THE VIVISECTION CONTROVERSY

—

DR. LEFFINGWELL

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Dr. ALBERT LEFFINGWELL.

(*From a Photo by Purdy, Boston, U.S.A. Taken December, 1907.*)

THE VIVISECTION CONTROVERSY

Essays and Criticisms

BY

ALBERT LEFFINGWELL, M.D.

AUTHOR OF ILLEGITIMACY AND THE INFLUENCE OF SEASONS UPON CONDUCT; SUICIDE IN AMERICAN CITIES; THE MORALITY OF LONDON; RAMBLES IN JAPAN WITHOUT A GUIDE; ETC.

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PREFACE.

The object of the London and Provincial Anti-Vivisection Society in issuing an English edition of Dr. Leffingwell's book is to place before the public additional and cogent reasons in furtherance of Anti-Vivisection principles.

Although the London and Provincial Anti-Vivisection Society is definitely committed by its rules to the prohibition of Vivisection, it takes no narrow or circumscribed view of its duty to the cause of humanity to animals. It does not ask that every writer who has anything to say that is worth saying on the question should necessarily endorse every principle of the Society. Although Dr. Leffingwell is in favour of the restriction of vivisection, as opposed to the prohibition of it, there is in his book, "The Vivisection Controversy," which he presented to the American public some years ago, so much that is valuable and cogently argued, so impressive a statement of facts, that the London and Provincial Anti-Vivisection Society felt it would be failing in its duty to the Cause if it did not take active steps to make the work more generally known.

The English edition here presented is slightly different in its arrangements. One or two chapters have been omitted and one or two added, in particular a most valuable one on the Royal Commission on Vivisection, which has been sitting in England this year. We venture to think that, for the

intelligent investigator who requires facts and logical arguments in preference to mere rhetorical and unrestrained sentiment, Dr. Leffingwell's work, "The Vivisection Controversy," will supply them with that of which they are in need.

It may be added that Dr. Leffingwell was a student of medicine and surgery not only in America, but in England and France, and that he has had practical acquaintance with the physiological laboratory in all these countries, and, therefore, does not speak at second-hand. He is undoubtedly one of the leading literary experts on the question in the medical profession. We issue his book in the certainty that what he has said commands the consideration, not only of the general public, but of his scientific colleagues, and that it cannot fail to do the greatest possible service to the cause of humanity to animals throughout the civilised world.

SIDNEY TRIST.
(Secretary; on behalf of the Committee of the Society.)

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The Vivisection Controversy.*

BY

ALBERT LEFFINGWELL, M.D.

The question of vivisection is always pushing itself to the front. A distinguished American physiologist has lately come forward in defence of the French experimenter, Magendie, and, parenthetically, of his methods of investigation in the study of vital phenomena. On the other hand, the Society for the Prevention of Cruelty to Animals made an unsuccessful attempt in the New York Legislature last winter, to secure the passage of a law which would entirely abolish the practice as now in vogue in our medical schools, or cause it to be secretly carried on, in defiance of legal enactments. In support of this bill it was claimed that physiologists, for the sake of "demonstrating to medical students certain physiological phenomena connected with the functions of life, are constantly and habitually in the practice of cutting up alive, torturing and tormenting divers of the unoffending brute creation to illustrate their theories and lectures, but without any practical or beneficial result either to themselves or to the students, which practice is demoralizing to both, and engenders in the future medical practitioners a want of humanity and sympathy for physical pain and suffering." Perhaps these assertions go a little too far. Let us endeavour to study the whole question dispassionately, and see how it thus appears.

Leaving out the animal world, there are three parties

* From *Scribner's Monthly*, July, 1880.

interested in this discussion. In the first place, there are the professors and teachers of physiology in the medical colleges. Naturally, these desire no interference with either their work or their methods. They claim that were the knowledge acquired by experiments upon living organisms swept out of existence, in many respects the science of physiology would be little more than guesswork to-day. The subject of vivisection, they declare, is one which does not concern the general public, but belongs exclusively to scientists.

Behind these stand the majority of men belonging to the medical profession. Holding, as they do, the most important and intimate relations to society, it is manifestly desirable that they should enjoy the best facilities for the acquirement of knowledge necessary to their art. In this, as in other professions or trades, the feeling of *esprit de corps* is exceedingly strong; and no class of men likes interference on the part of outsiders. To most physicians it is a matter with which the public has no concern. Society trusts its sick and dying members to the medical profession; can it not with equal confidence leave the lower animals to the same care?

The opinion of the general public is therefore divided and confused. On the one hand, it is profoundly desirous to make systematic and needless cruelty impossible; yet, on the other, it cannot but hesitate to take any step which shall hinder medical education, impede scientific discovery, or restrict search for new methods of treating disease. What, men say, are the sufferings of an animal, however acute, compared with the gain to humanity which would result from the knowledge thereby acquired of a single curative agent? Public opinion hesitates. And yet, either by action or inaction the State must finally decide whether vivisection shall be wholly abolished, as desired by some;

whether it shall be restricted by law within certain limits and for certain definite objects; or whether we are to continue in this country to follow the example of France and Germany, in permitting the practice of physiological experimentation to any extent devised or desired by the experimentalist himself. Any information tending to indicate which of these courses is best cannot be inopportune. Having witnessed experiments by some of the most distinguished European physiologists, such as Claude Bernard (the successor of Magendie), Milne-Edwards and Brown-Sequard; and, still better (or worse, as the reader may think), having performed some experiments in this direction for purposes of investigation and for the instruction of others, I believe myself justified in holding a pronounced opinion on this subject, even if it be to some extent opposed to the one prevailing in the medical profession.

At the outset of any discussion of the subject, there arises a very important question. Admitting the benefit of the demonstration of scientific facts, *how far may one justifiably subject an animal to pain for the purpose of illustrating a point already known?* It is merely a question of cost. For instance, it is an undisputed statement in physical science that the diamond is nothing more than a form of crystallized carbon, and, like other forms of carbon, under certain conditions, may be made to burn. Now most of us are entirely willing to accept this, as we do the majority of truths, upon the testimony of scientific men, without making demonstration a requisite of assent. In a certain private school, however, it has long been the custom once a year, to burn in oxygen a small diamond, worth perhaps thirty dollars, so as to prove to the pupils the assertion of their text-books. The experiment is a brilliant one; no one can doubt its entire success. Nevertheless, we do not furnish diamonds to our

public schools for this purpose. Exactly similar to this is one aspect of vivisection—it is a question of cost, Granting all the advantages which follow demonstration of certain physiological facts, the cost is pain—pain sometimes amounting to prolonged and excruciating torture. Is the gain worth this?

