



TABLE II.—RAINFALL AT OCHTERTYRE, NEAR STIRLING, PERTHSHIRE.

	1884.	1885.	1886.	1887.	1888.	1889.	1890.	1891.	1892.	1893.
January,	7.53	3.96	Bottle broken by frost	3.32	3.72	1.50	8.51	2.70	3.50	2.45
February,	5.56	2.96	1.53	3.33	0.55	1.93	0.75	0.43	0.75	5.18
March,	3.91	2.45	3.90	1.86	1.27	1.00	2.65	3.08	0.00	0.84
April,	1.00	2.90	2.55	1.77	0.00	1.18	1.50	1.90	1.30	1.23
May,	2.76	2.25	3.08	1.00	3.54	3.51	2.61	1.52	4.98	1.75
June,	1.25	.78	2.21	0.53	4.23	0.96	3.61	1.55	2.90	1.93
July,	5.29	1.02	2.92	2.50	4.62	1.91	3.88	1.95	1.92	5.09
August,	2.75	3.36	1.23	5.23	3.37	4.60	3.62	4.60	5.62	2.41
September,	3.37	6.22	3.15	3.96	0.82	1.26	4.91	5.00	4.36	2.12
October,	3.41	2.57	5.09	1.65	2.53	3.12	2.50	5.23	4.53	2.84
November,	3.96	2.00	3.76	3.46	7.26	2.20	7.35	3.50	4.19	2.32
December,	7.41	2.90	3.73	1.60	4.33	3.06	1.57	7.18	1.57	5.46
	48.19	32.67	32.85	30.25	36.29	25.93	43.46	33.44	36.22	33.97

Average for 10 years, 35.807 inches.

NOTES ON THE FLORA OF STIRLINGSHIRE.

[FOURTH PAPER.]

BY COL. STIRLING OF GARGUNNOCK AND ROBERT KIDSTON, F.R.S.E., F.G.S.

In continuance of the work of the Society, we beg to lay before you the results of the excursions made last season with the object of working out the Flora of Stirlingshire.

As you may remember when the reinvestigation of the County Flora was taken up by the Society, it was agreed to include in the lists only

those species whose records were accompanied by satisfactory vouched specimens. It is unnecessary for us to go into the reasons why this rule was found necessary. Therefore, though several of the plants we include as new to our lists had been previously recorded, still, until the past season, we had failed to find any herbarium specimens to confirm the records.

We have beside us a list of about 90 species and varieties which have been recorded from the County of Stirling, but of which up to the present time we have seen no specimens. Some of these are unquestionably errors of locality. In some cases where the locality was given for the plant, it has been found that it had been referred to the wrong county. In other cases we have the strongest ground for believing that the plant, though really found in *political* Stirlingshire, was not in *botanical* Stirlingshire, from which all north of the river Forth is excluded. Some of the reputed Stirlingshire records probably came from this botanically excluded part of the county. Then again some of the reputed occurrences of certain species of the genera *Rosa*, *Rubus*, and *Salix* require to be confirmed. These genera have been carefully revised lately by specialists, and it has been found that the older identifications of these groups are frequently open to doubt, and possibly the same plant is included in our lists under a different name. In passing, we may say, that in all these critical genera, we have referred our plants for identification or confirmation to botanists who are competent to give a judgment on such forms. And finally, contained among these 90 records for which we have not seen any specimens, there are undoubtedly some errors of identification. But notwithstanding what has been said, and making all allowance for error, many of these desiderated 90 records are of plants which one can scarcely doubt do occur in the county. The extraordinary thing is that several of them have not been found by us ere now. They are got both to the north and south of us, and we still hope to find or re-find many of them, but from our knowledge of the county Flora, I think we may safely say they are not common. We make these remarks to show how much still remains to be done.

Last spring and summer a good many excursions were made to various parts of the county in districts 1, 2, and 3. No excursion was made in district 4. The great majority of these trips were in district 1, though several were in district 2, but only one in district 3. The result of our labours was the addi-

tion of 22 species and 6 varieties new to our lists. In addition to this, and perhaps not less important, were many new district records. These are all shown in the appended table, the species new to our county being marked by a *.

