The Principles of Humane Experimental Technique

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CHAPTER 4

THE SOURCES, INCIDENCE, AND REMOVAL OF INHUMANITY

The three chief principles stated...

The Analysis of Direct Inhumanity

There are three obvious ways of classifying procedures in terms of their direct inhumanity. We may consider them under the heads of incidence, severity, and special character.

The incidence of direct inhumanity is a convenient concept in connection with assay, toxicity testing, or diagnosis. A procedure may be such that it causes no (or negligible) distress to some or most of the animals used, while likely or even certain to cause distress in a certain (often unpredictable) proportion, as a necessary consequence of the nature and object of the procedure. Thus, if a population of guinea pigs is inoculated with suspected TB material, it is part of the expectation that some may be specifically affected by the pathogen (in this case M. tuberculosis) which is the object of the test. Distress and losses due to other toxic or infective components of the inoculate are irrelevant, or rather detrimental, to the object of the experiment. They thus fall under the head of contingent inhumanity. (This also has its proportional aspects. Some particular animal may be more likely than others to respond to any given procedure with irrelevant reactions, such as anaphylactic shock when this is not the object of study. Borrowing a genetical term, we may speak of the penetrance of contingent inhumanity.) Incidence proper is illustrated in the example by the proportion of guinea pigs displaying the symptoms of tuberculosis. It is an important factor to be considered in weighing the inhumanity of a procedure as a whole. Often, incidence is total--that is, all animals treated are likely and expected to react similarly and specifically to the treatment. A special case of incidence is the distinction between experimental and control groups in many types of experiments. Sometimes the experimental group is likelier to suffer (as in the study of the effects of particular operations), sometimes the controls (as in chemotherapy or immunization experiments, where the unassisted group is expected to succumb).

The special character of procedures is often a unifying factor among experiments of extremely diverse objects. We might distinguish here such effects as general postoperative pain and stress, specific effects of widespread operations (such as adrenalectomy), modes of death due to various groups of poisons, general and specific effects of groups of pathogens, etc. We might note a special sort of semi-contingent inhumanity--a component of a procedure which is irrelevant or harmful to its success, but more or less indispensable to its performance. For instance, pyrogen tests often involve nothing more serious than a rise in temperature which would not even send most humans to bed. But, for their performance, animals are often restrained for periods of over an hour, and this may impose some distress.

This analysis might form a starting point for the third dimension of classification: the severity of a procedure in those animals which are affected. It was to this problem that Chapter 2 was addressed, and the criteria, methods, and definitions of that chapter should really be restricted to the assessment of severity.

Incidence, character, and severity are at least partly independent variables, and a cross-classification will ultimately be required along all three dimensions. It is true that special character is an initial guide to severity. The Home Office takes advantage of this in allotting its Certificates. However, groups of procedures must overlap at their extremes in respect of severity.

In Chapter 3 we have classified the procedures in use into major divisions. Of these, the two great divisions of Bioassay, etc. and Research will form the subject of much of the rest of this book, and will not be specially treated in the present chapter. It may, however, be worthwhile here to consider briefly a few points raised by the tables for the other main divisions.

There has been 16,094 experiments isolated as totally free of direct inhumanity. As was mentioned, this total represents a bare minimum and a gross underestimate.

Certain other groupings may be taken as of only slight direct inhumanity, involving the sort of distress which human blood donors cheerfully accept. All nontoxic antiserum production falls here, as well as a substantial proportion of injections for the production of antipathogenic or antitoxic sera. (Most or all antiviral serum production involves at least not detectable symptoms other than antibody production itself.) The horses used for antiserum production at one large and well-run institute do not even have to be restrained during injection or the collection of blood (Lane-Petter, personal communication). This is a convincing criterion for the trivial nature of the distress imposed.

Little more inhumane are the Ascheim-Zondek (mice), toad and Hogben (Xenopus) tests for human pregnancy (a substantial total--see Table 18). The first and second of these tests do not wholly eliminate toxic effects, but the Hogben test has been refined by suitable extraction procedures. (Other uses of Xenopus have been refined by the development of a special saline--Landgrebe and Waring, 1944--to avoid untoward effects on the lymph hearts of this species.) In the experience of one of us (W.M.S.R., actually in the Hamburger assay, which is procedurally similar to the Ascheim-Zondek test), mice may squeak and jump momentarily as a result of the volume of fluid injected; and everyone who has injected small animals with needles of the absolute size normally used will agree that they do not accept the treatment with complete indifference. These tests, and similar ones involving the injection of small animals1, may therefore be placed slightly higher up the severity scale, and are worth improving (cf. Russell, 1957b). The Friedman test, however, is often accompanied by one or more surgical operations. It is hard to understand why it is still performed. The Hogben test is the most efficient of all in terms of percentage accuracy and speed (Hobson, 1952) and the Ascheim-Zondek runs a close second. Neither requires cumbersome operative procedures. It is hard to ascribe the performance of 3,802 Friedman tests in 1952 (Tables 9 and 10) to anything other than inertia. The toad test is, still, less accurate than the two best, but ease of provenance may have resulted in an increase in its use.2

The remaining division to be discussed at this stage warrants a section to itself.

1It is pleasant to note that the reagent for the Coombs immunological test, formerly prepared from rabbits, can now be produced in large animals, such as sheep; this procedure naturally also requires fewer animals (Stratton, 1956).
2Since this paragraph was written, Lane-Petter has reported the changes cited in the second to last paragraph of The Latest Developments. It is indeed gratifying that amphibia are displacing rabbits from pregnancy diagnosis.