Let me mention an instance. Not long ago, in a certain medical college in the State of New York, I saw what Doctor Sharpey, for thirty years the professor of physiology in the University Medical College, London, once characterized by antithesis as "Magendie's *infamous* experiment," it having been first performed by that eminent physiologist. It was designed to prove that the stomach, although supplied with muscular coats, is during the act of vomiting for the most part passive; and that expulsion of its contents is due to the action of the diaphragm and the larger abdominal muscles. The professor to whom I refer did not propose to have even Magendie's word accepted as an authority on the subject: the fact should be demonstrated again. So an incision in the abdomen of a dog was made; its stomach was cut out; a pig's bladder containing coloured water was inserted in its place, an emetic was injected into the veins,—and vomiting ensued. Long before the conclusion of the experiment the animal became conscious, and its cries of suffering were exceedingly painful to hear. Now, granting that this experiment impressed an abstract scientific fact upon the memories of all who saw it, nevertheless it remains significantly true that the fact thus demonstrated had no conceivable relation to the treatment of disease. It is not to-day regarded as conclusive of the theory which, after nearly two hundred repetitions of his experiment, was doubtless considered by Magendie as established beyond question. Doctor Sharpey, a strong advocate of vivisection, by the way, condemned it

as a perfectly unjustifiable experiment, since "besides its atrocity, it was really purposeless." Was this American repetition of Magendie's experiment worth its cost? Was the gain worth the pain?

Let me instance another and more recent case. Being in Paris some years ago, I went one morning to the *College de France,* to hear Brown-Sequard, the most eminent experimenter in vivisection then living—one who, Doctor Carpenter has told us, has probably inflicted more animal suffering than any other man in his time. The lecturer stated that injury to certain nervous centres near the base of the brain would produce peculiar and curious phenomena in the animal operated upon, causing it, for example, to keep turning to one side in a circular manner, instead of walking in a straightforward direction. A Guinea-pig was produced—a little creature, about the size of a half-grown kitten—and the operation was effected, accompanied by a series of piercing little squeaks. As foretold, the creature thus injured did immediately perform a "circular" movement. A rabbit was then operated upon with similar results. Lastly, an unfortunate poodle was introduced, its muzzle tied with stout whip-cord, wound round and round so tightly that necessarily it must have caused severe pain. It was forced to walk back and forth on the long table, during which it cast looks on every side, as though seeking a possible avenue of escape. Being fastened in the operating trough, an incision was made to the bone, flaps turned back, an opening made in the skull, and enlarged by breaking away some portions with forceps. During these various processes no attempt whatever was made to cause unconsciousness by means of anæsthetics, and the half-articulate, half-smothered cries of the creature in its agony were terrible to hear, even to one not unaccustomed to vivisections. The experiment was a "suc-

cess"; the animal after its mutilation did describe certain circular movements. But I cannot help questioning in regard to these demonstrations, *did they pay?* This experiment had not the slightest relation whatever to the cure of disease. More than this: it teaches us little or nothing in physiology. The most eminent physiologist in the United States, Doctor Austin Flint, Jr., admits that experiments of this kind "do not seem to have advanced our positive knowledge of the functions of the nerve centres," and that similar experiments "have been very indefinite in their results." On this occasion, therefore, three animals were subjected to torture to demonstrate an abstract fact of absolutely no use to medical science; a fact, too, which probably not a single one of the two dozen spectators would have hesitated to take for granted on the word of the experimenter, Brown-Sequard. Was the gain worth the cost?

This, then, is the great question that must eventually be decided by the public. Do humanity and science here indicate diverging roads? On the contrary, *the highest scientific and medical opinion of England has pronounced against the repetition of painful experiments for teaching purposes.* In 1875, a Royal Commission was appointed in Great Britain to investigate the subject of vivisection, with a view to subsequent legislation. The interests of science were represented by the appointment of Professor Huxley as a member of this commission. Its meetings continued over several months, and the report constitutes a large volume of valuable testimony. The opinions of many of these witnesses are worthy of special attention, from the eminent position of the men who hold them. The physician to the late Queen Victoria, Sir Thomas Watson, with whose "Lectures on Physics" every medical practitioner in America is familiar, says: "I hold

that no teacher or man of science who by his own previous experiments, . . . has thoroughly satisfied himself of the solution of any physiological problem, is justified in repeating the experiments, however mercifully, to appease the natural curiosity of a class of students or of scientific friends." Sir George Burrows, President of the Royal College of Physicians, says: "I do not think that an experiment should be repeated over and over again in our medical schools for illustrating what is already established."* Sir James Paget, Surgeon Extraordinary to the Queen, said before the Commission that "experiments for the purpose of repeating anything already ascertained ought never to be shown to classes." [363.] Sir William Fergusson, F.R.S., also Surgeon to her Majesty, asserted that "sufferings incidental to such operations are protracted in a very shocking manner"; that of such experiments there is "useless repetition," and that "when once a fact which involves cruelty to animals has been fairly recognized and accepted, there is no necessity for a continued repetition." [1019.] Even physiologists—some of them practical experimenters in vivisection—join in condemning these class demonstrations. Dr. William Sharpey, before referred to as a teacher of physiology for over thirty years in University College, stated: "Once such facts fully established, I do not think it justifiable to repeat experiments causing pain to animals." [405.] Dr. Rolleston, Professor of Physiology at Oxford, said that "for class demonstrations, limitations should undoubtedly be imposed, and *those limitations should render illegal painful experiments before classes.*"

* "Report of the Royal Commission on the Practice of Subjecting Live Animals to Experiments for Scientific Purposes." 1875-6. Question No. 175. Reference to this volume will hereafter be made in this article by inserting in brackets, immediately after the authority quoted, the number of the question of this report from which the extract is made.

[1291.] Charles Darwin, the great naturalist, stated that he had never either directly or indirectly experimented on animals, and that he regarded a painful experiment without anæsthetics which might be made with anæsthetics as deserving "detestation and abhorrence." [4672.] And finally the report of this Commission, to which was attached the name of Professor Huxley, said: "With respect to medical schools, we accept the resolution of the British Association in 1871, that experimentation without the use of anæsthetics is not a fitting exhibition for teaching purposes."

It must be noted that hardly any of these opinions touch the question of vivisection so far as it is done without the infliction of pain, nor object to it as a method of original research; they relate simply to the practice of repeating painful experiments for purposes of physiological teaching. We cannot dismiss them as "sentimental" or unimportant. If painful experiments are necessary for the education of the young physician, how happens it that Watson and Burroughs are ignorant of the fact? If indispensable to the proper training of the surgeon, why are they condemned by Fergusson and Paget? If requisite even to physiology, why denounced by the physiologists of Oxford and London, and viewed "with abhorrence" by the greatest of modern scientists?

Another objection to vivisection, when practised as at present without supervision or control, is the undeniable fact that habitual familiarity with the infliction of pain upon animals has a decided tendency to engender a sort of careless indifference regarding suffering. "Vivisection," says Professor Rolleston of Oxford, "is very liable to abuse. . . . It is specially liable to tempt a man into certain carelessness; the passive impressions produced by the sight of suffering growing weaker, while the habit and

pleasure of experimenting grows stronger by repetition." [1287.] Says Doctor Elliotson: "I cannot refrain from expressing my horror at the amount of torture which Doctor Brachet inflicted. I hardly think knowledge is worth having at such a purchase."* A very striking example of this tendency was brought out in the testimony of a witness before the Royal Commission,—Doctor Klein, a practical physiologist. He admitted frankly that as an investigator he held as entirely indifferent the sufferings of animals subjected to his experiments, and that, except for teaching purposes, he never used anæsthetics unless necessary for his own convenience. Some members of the Commission could hardly realize the possibility of such a confession.