The following notes on a few of the plants met with last season are desirable :—

Ranunculus trichophyllus, Chaix, was got two years ago in Mugdock Loch, but the original specimens were imperfect. The plant was got by dredging in water about 6 ft. deep, where it seems to flower and perfect its seed without ever coming to the surface. To collect water plants successfully it is absolutely necessary to dredge from a boat, as several British species can only be got in good condition, if got at all, by this means of collecting.

Barbarea stricta, Androz.—was recorded some years ago by Mr G. Horn, and guided by his directions, we found it last season in the original locality. It is generally supposed to have been introduced into Scotland.

Hypericum hirsutum, L., has only been found in one locality. This is one of those species for whose scarcity in Stirlingshire it is difficult to account. We have specially looked for this plant in the county for some years, and as yet have only met with it in one locality.

Rubus Chamemorus, L. (The Cloudberry), though only met with by us in one place, was there in most extraordinary abundance. It covers a large extent of the muir between the Laird's Hill and the Black Hill reservoir near Kilsyth.

Pulicaria dysenterica.—Gærtn. though an old county record, is very rare, and we only have it from one locality, where, however, it seems to be established.

Andromeda polifolia, L., is also rare, and as yet we have only collected it from one of the carse mosses.

In our last report we mention that *Typha latifolia*, included in our second report, required confirmation. This year we found it near Mugdock, so the record for the county holds good. The plant originally supposed to be this species has been shewn from more perfect material to belong to *Typha angustifolia*.

Two very interesting varieties of *Potamogeton* were collected last year. *P. polygonifolius* var. *pseudofluitans*, Syme, and *P. crispus*, var. *serrulatus* Regl and Maack. The former seemingly depends on conditions of environment, and the latter is apparently a hybrid.

Several of our new records are evidently introductions or garden escapees, such as *Papaver Argemone* L. *Lepidium sativum*, L. *Potentilla norvegica*, L. *Archangelica officinalis*—Hoffm. (our attention having been drawn to the locality for this plant by Mr Morris) *Peucedanum sativum*, Benth. *Onopordon Acanthium*, L., *Narcissus Pseudo-narcissus*, L.

The third report brought up the number of species we had met with to 751 and 48 varieties. With those added last year, the numbers now are—773. Their distribution is as follows :—

No.	NAME.	Districts		
		1	2	3
*15	<i>Ranunculus trichophyllus</i> , Chaix.	x	-	-
18b	„ <i>truncatus</i> Hiern, var. <i>flabellatus</i> , Dumort.	x	-	-
*50b	<i>Nuphar luteum</i> Sm., var. <i>intermedium</i> .	x	-	-
54	<i>Papaver Rhæas</i> , L.	x	-	-
*56	„ <i>argemone</i> , L.	-	x	-
58	<i>Meconopsis cambrica</i> , Vig.	-	-	x
*76b	<i>Nasturtium officinale</i> , R. Br., var. <i>siifolium</i> , (Reich.) Koch.	x	-	-
77	„ <i>sylvestre</i> , R. Br.	x	-	-
*82	<i>Barbarea stricta</i> , Andrz.	x	-	-
121b	<i>Camelina sativa</i> Krantz, var. <i>foetida</i> , Fr.	-	x	-
*141	<i>Lepidium sativum</i> , L.	x	-	-
222	<i>Stellaria nemorum</i> , L.	-	x	x
*270	<i>Hypericum hirsutum</i> , L.	x	-	-
295	<i>Geranium sylvaticum</i> , L.	-	x	-
296	„ <i>pratense</i> , L.	-	x	-
*418	<i>Rubus fissus</i> , Lindl.	x	-	-
*442	„ <i>mucronatus</i> , Blox.	x	-	-
*455	„ <i>Radula</i> , Weihe.	x	-	-
*474	„ <i>Cæsius</i> , L.	x	-	-
*	„ <i>infestus</i> , Weihe.	x	-	-
*476	„ <i>Chamæmorus</i> , L.	x	-	-
482	<i>Fragaria elatior</i> , Ehrh.	-	x	-
*483	<i>Potentilla norvegica</i> , L.	x	x	-
579	<i>Myriophyllum spicatum</i> , L.	-	x	-
617	<i>Conium maculatum</i> , L.	-	x	-
*665	<i>Archangelica officinalis</i> , Hoffm.	x	-	-
*669	<i>Peucedanum sativum</i> , Benth.	x	-	-
724	<i>Scabiosa arvensis</i> , L.	-	x	-
*751	<i>Pulicaria dysenterica</i> , Gærtn.	x	-	-
*769b	<i>Matricaria chamomilla</i> , L., var. <i>discoidea</i> .	-	x	-
*811	<i>Onopordon acanthium</i> , L.	-	x	-
910	<i>Vaccinium Oxycoccus</i> , L.	-	x	-
913	„ <i>Myrtillus</i> , L.	-	x	-
*917	<i>Andromeda Polifolia</i> , L.	-	x	-
948	<i>Lysimachia thysiflora</i> , L.	-	x	-
985	<i>Symphytum officinale</i> , L.	-	x	-

