

THE CONFLICT OF THE CORD GRASSES  
 IN THE  
 SOUTHAMPTON WATER:  
 AN EVOLUTIONARY INCIDENT.

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I suppose that the most unbotanical of the readers of these Proceedings cannot have failed to notice, at some time or other, the coarse grasses that, sometimes in isolated patches, sometimes in fields many acres in extent, inhabit the mud-flats and oozy foreshores of the Southampton Water and its attendant river-mouths. These are the Cord Grasses, known to botanists under the generic name of *Spartina*, and this district has, or rather had, the unique honour of affording hospitality to all three of the British species, and what is more, of being the native place and original home of two of them, as far as this country is concerned.

These Cord Grasses are:—I. *Spartina stricta*, distinguished by its dwarf stature (1—1½ ft.), its twin spikes of flowers closely pressed together and overtopping its leaves, which taper to their base and are jointed to their sheaths. This species has long been known as a British plant, and is found along the east coast from southern Lincolnshire, and on the south coast from Chichester to the Solent. II. *S. alterniflora*, much taller (2—3 ft.), with many spikes of flowers loosely pressed together and outstripped by its long leaves, which are broadest at their base and more or less continuous with their sheaths. This was discovered by Borrer in the Itchen in 1829. III. *S. Townsendi*, the tallest of the three, often attaining a height of 4 ft. or more, and very robust, with many rather spreading spikes, which are later in appearing than those of its congeners and equal or overtop the proportionately short leaves, which are broadest at the base, but distinctly jointed to their sheaths. This is a

comparatively new comer, having been first noticed by those indefatigable botanists, the Brothers Groves, at Hythe in 1879. The occurrence of this grass in our district, and its great spread therein, have become matters of general interest since Lord Montague of Beaulieu called attention to it before the Royal Commission on Land Erosion. It seems likely to prove of some economic importance, from its effects in binding and solidifying the mud banks of our coasts.

"Mud-binding Grasses" forms the subject of an interesting paper in the *Kew Bulletin*, No. 5, in which it is very naturally taken for granted that the localities for these plants given in that indispensable work of reference, Townsend's "Flora of Hampshire," ed. ii., 1904, are correct,<sup>1</sup> but the actual state of things, as revealed in the case of a little tour of inspection that the writer made in the autumn of 1907 is widely different, and may be thought remarkable enough for detailed notice. It forms, indeed, a not insignificant instance of Natural Competition. We may summarise it in a few words: the total extinction of *Spartina stricta*, so far as this district is concerned (save for a struggling remnant in an outlying corner of it), and the enormous increase of *S. Townsendi*. It may be convenient for our purpose to divide our ground into four sub-districts, named from the rivers that feed them, viz., I. The Hamble; II. The Itchen; III. The Test; and IV. The Beaulieu. The last is of course topographically outside the Southampton Water, but, as will be seen, is so connected with it by our mud-binding grasses, as to make inclusion imperative.

<sup>1</sup> It may save readers the trouble of reference if I quote, for the sake of comparison with the state of things now described, Townsend's records of the Cord Grasses in the district under notice:—"S. STRICTA: Shore at Lower Exbury in plenty; B. Hythe; Groves. Banks of Southampton River by high water mark in great plenty; Sir F. Banks, 1805. Itchen Ferry; between South'ton and Millbrook; F. Woods. By the South'ton Water below the town and muddy shores of the Itchen near its junction; B. S. TOWNSENDI: abundant S. of Hythe, less plentiful northwards and not noticed above Cracknore Hard; Groves. S. ALTERNIFLORA: abundant from S. of Hythe to Eling; and plentiful from Redbridge to Millbrook; Groves. Profusely on mud flats of the Itchen River at South'ton (1850); B. Now (1879) abundant by the Itchen from the sea upwards to beyond South'ton. About the mouths of Shirley Brook; Groves. Ditch by the coast road from South'ton to Netley; Prior. Mud banks and flats on the Hamble opposite Warsash and Hook, abundant (1871); Tate.

I. THE HAMBLE RIVER. On approaching the ferry from the village, the first thing to strike the eye is a vigorous breadth of *S. Townsendi* fringing the river, continuing southwards along Hamble Common, invading it wherever the tide flows, and appearing in a broad mass, some 400 yards long, on the foreshore of the Southampton Water flanking the Common. If there be any *alterniflora* left here it must be a very small quantity, not easily discernible from dry land. Crossing the river to Warsash, and again turning south, one passes more *Townsendi* in great abundance, but as Hook is neared, *S. alterniflora* appears, in increasing quantity towards the coast guard station, where these plants cease; the proportion even here being at least three to one in favour of the new comer. From the high ground here it is easy to make a wide survey of these *Spartina* beds, and the difference of their appearance in the mass is as striking as that the accomplished Dr. Bromfield, of "Flora Vectensis" fame, so picturesquely drew between *S. alterniflora* and *S. stricta*. The "fine reddish brown or tawny hue" which the former species acquires after flowering, contrasts strongly with the fresh verdure of the later *Townsendi*, this being also distinguished by its taller and more robust growth, its conspicuous pale spikes, with proportionately shorter and more patent leaves. Returning to Warsash and proceeding up the left bank of the river, we encounter great breadths of both species (*Townsendi* decidedly predominating) as far as, and indeed considerably above Bursledon Bridge; at this part of the river there is little visible mudland and the *Spartinae* have to compete with *Scripus maritimus*, *Glyceria maritima*, *Juncus maritimus*, *Phragmites communis* and *Aster tripolium*. Out of this struggle *Townsendi* comes best, the growth of *alterniflora* being poor. More vigorous specimens may be gathered on the opposite bank, but on the whole there is not so great an abundance of either species on the right bank, the nature and occupation of the ground forbidding it.