"Do you mean you have no regard at all to the sufferings of the lower animals?"

"*No regard at all*," was the strange reply; and, after a little further questioning, the witness explained:

"I think that, with regard to an experimenter—a man who conducts special research and performs an experiment—he has *no time, so to speak, for thinking what the animal will feel or suffer!*" "You are prepared to acknowledge that you hold as entirely indifferent the sufferings of the animal which is subjected to your investigation?"—"*Yes.*" [3539-3544.]

Of Magendie's cruel disposition there seems only too abundant evidence. Says Doctor Elliotson: "Dr. Magendie, in one of his barbarous experiments, which I am ashamed to say I witnessed, began by coolly cutting out a large round piece from the back of a beautiful little puppy, as he would from an apple dumpling!" "It is not to be doubted that inhumanity may be found in persons of very high position as physiologists. *We have seen that it was so in Magendie.*" This is the language of the report of

* "Human Physiology," by John Elliotson, M.D., F.R.S. (p. 448).

vivisection, to which is attached the name of Professor Huxley.

But the fact which, in my own mind, constitutes by far the strongest objection to unrestrained experiments in pain, is their questionable utility as regards therapeutics. Probably most readers are aware that physiology is that science which treats of the various functions of life, such as digestion, respiration and the circulation of the blood, while therapeutics is that department of medicine which relates to the discovery and application of remedies for disease. Now I venture to assert that, during the last quarter of a century, infliction of intense torture upon unknown myriads of sentient, living creatures, has not resulted in the discovery of a single remedy of acknowledged and generally accepted value in the cure of disease. It is by no means intended to deny the value to therapeutics of well-known physiological facts acquired thus in the past—such, for instance, as the more complete knowledge we possess regarding the circulation of the blood, or the distinction between motor and sensory nerves, nor can original investigation be pronounced valueless as respects remote possibility of future gain. What the public has a right to ask of those who would indefinitely prolong these experiments without State supervision or control, is, "What good have your painful experiments accomplished during the past thirty years—not in ascertaining the causes of incurable complaints, but in the discovery of improved methods for ameliorating human suffering, and for the cure of disease?" If pain could be estimated in money, no corporation ever existed which would be satisfied with such waste of capital in experiments so futile; no mining company would permit a quarter-century of "prospecting" in such barren regions. The usual answer to this inquiry is to bring forward facts in physiology thus acquired in the past,

in place of facts in therapeutics. But, in urging the utility of a practice so fraught with danger, the utmost precaution against the slightest error of over-statement becomes an imperative duty. Even so distinguished a scientist as Sir John Lubbock* once rashly asserted in Parliament that, "without experiments on living animals, we should never have had the use of ether"! Nearly every American schoolboy knows that the contrary is true, that the use of ether as an anæsthetic—the most valuable discovery of modern times—had no origin in the torture of animals.

A vague impression regarding the utility of vivisection in therapeutics is still widely prevalent in the medical profession. Nevertheless, is it not a mistake? The therapeutical results of nearly half a century of painful experiments —we seek them in vain. Do we ask surgery? Sir William Fergusson, Surgeon to the Queen, tells us: "In surgery I am not aware of any of these experiments on the lower animals having led to the mitigation of pain or to improvement as regards surgical details." [1049.] Have antidotes to poisons been discovered thereby? Says Doctor Taylor, lecturer on Toxicology for nearly half a century in the chief London Medical School (a writer whose work on "Poisons" is a recognized authority): "I do not know that we have as yet learned anything, so far as treatment is concerned, from our experiments with them (*i. e.*, poisons) on animals." [1204.] Doctor Anthony, speaking of Magendie's experiments, says: "I never gained one single fact by seeing these cruel experiments in Paris. *I know nothing more from them than I could have read.*" [2450.] Even physiologists admit the paucity of therapeutic results. Doctor Sharpey says: "I should lay less stress on the direct application of the results of vivisection to improvement in the art of healing, than upon the value of these experiments in

* Now Lord Avebury.

the promotion of physiology." [394.] The Oxford Professor of Physiology admitted that Etiology, the science which treats of the causes of disease, had, by these experiments, been the gainer, rather than therapeutics. [1302.] "Experiments on animals," says Doctor Thorowgood, "already extensive and numerous, cannot be said to have advanced therapeutics much."* Sir William Gull, M.D., was questioned before the commission whether he could enumerate any therapeutic remedies which have been discovered by vivisection, and he replied with fervour: "The cases bristle around us everywhere!" Yet, excepting Hall's experiments on the nervous system, he could enumerate only various forms of disease, our knowledge of which is due to Harvey's discovery, two hundred and fifty years ago! The question was pushed closer, and so brought to the necessity of a definite reply, he answered: "I do not say at present our therapeutics are much, but there are lines of experiments which *seem to promise* great help in therapeutics." [5529.] The results of two centuries of experiments, so far as therapeutics are concerned, reduced to a seeming promise!

On two points, then, the evidence of the highest scientific authorities in Great Britain seems conclusive—first, that experiments upon living animals conduce chiefly to the benefit of the science of physiology; and, secondly, that repetition of painful experiments for class teaching in medical schools is wholly unjustifiable. Do these conclusions affect the practice of vivisection in this country (America)? Is it true that experiments are habitually performed in some of our medical schools, often causing extreme pain, to illustrate well-known and accepted facts—experiments which English physiologists pronounce "infamous" and "atrocious," which English physicians and surgeons stigmatize as purposeless cruelty and unjustifiable, which even

* "Medical Times and Gazette," October 5, 1872.

Huxley regards as unfitting for teaching purposes, and Darwin denounces as worthy of detestation and abhorrence? I confess I see no occasion for any over-delicate reticence in this matter. Science needs no secrecy either for her methods or results; her function is to reveal facts, not to hide them. The reply to these questions must be in the affirmative. In America our physiologists are rather followers of Magendie and Bernard, after the methods in vogue at Paris and Leipsic, than men who are governed by the cautious and sensitive conservatism which generally characterizes the physiological teaching of London and Oxford. Every medical student in New York knows that experiments involving pain are repeatedly performed to illustrate teaching. It is no secret; one need not go beyond the frank admissions of our later text-books on physiology for abundant proof, not only of this, but of the extent to which experimentation is now carried in this country. "We have long been in the habit, in class demonstrations, of removing the optic lobe on one side from a pigeon," says Professor Flint, of Bellevue Hospital Medical College, in his excellent work on Physiology.* "The experiment of dividing the sympathetic in the neck, especially in rabbits, is so easily performed that the phenomena observed by Bernard and Brown-Sequard have been repeatedly verified. *We have often done this in class demonstrations.*"† "The cerebral lobes were removed from a young pigeon in the usual way, an operation . . . which we practice yearly as a class demonstration."‡ Referring to the removal of the cerebellum, the same authority states: "Our own experiments, which have been very numerous during the last fif-

* A Text-book of Human Physiology, designed for the use of Practitioners and Students of Medicine, by Austin Flint, Jr., M.D. D. Appleton and Co. New York: 1876 (page 722).

