Br. vet. J. (1971), **127**, 394

PROCEEDINGS OF THE SOCIETY FOR VETERINARY ETHOLOGY

SUMMER MEETING, EDINBURGH, JUNE 1970

Animal Welfare: Synopsis of an Address

By D. G. M. Wood-Gush, A.R.C. Poultry Research Centre, Edinburgh

There is at present very little information on which standards of animal welfare can be based, and therefore it might be profitable to examine theories of motivation current in ethology and apply these to the behaviour of the main agricultural species under modern husbandry conditions in order to see if guide lines for their welfare can be more firmly based.

Motivational theories in ethology assume that the behaviour of animals consists of major tendencies or "drives" that are largely physiologically dependent but with an interplay of learning. For their expression the "drives" are dependent on releasers or key stimuli, although the animals may sometimes respond to sub-optimal stimuli or even supernormal ones. There is also the possibility that in very bare surroundings the animals may perform vacuum activities. Generally it is considered that under conditions of thwarting or of conflict between "drives" animals perform displacement activities, redirected behaviour or aggressive actions. It is also generally considered that animals want a certain amount of arousal but both over- and under-arousal are aversive.

In considering the "drives" of the domestic fowl under battery cage conditions in light of present knowledge of the development and expression of these "drives" the following guide lines for husbandry become apparent.

(1) It is possible to breed for birds better adapted to the battery cage, for, in some "drives" investigated, stocks have been found to differ widely in the adaptation of certain behaviour patterns to conditions of the battery cage.

(2) When temporarily frustrated the fowl will want to preen and when frustration is prolonged the fowl will develop stereotyped pacing. If unable to make these responses the physiology of the bird may possibly be adversely affected but more research into this question is necessary.

(3) Total social isolation of the fowl is to be avoided.

(4) Boredom is a factor to be considered even in an animal as phylogenetically primitive as the bird.

These guide lines also apply to the agricultural mammals, but with their better learning abilities, thwarting, both short-term and long-term, is more likely and more research is needed into the displacement behaviour of these animals, and the effects of preventing its expression.

A Review of Progress in Veterinary Ethology

By B. R. Howard, A.R.C. Poultry Research Centre, Edinburgh

The argument has been put forward that knowledge advances in a series of leaps, rather than as a steady incremental progression. It is intended here to outline the historical background of veterinary ethology, and to suggest that the general hypothesis certainly holds true in this case.

The word ethology is derived from the Greek ethos, meaning character, or something characteristic, but it was not used in its present context until 1843, when John Mill, in his *Logic*, defined it as "the ulterior science which determined the kind of character produced in conformity with the elementary laws of mind . . .". About the same time, Geoffrey St. Hilaire, in France, adopted the term to describe the branch of science which involved itself with studies of the intact animal in its natural environment, as distinct from the experimental, laboratory approach. Gradually, however, the term fell into disuse, as emphasis shifted to examination of the theoretical implications of Darwinism against the background of conditioned reflexes, which was being so fully prepared by Pavlov, Sechenova and others in the Soviet Union.

At the beginning of the present century, the theoretical groundwork for ethology was carefully prepared by Lorenz, Lashley and others who advanced the concept of instinctive behaviour as a chain of events leading to a consummatory act, linked by a number of complex controlling mechanisms. However, field examination of this hypothesis was delayed until the 1940's, when the term ethology once more came into general use to describe the discipline which depended on "field" observation of behaviour patterns.

With the dazzling exception of the domestic fowl, very little work had been done on the ethology of the domesticated species until the late 1940's. This was probably a matter of simple economics, and although the growing need for the intensification of farming methods must have been apparent, it was not until the end of the 1950's that the emphasis shifted from the dog and cat to farmyard animals.

