Sparrow Hawk No. 279949, banded at Huntington, Mass., June 21, 1926, was found dead by C. F. Garner, Dec. 16, 1926, at Newport News, Virginia.

Cooper's Hawk No. 312009, banded at Huntington, Mass., by Harry E. Woods, June 18, 1925, was killed by W. V. Yeager, of Brent, Alabama, Jan. 14, 1927.

Duck Hawk No. 204971, banded by A. A. Cross at Woronoco, Mass., June 1, 1924, was shot in November, 1925, five miles west of York, Pa., by William F. Maul.

These nine recoveries plotted on a map show that in each instance the birds moved southwesterly roughly parallel to the Atlantic, keeping generally some little distance from the coast and to the east of the Blue Ridge Mountains. The four Duck Hawk recoveries show this particularly well. The records, while very limited in number, also suggest that these eastern-born Hawks spend the winter months along the eastern fringe of the country.

Huntington, Massachusetts, February 11, 1927

SOME PROBLEMS FOR THE BIRD-BANDER

BY EDWARD HOWE FORBUSH

THERE are many investigations that suggest themselves to those who undertake to band both fledglings and adult birds. There are so many channels into which their efforts may be directed that no one can hope even to name off-hand all the various opportunities for the acquirement of ornithological knowledge that are open to bird-banders.

There is nothing new or original in the notes below, but they are offered with the hope that they may be useful to members of the Northeastern Bird-Banding Association and that some members may attempt to solve some of the problems briefly set forth. Some light has been thrown already upon the answers to some of these questions by the work of pioneers in this field, but there is still much to be learned. Any one who will choose some one line of investigation suggested below may be able to make a valuable contribution to our knowledge of the birds that we handle.

1. When and how do birds molt?

   In handling nestlings it is well to note the color of the natal down at first, its color later, and all the changes that take place until the bird becomes fully clothed in juvenal plumage. The location of the feather-

tracts from which the down grows should be noted also. Those who repeatedly take the same individual birds have an unparalleled opportunity to study the molt in the wild bird, to see when and where it begins and ends, to note its progress, and to determine whether it is partial or complete and whether the bird has one or more molts in a year.

2. What is the result of fading and wear on the plumage of birds?

   Some birds change color very quickly in the spring without molt. In such cases it is probable that dull colors which veil the brighter plumage below and which are mainly confined to the edges and tips of the feathers are broken off or drop off. Thus the Purple Finch probably grows suddenly red in the spring and thus the Snow Bunting rapidly develops its breeding plumage without molt.

3. Do individual birds occupying the southern part of the breeding-range go farther south in winter than those of the same species that breed in the northern part?
4. Do the individuals breeding in the southern part of the range start south first and return before those breeding farther north?
5. Where, in what direction, and how far — do birds go when they begin to wander after the breeding-season?
6. Just when do the local breeding individuals start south?
7. Do birds return to the same breeding-places year after year?
8. Do birds return year after year to the same wintering-grounds?
9. How extensive is midwinter migration?
10. How far do individual birds travel daily in migration?
11. What local summer resident species winter with us individually as residents, and in what species do individuals move southward to have their places taken by those from farther north?
12. In what way or by what route do land-birds cross the ocean?

    (Many American birds have been taken in European countries and a number of European birds have been taken here.)

13. What birds, if any, migrate in family or neighborhood groups?
14. What is the length of the migration route of individual birds?

15. What is the direction of migration of the erratic species?
    (Some species are very erratic in migration, and appear to be influenced more by food-supply than by the changing seasons.)
16. What routes of migration are followed by individual birds?
17. Determine the number of broods reared by individual birds in a season.
    (Some conflicting statements are made by ornithologists about the numbers of broods reared by some of the most common birds.)
18. What species of birds mate for life, and in what species does mating take place twice in the same season?
19. When sexes are alike (and it is difficult to tell male and female apart), whether or not both sexes engage in nest building and incubation.
20. In what species do the young begin to sing in autumn?
21. In what species do both sexes sing?
22. Note what changes take place in the calls and songs of the individual from juvenal stage to maturity?
23. Make a list of the favorite foods of each species investigated.
24. What do different species weigh?
25. Which species normally mate and breed the second year, and which do not until the third year or later?
26. Note the development and change of color in the soft parts of birds.
    The colors of the eyes, bill, legs, and feet, and also cere, lores, and eyelids, which are naked in some species, change frequently in color from youth to maturity or with the seasons. No accurate records have ever been made of all these changes. I include also the lining of the mouth and the tongue.
    The bird-bander's opportunity for studying and noting these color-changes in the living bird is unequalled. Most of these colors fade or disappear soon after the bird is dead, and can only be studied by examination of the living bird.
27. How long do wild birds live?

In addition to the above a study should be made of the diseases and injuries of birds and a study of external parasites.

No reference is made in any of the above problems to the individuality of birds; i.e., the difference in the temperament, habits, etc., of individuals. There is a wide field for investigation here.