† Page 738. ‡ Page 585.

teen years, are *simply repetitions of those of Flourens, and the results have been the same without exception.*"* "We have frequently removed both kidneys from dogs, and when the operation is carefully performed the animals live for from three to five days. . . . Death always takes place with symptoms of blood poisoning."† In the same work we are given precise details for making a pencreatic fistula, after the method of Claude Bernard—"one we have repeatedly employed with success." "In performing the above experiment it is generally better not to employ an anæsthetic,"‡ but ether is sometimes used. In the same work is given a picture of a dog, muzzled and with a biliary fistula, as it appeared the fourteenth day after the operation, which, with details of the experiment, is quite suggestive.§ Bernard was the first to succeed in following the spinal accessory nerve back to the jugular foramen, seizing it here with a strong pair of forceps and drawing it out by the roots. This experiment is practised in our own country. "We have found this result (loss of voice) to follow in the cat after the spinal accessory nerves have been torn out by the roots," says Professor John C. Dalton, in his Treatise on Human Physiology.‖ "The operation is difficult," writes Professor Flint, "but we have several times performed it with entire success;" and his assistant at Bellevue Medical College has succeeded "in extirpating these nerves for class demonstrations."¶ In withdrawal of blood from the hepatic veins of a dog, "avoiding the administration of an anæsthetic" is one of the steps recommended.** The curious experiment of Bernard, in which artificial diabetes is produced by irritating the floor of the fourth ventricle of the brain, is carefully described, and illustrations afforded both of the instrument and the animal undergoing the opera-

* Page 710. † Page 403. ‡ Page 269-70. § Page 282.
‖ Page 489. ¶ Page 629. ** Page 463.

tion. The inexperienced experimenter is here taught to hold the head of the rabbit "firmly in the left hand," and to bore through its skull "by a few lateral movements of the instrument." It is not a difficult operation; it is one which the author has "often repeated." He tells us "*it is not desirable to administer an anæsthetic,*" as it would prevent success; and a little further we are told that "we should avoid the administration of anæsthetics in all accurate experiments on the glycogenic function."* It is true the pleasing assurance is given that "this experiment is almost painless"; but on this point, could the rabbit speak during the operation, its opinion might not accord with that of the physiologist.

There is one experiment to which the severe denunciation of English scientists is especially applicable. Numerous investigators have long established the fact that the great sensory nerve of the head and face is endowed with an exquisite degree of sensibility. More than half a century ago both Magendie and Sir Charles Bell pointed out that merely exposing and touching this fifth nerve gave signs of most acute pain. "All who have divided this root in living animals must have recognized, not only that it is sensitive, but that its sensibility is far more acute than that of any other nervous trunk in the body."† "The fifth pair," says Professor John C. Dalton, "is the most acutely sensitive nerve in the whole body. Its irritation by mechanical means *always causes intense pain, and* even though the animal be nearly unconscious from the influence of ether, any severe injury to its large root is almost invariably followed by cries."‡ Testimony on this point is uniform and abundant. If science speaks anywhere with assurance, it is

* Pages 470-71.

† Flint: "Text-book on Human Physiology" (page 641).

‡ Dalton's "Human Physiology" (page 466).

in regard to the properties of this nerve. Yet every year the experiment is repeated before medical classes, simply to demonstrate accepted facts! "This is an operation," says Professor Flint, referring to the division of this nerve, "that we have frequently performed with success." He adds that "it is difficult from the fact that one is working in the dark, and it requires a certain amount of dexterity, *to be acquired only by practice.*" Minute directions are therefore laid down for the operative procedure, and illustrations given both of the instrument to be used, and of the head of a rabbit with the blade of the instrument in its cranial cavity.* Holding the head of our rabbit firmly in the left hand, we are directed to penetrate the cranium in a particular manner. "Soon the operator feels at a certain depth that the bony resistance ceases; he is then on the fifth pair, and the cries of the animal give evidence that the nerve is pressed upon." This is one of Magendie's celebrated experiments; perhaps the reader fancies that in its modern repetitions the animal suffers nothing, being rendered insensible by anæsthetics? "It is much more satisfactory to divide the nerve without etherizing the animal, as the evidence of pain is an important guide in this delicate operation." Anæsthetics, however, are sometimes used, but not so as wholly to overcome the pain.

Testimony of individuals, indicating the extent to which vivisection is at present practised in this country might be given; but it seems better to submit proof within the reach of every reader, and the accuracy of which is beyond cavil. No legal restrictions whatever exist, preventing the performance of any experiment desired. Indeed, I think it may safely be asserted that, in the city of New York, in a single medical school, more pain is inflicted upon living animals as a means of teaching well-known facts, than is

* Flint (pages 639-40).

permitted to be done for the same purpose in all the medical schools of Great Britain and Ireland. And *cui bono?* "I can truly say," writes a physician who had seen all these experiments during his course of study in Bellevue Hospital Medical College, "that not only have I never seen any results at all commensurate with the suffering inflicted, but I cannot recall a single experiment which, in the slightest degree, has increased my ability to relieve pain, or in any way fitted me to cope better with disease."

*CERTAIN DANGERS OF VIVISECTION.**

What is the true value of vivisection? No question needs more careful consideration, and to none is it more difficult to make an unconditional reply. "When we have stated our terms and cleared our ground," said Cardinal Newman, "all argument is generally either superfluous or fruitless"; and assuredly, no little misapprehension exists in this matter from lacking agreement on the meaning of words. Does the gain of a scientific fact outweigh all regard for the method of its attainment? Then we must acknowledge that from innumerable tortures may have resulted a little gain. If, on the other hand, value includes an account of cost, what tribunal shall estimate for us the price of another's pain? The very word "vivisection" may include practices far more innocent of pain than the butchers' shambles, or, on the other hand, tortures as exquisitely acute and prolonged, as the torments of Damiens on the rack. Before looking at the question, let us glance briefly at a few points wherein, as a needful preliminary, it is necessary to state terms and to clear ground.

