

MICROSCOPICAL AND NATURAL HISTORY SECTION.

December 2nd, 1867.

A. G. LATHAM, ESQ., in the Chair.

Mr. DANCER sent for exhibition a Revolving Platform for the Microscope, similar to one shown by Mr. HEPWORTH some years ago at a meeting of the Section; the one now exhibited has been patented in London. He also showed a Paper Slide Cabinet, invented by Mr. PIPER, of London.

“On Plants appearing in successive years on land prepared for Plantations, in Cheshire,” by H. A. HURST, Esq., and GEORGE CARTER, Esq.

The struggle for existence between man and his fellow-man hourly going on in all populous countries has long been the theme of the historian, and forms the subject matter of the science of political economy. It is, however, but recently that Mr. Darwin, in his great work on the origin of species, has shown that this same struggle is proceeding with perhaps greater intensity in the animal and vegetable kingdom. With greater intensity because moral force, which mitigates the severity of the conflict among the human race, is, as far as we know, wanting in purely animal and vegetable organisms. Man would recoil from destroying an aged pauper merely because he was useless; but a tree must necessarily destroy most plants growing under its shade. It has no power to do otherwise. Still, the truth of this theory is only partially admitted and its full effect hardly ever realised even by scientific men.

We attribute this, in a great measure, to the recent date of its promulgation and the comparatively few facts bearing on the subject which have been hitherto accumulated. Like Newton's great ideas, it will be left to the future patient student of the facts of natural history to discover the many

proofs existing of its accuracy. As the discovery of Neptune by Adams and Le Verrier demonstrated the theory of gravitation, so probably at some future day will the truth of Darwin's assertion of the antagonism, as opposed to the so-called peace, existing in nature be proved by the prediction of some fact in botany of similar importance. In the meantime, it is the duty of all lovers of natural history to go on quietly accumulating facts bearing on the subject; and we therefore submit to your consideration the following observations, not as being in themselves of any value, but as affording an instance of this great struggle for existence going on in the vegetable world observed under unusually favourable conditions.

In Tatton Park, Knutsford, it has been the practice for the last few years to dig up, enclose, and plant with young trees each December, about an acre of land.

The size of the trees planted is so small that the effect on the vegetation around may, at least for some years, we think, be neglected without any error of magnitude being introduced into our results. Hence we have plots of land placed before us at intervals of one, two, three years in a state of nature—the disturbance of deer, cattle, &c., and especially man, carefully guarded against. These appear to be favourable circumstances for the discovery, if not of the indigenous plants, at all events of those which would eventually obtain possession of the land of the district, were it left in a state of nature.

We have not thought it necessary to go farther back than four years, because at that period the question appears to be decided, and the trees artificially planted had then acquired a height which would affect the conditions of the problem.

The plots were examined at two periods—January and the end of July, 1867.

The site is on what is called in the Ordnance Geological Survey, the Upper (Keuper) Bed Marl of the New Red

Sandstone, and has an easterly aspect. The ground is dug two spades deep, and is a light sandy soil.

The young trees planted in each plot comprise Larch, Spruce, Scotch Fir, Oak and a few Sycamore.

No. 1. *Cleared January, 1867.*

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| 19. <i>Ranunculus acris,</i> | } <i>few plants.</i> | 800. <i>Anagallis vulgaris,</i> red flower, in great abundance. |
| 20. <i>„ repens,</i> | | 914. <i>Chenopodium album,</i> one plant. |
| 21. <i>„ bulbosus,</i> | | 934. <i>Polygonum lapathifolium.</i> |
| 63. <i>Capsella Bursa Pastoris.</i> | | 939. <i>„ aviculare.</i> |
| 136. <i>Viola arvensis.</i> | | 941. <i>„ convolvulus.</i> |
| 218. <i>Hypericum humifusum.</i> | | 952. <i>Rumex Acetosella.</i> |
| 267. <i>Trifolium repens.</i> | | 1162. <i>Juncus bufonius.</i> |
| 332. <i>Potentilla Tormentilla.</i> | | 1186. <i>Scirpus setaceus,</i> one plant. |
| 588. <i>Taraxacum officinale.</i> | | 1313. <i>Holcus lanatus,</i> } tufts here |
| 643. <i>Senecio vulgaris.</i> | | 1314. <i>„ mollis,</i> } and there. |
| 671. <i>Achillea Millefolium.</i> | | |

21 species. The ground not one eighth covered.

