

EVENING DRILL OF CHIMNEY SWIFTS DURING
THE LATE SUMMER.

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Boy and man, to use a quaint old expression, I had had a friendly interest in Chimney Swifts (*Chatura pelagica*) for years before I had opportunity to observe one of their retiring drills. In August, 1922, a group gathered at one of the tall old chimneys in a house near the Governor's mansion in Columbia, S. C. My work carried me out of the city the next day, and I was gone for several days. Ten years later, almost to the day, I found another such band wheeling about the chimney of Christ Episcopal church in this city. For several days I had excellent opportunity to study their movements. The advance of twilight brought out the gathering "chippers," though one evening they began more than half an hour before sun-down.

Swifts collect by hundreds in a formless mass, then perhaps they dart away for a number of blocks, form a long line like a letter "I" and advance on the chimney that is to be their host. Coming near the leaders veer to the right or left and draw the line into a "J," at times perhaps reversed. The tail curls into a circle, and the whole band presents the appearance of a script figure of "6," also perhaps reversed, the tail being wound rapidly on the revolving loop to form an "O." This ring may grow wider or contract, and often a few birds lead off to the outside and are followed by a trail that for an instant gives the whole group the appearance of a small Greek delta, " δ ," then if all follow, in another instant we have an "S"; then quickly the upper loop closes into a new circle on which the lower part of the "S" is rapidly wound, and soon a counter-clock revolving ring has given place to one turning clockwise. But all the individuals may not follow. Sometimes enough remain in the old circle to keep it going, the neck of our small "delta" turns upon itself and strikes back upon the first ring and quickly we have a figure of "8" the two loops revolving in opposite directions, one on the other like cog-wheels! The law that drives vortices in a particular direction on a particular side of the equator cannot tyrannize over the Swifts. Once only a crowded "10" (with the "1" apparently crushed against the "0") was seen; better say a small alpha, " α ," or a mathematical node. The birds seemed to sweep in at the upper tab, swing round the loop and emerge at the lower tab. This gave place to a sort of double ring or figure of "8" with segments dropped from each loop in such a way as to produce a fleeting figure of "3," but so rapidly was all this done that the eye could not record with accuracy the processes involved. The absence of the involved figures is noticeable during the last days of their performance, but this may be no more than coincidence.

This unconscious sky-writing, or perhaps merely sky-lettering, was concluded one evening in ten minutes, on another it ran to nearly fifty. A new band coming up one evening seemed about to plunge into the oncoming side of the ring. Some collisions must have resulted had they not quickly adjusted themselves to the flow of the current the group being wound gracefully into the revolving reel. Once only, circling gave rise to two nearly parallel lines travelling in opposite directions. Again a spindle-shaped mass curved at each end to form a crescent; some birds sped across from one tip to the other forming a clumsy one-sided "O" like an old bow-basket and its handle, but the mass quickly followed the lead to form the revolving circle.

However the drill progress, long or short, it terminates in the unwinding of the final circle into the mouth of the chimney. Sometimes small groups of the birds passing above the chimney drop toward its mouth in a gesture of seeming salute but the urge of the ring above seems to draw them back. It is dip, dodge and pass on. At last, however, with increasing darkness, some drop from the ring and settle within the chimney and a living line follows like a thread from a rapidly revolving spool or reel. The unwinding may come either from the inner or from the outer side of the circle. As many as 300 may drop in per minute and the circle quickly unwinds. Small bands arriving late may drop in without any more formality than momentarily fluttering above the chimney.

Probably members of the same flock seen at Christ Church in August, 1932, used the same chimney May 4, 1933, with some attendant aerial evolutions.

The records given here are from notes made on the spot during the August drills. The term "S-ing" is of course coined from the process already described. The figures at the left refer to the number of minutes elapsing after the drill got under way. In the case of duplication of a figure the latter indicates the same minute plus additional seconds not accurately determined.

August 25—At 6:55 a gathering action was apparent among the birds. In five minutes, at seven o'clock, notes on the evolutions of the group were possible.

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| 1. Mass; disperse; fly away; return. | 18. Return. |
| 3. Ring forms. | 19. "I, J, reverse 6, to O." |
| 5. Breaks up. | 20. Great ring. |
| 6. Ring reforms. | 21. Becomes an "8." |
| 16. Break; fly off. | 22. One ring again. |
| 16. Back over chimney. | 22. Break up. |
| 17. Fly away again. | 23. Fly away. |

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| 23. Back; great ring. | 30. "I, J, reverse 6, to O." |
| 24. Rearranging. | 31. Begin dropping in. |
| 24. Great ring. | 33. Loud chippers cease. |
| 25. Concentrating. | 33. Nearly all in; ring almost gone. |
| 25. Massed. | 35. Seven still out. |
| 26. "Crowded 10." | 37. Two still out. |
| 28. "Figure of 3 into an 8." | 37. One chippers. |
| 28. Re-ring over chimney; some
dip and dodge. | 41. One drops in; other disappears. |
| 29. Reverse movement. | 53. Too dark to distinguish the
birds from the bats; others may
be in. |
| 29. Ring breaks up. | |

August 26—Some western clouds were visible. At 6:44 an assembling had begun. Nothing noteworthy in action until the first minute after 7:00.

