Summary:

	Cooperators	Birds Banded
State Game Departments	38	90,229
National Wildlife Refuges	28	26,287
Special Units	19	60,571
Cooperators Banding Over 1,000	35	66,633
Cooperators Banding 500 to 1,000	42	29,614
Cooperators Banding 100 to 500	153	34,867
Sub-totals	315	308,201
Cooperators reporting less than 100	298	10,020
Late schedules not included above	...	36,349
Total	613	354,570

From the summary it will be seen that the banding of 354,570 birds during the banding year 1950 was the accomplishment of less than 700 cooperators and units.

Bird-Banding Office, U. S. Fish and Wildlife Service, Laurel, Maryland

A STUDY OF THE BEHAVIOR AND POPULATION OF PINE SISKINS AT NORTHAMPTON, MASS., FEBRUARY-MAY, 1947

BY B. M. SHAUB

Small groups of Pine Siskins, *Spinus p. pinus* (Wilson) were observed on the lawn and occasionally about the feeding trays around the middle of February. Later they visited the traps used for taking Evening Grosbeaks, the banding of which was conducted in cooperation with Mr. Edwin Mason, Superintendent of the Arcadia Wildlife Sanctuary, which is located a couple of miles to the south. Our station was at that time operated as a sub-station of the Sanctuary and when the Siskins began to enter the Grosbeak traps during the last week of February, arrangements were made with Mr. Mason to band some of these birds to see if they were winter residents or if they would move on to another locality as the winter progressed.

Trapping began on the 26th of February and within a week it was quite evident that there were more Siskins in the vicinity than we had estimated and the repeats appeared to indicate that a population study of the birds as winter residents or as a migrating flock might readily develop. In order to take advantage of an excellent opportunity to obtain detailed and accurate data on the behavior and population of our little visitors we gave considerable and careful attention to the details of the study which ran parallel with the work of banding the Evening Grosbeaks. At times one had to waver in his decisions as to which should be given first consideration as the small birds were usually

taken in the same traps used for the larger ones. However, the work progressed at all times without too much interference and loss of takes of either species.

The Siskins as well as the Grosbeaks and Purple Finches were taken in wire traps into which the birds walked or they were captured in a window trap with a drop door operated from within the house. When the Siskins were not disturbed they would walk in and out of the large wire traps without much concern or difficulty. They would usually keep their gaze directed to the ground in search of food and consequently they easily found the openings through which they would readily leave the traps. After walking around the outside for a short time they would often repeat a trip to the inside.

When it seemed that the Siskins were leaving the traps as fast as others would enter, we would approach the site and the movement thus entailed would alarm them and in the excitement they seldom found the openings but were transferred to a small cage from which they were taken and banded. When released they would usually fly to the nearest tree and then shake their feathers a few times, peck at the band and be off in search of more food.

In addition to the food in the traps, we kept a "free" supply of sunflower seeds and small bird food in a window feeding tray to which many of the birds in the vicinity came readily for their supply. The Grosbeaks and the Purple Finches crushed the husks of the sunflower seeds while standing in the trays. In this operation they often crushed the kernels, as well, and the small fragments would often drop to the tray. The squatty little Siskins spent much time searching through the husks of the sunflower seeds for these tidbits, and while searching for these they would challenge any other bird that was in their path or that approached them. The challenge was made by partly spreading their wings and extending their necks with open bills and at the same time uttering a series of faint threatening notes. The Purple Finches and other birds of a similar size would retreat before this formidable approach. Frequently the Grosbeaks, many times their size, would shy away, apparently out of courtesy for the little fellow, but occasionally the Grosbeaks would stand their ground and extend their big bills toward the Siskins. In such instances the Siskins would quickly make a hasty retreat without any further argument or show of displeasure.

The Siskins came as readily to the window tray and trap as they did to those on the porch and on the ground. It was not until the snows disappeared and the ground opened up that they deserted the offerings at the feeding tray and traps. They were quite tame and would frequently come within a distance of a few feet while others were being taken from the traps and after we left the traps they would often return in a few minutes. It was not too unusual for them to repeat on the same day that they were banded. One was trapped five times on the first day it was first caught but it did not repeat later. Others occasionally repeated three and four times a day.

