

[On vivisection].

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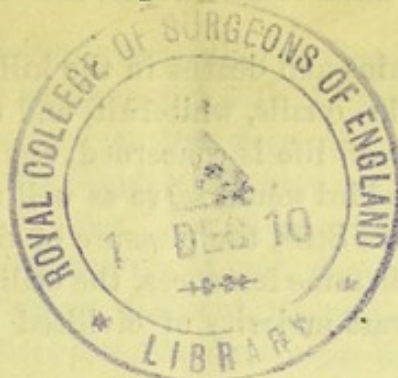
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III.

It seems fair to demand that those who inflict pain or other distress on animals, for the purpose of acquiring knowledge, should be judged by the same rules as those who, for any other purposes, do the same. The rules by which these are judged may be read in the customs by which a very great majority of sensible and humane persons encourage or permit the infliction of pain and death on large numbers of animals, for purposes far short of great utility, necessity or self-defence. It seems in these customs an admitted rule that, for the sake of certain quantities of utility or pleasure, or both, men may inflict great pain on animals without incurring the blame of cruelty. Can it be shown, for those who make painful scientific experiments, that the pain of their experiments is less and the utility more than in the majority of the practices permitted or encouraged by the great majority of reasonable and humane persons among the educated classes in this country?

In enumerating some of the instances of pain-giving which are generally and, as I think, for the most part rightly allowed, I am aware that some may seem trivial, and some nearly necessary to human welfare; however, they are not cited for the purpose of speaking ill of them, but as examples of practices which, not being deemed blameworthy or restrained by law (unless in respect of the seasons in which they are allowed), may serve as measures with which to compare the pain-giving experiments of scientific enquirers.

Among such practices are the painful restraints and training of our horses and other domestic animals; the caging of birds for the sake of their beauty or their song; the imprisonment of animals of all kinds in zoological gardens and aquaria for study or for amusement. In all these instances animals are compelled or restrained from the happiness of natural life; they have to endure what might be inflicted as severe punishment on criminals—slavery or imprisonment for life. But the inflictions are justified by the utility which men derive from them.

In another large group of painful customs generally encouraged are those inflicting death and often great suffering on birds and beasts for obtaining ornamental fur or feathers; the mutilation of sheep and oxen for the sake of their better or quicker fattening; the mul-

tiplication of pains and deaths in the killing of small birds and small fish, such as larks, quails, whitebait, and the like; although, so far as mere sustenance of life is concerned, any weight of food in one large fish or one large bird would serve as well as an equal weight in a hundred small ones. Still, the pleasure of delicious food, or of beautiful decoration, or, in some instances, the utility of better nutriment, seem sufficient to a vast majority of civilised men and women to justify these customs.

In another group may be named all the pain-giving sports—shooting, hunting, stalking, fishing, and the rest—various in the pleasure that they give, various in utility. And in yet another, the trapping, hunting, and killing of mice, rats, stoats, frogs, and toads invading cultivated land—worms, and slugs, and the whole class of what we call vermin—creatures generally troublesome and sometimes injurious.

From a list such as this, which might easily be enlarged, a rough estimate may be formed of the quantity of pain or distress, imprisonment or death, which, in the opinion of great majorities of persons entitled to judge, may be inflicted on animals for purposes of utility or of pleasure, or of other motives far less than those of necessary self-defence or maintenance of human life. The list may thus serve as a standard with which to compare the pains and the utilities of vivisections. Doubtless many persons would find in it some practices which they would forbid; some would hunt or shoot, but would not keep parrots or larks in confinement; some would eat whitebait or small birds, and wear sealskin, and order the destruction (anyhow) of all the rats and mice in their houses, but would put down fox-hunting and salmon-fishing. But there are very few, even among the generally most sensible and humane, who do not allow or encourage, even if they do not practise, many things of which I think it certain that the pain is greater and the utility less than that of many experiments on living animals. They may do it thoughtlessly, but they may find that they do it, if they will make a careful survey of their furniture, clothes, and ornaments, their food, amusements, and habits of life for a year, and then estimate the pains which in providing all these have been inflicted upon animals. Let them estimate them, if they can, with the same measure as that with which they estimate the pain of vivisection.

