

with no object in view but to satisfy an idle curiosity, that suffering is inflicted out of proportion to the benefits received, that it is not a useful means of obtaining information which is procurable in some other way, and is essentially bound up with cruelty, then grounds may be said to exist for its limitation, or even its actual suppression. What restrictions, if any, should be laid upon the practice are to be considered afterwards.

By vivisection is to be understood the operating with cutting instruments or other means on the bodies of living animals. The objections advanced against it are mainly three: the cruelty involved, the consequent injury to the moral nature through the infliction of a wrong, and that the practice is not justified by the results. It will first be necessary to estimate the amount of pain actually caused, for in this the principal fallacy lies.

In the transition from life to death there are three stages: the first, marked by loss of consciousness; the second, cessation of breathing and heart action; and the third is initiated by those changes that characterize the rigidity of final death and decomposition. An animal may have life and not be "living," that is, it may be alive but unconscious and without the capacity for suffering pain. The animal lies perfectly quiet and appears dead; it can be pricked or cut in the most sensitive parts and give no signs of pain. The only functions that remain are breathing and heart beating; all consciousness is asleep, and these two mechanical operations alone are unsuspended. It is under these conditions, induced by anæsthetics, that most vivisection is performed. The heart may be in full working order, the respiratory movements unimpeded for hours after consciousness has disappeared, and in the case of cold-blooded animals even for days. Operations performed on such an animal are rightly classed under the head of vivisection, but to brand them as improper is as unreasonable as to charge the skillful surgeon with cruelty, who uses all care in removing a tumor from a living but unconscious patient. By the use of those anæsthetics which physiologists habitually employ the animal is rendered unconscious. This is the moment the vivisector chooses for his work. He brings into use the instruments of his research. He watches the ebb and flow of blood, the throbbing of vessels, and takes tracings of them; he measures their force; he gathers the juice which a gland secretes; he divides one nerve and stimulates another, or poisons a third. He records his observations and finishes a painless but profitable death in one of a variety of ways. Just as anæsthetics have rendered the surgeon's task a simple one and enlarged his sphere, so they have rendered new experiments possible and have become as great a necessity in physiology as in surgery.