end of the first quarter of a century of the existence of the Society, it seems to be a proper occasion on which to take a brief retrospect of its history. Such retrospects have already been made at two eventful periods of our career—namely, in 1881, when we had but recently entered into possession of this building, and again in 1888, when we came of age. Still, however, I think it will be advantageous to give a short history of our doings during the past five-and-twenty years.

Up to November, 1881, 114 ordinary monthly meetings had been held. Since that time the number of these meetings has been 71, making a total of 185. In this total conversaziones, dinners, and

other special meetings of a less festive character, are not included. At these meetings 280 papers were read—169 in the first period and 111 in the second,—exclusive of many short notes, reports of the executive officers and of the delegates, and other communications, but including 32 presidential addresses.

Of official excursions of which a record has been kept there were 57 in the first period and 68 in the second, making a total of 125. In addition to these official excursions many others were planned and carried out by the members. It would be interesting to ascertain how many miles of Perthshire have been traversed in the 125 excursions, but I fear that this is now impossible. If, however, we allow an average of 8 miles for each excursion—probably too low a figure—we have 1000 miles. To this must be added the train mileage, covered in going to and returning from our ground, which may possibly exceed 3000 miles—a moderate estimate when we consider that the journey to and from the west of the county is over 100 miles, and to and from the north about as much. These and other excursions have resulted in a great increase in our knowledge of the natural history and particularly of the botany of Perthshire, and in adding to our herbarium a very large number of specimens.

Although in 1881 we had entered into occupation of the Museum buildings, it was not till December, 1883, that the Museum itself was ready for public inspection. The period between November, 1881, and December, 1883, was, I need hardly remind you, a very busy one for those who were engaged in forming and arranging the Museum collections, and many of the years which followed saw an equal amount of hard work. Whilst our hearty thanks are due to all those who have laboured so well and effectually, to no one are we more indebted than to our Curator, Colonel Drummond-Hay, whose incessant and skilful work has in a great measure contributed to bring the Museum to that excellency which it has attained.

Since the Museum was opened, communications have on more than one occasion been laid before you dealing with its arrangement, condition, and future needs. Therefore I will not say anything on these points further than to repeat what has often been said before, that there is urgent necessity for more room. I would, however, deprecate any scheme of extension that is not effectual and final being entered upon. Some time ago a plan of extension was submitted to you. This plan, subject to some modification, is, I still think, the best. Our present Lecture Room might be retained as it is, and the present Museum Hall be devoted to the Index Collection, instead of the reverse arrangement, as was suggested. Then we might do without having a care-taker's house on the premises, and devote the space thus obtained to some of our collections. This would enable us to dispense with one of the galleries, and thus avoid the well-like appearance which, rightly or wrongly, it was supposed the new Museum Hall would have.

The years that have elapsed since 1881 have seen a wonderful development of our Library. Though the Society began to collect books at a very early date, it was not till 1881 that it was able to place the Library on a proper footing. After 1881 there came some

years of starvation, when the additions were few and far between, but about a year ago—thanks to the generous friends who, according to their various abilities, have so often helped us—we were enabled to add very considerably to the number of our books. Now we have a Library of works relating to Natural Science which is probably much superior to any in Scotland outside of a university town. It is not yet, however, as complete as it might be, and the Society ought never to lose sight of the importance of keeping it up to date.

In the retrospect which was given in 1881 there was a short account of the publications of the Society. It was pointed out that in 1871 we were bold enough to start a Quarterly Magazine—the *Scottish Naturalist.* This we retained in our own hands till 1878, when it was made over to Messrs. Blackwood & Sons, but still under the same editorship. In 1883, after having ceased to appear for a few months, the Magazine began a new career in the hands of Messrs. Cowan & Co. This year has seen a new development of it and a change of owners and name, its title being now "*The Annals of Scottish Natural History;*" under which designation we trust it may have a long and prosperous existence. In 1881 we began to publish an annual part of our "*Proceedings.*" Of these "*Proceedings*" six parts were published, bringing us down to 1886. Since this publication was merely—to a great extent—a reprint of the newspaper reports of our meetings, it was found to be not altogether satisfactory, so in 1887 we started "*The Transactions and Proceedings,*" which have since been published annually.

I need continue this retrospect no further. Enough has, I think, been said to show that in the 25 years of our existence we have been able to do something, however little, for the advancement of that science in whose name we are banded together. Let us trust that the next 25 years will be even more prolific!

