Bird's Steering Methods.

MR. HEADLEY's suggestion (NATURE for July 27) that gulls sometimes steer by dropping one foot, is, it seems to me, hardly tenable, for so small a rudder acting on so thin a medium as air would be of little effect. And although I have seen many gulls under very varying circumstances, I have never seen them even appearing to direct their course in such a manner.

That birds, to a great extent, steer by changing the position of their centre of gravity is undoubtedly correct, and it is especially true of birds with long narrow wings, such as the petrels and shearwaters. The albatross exhibits this method to perfection, and anyone who has watched this bird circling far and wide, will have noticed what an angle the outstretched, almost motionless, wings make with the level of the water, an angle frequently as great as 45°.

The flexion of the body is, I take it, of comparative little help, difference in force or direction of wing stroke being the main method by which birds direct their course.

The wings may act synchronously, a change in the direction of one wing causing it to act with more or less force than the other, while such change might be so slight as to elude the eye, or even a camera. A humming-bird will hover about a cluster of blossoms, now hanging motionless, now circling right or left around the flowers, and as there is no turn of the head or swaying of the body, it is evident that the directed force lies in the wings, although their presence is indicated by a mere hazy blur. The body is usually held at an angle of from 30° to 45° with the vertical, and the tail is kept closed, being indeed rarely spread, except when the bird is darting about in the air.

The use of wings is well shown by the crows, which in fall and winter roost in great numbers on the other side of the Potomac, and may be seen towards sunset winging their way homeward from their feeding places. When the wind is light, the crows fly high and steadily, but in windy weather they may be seen beating back, just skirting the tree-tops, apparently to take advantage of any favouring eddy that may exist near the earth. As the birds dart up and down, and from side to side, one can clearly see the wings open and close, and unless my eyes are very deceptive, the two wings are by no means always opened to the same extent.

The principal use of a bird's tail seems to be to effect vertical changes in direction, and while birds with moderately long tails usually have a more graceful, gliding flight than their abbreviated relatives, they are no more expert on the wing. The flight of the forked-tailed swallow is more pleasing than that of the short-tailed chimney swift, but the swift is quite as much at home in the air as is the swallow.

Birds with unusually long tails, such as the hornbills, are apt to be but indifferent flyers.

Washington, D.C., U.S.A., August 14. F. A. LUCAS.

The Early Spring of 1893.

THE exceptional character of the spring of this year has already been described in these columns. It seems worth the while to inquire to what extent the warm weather commencing in March affected the times of flowering of our native flora. The Botanical Section of the Halifax Scientific Society has now for seven years, since 1887, kept a record of all plants observed by its members growing within the limits of the Halifax parish. This, it may be mentioned, is of considerable extent, perhaps measuring six miles by twelve or more. Thus, the record affords a means of comparing the dates of flowering this spring with those of previous years. Of course these will not coincide with records from other districts, as the South of England, but they will satisfy the necessary condition of such an inquiry, viz. that the district should be of limited extent so that the time of flowering of any species in one year is practically the same throughout it. In addition there is the advantage that the drought was not so great as to retard or kill the vegetation. On the other hand, such a record must necessarily be open to error; a plant may have been in bloom some time before it was met with; only a comparatively few species have been recorded every year without a break; some days often intervene between a flower being in bud and in bloom, and the record may possibly, without saying so, refer to the former. However, these errors are partly constant, and may be partly eliminated by neglecting the rarer species, which have only been noted two or three times.

In February almost the only plant to flower was the hazel, seen this year on the 15th, and last year fourteen days later.

In March twenty different species were observed in flower; of these only half had been previously recorded in March, the other half being equally divided between April and May. Coltsfoot (*Tussilago Farfara*) and *Salix Caprea* appeared at the usual time within the first week; the daisy was not noticed till the 31st, whereas it had previously been found on the 29th; but almost all the others were very much earlier than usual. The average was more than eighteen days before the earliest previous record. This is borne out by the fact that the same elm (*Ulmus montana*) was in flower this year (on March 9) twenty days earlier than last year. In some cases, e.g. *Stellaria Holostea*, *Ranunculus acris*, and *Alchemilla vulgaris*, the period was increased to as much as five weeks.

There were a few apparent exceptions, but they may certainly be put down to accident or rather neglect. The chickweeds, *Cerastium triviale* and *Stellaria media* escaped notice till April, groundsel had previously been noted earlier than April 9, and shepherd's purse was no doubt in flower early in April, but was ignored till May came in.

The effect of the weather became more pronounced throughout April. Excluding the common "weeds" just mentioned, every flower was at least a fortnight before its earliest previous record, and the list of twenty-five species is composed almost entirely of May flowers; in fact the only exceptions were the wood sorrel and the marsh marigold, in flower on the 5th and 8th, or antedated fourteen and twenty days respectively. On an average the flowers of April were 25.5 days earlier than in any of the previous years. The exact dates of a few of the commonest are appended.

<i>Cardamine pratensis</i>	April 8, 1893; May 10-15, 1887-92
<i>Scilla nutans</i>	" 13, " " 1, 1887
<i>Lychnis diurna</i>	" 13, " " 10, " "
<i>Veronica Chamaedrys</i> ...	" 13, " " 15, 1888
<i>Allium ursinum</i>	" 16, " " 5, " "

Thirty-five fresh species were added in May, twelve of which are usually June flowers. By this time, however, it became difficult to keep a complete record, so that about half a dozen appear to flower later this year than in one or other of the previous years. Again excluding these, the remainder flowered seventeen days earlier than before. From a consideration of those given below it would appear that the season was about three weeks earlier at the beginning of the month, and a fortnight at the end.

<i>Cytisus Scoparius</i> ...	May 6, 1893; May 13, 1890
<i>Orchis mascula</i>	" 6, " " 14, 1892
<i>Geranium Robertianum</i> ...	" 6, " " 17, 1887
<i>Trifolium pratense</i> ...	" 6, " " 28, 1892
<i>Quercus Robur</i>	" 6, " " 29, 1887
<i>Crataegus Oxyacantha</i> ...	" 7, " " 29, 1888

(But usually June 3-9.)

<i>Rhinanthus Cristagalli</i>	" 27, " " June 9, 1890
<i>Chrysanthemum Leucanthemum</i> ...	" 27, " " 9, " "

In June the advance still remained about a fortnight, taking twenty seven species into consideration, but an increasing number have to be left out owing to the impossibility of recording all as soon as they appeared. Ten out of the twenty-seven had previously belonged to the catalogue of flowers appearing in July.

<i>Lychnis Flos cuculi</i> ...	June 10, 1893; June 17-26, 1887-92
<i>Silene Cucubalus</i>	" 10, " " 26, 1888
<i>Rosa canina</i>	" 10, " " 28, 1887
<i>Centaurea nigra</i>	" 10, " " July 2, 1889
<i>Lonicera Periclymenum</i>	" 15, " " 2, 1892
<i>Spiraea Ulmaria</i>	" 15, " " 2, 1889
<i>Digitalis purpurea</i> ...	" 15, " " June 24, 1890
<i>Valeriana officinalis</i> ...	" 17, " " 21, " "
<i>Achillea millefolium</i> ...	" 26, " " 27, 1892

In July there seems to be no evidence for the maintenance of the advance; the flowers were then appearing at their normal season, e.g. —