No.	NAME.	Districts.		
		1	2	3
999	<i>Myosotis arvensis</i> , Hoffm.	-	-	x
1036	<i>Linaria viscida</i> , Mœench.	x	-	-
1051	<i>Veronica persica</i> Poir.	-	x	-
1073	<i>Pedicularis sylvatica</i> , L.	-	x	-
1137	<i>Stachys palustris</i> , L.	-	x	-
*1216b	<i>Polygonum amphibium</i> , L., var. <i>terrestre</i> Fries.	x	-	-
1280	<i>Salix pentandra</i> , L.	-	x	-
1295	„ <i>cinerea</i> , L.	-	x	-
1315	<i>Empetrum nigrum</i> , L.	-	x	-
*1320	<i>Taxus baccata</i> , L.	-	-	x
1371	<i>Iris Pseudacorus</i> , L.	-	x	-
*1380	<i>Narcissus Pseudo-narcissus</i> , L.	x	-	-
1422	<i>Narthecium ossifragum</i> , Huds.	-	x	-
1450	<i>Juncus maximus</i> , D.C.	-	x	-
1453	„ <i>campestris</i> , D.C.	-	x	-
*1456	<i>Typha angustifolia</i> , L.	x	-	-
1459	<i>Sparganium simplex</i> , Huds.	x	-	-
1480	<i>Potamogeton polygonifolius</i> , Pour.	-	x	-
*1480b	„ <i>polygonifolius</i> , Pour, var. <i>pseudo-</i> <i>fluitans</i> , Syme.	-	x	-
*1496c	„ <i>crispus</i> , L., var. <i>serrulatus</i> Regel, and Maack.	-	x	-
1502	„ <i>pusillus</i> , L.	-	x	-
1539	<i>Scirpus sylvaticus</i> , L.	x	-	-
1543	<i>Eriophorum vaginatum</i> , L.	-	x	-
1544	„ <i>angustifolium</i> , Roth.	-	x	-
1600	<i>Carex pendula</i> , Huds.	x	-	-
*1621	„ <i>paludosa</i> , Good.	x	-	-
*1694	<i>Melica nutans</i> , L.	x	-	-
1785	<i>Cystopteris fragilis</i> , Benth.	-	x	-
1789	<i>Polystichum lobatum</i> , Presl.	-	-	x
1822	<i>Lycopodium Selago</i> , L.	-	x	-

In conclusion we have again to thank those botanists who in past years have assisted us in our difficulties, for help in the present report.

THE GLACIATION OF THE FORTH VALLEY.

BY DAVID B. MORRIS.

INTRODUCTORY.

No period of geological history has within recent years excited more interest among scientists, or attracted a greater amount of popular attention than that generally known as the "Glacial epoch," or "Ice Age." After much controversy, the fact of the existence of a glacial epoch is now generally admitted, and recent discussion has centred round the