And now, in retiring from that positlon which I have had the honour to hold so long, may I be permitted to tender my personal thanks to the various officers who have so heartily co-operated with me in conducting—I think not unsuccessfully—the business of the Society. When all have worked so well, it would be invidious to select for special mention any past or present member of the executive. An exception must, however, be made in favour of those who have held an office, on the proper discharge of whose duties, more than anything else, the well-being of a Society depends. During my last tenure of the Presidentship there have been two Secretaries—Mr. John Young and Mr. S. T. Ellison,—and I think that no member knows so well as I do the extent to which the Society is indebted to the labours of these gentlemen.

I have finally to thank the Council for the honour done to me in pressing me to retain the Presidential Chair. As, however, I have had the privilege of presiding over your meetings for 13 years, and have held, moreover, the office of Secretary for 2 years, and of Editor for 10, I felt that, apart from personal considerations, it might conduce to the welfare of the Society to have a new occupant of the chair.

All that remains for me to do now is to introduce to you your new President, and to congratulate you on having found one who,

alike by his scientific attainments, by his enthusiasm, and by the practical interest he has so long shown in the Society, cannot fail to do credit to your choice.

The Chairman then introduced his successor, Mr. Henry Coates, who delivered the following Presidential Address :—

GENTLEMEN,—My first duty this evening is to thank you for the honour you have conferred upon me in electing me your President for the ensuing year. When your Council first proposed my nomination I had the strongest reluctance to allowing my name to be brought forward, being of opinion that the Presidential Chair ought to be filled by one with much wider scientific experience, and with more leisure for research, than myself. When I remembered the names of the four gentlemen who had successively filled this office in the past, my scruples were increased ten-fold. One of these, who is now no more, devoted the ample leisure of a country life to the study of the entomology of his native county; another, whom, happily, we still number amongst our office-bearers, has devoted a long life to the investigation of the bird-life, not only of this country, but of Europe; a third is one of the most accomplished field geologists that this country has produced; while the fourth is the distinguished botanist who has just vacated the Chair, and of whom I shall have more to say presently. After such leaders as these, I can only hope to follow at a very respectful distance indeed. Taking these difficulties into consideration, I certainly should not have allowed my name to be brought forward, had it not been for the unanimous and very encouraging way in which the Council urged the matter upon me. Such being the case, I feel sure that I may count upon their hearty support in any efforts of mine to maintain the important position of the Perthshire Society of Natural Science, and to increase its usefulness and popularity. I need hardly add that what I am lacking in knowledge and experience I shall endeavour to make up for in zeal, and that I shall spare no pains to further the interests of the Society where I can do so.

Your retiring President has given a survey of the past. Allow me, for a few moments, before proceeding to the subject proper of my address, to look towards the future of our Society.

In my recent Report as Delegate to the British Association, I ventured to express the opinion that we should not be discouraged although the attendances at our meetings are not so large as we should like them to be. Two causes may be mentioned which in part account for this. The first is that in all Societies having for their object the study and advancement of some special subject, there comes, as it were, a pausing time, when the interest and novelty of the subject, in its more superficial aspects, have, for the time, worn off. This much I think we may admit to be, to a certain extent, the case with our Society. But that the subject itself is exhausted is very far from being the case. On the contrary, it is practically, so far as we are concerned, inexhaustible. The second excuse for small attendances, and one that is very frequently heard, is the large number of other meetings, of a more or less educational and intellectual

character, that one is called upon to attend during the winter months. This, however, instead of being a matter of regret, should be one of congratulation, seeing that some of these organisations are the direct offspring of our Society, and that they make use of our buildings, and thus widen the sphere of our usefulness. It seems to me that far from any jealousy among such societies, there should be, and I trust always will be, a feeling of cordial fellowship among them, and a desire to help each other in their several efforts to raise the intellectual standard of the community. Such, then, are two of the causes which militate against our meetings. Now let us see if there is no way in which we can increase their popularity. It seems to me that there are three ways in which we might do this. In the first place, we should do our utmost to persuade some of our members who have not yet contributed any papers or notes to do so. I have no doubt, for instance, that several of our country members could send most interesting communications resulting from original observation. Even though they do not know the scientific name or the systematic position of any particular animal or plant, let them tell us something they have observed about its life-history, its haunts, or its habits. Gilbert White and Richard Jefferies were not systematic naturalists in the modern sense of the term, and yet what truer descriptions have we, both of the outward appearances and the inner workings of nature, than in the "Natural History of Selborne," or "The Gamekeeper at Home." But there is another class of our members to whom we might surely look for some assistance in this direction, namely our lady members. I believe I was the first to introduce the innovation of admitting ladies to our membership, and I certainly should feel that I had not occupied the Presidential Chair in vain if I could persuade some of them to give us the results of their observation or research in the form of papers, however short. In this connection, my experience at Cardiff last summer comes to my aid again, for there the most interesting paper I heard in the Geographical Section was one by Mrs. Bishop, better known as Miss Bird.