II. THE ITCHEN. The botanist who boards the Itchen Ferry—known to natives as the "Floating Bridge"—in the fond hope of seeing *S. stricta*, is doomed to disappointment speedy and complete. There is no *Spartina*, or any grass at all, visible from this spot, and for the best of reasons—there is

no ground for them to grow on; every foot of it is occupied with wharves and builders' yards. *S. stricta* has utterly vanished from these shores. On turning north, however, after crossing the river, penetrating the purlieus of Itchen, and passing the timber yard, to the mud-flats bordering the river here, a great field of *S. alterniflora* is encountered, with a comparatively small quantity of *Townsendi* intermingled with it, both somewhat smirched from the chimneys of this busy district. The same occurs farther up; near the S.E. side of Northam Bridge broad stretches of *alterniflora*, diversified with clusters of *Townsendi*, strike the eye; while just above the bridge is seen a wide fringe of *alterniflora* alone. These are all on the Bitterne side of the river; on the other or right bank, only the tongue of mudland at Northam is available for these grasses. It will be remarked that in the seventy years since Dr. Blomfield noted it on this spot, *S. alterniflora* has extended its territories little northwards, and has lost ground S. of the ferry. On the Hamble, on the other hand, it has succeeded in spreading a good three miles up stream.

III. THE TEST. Walking along the Western Shore at Southampton towards Millbrook Railway Station, pretty near it one meets with the first of about a dozen beds, roughly circular and distinct from one another, of *S. alterniflora*—not a blade of *stricta*, though this is one of the localities for it given in Townsend's "Flora"—and immediately on passing Millbrook Station are some vigorous, though not extensive colonies of *Townsendi*, with patches of *alterniflora* accompanying. Further along we notice a vast mass of the latter species, but with a good deal of *Townsendi* intermingled, while above Redbridge, at the mouth of the Test, but not passing the stone bridge that spans it, we find *Townsendi* alone. Traversing the grassy marshland which bounds the estuary of the Test, and fronts Redbridge, Totton and Eling, we see on the Redbridge side a number of circular and isolated young colonies of *Townsendi*, but met from the Eling side with larger and more irregular but still definite patches of *alterniflora*, the two intermingling in the middle of the mudland. A vast band of *alterniflora* lines the Eling side, past Marchwood to Cracknore Hard, where we meet with *Townsendi* intermixed again. *Alterniflora* ceases

abruptly at Hythe pier (though nowhere have I seen it finer than here), the barrier formed by projecting yacht yards and dwellings effectually preventing it from descending south, though it seems powerless to stop *Townsendi's* pioneers from advancing north. Immediately south of Hythe pier we find ourselves in the *locus classicus* of *Townsendi*, where it was discovered thirty years ago by H. and J. Groves, and is still the only station for it—so far as the area under notice is concerned—recorded in the county "Flora." We learn that at that time it shared this station with *alterniflora* and *stricta*, but the former, as we have seen, cannot now venture beyond the rampart we have mentioned; and the latter has disappeared altogether.

IV. THE BEAULIEU RIVER. Unsuccessful in my search for *S. stricta* in the Southampton Water, I shook its mud off my hob-nailed boots, and betook myself to the banks of the Beaulieu. After my late experiences I did not build much on Bromfield's "shore at lower Exbury in plenty" cited by Townsend; and when I reached this beautiful stream at Gilbury Hard I was not surprised to find the ground occupied by the aggressive *Townsendi*. As far as the eye could reach, on either bank, the giant *Spartina* held sway; not only fringing the water, but running along every dyke, filling every pool, and invading the broad borders of marshland, now crimson with sheets of dwarf *Salicornia*, and lately blue with *Statice*. It has advanced up stream half-way to Beaulieu village; down stream of course it has annexed every foot of the salt mud it covets. It stretches right and left from the river-mouths. It is recorded as far as Hurst Castle and Lymington. I have gathered it at Calshot. At Fawley I have looked down on the vast territory it now occupies, and so we trace it back to its *fors et origo* at Hythe.

But the conquests of *Townsendi* must not make me forget that I have witnessed the last stand of *stricta*. A little below Gilbury Hard I came upon a straggling camp of poor little pigmies, almost at their last gasp. Hemmed in, with the ruthless hordes of *Townsendi* in front, and the deadly dry bank behind—an object-lesson, let us say, in the Survival of the Fittest, but even so, it was a spectacle not without its pathos.