Such an estimate will probably seem the more easy the less the subject of pain has been studied. If we reflect on the evidence on which we believe that, from any given injury or disease, anyone must suffer less or more pain, we find that we are generally guessing, or saying to ourselves, 'It must be so,' without any clear evidence that 'It is so.' At most, if we have ourselves had any injury or disease, we may believe that another in the same condition would suffer just as we did. But few beliefs would be more fallacious. The sensibility to pain is as various as is the 'ear for music'; the disease which

by one is described, and very truly according to that one's sensations, as a source of agony only to be compared with the rack or some such torture, is by another described as not very distressing; and the accounts given of it by others imply that between these extremes there are all intermediate degrees. To those who study them in surgical practice it is sure that degrees of pain depend on differences of personality much more than on different intensities or quantities of disease or injury. And there are abundant cases to prove that the general sensibility to pain is far greater among the more than among the less cultivated races of mankind; that savages, as they are called, endure with comparative indifference inflictions which to most persons of the higher races would be terrible. Mental cultivation continued through many generations has not only increased the general keenness of our senses so that we discern far wider and minuter varieties and combinations of form, colour, sound, and flavour, than can be discriminated by lower races; it seems to have increased equally our sensibility to pain and our power of directing our attention to it. This seems to be especially true among persons with poetic and artistic minds: and, as we may be sure of the contrast between the higher and the lower races of men, so we may believe that the contrast must be yet greater between ourselves and any of the animals lower than man. It is as nearly certain as anything of the kind can be that with every degree of diminution of the proportion which the nervous system bears to the rest of the body there is an equal diminution of the sensibility to pain—the lower in the scale of nature the less the sensibility; so the pain inflicted by a deer-stalker, a salmon-fisher, or a vivisector is certainly less than would be inflicted in a similar injury on any man.

But the question is whether vivisections inflict less or more pain than do sports or any other generally encouraged pain-giving practices, on animals of the same kind. I may offer some evidence on this question; for while studying and teaching physiology I saw many experiments on animals, and made some; and although I have not seen much of any pain-giving sport, or other such pursuits, yet I have seen enough to enable me to compare the pains they give with those of vivisections, and I have been able to study the effects of wounds with which hares, birds, and other game or vermin have escaped, and have lived long before they were again shot or died, diseased or starved. And for comparison, so far as may be possible, of the pain of injuries and their consequences in animals with those in men, I can call to mind the impression made by hundreds of surgical operations which I saw before the discovery of anæsthetics, and by the thousands of patients watched after operations before and since that discovery.

Of course the pains given in experiments on animals, not under an anæsthetic, are as various as were those which before 1839 were given

in surgical operations. But, for the worst, I think it probable that the pain inflicted in such experiments as I saw done by Magendie was greater than that caused by any generally permitted sport; it was as bad as that which I saw given to horses in a bull-fight, or which I suppose to have been given in dog-fighting or bear-baiting. I never saw anything in his or any other experiments more horrible than is shown in many of Snyders's boar-hunts, or in Landseer's 'Death of the Otter.' Among the most painful experiments I saw many years ago were some for studying the effects of mineral poisons by giving them to animals, but they only matched the poisoning of rats and other vermin; which is encouraged by all who thus direct their destruction. I have never seen or read of an experiment on a fish so painful as the ligger-fishing (in which I have seen,) a live fish is impaled as bait on a long double-hook, with which he swims till a pike or other big fish swallows him with the hook, and thus remains in his turn hooked all night, till the fisherman unhooks and kills him. I doubt whether any experiment on fish or reptile can in an equal time give more pain than is given in long 'playing' with a deeply-hooked salmon, or in any length of time give more pain than is endured by a fish, which escape with a hook fixed deeply in his throat. Probably, a thoroughly heartless vivisector, if one could be found, might inflict in a day more pain than an ordinary sportsman, but in the ordinary practice of experiments on animals it is not possible that a vivisector should in a day or a month cause nearly so much pain as would, in the same time, be caused by an active sportsman shooting among abundant game, or a fly-fisherman in a well-stocked stream, or as a man successfully hunting seals or ermines, or poisoning rats. Certainly all the vivisectors in Paris will not be the cause of nearly so much suffering as the promoters of the scheme for preserves of lions ~~so~~ and other carnivora, to be shot at, in Algeria.

I believe, therefore, that, with these few exceptions which I have mentioned, there are no physiological experiments which are not matched or far surpassed in painfulness by common practices permitted or encouraged by the most sensible and humane persons of the time.