Our last takes were on the 11th of May; however, the Siskins remained for several weeks longer, spending their time mostly in the elm and other trees. Occasionally they would alight on the lawn and search

it industriously for seeds and other requirements. When the dandelions sent up their white seed heads the Siskins could be seen hopping up onto the stems to bend them to the ground where they would pull out the seeds for food.

Aside from the pleasure of working with these delightful little birds, there are several interesting deductions that can be made from the banding data. While it is desirable from a statistical point of view to have a greater number of individuals under consideration, nevertheless, the number involved in this study together with their distribution in time is sufficient to indicate clearly, and possibly quite truthfully, certain behavior characteristics and supply ample data for a reasonably close approximation of their population in the vicinity where banded. It would have been desirable to have had other stations radially disposed to determine the area covered by the individuals banded and to determine to what distance they would return to the station where banded. One report was sent to Mr. Mason at the Sanctuary by Mrs. Louis Cave, Jr., of Northampton stating that two banded Siskins visited her feeding tray on April 25th. The distance is about 1½ miles.

The entire record of banding and repeats is shown in fig. 1. An examination of this record will show at once that the birds with which we were working were not, in all probability, wandering winter visitors or transients as they generally have been described. On the other hand they had more-or-less settled down in Northampton and vicinity for the winter and spring as is shown by the continued repeat record of the birds banded on the first two days, February 26th and 27th. The birds banded on these days, Nos. 43-25350-56 were with us rather regularly over a period of 2½ months, although it is possible that they could have made visits to other localities nearby and as often returned.

Concerning the occurrence of the Pine Siskin in the Connecticut Valley of Massachusetts Eliot (1932: 102) states that "it seems curious that this bird should be almost exclusively a May migrant here. It is often common in the first third of May and has been seen as late as May 28th, 1926." And again Bagg and Eliot (1939: 726) refer to the Siskin as an "irregular visitor, in autumn usually rare but once in eight or ten years widely distributed; in winter usually to be found in the hill-country but only occasionally in the lowlands; in spring, particularly early May, frequently observed but not a regular transient."

Where numbers other than 1 occur in the squares at the intersections of band numbers and dates, Fig. 1, for any particular band number it indicates the frequency that the bird repeated on that date. The multiple daily repeats are of some interest for it shows that the birds were not extremely wild but on the other hand 11 of the 26 multiple repeats occurred on the first day the bird was caught and most of these were during the first two weeks after the birds discovered the food supply at the traps and window tray. This could indicate that the Siskins either became more wary after being trapped or, what is more likely, that they were on the average hungrier on their arrival and less fearful than later when they could readily obtain food at quite a number of places in the neighborhood where the Grosbeaks were being fed. The frequency of multiple repeats of the same number of times per day