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| 1. Circling. | 13. Sweeping about. |
| 1. Into parallel lines. | 14. "Mass; crescent; bow-basket, to
O." |
| 3. Broader circle. | 14. Counter-clock; S-ing apart. |
| 4. Counter-clock S-ing into clock-
wise O. | 15. Gesture to chimney. |
| 5. Circling. | 16. "Figure of 8." |
| 6. Counter S-ing to Clock. | 17. Circle; new band joins. |
| 7. Disruption. | 18. S-ing into counter-clock. |
| 7. Dispersal. | 20. Reverse; then "8." |
| 8. Return. | 21. Still an "8." |
| 9. Sweeping about. | 22. Begin dropping in. |
| 10. Circle; reverse. | 22. Circle broken up; chippers cease. |
| 11. Sweeping; circling. | 28. Last seen to drop into chimney. |
| 12. Counter-clock. | |

August 27—A few were about the place at 6:43. Drill began about 7:10.

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| 1. Circling counter-clock. | 8. S-ing to counter-clock. |
| 1. S-ing into clock-wise. | 9. Clock-wise. |
| 2. Break up. | 10. Many drop in. |
| 3. Counter clock. | 10. S-ing to counter-clock. |
| 4. Break up. | 12. Dropping in again. |
| 4. Counter clock. | 14. Chippers cease. |
| 5. "Figure of 8." | 16. 3 fly away. |
| 5. Break up. | 18. One seen outside. |
| 6. Clock-wise. | 20. One drops in. |
| 7. First dips at chimney. | |

August 29—A trip out of the city caused me to miss observations on the 28th. About 6:45 the first chipper was heard; by 7:00 gathering chippers were heard. The circle drill began about nine minutes later.

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| 1. Clock-wise circle. | 7. Clock-wise; dropping in resumed. |
| 2. Counter-clock. | |
| 3. Clock-wise. | 8. General chippers cease; belated band arrives and drops in without going through any true circular drills. |
| 4. Gesture to chimney. | |
| 5. Counter-clock. | |
| 5. Dropping into chimney. | |
| 6. Dropping in suspended. | 10. Last two left on the outside drop in. |

By way of experiment, this time I went to the chimney and struck a large piece of tin that closed an opening at the base. Perhaps a hundred out of eight hundred or a thousand in the chimney fluttered out and flew off, but most or all later returned and entered the chimney again. One might have conjectured an increasing efficiency in the bed-time drill from following the actions of the last few evenings.

August 30—First chipper was heard overhead at 5:30; another at 5:47; as the clock was striking six a number swept in from the west flying low. A minute and a half later a few essayed one or two circles. At 6:23 they were thick. Several dipped toward the chimney amid chippers. Real drill soon began.

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| 1. Gathering thick. | 14. Dropping in suspended. |
| 3. Counter-clock. | 14. Dropping in resumed. |
| 3. Reorganizing. | 17. Circle disrupted. |
| 3. Clock-wise. | 29. Much chipping; new band arrives; circle reformed; another band arrives; counter-clock. |
| 4. Counter-clock. | |
| 4. Break up. | 31. Scatter; counter-clock. |
| 5. Almost counter-clock. | 32. S-ing to clock-wise. |
| 6. Clock-wise. | 33. Counter-clock. |
| 7. Break up. | 34. Break up, from new bands pouring in as it appears, these tend to disrupt drill. |
| 8. Counter-clock. | |
| 9. Clock-wise. | 38. Clumsy circling, and apparently disordered dropping in. |
| 9. Counter-clock. | |
| 10. Break up. | 49. 2 out; new group arrives. |
| 11. Clock-wise. | |
| 12. Broader circle; and counter-clock; begin dropping in. | |

Whether the seeming disruption of the seeming increase of efficiency came as a result of new and untrained recruits from further north coming in would not be wise to conjecture. Nor can any reason for the earlier time period on this afternoon be given. Observations were interfered with after this by the birds shifting their location. Either this flock or another

showed up at the chimney of a church in another block. Persecutive measures on the part of a church, that could not appreciate with the psalmist the cradle the Swallow found for her young at God's altar, interfered with scientific observation. Smoke, fire, sling-shot, persecutive small boy, and neurotic adult gave scant welcome to these useful insect-destroyers.

Effort to observe the morning departure of the birds was highly unsatisfactory. August 27, I rose early, and at 5:30 with the bats still about, was in the cemetery back of the church waiting. One bird after another awoke and gave its distinctive call. The sun came, rose to an hour high, still no birds. At ten minutes to seven, in response to a noise below, they came boiling out, dropping like emerging bats do over the edge of their dormitory. In three minutes all were out; in another two minutes the sky showed not a Swift, all had flown west, probably making for a large meadow on the nearby river. August 28, I arrived before the emerging time of the previous day, and waited until after nine o'clock to find the chimney empty, they had gone ere I arrived. August 30, while I waited at about 7:12 a.m. a laborer began whetting a scythe near the chimney and the sooty host seemed to explode into the air. September 1, I reached the churchyard some time before darkness lifted. The low mutter of wings inside the chimney seemed to indicate an approach toward the mouth. At 5:52 there was a chipper overhead and finally in the dim light cast by the obscured sun I made out the forms of a few Swifts. At two minutes of six I was testing the depth of a hole in one of the buttresses of the church with a straw, when the Swifts started from the chimney and kept coming for about seven minutes, some seven to eight hundred in number. By the lapse of an additional seven minutes the sky was virtually clear of Swifts. Their irregular rising is quite as intriguing a habit as their evening drill. To say the least, I have lost some of the superior feeling I once entertained for the old protonaturalist who, intrigued by such mysterious birds, theorized that they spent the winter on the bottom of the sea!

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