In this comparison I have been considering experiments in which anæsthetics are not used. Where these are used, as for many years past they have been in the vast majority of experiments, at least in this country, the case is immensely stronger. For, in respect of all these instances of giving pain, there are two distinct things to be estimated—the immediate pain of the inflicted injury, and the consequent pain and other misery, if the injury be survived. As to the first, what has been already said may suffice; as to the second, the comparison is more easy, because it may be made between animals injured in vivisection and in any other manner, and men after accidental in-

juries or surgical operations. When, for this comparison, I call to mind the conditions which I have seen in animals living after vivisection, and those which I have seen in others who have long survived the injuries inflicted in sport or in other attempts to kill them, I can only think of them as equal in pain or disability; but with this advantage to the vivisected, that it has been an object of care, provided with food and rest, and safe from the attacks of others of its own or other kinds.

I am aware that some say that this keeping alive is itself a shameful cruelty; but probably the animals themselves, if they could think like men, would not so judge; for the vast majority of animals used for experiments are taken from those already marked for death: stray dogs who would be carried away by the police, horses assigned to the knacker, rabbits and guinea-pigs whom none would keep, rats and mice whom anyone would kill or direct to be killed. They may be compared with men dying of some mortal disease whose lives may be prolonged by operations which will leave them in some way mutilated, likely to live long, but as invalids. In these cases the great majority of persons endure the mutilation for the sake of the longer life, and they very rarely repent their choice; rather, as time passes, and they become habituated to the consequences of the operation, they regain nearly all the happiness of their former healthy life. No one accustomed to such cases can doubt that if an animal consigned to death reasoned as a man, he would accept his life on condition of submitting to any experiment under an æsthetic. I have seen many animals after vivisection looking as happy as before them; many of them were happier, being better fed and in every way more cared for than they had ever been before.

If it may thus be justly held that the pain and other miseries inflicted by vivisection are less than those inflicted in many practices encouraged by sensible and humane persons, it may next be considered whether their utility be as great. It might justly be asked whether their utility and pleasure be as great, for it will not be denied that pleasure is a considerable motive in most of the sports, and in the wearing of decorative dresses such as cannot be procured without giving pain. But I would rather not argue that man's pleasure can ever be reason enough for his giving pain. It seems impossible to define even nearly the 'when,' or the how much pain for how much pleasure. But, if any will hold the contrary, and that in the pursuit of pleasure pain may be inflicted, even without considerations of probable utility, then it may certainly be maintained that, to minds trained in scientific enquiries, there are no pleasures more intense than the pursuit of new knowledge, nor any for which, if for any, greater pain might be given.

But, omitting the pleasures of both, may the utilities of the two groups of pain-giving pursuits be estimated? Looking back at the

list, it is clear that one method of utility cannot be pleaded for all. Sports may well be justified by the skill, patience, self-control, and endurance which may be trained in them; by the recreation which they provide for tired men; by their great social advantages; by their satisfaction of a desire which, in many minds, has the force of a natural instinct that cannot safely be repressed. As for the restraints, and imprisonments, and fattenings of animals, their utility is in most instances so evident that the whole course of quiet social life and trade would need to be changed if they were forbidden. Besides, for most of these, as well as for most field sports, the creatures would have no opportunity of living at all if it were not given on condition of their submitting to restraint or death at the will of men. There would be no more foxes than wolves in this country if they were not kept to be hunted; pheasants, partridges, and other game would soon be extinct if they were not preserved on purpose to be shot.

The destruction of vermin has, no doubt, utility—is sometimes even necessary for the safety of our food and property; but one must regret that it is so often pursued in a very merciless manner—left to cats or dogs, or slowly-acting poisons, or starvings in traps. The procuring of decorative furs and other parts of dress and furniture, attended as it often is with great suffering to the creatures hunted, may, I suppose, be justified by some utility. But I am not a fair judge of it. I can speak more certainly of the utility of vivisection.

Speaking generally, it is certain that there are few portions of useful medical knowledge to which experiments on animals have not contributed. The knowledge may be now so familiar that the sources from which parts of it were derived may be forgotten; or what was first found by experiments may now have other evidences; or, experiments may only have made sure that which, without them, was believed: but the whole history of medicine would show that, whatever useful or accurate knowledge we possess, we owe some parts of it to experiments on animals.

To different parts of knowledge they have contributed very different proportions; and it is often difficult to assign to them their just proportion. They have never been the sole means of study. Chemists, physicists, practitioners, all have worked as well as physiologists; and the work of each has guided and strengthened that of others. The whole value of experiments on animals, therefore, cannot be estimated by a few examples; it may be made evident in them, but no one can measure it who is not able to analyse the whole progress of medical knowledge during at least the last century.