The most recent stride was taken in 1965, with the publication of the report of the Technical Committee set up under Professor Rogers Brambell to enquire into the welfare of animals. Outstanding in this was Appendix III, outlining the "science at hand"; this was outdated, largely empirical and totally dogmatic, invoking deductions from the feral state and even assumptions of function from structure. It was the marked lack of knowledge thus revealed which prompted the establishment of this Society. To be fair, veterinary ethology as a scientific discipline had only existed about 10 years but already a couple of dozen relevant papers were appearing each year, and a great sense of urgency was inescapable.

The immediate sequel to the publication of the "Brambell Report" has been a reduction, by over half, of the number of full papers dealing with veterinary ethology which appear in the British scientific literature each year. This is partly offset by a total of 36 communications which have appeared in the Proceedings of this Society, but it is difficult to see what happens to full reports

of this latter work, unless it is assumed that the material thus collected would not, otherwise, have achieved publication.

It is earnestly to be hoped that the lull is only temporary. Codes of Practice for the intensive keeping of farm animals have already been established, apparently largely on empirical lines. It is essential that the present ground should be adequately tilled and knowledge in the field be generally assimilated before further advances in ethology again shift the emphasis from its present, practically orientated course. Farming techniques are undergoing a radical modification, and it is the duty of the veterinary profession to be prepared for them.

Decreasing Space—Increasing Problems?

By Dr G. C. Perry, Department of Animal Husbandry, University of Bristol

A specific cross-breeding programme was used to produce four-way-cross mice. Twenty-five breeding pairs were then allocated to each of three treatments—small, medium or large cages. The cages were so designed that the floor area could be adjusted according to the number of mice and thereby maintain a constant ratio of floor area per mouse.

First generation breeding results showed wide differences in productivity between treatments. At three weeks of age there were 17 surviving litters in the small cages compared with 7 and 15 in the medium and large cages respectively. Repeat matings were made and the second litter results confirmed the previous pattern (respective figures were 18, 11 and 13).

The cause of mortality among young mice was starvation, and a subsequent examination of some of the breeding females revealed an absence of mammary gland development.

Growth data gathered from the surviving litters showed a non-significant positive relationship between litter size and weight at 5 days of age, which was inversely related to cage size. This effect was not present at 21 days of age, when the heaviest mice were found in the large cages (N.S.).

Observed sex ratios at 21 days of age revealed a relationship with cage size. In the small cages there was 1 male per 0·66 female, medium cages 1 male per 0·89 female and large cages 1 male per 1·5 females.

Activity counts, reflecting emotional or nervous condition of the mice, on randomly selected litters within each line revealed non-significant differences between small and large cages; but a reclassification according to the genotype of the maternal dam indicated the presence of a genotype-phenotype interaction. Similar re-classification of the mortality data also confirmed such an interaction.

Adrenal weights, corrected for differences in the weights of the mice, showed that the ranking of generation 1 breeding females followed a medium cage > large cage > small cage trend. Similar determinations will be carried out on the young mice at 8 weeks of age. In addition, corticosteroid analyses will be carried out.

It is intended to continue this experiment into future generations and

breeding stock will be selected on a body weight basis at 8 weeks of age. A cyclical mating programme will be used to minimize the effects of inbreeding.

Maternal Behaviour in Cats

By Marianne F. Stewart, Glasgow

Observations were made of feline maternal behaviour. Incidences of cannibalism occurred, and inferences were drawn as to the relationship of such occurrences with the environment, size of litter, health of the kittens, health and disposition of the queen and the number of pregnancies she had sustained previously.

The effect of both neonate health and maternal health on maternal behaviour was suggested, and cases were cited of clinical entities in older kittens possibly related to unsatisfactory maternal care in the early neonate stage.

Other behavioural phenomena were noted, such as (a) the tendency of certain groups of cats to adopt a crêche system for their kittens, (b) the attitude of different queens to unrelated kittens, (c) the shifting of kittens from one nest to another, and (d) attitude of the male in certain cases of advanced pregnancy.

These observations were made not primarily as an ethological study, but incidentally while maintaining a cat breeding colony of approximately 125 adults for medical research. As such it can only be regarded as a pilot study, possibly leading to more valuable detailed observations at a later date.