Assuming, then, that we have got more variety in our Syllabus, it is certainly desirable to have more discussion on the papers read. In proof of this, I need only refer to our last monthly meeting, when Mr. Barclay's paper was criticised on the botanical, the chemical, and the practical side, by gentlemen competent to speak on these matters, and much interesting light was thrown on the subject.

The third and last practical suggestion I would make, with a view to popularising our meetings, is that additional means should be taken to inform the members of the subject and date of each meeting. No doubt the Syllabus card *ought* to be sufficient for this purpose, but, unfortunately, memories, like everything else mortal, are frail. In this matter we might with advantage take a hint from our friends of the Students' Union, and issue a card intimating each meeting. Of course the obvious objection to such a practice is the extra labour which it would involve on our already hard-worked Secretary.

But our winter meetings do not by any means exhaust the functions of our Society. I think we are apt to forget the very im-

portant, though silent, work which our Museum is doing as a popular educator. This is work, too, which is not for the hour or the day, but which we trust will endure even after our Society has ceased to exist, and after those who have founded it have passed away. It has now become one of the firmly established institutions of the town and of the county. One of the most encouraging features of its success is the large number of school children who visit it, particularly on Saturday afternoons.

Speaking of the Museum brings me to what I had intended to say regarding our retiring President. It would be presumption on my part to enlarge on the services which Dr. Buchanan White has rendered to the Perthshire Society of Natural Science, as these are already so well known, not only to all the members, but to all the citizens of Perth. Suffice it to say that he helped to found it a quarter of a century ago, and that ever since he has devoted to its interests a large share of his time, his energies, and his wide scientific knowledge, and has used his influence and his powers of persuasion to induce others to taste for themselves the joys of the study of Nature. Such services as these are certainly far beyond the reach of any recognition in a tangible form that we could offer. Yet I think there is one way in which we could show our gratitude. When our Museum was built, the necessary funds were raised as a memorial to the late Sir Thomas Moncreiffe. Why should we not raise a Testimonial Fund to our retiring President, to be devoted to the scheme of Museum Extension which he has so much at heart?

Passing from these general remarks on the present position and future prospects of our Society, I come now to the subject on which I propose to address you very briefly this evening, namely, Denudation, or the gradual wearing down of the Earth's surface. I have chosen this subject because it is the very key-note of all geological science. It is the A. B. C., as it were, whereby all geological phenomena must be interpreted. Geologists tell us that the great majority of the rocks comprising the earth's surface have been built up of the ruins of older rocks. They tell us that these have been piled up, layer upon layer, through countless ages of time, to thicknesses of hundreds and thousands of feet. Nay, they even point to an example in America,—that continent of all things large,—where, in the Grand Cañon of the Colorado, we may behold a cleft cut through a vertical mile of horizontal sedimentary strata. Now, it is easy to tell us that these strata, a mile in thickness, have been built up of grains of sand washed down from the sides of primeval mountains. It may even be easy to believe the statement on the faith that those who make it ought to know. But the question is, can we realise it? Can we, individually, grasp the fact that such stupendous ruin and such stupendous re-building have been wrought on the face of the earth, not, as was once conveniently supposed, by convulsions and forces proportionately vast, but simply by the imperceptibly slow action of the forces which are at work around us at the present day? I confess that it was long after I began my geological studies before I saw clearly how these things could be, and still more difficult do I find it

to bring tbe truth home to the minds of others who have not thought the matter out for themselves. We need not wonder, then, that it is barely a century since this theory of the gradual development of the sedimentary rocks, through the action of familiar forces, was first broached by James Hutton.*

Stated in their barest outline, the processes of denudation are carried on as follows. Heat, frost, moisture, and acids contained in the atmosphere, loosen the surface particles of a rock-mass; the rain washes these loosened particles into the nearest stream; the stream bears them along in its current towards the sea, and as it does so it uses them as graving tools to carry on the work of destruction. The sea, in turn, performs its share of the work around the margins of the land, using its shingle and sand as hammer and file to batter its cliffs and to grind its rocks. Thus we see that the forces at work fall naturally into three groups—first, the atmospheric agencies; second, running water (with which may be classed flowing ice, or glaciers); and third, the sea. Let me illustrate the action of each of these three by phenomena which have recently come under my own observation.