Vivisection, so far as it seems to us in any way liable to criticism, always means that for which Dr. Wilder, of Cornell University, suggests the word "*sentisection*,"—a presumably painful experiment upon a sentient animal. Demonstrations of physiological phenomena in our medical schools are frequently made upon animals in which sensation has ceased, and whose consciousness has passed into an

* Originally published in LIPPINCOTT'S MAGAZINE, for August, 1884. Revised.

oblivion from which it need never awake. That this is not the uniform practice in our country, is unfortunately capable of abundant proof. When a leading medical journal does "not hesitate to take the position that it is right for a few animals to suffer briefly once a year, in order to impress a physiological truth,"* it is time that the public should know that in this respect American schools of medicine occupy a position which not a single English physiologist ventures openly to advocate at the present time. If, as we are told by the same authority, "the pains inflicted in the laboratory are not caused needlessly or unintelligently," surely this is no more than might have been said by Cicero of the dying gladiator, by Calvin of the execution of Servetus, or by Sir Matthew Hale of a burning witch. An English bishop, speaking on the subject of vivisection, once told the House of Lords that "it was very difficult to decide what was unnecessary pain," and as an example of the perplexities which invested the question in his own mind, he instanced "the case of the wretched man who was convicted of skinning cats alive, because their skins were more valuable when taken from the live than the dead animal. The extra money," added the bishop, "*got the man a dinner!*"† We can hardly agree with the bishop's implied justification for such a practice, even though suggested by such distinguished ecclesiastical authority. Given an end, whose attainment is possible only through extreme suffering, and the question is not whether the pangs are needless, but rather whether the object to be attained makes justifiable the infliction of the pain.

And this is the point in dispute. Is it true that the gains from painful experiments are of such immeasurable utility to the science and art of medicine that we may look with-

* The "Medical Record," New York, July 31, 1880.

† Bishop of Peterborough, in House of Lords, June 20, 1876.

out concern at the widest possible extension of the practice? Are the deductions it gives science always clear, absolute and certain, or often equivocal, dubious and unconvincing? Are experimenters agreed upon the significance of observed phenomena, or do they differ on a thousand points, each appealing to his own experience in support of his own views? May we note any tendency in scientific enthusiasm to over-rate excellence or to under estimate danger? In short, are the objects so grand, the costs so trivial, the dangers so petty, the gains to humanity so great, that society can continue without concern to relegate the whole matter to the zeal of the inquisitor, the enthusiasm of the vivisector? Omitting for the moment any consideration of the ethics of vivisection, let us consider some of the dangers arising from unlimited animal experimentation.

I. One peril to which scientific truth seems thereby to be exposed, is a peculiar tendency on the part of the apologist for vivisection without control, to under estimate the numberless uncertainties and contradictions created by experimentation upon living beings. Judging from the enthusiasm of its advocates, one would think that by this method of interrogating nature, all fallacies can be detected, all doubts determined. But, on the contrary, the result of experimentation, in many directions, is to plunge the observer into the abyss of uncertainty. Take, for example, one of the simplest and yet most important questions possible,—the degree of sensibility in the lower animals. Has an almost infinite number of experiments enabled physiologists to determine for us the mere question of pain? Suppose an amateur experimenter in London, desirous of performing some severe operations upon frogs, to hesitate because of the extreme painfulness of his methods, what replies would he be likely to obtain from the highest scientific authorities of England as to the sensibility of these

creatures? We may fairly judge their probable answers to such inquiries from evidence given before the Royal Commission of 1875-6.*

Dr. Carpenter would doubtless repeat his opinion that "frogs have extremely little perception of pain"; and in the evidence of that experienced physiologist, George Henry Lewes, he would find the cheerful assurance, "I do not believe that frogs suffer pain at all." Our friend applies, let us suppose, to Dr. Klein, of St. Bartholomew's Hospital, who despises the sentimentality which regards animal suffering as of the least consequence; and this enthusiastic vivisector informs him that, in his English experience, the experiment which caused the greatest pain without anæsthetics was the cauterization of the cornea of a frog. Somewhat confused at finding that a most painful experiment can be performed upon an animal that does not suffer, he relates this to Dr. Swaine Taylor, of Guy's Hospital, who does not think that Klein's experiment would cause severe suffering; but of another—placing a frog in cold water and raising the temperature to about 100degs.—"that," says Doctor Taylor, "would be a cruel experiment: I cannot see what purpose it can answer." Before leaving Guy's Hospital, our inquiring friend meets Dr. Pavy, one of the most celebrated physiologists in England, who tells him that in this experiment, stigmatized by his colleague as "cruel," the frog would in reality suffer very little; that if we ourselves were treated to a bath gradually raised from a medium temperature to the boiling point, "I think we should not feel any pain;" that were we plunged at once into boiling water, "even then," says the enthusiastic and scien-

* The contradictory opinions ascribed to most of the authorities quoted in this article are taken directly from the "Report of the Royal Commission on the Practice of Subjecting Live Animals to Experiments for Scientific Purposes."—a Blue-Book Parliamentary Report.

tific Dr. Pavy, "I do not think pain would be experienced!" Our friend goes then to Dr. Sibson, of St. Mary's Hospital, who as a physiologist of many years' standing, sees no objection to freezing, starving, or baking animals alive; but he declares of boiling a frog, "That is a horrible idea, and I certainly am not going to defend it." Perplexed more than ever, he goes to Dr. Lister, of King's College, and is astonished upon being told "that the mere holding of a frog in your warm hand is about as painful as any experiment probably that you would perform." Finally, one of the strongest advocates of vivisection, Dr. Anthony, pupil of Sir Charles Bell, would exclaim at the suggestion of exposing the lungs of a frog: "Fond as I am of physiology, I would not do that for the world!" What affectation is here! No physiologist of to-day hesitates to make experiments far more severe.

Now, what has our inquirer learned by his appeal to science. Has he gained any clear and absolute knowledge? Hardly two of the experimenters named agree upon one simple yet most important preliminary of research—the sensibility to pain of a single species of animals.

Let us interrogate scientific opinion a little further on this question of sensibility. Is there any difference in animals as regards susceptibility to pain? Dr. Anthony says that we may take the amount of intelligence in animals as a fair measure of their sensibility—that the pain one would suffer would be in proportion to its intelligence. Dr. Rutherford, for instance, never performs an experiment upon a cat or a spaniel if he can help it, because they are so exceedingly sensitive; and Dr. Horatio Wood, of Philadelphia, tells us that the nervous system of a cat is far more sensitive than that of the rabbit. On the other hand, Dr. (now Lord) Lister, of King's College, is not aware of any such difference in sensibility in animals, and Dr. Brun-

ton, of St. Bartholomew's, finds cats such very good animals to operate with, that on one occasion he used ninety in making a single experiment.

Sir William Gull thinks "there are but few experiments performed on living creatures where sensation is not removed," yet Dr. Rutherford admits "about half" his experiments to have been made upon animals sensitive to pain. Professor Rolleston, of Oxford University, tells us "the whole question of anæsthetizing animals has an element of uncertainty"; and Professor Rutherford declares it "impossible to say" whether even artificial respiration is painful or not, "unless the animal can speak." Dr. Brunton, of St. Bartholomew's, says of that most painful experiment, poisoning by strychnine, that it cannot be efficiently shown if the animal be under chloroform. Dr. Davy, of Guy's, on the contrary, always gives chloroform, and finds it no impediment to successful demonstration. Is opium an anæsthetic? Claude Bernard declares that sensibility exists even though the animal be motionless: "*Il sent la douleur, mais il a, pour ainsi dire, perdu l'idee de la defense.*"* But Dr. Brunton, of St. Bartholomew's Hospital, London, has no hesitation whatever in contradicting this statement "emphatically, however high an authority it may be." Is it then true, that the absolute certainty of some of the most important deductions must remain for ever hidden "unless the animal can speak"?