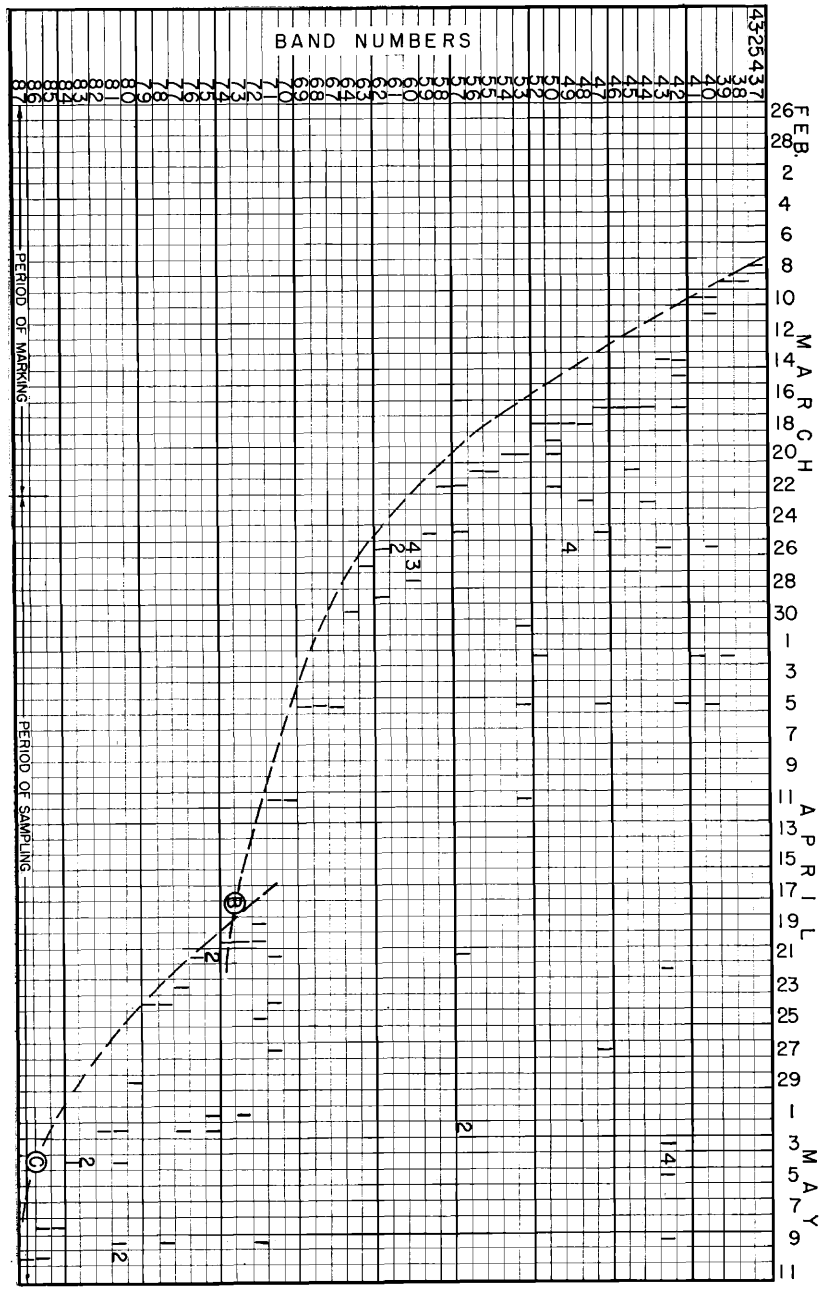

BAND NUMBERS
PERIOD OF MARKING
PERIOD OF SAMPLING
FEB.
MARCH
APRIL
MAY

Figure 1

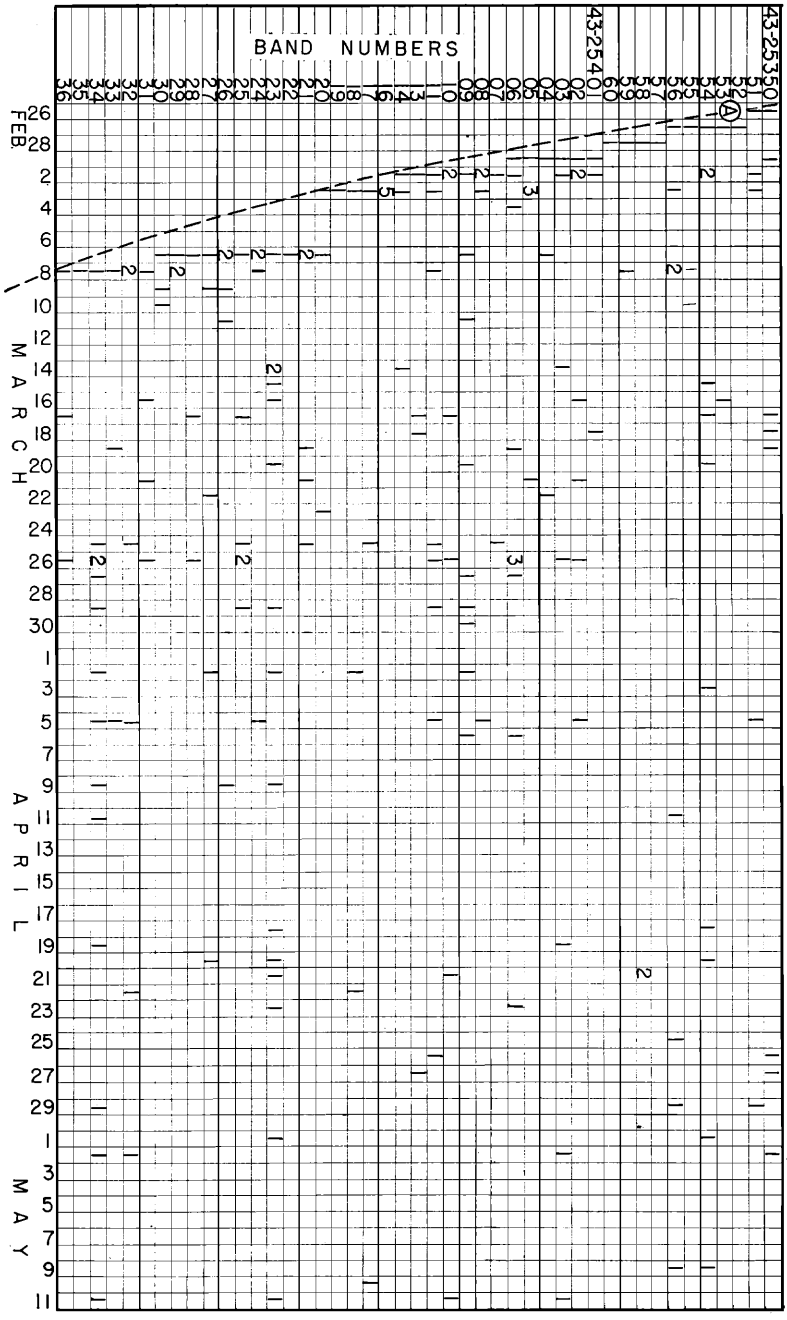


Figure 1 *(Continued)*

is of the general order to be expected for the low number of instances involved. One bird repeated five times in a day, 3 each repeated 4 and 3 times while 19 repeated twice in a day.

During the first 11 days of the 75 included in this study, 51.6% of the birds were banded. When we started the banding of the Siskins it was with a view of possibly determining something about their habits as sporadic visitors or transients during the winter and spring. As they came so readily to our traps, it was hoped that a considerable number might also be taken and reported by the other banders in Massachusetts and Connecticut engaged in the banding of Evening Grosbeaks. Only one such report was obtained. Mr. Alfred Tobey of Eaglebrook School at Deerfield, an air line distance of 17 miles, trapped 43-25445 on April 24th. The bird had been banded on March 17th and repeated once on the 21st.

On the other hand the answer to another interesting problem seemed to be developing rapidly as the banding progressed. The birds always appeared in small flocks and the total number of individual birds was estimated to be of the order of 20 to 25 by a few of the birders who saw them. In five days we had banded the maximum number estimated and it was evident that there was a considerably larger number of birds in the area. As the work continued the behavior pattern and the accumulated number of birds banded showed that we were dealing with an apparently constant population and a small statistical universe of animate objects. The interest in the work was heightened by the little known and unusual behavior of these birds in the Connecticut Valley.

Three factors are necessary for a population study by statistical methods if some degree of accuracy is to be obtained. First, the population must remain essentially constant for the next two steps which consist of marking and sampling the flock. When the numbers of birds taken at one time are small and since the birds must be released at once the identity of each, as its band number, is essential for in a sample consisting of a week's take the individuals cannot be counted more than once.

If the population remained absolutely constant, with no additions or removals, and every bird were *equally likely* to be trapped then the results would be accurate except for such variations as occur in dealing with a comparatively small number of things or individuals as the case may be.

The constancy of the population might be recognized by the rate of takes together with the distribution of repeats subsequent to the day of banding; all other factors remaining reasonably constant. One of the determining factors of considerable importance on the rate of takes is of course the weather. On cold snowy days the number of birds trapped is rather high while on warm spring-like days it is low and little knowledge about the flocks can be gained, although the birds are often in the immediate vicinity.

The addition or departure of a comparatively large number of individuals would be expected to affect the data in some noticeable way providing other compensating factors did not simultaneously occur. The addition of a considerable number would change the rate of takes