Ten days ago a heavy fall of snow occurred, followed by frost, and then a sudden thaw. In walking along the footpath outside the Barracks wall, on the Dunkeld Road, I noticed that the snow at the foot of the wall was thickly sprinkled with sand, as if it had been shaken from a pepper-box, in a regular line. The wall is built of Old Red Sandstone, of a yellowish-grey colour and soft in texture, and on comparing the grains of sand on the snow there could be no doubt where they had come from. Here, then, was a striking example of the unaided work of frost in disintegrating a rock surface. The stone had first absorbed moisture from the atmosphere into its pores; when frost came the moisture froze, and in doing so expanded, and thus forced the component grains of sand slightly apart, though still holding them together in its ice-grip; lastly the thaw came, melted the ice in the rock's pores, and the loosened particles of sand fell on the snow-covered ground by their own weight.

A still more instructive example of surface weathering was one I came across only to-day. At the corner of Carpenter Street and Cherry Lane is a house which, I am informed, is about ninety years old. It is built partly of porphyrite ("whinstone") and partly of sandstone ("freestone"), the latter being laid on edge, and the two being mixed indiscriminately. The hard porphyrite, being scarcely worn at all, stands boldly out from the sandstone, and forms an index to the amount of weathering which the latter has undergone. On measuring the difference of level of the two, we find that the sandstone has been worn away in places to a depth of three inches. This shows the rate of weathering, in this instance, to have been one inch in thirty years.

On mountain slopes, and other places where the rocks are not

* *Vide* "Theory of the Earth," by Dr. Hutton, 1795; also "Illustrations of the Huttonian Theory of the Earth," by John Playfair, 1802.

protected by a covering of soil or vegetation, this work of frost goes on all winter, not only on the outer surface, but in all the joints and fissures of the rock, so that not only is the face crumbled into powder, but great blocks, perhaps tons in weight, are hurled to the foot of the slope. You must all have observed the results of this action in some of our rocky Highland glens, such as Glen Ogle, Glen Lyon, etc. The same thing may be seen on a very much grander scale in some of the Norwegian valleys, such as the Naerodal and the Norangsdal, where I have travelled for miles through the most stupendous rock ruins.

To return again for a moment to our Barracks-wall illustration,—if nature had been left to her own courses (instead of being interfered with by the scavenger), the snow would have melted and deposited the sand on the footpath; from thence the first shower of rain would have washed it into the gutter, and finally into the river. Precisely the same process goes on on the hillside. The loosened particles lie at the foot of the rocks and crags till the rain carries them into the nearest runnel, thence they reach the stream, and at last the river.

Last summer I had an example of what a mountain rain-storm can do, which enabled me to realise the denuding power of running water more clearly than I had done before. It was early evening, and I was returning by train from Dalmally to Perth. All morning it had rained heavily, and the mountains had been obscured by thick mist; but by the time I started the rain had ceased and the mists began to roll up the mountain sides, revealing a scene both most impressive in its grandeur of outline and its beauty of colouring, and also most instructive in its geological teaching. The sides of Ben Cruachan were seamed with a close net-work of mountain torrents gleaming white in the evening sunlight, and producing in the distance a dull continuous roar, as a thousand miniature cascades leaped down the rocks. The sound is exquisitely described by Wordsworth, who must often have listened to the same music amid his own lakeland hills. The following stanza occurs in "Lines composed at Grasmere, during a walk, one evening, after a stormy day":—

> "Loud is the vale!—the voice is up
> With which she speaks when storms are gone,
> A mighty unison of streams!
> Of all her voices, one!"

All through Glen Lochy, Strath Fillan, and the long Glen Dochart, the hill sides presented the same appearance. The sudden heavy rainfall had revealed an infinite number of water-courses, whose existence was not suspected until pencilled by the foaming waters.

Here, then, was one of Nature's carving tools at work in earnest, namely, running water. That it was doing real destructive work was evidenced by the colour of the water in the larger streams, dark brown with peat, sand, clay, and other detritus.

Time will not allow me to follow the course and the work of the

stream, and to show how its carrying power depends on its velocity and its gradient; how its work is here destructive and there constructive; how its results vary according to the varying hardness and solubility of the rocks it encounters; and how the contour of its valley is largely determined by the nature of the climate.