II. Between advocating State supervision of painful vivisection, and proposing the total suppression of all experiments, painful or otherwise, there is manifestly a very wide distinction. Unfortunately, the suggestion of any interference whatever invariably rouses the anger of those most interested—an indignation as un-

* "He feels the pain, but has lost, so to speak, the idea of self-defence." "Leçons de Physiologie Opératoire," 1879, p. 115.

reasonable, to say the least, as that of the merchant who refuses a receipt for money just paid to him, on the ground that a request for a written acknowledgment is a reflection upon his honesty. How otherwise than by State supervision are we to reach abuses which confessedly exist? Can we trust the sensitiveness and conscience of every experimenter? True, there are men who can stand above the lowest creature with such exceeding pity, such anxiety to spare it every needless throe, that not a pang is inflicted of which they do not count the cost. Such an investigator was Sir Charles Bell, who hesitated even to corroborate one of the greatest physiological discoveries of this century, at the price of painful experiments. Writing to his brother, June 10, 1822, he says: "My discoveries have made more impression in France than here, and I have received a second message from Magendie, saying that if I would send them any short account, I should have the prize medal,—a ridiculous thing for an old fellow!" Three weeks later he writes again, under date of July 1: "I should be writing a third paper on the Nerves; but I cannot proceed without making some experiments which are so unpleasant to make that I defer them. You may think me silly, but I cannot perfectly convince myself that I am authorized in Nature or Religion to do these cruelties. . . . . And yet, what are my experiments in comparison with those which are daily done, and are done daily for nothing!"*

But sensitiveness like this finds few counterparts among the physiologists of history. Magendie, declaring of his mutilated animals, that "*it is droll* to see them skip and jump about,"† and driving from his lectures by his cruelties, a man destined to be among the first and most honoured of British physiologists; Spalanzani, of whom

* Letters of Sir Charles Bell, London, 1875, p. 275.

† "Journal de Physiologie," tom. III, p. 155.

Abernethy declared that he had "tortured and destroyed animals in vain";* Schiff, cutting the nerves of vocalization in his victims, that they may be prevented,—as he tells us with diabolic humour, "de se livrer a des concerts nocturnes, et de *discréditer ainsi les études physiologiques*";† Mantegazza, of the University of Pavia, experimenting upon animals "with extreme delight" simply to note the effects of continuous torture and of extremest possible torment,‡—these are not types of men society should wish to see multiplied in the medical profession. One of the leading physiologists in this country (United States), Dr. John C. Dalton, admits "that vivisection may be, and has been, abused by reckless, unfeeling or unskilful persons"; that he himself has witnessed abroad, in a veterinary institution, operations than which "nothing could be more shocking." And yet the unspeakable atrocities at Alfort, to which, apparently, Dr. Dalton alludes, were defended upon the very ground that he and his associates occupy to-day in advocating the present methods of experimentation in laboratory and class-room; for the *Academie des Sciences* decided that there was "no occasion to take any notice of complaints; that in the future, as in the past, vivisectional experiments must be left entirely to the judgment of scientific men." The experiments that seemed "atrocious" to the more tender-hearted Anglo-Saxon were regarded as perfectly justifiable by the scientists of France.

A curious question suggests itself in conection with this point. There can be little doubt, I think, that the sentiment of compassion and of sympathy with suffering is more generally diffused among all classes of Great Britain than elsewhere in Europe; and one cannot help wondering what our

* Lecture IV.

† "Leçons sur le Physiologie de la Digestion," tom. I, p. 291.

‡ "The Lancet." London. No. 2482, p. 415.

place might be, were it possible to institute any reliable comparison of national humanity. Should we be found in all respects as sensitive as the English people? Would indignation and protest be as quickly and spontaneously evoked among us by a cruel act? The question may appear an ungracious one, yet it seems to me there exists some reason why it should be plainly asked. There is a certain experiment—one of the most excruciating that can be performed—which consists in exposing the spinal cord of the dog for the purpose of demonstrating the functions of the spinal nerves. It is one, by the way, which Dr. Wilder forgot to enumerate in his summary of the "four kinds of experiments," since it is not the "cutting operation" which forms its chief peculiarity or to which special objection would be made. At present all this preliminary process is generally performed under anæsthetics: it is an hour or two later, when the animal has partly recovered from the severe shock of the operation, that the wound is reopened and the experiment begins. It was during a class demonstration of this kind by Magendie, before the introduction of ether, that the circumstance occurred which one hesitates to think possible in a person retaining a single spark of humanity or pity. "I recall to mind," says Dr. Latour, who was present at the time, "a poor dog, the roots of whose vertebral nerves Magendie desired to lay bare to demonstrate Bell's theory, which he claimed as his own. The dog, mutilated and bleeding, twice escaped from under the implacable knife, and threw its front paws around Magendie's neck, licking, as if to soften his murderer and ask for mercy! I confess I was unable to endure that heartrending spectacle." Now, what do English physiologists and vivisectors of the present day think of the repetition of this experiment solely as a class demonstration?

They have candidly expressed their opinions before a

Royal Commission. Prof. Ferrier, of King's College, noted for his experiments upon the brains of monkeys, affirms his belief that "students would rebel" at the sight of a painful experiment. The late Prof. Rutherford, who certainly dared do all that may become a physiologist, confessed: "*I dare not* show an experiment upon a dog or rabbit before students, when the animal is not anæsthetized." Dr. Pavy, of Guy's Hospital, asserts that a painful experiment introduced before a class "would not be tolerated for a moment." Sir William Gull, M.D., believes that the repetition of an operation like this upon the spinal nerves would excite the reprobation alike of teacher, pupils, and the public at large. Michael Foster, of Cambridge University, who minutely describes all the details of the experiment on recurrent sensibility in the "Handbook for the Physiological Laboratory," nevertheless tells us, "I have not performed it, and have never seen it done," partly, as he confesses, "from horror at the pain." And finally Dr. Burdon-Sanderson, physiologist at University College, London, states with the utmost emphasis, in regard to the performance of this demonstration on the spinal cord, "I am perfectly certain that no physiologist—none of the leading men in Germany, for example—would exhibit an experiment of that kind."*

Now mark the contrast. This experiment—which we are told passes even the callousness of Germany to repeat; which every leading champion of vivisection in Great Britain reprobates for medical teaching; which some of them shrink even from seeing themselves, from horror at the tortures necessarily inflicted; which the most ruthless among them dare not exhibit to the young men of Eng-

*This of course was not only untrue, but it is difficult to imagine that its untruth was unknown to the speaker. "The leading men of Germany" do not hesitate at vivisection far worse than this.