No. 2. *Cleared January, 1866.*

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| 88. <i>Arabis Thaliana.</i> | 671. <i>Achillea Millefolium.</i> |
| 136. <i>Viola arvensis.</i> | 675. <i>Campanula rotundifolia.</i> |
| 168. <i>Sagina procumbens.</i> | 756. <i>Veronica officinalis.</i> |
| 185. <i>Stellaria media.</i> | 778. <i>Digitalis purpurea.</i> |
| 189. <i>„ uliginosa.</i> | 844. <i>Prunella vulgaris.</i> |
| 193. <i>Cerastium triviale.</i> | 952. <i>Rumex Acetosella,</i> in large quantity, disputing the ground with the <i>Holci.</i> |
| 218. <i>Hypericum humifusum.</i> | 1251. <i>Carex præcox,</i> single plant |
| 267. <i>Trifolium repens,</i> more numerous than in No. 1. | 1271. <i>Anthoxanthum odoratum,</i> scarce. |
| 282. <i>Trifolium minus.</i> | 1291. <i>Agrostis vulgaris.</i> |
| 283. <i>Lotus corniculatus.</i> | 1313. <i>Holcus lanatus,</i> } occupying equal ground with <i>Rumex acetosella.</i> |
| 291. <i>Ornithopus perpusillus.</i> | 1314. <i>„ mollis,</i> } |
| 297. <i>Vicia Cracca.</i> | 1528. <i>Poa annua.</i> |
| 332. <i>Tormentilla potentilla.</i> | 1362. <i>Lolium perenne,</i> scarce. |
| 517. <i>Galium saxatile.</i> | |
| 588. <i>Taraxacum officinale.</i> | |

28 species. *Holcus lanatus,* *mollis* and *Rumex acetosella,* the predominant plants, struggling together for supremacy.

No. 3. *Cleared January, 1865*

In 1866 *Galium saxatile* was a very prominent plant.

21. <i>Ranunculus bulbosus</i> .	756. <i>Veronica officinalis</i> .
283. <i>Lotus corniculatus</i> .	952. <i>Rumex acetosella</i> , strug-
332. <i>Potentilla Tormentilla</i> .	ling for existence against
340. <i>Rubus fruticosus</i> .	the <i>Holci</i> .
517. <i>Galium saxatile</i> .	1151. <i>Juncus effusus</i> .
671. <i>Achillea Millefolium</i> .	1313. <i>Holcus lanatus</i> .
750. <i>Veronica serpyllifolia</i> .	1314. „ <i>mollis</i> .

12 species. Here the *Holci* are acquiring possession of the ground to the exclusion of other species. *R. acetosella* alone making a feeble struggle against them.

No. 4. *Cleared January, 1864.*

21. <i>Ranunculus bulbosus</i> .	944. <i>Rumex crispus</i> .
283. <i>Lotus corniculatus</i> .	952. „ <i>Acetosella</i> .
332. <i>Potentilla Tormentilla</i> .	1151. <i>Juncus effusus</i> .
339. <i>Rubus Idæus</i> .	1291. <i>Agrostis vulgaris</i> .
340. „ <i>fruticosus</i> .	1313. <i>Holcus lanatus</i> .
588. <i>Taraxacum officinale</i> .	1314. „ <i>mollis</i> .
778. <i>Digitalis purpurea</i> .	1339. <i>Dactylis glomerata</i> .

14 species. Here *Holcus lanatus* and *mollis* cover more than seven-eighths of the ground, the next plant in number being *Rumex Acetosella*, the specimens of which are poor and stunted, the species evidently unequal to struggle with the *Holci*.

The total absence of *Umbelliferæ* in all these plots is curious, especially as the biennial and perennial plants, *Rubus fruticosus* and *Digitalis purpurea* appear in the last plot. Perhaps the *Umbelliferæ* require the presence of shade.

From the above lists of plants, it follows that the first occupier of the ground in mass is *Rumex Acetosella*, and that it continues the struggle for two years with *Holcus mollis* and *lanatus*, which two species or varieties finally usurp the ground, destroying all competitors with the exception of a few single representatives chiefly of biennial plants.

The absence of any species of *Fumaria* and *Papaver* so common, nay almost universal, in similar situations, appar-

ently points to the agency of man in distributing these plants, as it is the only condition wanting.

The nomenclature here adopted is that of the London Catalogue of British Plants of 1867, printed by Robert Hardwicke.

In our remarks we have considered the whole four plots as if they were one observed at different periods; but it is obvious that this is not absolutely correct, but that subsequent investigations will be required to confirm our conclusions.

Mr. J. SIDEBOTHAM wrote, stating that *Polygonum convolvulus* was the only plant which grew from soil obtained from under the foundations of a wall built some thirty years ago at Bowdon.