Nor must I linger over the last class of eroding agents to which I have referred, namely, the sea. I had intended, in illustration of this, to describe some of the effects of wave action which I have witnessed on the coasts of Cornwall and the Scilly Isles, where the full violence of the Atlantic breakers is expended on the brittle granite crags. The effect, particularly in the Scilly Isles, is a succession of such fantastic shapes that the Scillonians point, with a certain display of pride, to a bewildering series of camel-rocks, elephant-rocks, etc., until one is tempted to ask, like the small boy in the menagerie, "which is which?"

But I fear I have overtaxed your patience with a subject which to the uninitiated must appear somewhat dry. In excuse, I can only refer to what I said at the outset regarding the importance, to a student beginning the study of geology, of assimilating the idea of the universality of those processes of denudation. But even apart from an abstract study of Geology, everyone who loves his native country must experience some pleasure in being able to trace how her hills and valleys have come to assume their present forms. If we are able to do this, even to a very limited extent, then to the charm of lovely scenery and the interest of thrilling historic association will be added a third source of delight as we explore afresh the familiar fields of our native land.

7th April, 1892.

H. Coates, F.R.S.E., President, in the Chair.

The following donations were intimated:—

Museum—Perthshire Collection.—Nest of Water Ouzel, built on a tree—from Mr. C. L. Wood of Freeland. Pied Woodpecker, shot at Kilgraston—from Mr. H. Young.

Library.—Books from Mr. A. Coates and Dr. H. R. Mill.

The Marquis and Marchioness of Breadalbane; Mrs. A. E. Pullar, Durn; Miss Wallace, Knowehead; Mr. H. Robb, Balhousie School; Sheriff Jameson; Dr. A. Campbell; Mr. J. M'Ewan; Mr. J. Chalmers; Rev. T. Crawford, B.D.; Mr. J. Hay; Sir J. Kinloch, Bart., M.P.; Mr. J. Mackay, New Scone; Mr. G. Miller; Mr. J. Leslie; Mr. R. Brand; and Mr. T. West Carnie, London, were elected Ordinary Members, and Mr. H. R. Mill, D.Sc., F.R.S.E., a Corresponding Member.

The following papers were read :—

1. "*Hypnum procerrimum*, Molendo, a New British Moss." By R. H. Meldrum. (See *Trans.*, Vol. I., p. 255).

2. "The Old Red Sandstone of Perthshire." By H. Coates, F.R.S.E., and P. Macnair. (See *Trans.*, Vol. I., p. 235).

SUMMER SESSION, 1892.

The following Excursions were arranged :—

April 30, &c.—Crieff and Comrie Railway. (See Report in *Trans.*, p. 257).

1. May 26.—Craigie Barns.
2. June 14.—Longforgan and Redmyre.
3. June 18.—Forteviot, by Dupplin Loch, to Methven.
4. July 2.—Craighall.
5. July 16.—Ballinluig and Loch Broom.
6. July 27-30.—Ben Lawers.
7. August 13.—Millhaugh and Lynedoch.

BALANCE-SHEET of THE PERTHSHIRE SOCIETY OF NATURAL SCIENCE for the Year ended 29th February, 1892.

INCOME.

To Balance in hand at last audit, ...	£2	4	10
,, Annual Subscriptions and Entrance Fees, ...	60	5	0
,, Payments from other Societies for Coal, Gas, &c.,	12	6	9
,, Cash drawn out of Bank, ...	14	10	0
,, Sale of *Transactions* and *Museum Guides*, ...	1	0	7
	£90	7	2

EXPENDITURE.

By Feu-Duty for two years, ...	£14	7	8
,, Janitor's Salary, ...	20	0	0
,, Insurance, ...	1	17	6
,, Repairs and Furnishings, ...	15	3	9
,, Printing and Postages, ...	20	6	6
,, Books and Magazines, ...	3	15	0½
,, Birdstuffing, ...	2	12	9
,, Subscription to East of Scotland Union of Naturalists' Societies, ...	3	18	4
,, Gas, ...	5	3	8
,, Janitor for Incidental Expenses, ...	2	0	0
,, Balance in Treasurer's hands, ...	1	1	11½
	£90	7	2

PERTH, March, 1892.—We, the undersigned, Auditors appointed by the Society, having examined the foregoing, and compared the same with the relative Vouchers, find them correctly stated and properly vouched—the sum in the Bank at the credit of the Society being £15 0s 9d, and in the Treasurer's hands, £1 1s 11½d.

(Signed) A. T. SCOTT, A. JAMIESON, } *Auditors.*