

The Principles of Humane Experimental Technique

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CHAPTER 3

THE ECOLOGY OF EXPERIMENTAL ANIMALS

We may infer that our domestic animals were originally chosen... because they were useful...

The rat and mouse... have been transported by man to many parts of the world...

The L.A.B. Survey of 1952

The L.A.B. questionnaire for 1952 was "sent to all laboratories in Great Britain where animals were, or were thought to be used" (Lane-Petter et al, to which the whole of the present section refers). "It is unlikely that any laboratory using an appreciable number of animals was omitted from the circulation list." Altogether 675 laboratories were circulated; of these, 355 sent in returns fully satisfactory for all purposes of the survey except one (the cost problem). A further 149 sent in nil returns, gave inadequate detail, or refused to supply information. One hundred and seventy-one failed to reply to the questionnaire. The useful 355 were spread over all three main laboratory groupings, and may reasonably be supposed to be proportionally representative. In some of these replies, information about farm animals and lower vertebrates may have been omitted, but much information was provided about even these groups. Fishes (although returned in some quantity) were omitted from the bureau's analysis. One laboratory using very large numbers of mice failed to return a questionnaire. In spite of these omissions, 'it may be taken as a working basis for calculation that the return represents about an 80 percent sample, and that this sample is reasonably representative'. This appears particularly from Table I (from Lane-Petter et al), where the figures of the return are compared with those of the Home Office. The Home Office figures include fish but exclude animals used for serum production. They also probably include repeats of experiments on individual animals; this is less likely to apply to the L.A.B. data, owing to the way which questions were phrased. On the whole, however, the L.A.B. survey may be taken not as a sample one but as something approaching a complete return. This evidently applies also to our own analysis of the same data (next section).

For their analysis, the authors divided all laboratories into three groups. Group I contained laboratories mainly concerned with medical and veterinary diagnosis--public health, hospital pathology, and veterinary laboratories. Group II included laboratories engaged mainly in research and teaching, Group III commercial laboratories concerned mainly with the production and testing of therapeutic substances. "Research" is here used (and by use throughout this chapter) to include both "pure" and "applied"--that is, both fundamental investigations and their application to practical problems until this becomes routine. Group I contains many small or medium-sized laboratories, Group II many of very variable size, Group III a few large laboratories (60 circulated, 26 fully returned). There was admittedly overlap between these categories.

The authors first tabulated the numbers of laboratories using different species (see our Table 2), and then the number of each species used in each Group of laboratories. We shall discuss these results later; here we shall notice an astonishing historical detail. The number of mice used was shown to be over two-thirds of the total for all species. It is between four and five times as great as that of the next most numerous species (rat), between five and six times as great as that of the third (guinea pig), between 27 and 28 times as great as that of the fourth (chicken), and between 35 and 36 times as great as that of the fifth (rabbit); after this the numbers fall off steeply. Even this enormous preponderance is probably an underestimate, in view of the omission of one large mouse-using laboratory. On the basis of the bureau's earlier sample survey, Lane-Petter (1953b) had estimated that mice made up 79 percent of all animals used. It would seem that so gross a preponderance could hardly escape notice; yet until as late as 1943 it was not only not known but not even guessed which was the most numerous species in use! It is clear how much we owe to the war-time pioneers, and to the work of the L.A.B. itself. At the same time this illustration warns us just how ignorant of its own doings this extremely scattered industry can be.

The authors' next table concerned the distribution of animals (of all species indiscriminately) to the three groups of laboratories, and the average number of animals used per laboratory within each group (cf. our own findings, next sections). We reproduce their next table (Table 3), which displays the relative concentration and dispersal of the (numerically) main mammal species among laboratories. Specially striking is the great concentration of mice in a few of these (largely Group III).

The authors divided "purposes" into six headings: Diagnosis, Research, Cancer Research, Teaching, Applied Pharmacology, and Bioassay. They tabled the relations between species and these six rather wide and overlapping heads, and further reported that, on the whole, diagnosis corresponds with Group I laboratories, applied pharmacology and bioassay with Group III, and the remaining purposes with Group II. There were, however, overlaps between the groups. It has proved possible to

analyze "purposes" further, so we shall defer consideration of these findings. Reference may also be made to an interesting table of Lane-Petter's (1953b) in which he considered a greater number of "purpose" headings. This table, however, was qualitative, and only showed the main use of each species. More recently, Lane-Petter (1957a) has expressed the survey results in a graphic diagram.

The remaining tabulations concerned procurement, causes of mortality, and use of inbred strains; this part of the paper will be referred to later in other contexts.

We have dealt in a cursory way with the bureau publication. It is therefore important to state here that almost all the major discoveries to be discussed in the next section were made by the bureau workers themselves, as can readily be seen by reference to their paper. Our reinvestigation merely confirms theirs on most points, sometimes with additional detail, and has leaned heavily upon it. The only important new information in the present book concerns the more specific usage of animal under greater number of headings. It is easy to glean, where others have both sown and reaped the bulk of the crop. We may, therefore, fittingly end this section by congratulating Lane-Petter and his associates on the first major contribution to the monitoring of experimental biology.