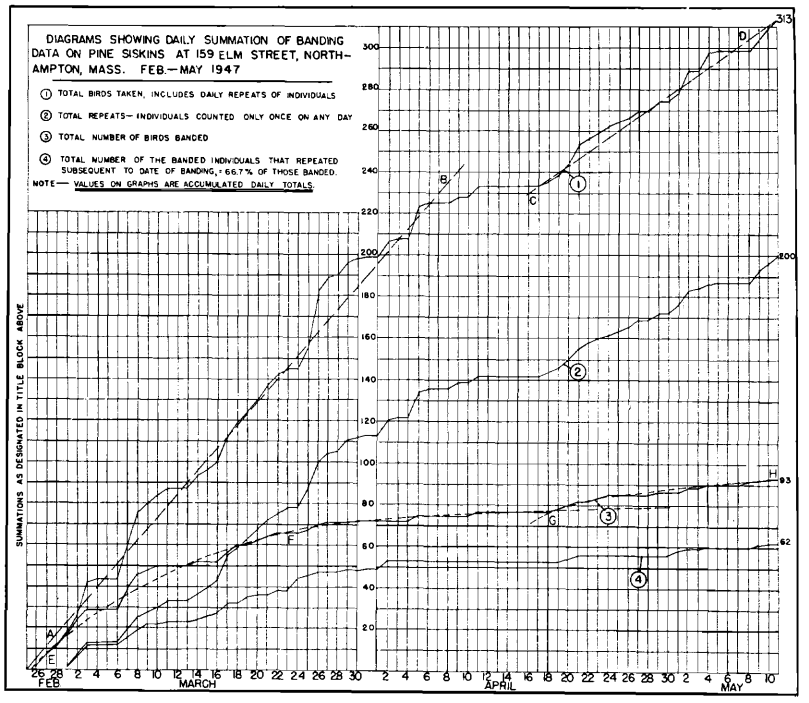
by steepening the curve while the removal would produce the opposite effect as well as show blank repeat areas if they represented a closely bonded unit which was banded at the same time. However, the loss and gain of birds might balance so that the rate of takes would remain constant.

The departure, as a group, Fig. 1, of birds 43-25458 to 64 incl. and 43-25467 to 70 incl., 11 individuals, might be suspected by the absence of repeats in the area following the numbers. It is also a possibility that these birds remained in the general area and were not trapped although they were equally likely to have repeated.

TABLE 1

SAMPLE NO	SAMPLE PERIODS DATES INCLUSIVE	TOTAL NO. OF BIRDS BANDED = A	NO. OF BANDED BIRDS IN SAMPLE = B	NO. OF UNBANDED BIRDS IN SAMPLE = C	TOTAL NO. OF BIRDS IN SAMPLE = B+C	RATIO = R=B+C/B	POPULATION = A x R
1	MAR. 23 – MAR. 29	67	24	5	29	1.21	81
2	MAR. 30 – APR. 5	67	20	4	24	1.2	80
3	APR. 6 – APR. 12	67	7	2	9	1.28	86
4	APR. 13 – APR. 19	67	4	1	5	1.25	84
5	APR. 20 – APR. 26	67	13	7	20	1.54	103
6	APR. 27 – MAY 3	67	12	3	15	1.25	84
7	MAY 4 – MAY 11	67	8	5	13	1.63	109
8	MAR. 23 – APR. 19	67	38	12	50	1.32	88
9	MAR. 23 – MAY 11	67	41	27	68	1.66	111
10	APR. 20 – MAY 11	67	19	13	32	1.68	113
11	APR. 20 – MAY 11	81	23	13	36	1.56	127
POPULATION AVERAGE OF ALL SAMPLES IS 97							

Figure 2



The examination of the accumulation curves of Fig. 2 shows a number of interesting facts. Curve 1 represents the accumulated takes including the daily repeats of individuals. The rate of takes, as represented by this graph, remained rather close for the average, line A-B, from the start of banding until the 6th of April, a period of 40 days. This period was followed by nearly two weeks of warm spring-like weather during which relatively few takes were made. This period of warm weather was followed by three weeks of unseasonably cold, rainy weather which sent the birds back to the feeding stations but not in the numbers previously present as shown by line C-D and the repeats on Fig. 1. This lower average in the number of birds trapped per day indicates that the population had decreased by birds moving out of the area during the warm weather or that they spent much less time around the feeding stations as this season of the year is more favorable for them to obtain a considerable part of their food requirements than during the months of February and March. The number of repeats of the earlier birds banded shows a definite decrease while an apparently new group entered the area as is shown by an increase in unbanded birds and the proportionally higher number of repeats of this new group as shown at the lower right part of Fig. 1 and outlined by the dotted line B-C.

Graph No. 3 Fig. 2 is the accumulated record of the number of birds banded. It shows a rather decided flattening around the 20th to 22nd of March although the rate of takes, curve 1, remains constant. This flattening of curve 3 indicates that the remaining unbanded birds were becoming fewer. The curve will flatten along the line representing the total population. To effect the banding of the total population would require a considerable time even though the birds remained and continued to visit the feeding stations and traps. This curve also indicates the addition of a new group of birds during or at the end of the warm period when the birds again came to the traps. This section G-H of the curve continues to rise showing that an addition has undoubtedly been made to the previous and much larger group.

