STUDYING ANIMALS

(Summary of the lecture by Dr. V. C. Quesnel delivered at the regular monthly meeting of the club on 12th September, 1968.)

With time and money at his disposal the professional zoologist has an almost unlimited field of study. With little time and money the amateur zoologist is restricted to those areas that may be studied with the simplest means and the most profitable of these are ecology and behaviour.

As an example of what may be accomplished with expensive instruments the identification of pheromones and defensive secretions was mentioned. With such instruments the defensive secretion of the Orange Dog butterfly has been identified as a mixture of two fatty acids, isobutyric and probably isovaleric. But, at the other end of the spectrum, a great deal can be accomplished with only paper, pen and a pair of eyes.

Take for instance, the study of territorial behaviour. The individuals of a species do not roam freely about the countryside; they are restricted to certain small areas. This is the home range. Within this there is usually a smaller area, the territory, which is defended against encroachment from another member of the same species. With birds, a rough idea of the size of the territory may be obtained by counting the nests in a measured area and determining the average area per nest. With other animals such as lizards, more accurate estimates of size can be obtained by observing marked individuals. Minimum area can be found by keeping animals in captivity. In a cage of dimensions 3' x 1' x 1¼' two pairs of **Gonatodes vittatus** could be kept successfully, but not three. Fighting and deprivation of food prevented a third pair from surviving. A description was given of defensive and threat postures in this species. Courtship can also be easily studied by observation of captive and wild animals. A description of courtship in the lizard **Ameiva ameiva** was given.

By conducting experiments with models the important features of the animal for stimulating the behaviour can be discovered. Thus, it has been shown that the essential feature of the European robin in stimulating territorial behaviour is the red breast.

The number of eggs to a clutch, choice of nesting site, breeding season and the growth rate of the young are other aspects of animal biology that can be studied easily. How long does a crapaud take to grow from a length of ½ in. to 8 in.?

Feeding behaviour also provides opportunity for profitable study. What the animal eats can be studied by dissection; how it eats can be studied by observation and experiment. Thus, **Gonatodes** lizards tend to attack prey near the head. In a series of trials 36 out of 50 caterpillars were seized in the front third of the body. By painting false heads on caterpillars and by dragging dead ones backwards it should be possible to discover whether motion or appearance is more important in determining the point of attack.

Once an investigation has been begun opportunities for study multiply. The great thing is to make a start.

HOW TO STUDY ANIMALS

(A drastic condensation of a paper by F. R. Cagle, Tulane Studies in zoology Vol. 1. p. 31, 1953 — An outline for the study of a reptile life history. The subjects included here are those thought to be most suitable for study by amateur naturalists.)

1. Identification; description.
   - Sex differences in size, colour, etc.
   - Changes in colour, weight, form etc. during life: Maximum weight.
   - Are variations a result of environmental factors or heredity ?

2. Geographic range; habitat.

3. Annual changes in the composition of a local population.
   - Sex ratio in mature individuals, juveniles and young at birth.
   - Ratio of juveniles to adults.
   - Enemies.

   Territorial behaviour.
   - Size of territory.
   - Selection of territory; by male or female.
   - Defence of territory by single individual or pair.
   - Behaviour in defence of territory; song, posturing, fighting, etc.
   - Length of time that the territory is maintained.

4. Reproductive performance, potential and actual.
   - Age of attaining sexual maturity.
   - Age of acquiring secondary sex characters.
   - Total period of reproductive activity.
   - Annual season of reproductive activity.
   - Courtship patterns; sex characters involved.
   - Number of groups of young or eggs annually.
   - Number of young or eggs in each group.

5. Eggs and young, and the factors determining survival.
   - Description of eggs; size, weight, colour, etc.
   - Changes in size or weight of eggs during incubation.
   - Place where eggs are laid.
     - Description of nest; behaviour of building adult.
     - Factors determining nest site and reuse of site.
   - Attitude of female (or male) to eggs.
     - Incubation, defence, recognition, etc.
   - Length of incubation: dependence on temperature; extremes tolerated.
   - Gestation: Behaviour of female; length of gestation.
   - Description of birth (or hatching) of young.

6. Description of young: appearance and behaviour.
   - Length of time young remain with parent(s).
   - Major hazards to young.

7. Growth curve: characteristics, rate of growth.
   Length of growing season.
   Factors involved: available food, changes in environment, cyclic changes independent of temperature.
   Possible length of life.
   Average length of life under natural conditions.

8. Annual cycle of activity: growing periods, reproductive periods; quiescence.
   Place of hibernation, or aestivation.
   Factors causing quiescence.
   Preparations for quiescence.

9. Daily cycle of activity.
   Basking: Time, length etc.
   Breeding activities; restriction to part of day.
   Feeding: time of day, length of feeding period, etc.

10. Food Habits.
   Method of feeding or catching prey.
   Food preferences; principal foods.
   Variation in feeding habits during life.
   Seasonal variation in feeding habits.
   Is the animal a controlling or limiting predator?

11 Characteristic and genetically limited patterns of group behaviour.
   Social behaviour; rank, etc.
   Migration.
   Offence and defence.