A clear instance of its utility may be found in the tying of arteries whether for the cure of aneurism or for the stopping of bleeding. Before Hunter's time—that is, about a hundred years ago—it is nearly certain that ninety-five out of a hundred persons who had aneurism of the principle artery of the lower limbs died of it: a few more may

have been saved by amputation above the knee, but at that time about half the patients who submitted to that operation died. At the present time, it is as certain that of a hundred persons with the same disease less than ten die. At that time all patients with aneurisms of arteries between the thigh and spine or in the neck or arm-pit, died, unless by some strange course of the disease one or two in a hundred went on living. Now, among all such patients, from fifty to seventy in every hundred are saved by operations. In the same time there has been a great diminution in the deaths from bleeding after large operations: I remember when such bleeding might be called common; it is now very rare.

By these improvements in surgery some hundreds of lives are annually saved in this kingdom; lives of which it may be deemed certain that, less than a century ago, 10 per cent. would have been lost. The proportion saved has from the beginning almost steadily increased, chiefly because of improvements in the materials used for tying the arteries, for which experiments on animals have given good guidance. Hunter and his first followers used tape, or applied extra ligatures in fear that the chief ones should give way, or they put pads under ligatures in fear that the arteries should be cut through. Even then they saved some lives, but many of their patients died. It was a great advance when the changes really produced in arteries variously tied were more exactly ascertained by experiments, especially by those of Dr. Jones. They showed that single ligatures of twine or silk were better than any others then known, and, using these, the proportion of lives saved by operation was greatly increased. But the ends of these ligatures hanging out of the wounds hindered their healing, and sometimes excited such irritation that the tied arteries were ulcerated, and, with losses of blood, the patients died. Many things were tried in animals and men; precautions constantly more careful were taken; various silks and various twines and wires were used, with very slowly increasing success, till (omitting some facts in the history of progress) catgut was employed. This could be left in the wound, and the skin could be closed over it and quickly healed. It was a great improvement, and has certainly saved many lives which even ten years ago would have been lost. Still, in spite of catgut, specially manufactured and carefully carbolised and used with every precaution, some few patients die, and some operations fail through defects in the ligatures. Now, it seems probable that catgut may be superseded by thread prepared from sinews of the kangaroo.

Such is a mere sketch of the progress by which a disease which less than ninety years ago was fatal to at least ninety per cent of those affected with it is now fatal to not more than 10 per cent. If we add to this the great diminution in the losses of life from wounds of arteries, whether they be wounded in accidents or in operations,—a

diminution similarly due, for the most part, to the improvement of ligatures—it is safe to say that not less than five hundred lives are now saved every year, in this country alone, which fifty years ago would have perished. In this, as in every case, all methods of study have been used: careful watching of the patients, examinations of the dead, published records of failures as well as of successes, experiments on animals; and it is not possible to assign exactly to each of these its share in the good result; but no one who can fairly judge will doubt, I think, that at least one-fifth may be assigned as the share due to experiments on animals—say one hundred lives a year in this one department of surgery.

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Histories similar to these may be told of the improvement of many other parts of surgical practice, through knowledge of the processes of repair, as in fractures, divided tendons, divided nerves, or as in the union of separated parts and in grafting. In these there may, rarely, be questions of saving life; but in all of them, the length of illness and the degree, if any, of permanent impairment of power for work or pleasure depends in great measure on the knowledge of facts and principles to which experiments on animals have contributed. But I need not dwell on these; others, I believe, will largely illustrate them; I will rather suggest some general considerations on the whole subject.

Looking back over the improvements of practical medicine and surgery during my own observation of them in nearly fifty years, I see great numbers of means effectual for the saving of lives and for the prevention or quicker remedy of diseases and physical disability, all obtained by means of knowledge to the acquirement or safe use of which experiments on animals have contributed. There is scarcely an operation in surgery of which the mortality is now more than half as great as it was forty years ago; scarcely a serious injury of which the consequences are more than half as serious; several diseases are remediable which used to be nearly always fatal; potent medicines have been introduced and safely used; altogether such a quantity of life and of working power has been saved by lately-acquired knowledge as is truly past counting. And in these advantages our domestic animals have had due share by the improvement of veterinary medicine. What proportion is due to experiments on animals no one can tell; it would be as easy to estimate the proportion contributed by each national means of education to the general intellectual improvement of our population. Let it be guessed at a tenth or a twentieth of the whole, and in either case the utility of vivisection must far surpass that of the great majority of pain-giving practices permitted or encouraged by thousands of persons of recognised humanity and good sense. And it is by these, when duly informed on the facts, that the question should be judged, for it is eminently one of those in which sentiment is predominant on one side, reason on the other;

in which the arguments on one side are mainly based on kindly feeling and sympathy with sufferings of which the amount is guessed at, while on the other they rest mainly on facts observed, on considerations of utility, and in the desire for knowledge. The only competent judges in such a case are those in whom sentiment and intellectual power are fairly balanced, and who will dispassionately study the facts and compare the pain-giving and the utility of experiments on animals with those of any generally allowed or encouraged pursuit.