The accumulated total of banded birds that repeated subsequent to the date of banding is shown by graph No. 4 of Fig. 2. These birds had to make at least one return from their roosting place. The graph has essentially the same characteristics as number 3 and shows that two-thirds of the birds banded repeated subsequent to the date of banding. It is this large number of repeats which, about the middle of March, made it possible to make a reasonably accurate calculation of the number of birds in the flocks at that time.

For the purpose of calculating the number of Siskins in the area one could select any initial sampling time after 50 to 75 birds had been banded. For this study one could select dates between the 9th and 23rd of March with approximately the same result, the variation being about $\pm$ 5 birds. If we select the later date we have a banded population of 67 individuals as a basis for computations. The results of the weekly samples from the 23rd of March is shown in Table 1. During the next four weeks, 4 samples, Nos. 1-4, were taken giving an average of 83 $\pm$ 3 birds. Sample No. 11 for the period April 20th to May 11th,

based on 81 birds banded up to the beginning of the period, gives a population of 127. This is obviously too high because of variations in the numbers of the departures and arrivals previously discussed. On the assumption that the arrivals and departures were of the same order of magnitude and that the "old" birds visited the traps as frequently as the "new" ones from April 20th to May 11th, a sample between these dates, based on 67 banded individuals, would indicate a population of 113 birds as shown by sample No. 10. An average of samples Nos. 7, 9, 10 and 11 gives a population of 115 as an over-all figure. These are believed to be too high as the new arrivals appeared to rely more on the newly discovered food supply than the older birds which were no doubt more widely distributed and familiar with other food supplies. A still more valid assumption is that there was a larger number of departures than arrivals. These factors appear to give a somewhat higher population than it actually was. I believe a somewhat lower value of 105 to 110 is probably closer to the actual numbers over the period of this study.

Much of the credit for the success of this study is due Mrs. Shaub, who spent many hours, in the writer's absence, tending the traps and keeping the record. .

LITERATURE CITED

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1932 Notes from the Connecticut Valley of Massachusetts. *Auk*, 49: 101-102.

BAGG, AARON CLARK, and ELIOT, SAMUEL ATKINS, JR.
1937 Birds of the Connecticut Valley in Massachusetts. p. 726. Hampshire Book Shop, Northampton, Mass.

GENERAL NOTES

A Twelve-year-old Sooty Tern in Arkansas.—A Sooty Tern (*Sterna fuscata* L.) wearing U. S. Fish and Wildlife Service band No. 38-352683 was found dead on Highway 110, near Shirley, Van Buren County, Arkansas, on September 4, 1950. This individual was banded as an immature on June 23, 1938, at Garden Key, Dry Tortugas, Florida. Correspondence with Mrs. Ray Murray, of Route 2, Shirley, Arkansas, finder of the bird, indicates that there is little doubt as to the authenticity of this record.—J. C. Dickinson, Jr., Department of Biology, University of Florida, Gainesville.

(*Ed. Note:* a brief check of published records suggests this may be the first definite record for the species north of the Gulf of Mexico (Louisiana and Texas) and west of the Appalachians-Tennessee and W. Virginia.)

A New Method of Capturing Chimney Swifts.—The classical method of capturing Chimney Swifts (*Chaetura pelagica* L.) involves setting a trap atop a chimney sometime during the hours of darkness. As day approaches, the swifts leave the chimney and are guided into a gathering cage attached to the trap. Although this is an admirable procedure when used on flocks of swifts, it leaves much to be desired when one is studying breeding birds.

During my study of the nesting behavior of this species, a technique was developed which has greatly expedited their capture. At first a small wooden box was fastened, open part up, to the end of a thin pole about 18 feet long, the idea being to scoop the birds off the chimney wall. But as the device was lowered, the swifts fluttered deeper and deeper into the chimney, until they were almost in the fireplace of the unoccupied house.

Further thought yielded a solution which has never failed. On either side and just under the lip of a tall coffee or fruit juice can two holes are punched—one on either side. The ends of a piece of string 4 feet long are tied to each hole.