land,—this experiment has been performed publicly again and again in American medical colleges, without exciting even a whisper of protest or the faintest murmur of remonstrance! The proof is to be found in the published statements of the experimenter himself. In his "Text-Book of Physiology," Professor Flint says, "Magendie showed very satisfactorily that the posterior roots (of the spinal cord) were exclusively sensory, and this fact has been confirmed by more recent observations upon the higher classes of animals. We have ourselves frequently exposed and irritated the roots of the nerves in dogs, in public demonstrations in experiments on the recurrent sensibility, . . . and in another series of observations."*

This is the experience of a single professional teacher; but it is improbable that this experiment has been shown only to the students of a single medical college in the United States; it has undoubtedly been repeated again and again in different colleges throughout the country. If Englishmen are, then, so extremely sensitive as Ferrier, Gull, and Burdon-Sanderson would have us believe, we must necessarily conclude that the sentiment of humaneness is far stronger in Britain than in America. Have we then drifted backward in humanity? Have American students learned to witness, without protest, tortures at the sight of which English students would rebel? We are told that there is no need of any public sensitiveness on this subject. We should trust entirely, as they do in France,—at Alfort, for example,—"to the judgment of the investigator." There must be no lifting of the veil to the outside multitude; for the priests of unpitying science there must be as absolute immunity from criticism or inquiry as was ever demanded before the shrine of Delphi or the altars of Baal. "Let them

* "A Text-book of Human Physiology." By Austin Flint, Jr., M.D. New York, 1876. Page 589; see also page 674.

exercise their solemn office," demands Prof. Wilder, "not only unrestained by law, but upheld by public sentiment."

For myself, I cannot believe this position is tenable. Nothing seems to me more certain than the results that must follow if popular sentiment in this country—knowing the truth,—shall sustain the public demonstration of experiments in pain, which can find no open defender among the physiologists of Great Britain. It has been my fortune to know something of the large hospitals of Europe; and I do not know one in countries where painful vivisection flourishes unchecked by law, wherein the poor and needy sick are treated with the sympathy, the delicacy, or even the decency, which so universally characterize the hospitals of England. When Magendie, operating for cataract, plunged his needle to the bottom of his patient's eye, that he might note upon a human being the effect produced by mechanical irritation of the retina, he demonstrated how greatly the zeal of the experimenter may impair the responsibility of the physician and the instinctive sympathy of man for suffering humanity.*

III. Another danger inherent to the practice of vivisection is the injury to Science caused by an exaggeration of its utility. For, despite much argument, the extent of this utility remains still an open question. No one is so foolish as to deny the possibility of future usefulness to any discovery whatever; but there is a distinction, very easily slurred over in the eagerness of debate, between present applicability and remotely potential service. Science never needs the tribute of inaccuracy and untruth. Every discovery in vital phenomena is a gain to physiology as a science; if this be all that we can perceive as profit, why is it needful to imagine more? Art does not defend her exist-

* "An Elementary Treatise on Human Physiology." By F. Magendie. American Edition, p. 64.

ence by reference to the ledger; nor Philosophy deign to count purses with Commerce. Yet there has been in medicine, or surgery, hardly any advance in modern times, but some zealot has attributed it solely to experimentation upon animals; there is not an experiment so hideous or brutal, but that some defender has arisen to excuse it, because perpetrated "in the interests of sick and suffering humanity!" Why is it that this line of argument is heard chiefly in England and America where vivisection is most severely challenged, and hardly, if at all, on the continent, where are practised, as we are told by good authority, "the more brutal methods of physiological experiments?"* Dr. Herman, for instance, the great German apologist for vivisection, tells us frankly and honestly, "The advancement of our knowledge, and not practical utility to medicine, is the true and straightforward object of all vivisection. *No true investigator in his researches thinks of practical utilization.* Science can afford to despise this justification with which vivisection has been defended."† Regarding the practical utility of vivisection, surely the opinion of the leading vivisector of France for the last quarter century should be accepted as scientific authority; but Claude Bernard tells us it is hardly worth while to inquire. "A ceux qui nous demandent ce qu'a produit la medicine experimentale, nous sommes donc fondes a repondre, *qu'elle est née à peine. . . . Sans doute nos mains sont vides aujourd'hui*, mais notre bouche peut-etre pleine de legitimes promesses pour l'avenir."‡ With hands empty, but mouths full of promises for the future, thus stands vivi-

* "The Medical Record." New York. July 10, 1880.

† "Die Vivisectionsfrage. Für das grössere Publicum beleuchtet." By Dr. L. Herman, Professor of Physiology, Zurich. London Translation, page 16.

‡ "Leçons sur Le Diabète." Paris, 1877. p. 43.

section, in the mind of the most eminent physiologist of the nineteenth century!

Was Claude Bernard in any way right as to the "empty hands"? Has vivisection within the last quarter century, produced a single remedy, the value of which is beyond all question? I doubt it; remedies there are, but they are still in the experimental stage. On the other hand, scientific evidence points to the appalling conclusion, that during the last thirty years, some of the chief forms of incurable disease have steadily increased in fatality, notwithstanding the vast increase of the practice of vivisection. There is no doubt of this fact; the authority for the statement is one upon which reliance may be placed,—the statistics of a nation's mortality, presented to the British Parliament by the Registrar-General.

Although the death-rate of England has very sensibly diminished during the past half century, the decrease has chiefly been due to the lessened mortality of childhood and to the vast influence of Public Hygiene in the prevention of disease. "It is a fact," said the Registrar-General in his report of 1881, "that while mortality in early life has been very notably diminished, the mortality of persons in middle or advanced life has been steadily rising for a long period of years." And whatever may be the cause of this increasing fatality, it is evident that vivisection has opened no door through which those subject to the stress and strain of life may escape from the penalties imposed by nature upon those who either ignorantly or recklessly break her laws.*

* In the death-rate of England and Wales, during the past forty years, there has been a marked decline. That this is due largely to increased attention to sanitation and the influence of preventive medicine can hardly be disputed. A large proportion of the decrease, pertains to the mortality of diseases which chiefly prevail in squalid and filthy surroundings. On the other hand, there are causes of death in England which were respon-

What then is the substance of the whole matter? It seems to me the following conclusions are justified by the facts presented.

I. Experiments upon living animals may be divided into two general classes; first, those which produce pain,—slight, brief, severe or acute and prolonged; and second, those experiments which are performed under anæsthesia, from which may follow either death during unconsciousness, or entire recovery.

II. A number of the vivisections requisite for purposes of teaching physiological facts may be so carried on as to take life with less pain or inconvenience to the animal than is absolutely necessary in order to furnish meat for our tables.

III. Prohibition of all experiments may be fairly demanded by those who believe that the enthusiasm of the scientific experimenter will outweigh all considerations of good faith, provided the success of his experiment depend on the consciousness of pain; in other words, that the experimenter himself will either evade or disobey any restrictive law which may be passed.