But it may be said, Would not all this useful knowledge have been gained by the other methods of study, without the experiments, less quickly, perhaps, but not less surely? And now will not scientific progress, be as sure though not so speedy, without as with them? Possibly, yes; most probably, no. But suppose it were so, what should we say to those who suffer by the delay? At the present time 20,000 persons are annually killed by venomous snakes in India. If the discovery of a remedy without experiments on animals would come later by, say five years, than one made with their help, would it be nothing to have lost 100,000 lives? The case is worth considering because of an almost consequence of the Vivisection Act. A physiologist may pay a rat-catcher to destroy all the rats in his house with any poison that he pleases; but he may not himself, unless with a licence from the Home Secretary, poison them with snake-poison, and then try to save their lives.

Happily for other people, medical practitioners who watch the course of science are not content to wait longer than can be helped; they see the miseries of disease and of all its consequences better than others do, and they are stirred to the desire of knowledge by motives of the greatest force—by humanity and the consciousness of deep responsibility; for they are just as plainly bound to acquire more knowledge as they are to use aright that which is already at hand. Moreover, they are stirred by emulation and a fair ambition of success, and the unhappiness of failures in what had full promise of good. No distress, I think, can be greater than that of losing a life committed to one's charge by some accident, as it must be called, which might have been averted by some piece of knowledge which seems within reach. Such are the losses of life in the use of anæsthetics.

The annual deaths from chloroform in this country used to be about twenty. They were, probably, not more than 1 in every 30,000 of persons to whom it was given; but they were intolerable to those who felt in any measure responsible, though blameless, for them, and many went back to the use of ether, which is safer, though less convenient. Probably less than 1 in 50,000 die of it; but I saw one die to whom it was faultlessly given, and he was so good and generous a man that I felt it would have been right to kill a hun-

dred animals either to save his life or to find out why he died, and to be able in the future to avert so awful a catastrophe.

It is in reflection on cases such as this, in which lives are lost or health is impaired for want of knowledge which seems to be within reach, that medical men of science feel justly impatient of the restraints put upon experimental researches. They know that such knowledge as they want has often been gained by experiments on animals; they know that the experiments made in this country are, both severally and in their total, far less pain-giving and far more useful than are either the shooting, hunting, or fishing practised by many, and encouraged by nearly all, of the best people in the land; they see all round them mere luxuries of dress and furniture, gathered at immense cost of pain and misery, and perhaps only a little more useful than might be obtained from animals killed for necessary food, and yet they find themselves selected for legislative restraint and still exposed to public and private charges of vile cruelty, abused in sensational meetings, and as much as possible hindered in the studies which even legislation would permit.

Of course, among the opponents of experiments on animals there are several very different groups, and with some of these it is useless to appeal to reason. Some have committed themselves to the agitation, and cannot recede without dispute or more material loss, and some are carried on with so strong an impulse of a mind once made up that they cannot pause for a revision of their judgment. But there are many who favour the agitation only because they are ignorant of the facts of the case; they have heard or read accusations of cruelty grossly misstated, and have heard no defence or denial of them.

That which is most to be desired is that persons with fairly-balanced minds, with at least an average both of humanity and of capacity for judgment in cases in which deep feeling may be stirred, should study the whole matter, and judge of experiments on animals as they would of other practices in which utility or even pleasure is pleaded as justifying the infliction of pain. Let them visit physiological laboratories, and see what is done, and compare the work and its results with those of a day's shooting, or a night's trapping of rabbits, or of any sport or trade in which the lives of animals are concerned.

And chiefly it is to be wished that the subject should thus be thoroughly studied by those who administer the Act. If they would thus study it, they would be more sure that the Act is at least a sufficient deference to public sentiment, and they would resist further restraints of experiments on animals with as much resolution as they resist other hindrances to the doing of what they judge to be right.

JAMES PAGET.