IV. Absolute liberty in the matter of painful experiments has produced admitted abuses by physiologists of

sible for a considerably higher death-rate *during the first five years of this century* (1901--'05) *than thirty years ago.* The death-rate from diphtheria, for instance, was 121 per million population during 1871--'75; during the last-mentioned period it was 204. Cancer has steadily increased its mortality for many years, going from 446 to 864; Bright's disease in its acute and chronic forms has increased from 183 to 378, or more than double; diabetes has increased from 36 to 89; cirrhosis of the liver has gone from 72 to 121, and even pneumonia from 1,025 to 1,271. Even if we confine attention to the last twenty years, we find that the death-rate from insanity (including general paralysis), which was 86 in 1886, was 128 in 1905; and valvular disease of the heart increased from 258 to 435. (See Report of Registrar-General for year 1905.)

Germany, France and Italy, and in America it has led to the repetition before classes of students of Magendie's extreme cruelties,—demonstrations which have been condemned by every leading English physiologist.

V. In view of the dangerous impulses not unfrequently awakened by the sight of bloodshed, or pain intentionally inflicted, experiments of this kind should by legal enactment be entirely forbidden before classes of students in our schools.

VI. Vivisection, involving the infliction of pain, is, in its best possible aspect, a practice so linked to danger, that it should be placed under the control and supervision of the State.

CONCERNING A PRIZE ESSAY.

A short time since, while calling at the office of the American Humane Education Society in Boston, there was put into my hands, with other documents, a copy of the "Five Hundred Dollar Prize Essays" for and against the practice of vivisection. For some reason, perhaps because of prolonged absence abroad, this pamphlet, which has been so widely circulated, never before came to my notice. Glancing it over, I was rather startled to see that both essayists had quoted from what I had written on the same subject, to support their widely variant views; but, when at more leisure I came to study carefully the argument of Dr. Macphail in defence of vivisection, surprise gave way to indignation. To what extent it was justifiable, the reader shall judge.

From nineteen essays in favour of vivisection, a committee from Harvard University Medical School selected that of Dr. Macphail, of Canada, as the best. Apparently the committee made no attempt to test the accuracy of his quotations, assuming, perhaps, that an advocate of scientific research would of course be scientifically exact in statements of arguments or relation of facts. That this faith was not justified is abundantly evident. Let me quote one paragraph of this essay in regard to which I can speak with especial emphasis:

"Dr. Leffingwell, by quotations from the physiological treatises of Professors Dalton and Flint, shows that there are only seven cases in which anæsthetics are not always employed; and in them there is reason to believe the pain is either brief or not very severe, and that there is also reason for belief that there is an annual decrease in the number of such demonstrations. The charge of Ray Lankester is thus disproved, that the number of experiments must increase in geometric ratio as physiology advances."

What does Dr. Macphail mean by this paragraph? Here are four distinct statements, and every one of them is untrue. I challenge Dr. Macphail to produce the evidence upon which he has declared that I have shown "there are only seven cases in which anæsthetics are not always employed, and in them there is reason for belief the pain is brief, or not very severe," etc. Nothing of the kind was ever even attempted to be shown by anything I ever wrote. In the two essays which I contributed to *Scribner's Monthly* and *Lippincott's Magazine*, perhaps a dozen instances of vivisection experiments were mentioned. Not a word, not a single word of either article, can by any manner of interpretation be distorted into a statement that these were the "only seven cases in which anæsthetics are not always used," or "that there is reason for belief that there is an annual decrease in the number of these demonstrations." Why, Dr. Macphail must know that, if any one should say there were "only seven" painful experiments, it would be a falsehood. He is not ignorant of the range of physiological investigation.

Dr. Macphail has been awarded $250 for his essay. It is too late to protest against it; but, if he can quote from any of my writings in proof that I have shown or attempted to show the annual decrease in experimentation, its comparative painlessness, and that there are only seven cases in which anæsthetics are not always used, I shall be pleased to tax myself another $250 for the benefit of his purse. If, on the contrary, he can produce no such evidence, then it seems to me that some portion of the prize awarded him might be returned to the American Humane Education Society,—a self-imposed tax for careless and inaccurate quotation.

Dr. Macphail seems to have a fine contempt for footnotes and references. It is somewhat difficult therefore to

decide the value of other statements of his essay. Some of them I should assuredly question; for their support, evidence must be adduced infinitely superior to anything he has given. Take, for instance, that remarkable narrative of a missionary in India who "by vivisection obtained an antidote successful in sixty cases out of one hundred of bite by the brown viper, and with it saved the life of a fellow-worker, who was afterwards instrumental in inducing two thousand natives to embrace Christianity." To any one who has never lived in India, there seems nothing especially improbable in the story. It looks plausible at first sight, but the omissions are suspicious. In what part of India did that missionary live? What is the nature of his "antidote"? Is the bite of a viper always otherwise fatal? What proof exists that the cures were exactly sixty per cent.? What is the name and address of that "fellow-worker" whose life was saved by the newly-discovered antidote? Upon what evidence rests the claim that, subsequent to his rescue from death, he was instrumental in the conversion of heathen to Christianity? Any one acquainted with the stubborn adhesion of the Hindu and Mahomedan peasantry of India to their own faith must acknowledge that labours so efficient ought not to have been hidden under an anonymous story. Yet the entire narrative is given without a word of proof by an advocate of "scientific research"!

Other assertions of the prize essayist are equally untrustworthy, but it is difficult to explain their untrustworthiness outside the medical profession, or to casual readers. "In one year Dr. Echeverria collected 165 cases of epilepsy, of which 75 were cured by following the principles of localization laid down by Ferrier." The unprofessional reader would fancy this meant that nearly half the cases of epilepsy were now curable by some new method of treatment. On the contrary, I venture the assertion that Dr. Macphail

never cured a single case of epilepsy by following the principles of localization laid down by Ferrier. "Glanders," he asserts, "can only be diagnosed by the method of inoculating animals" (p. 35). Nonsense. If Dr. Macphail's hostler should ever contract this disease, I have full faith in the ability of his employer to detect it without resort to vivisection. "Hydrophobia is now robbed of its terrors" (p. 35). Then it is no longer fatal? The reports of the Registrar-General of England tell a different story, and the reports of the Pasteur Institute confirm it. By vivisection, "Martin of Berlin proved the possibility of ovariotomy" (p. 33). Why, the operation of ovariotomy was performed by the American physician, Dr. McDowell, before Martin of Berlin was born. "In the American Civil War, out of 3,717 cases of wounded intestines, 3,273 cases ended fatally." Now, Dr. Macphail says, if certain vivisectional experiments had been performed before the Civil War, 3,263 soldiers, instead of 446, would now be living; "and their injuries would not even be considered grave enough to entitle them to a pension!" (p. 32.) Was ever a more stupid deduction reached by a scientific writer? What earthly reason has Dr. Macphail for assuming that a certain surgical operation, if it could have been performed on soldiers during the struggle between the Northern and Southern States, 1862-8, would have insured the lives of all who submitted to it *up to the present day?* For that is what he says. No allowance is made for the death of these veterans from disease or accident; "they would now be living," forty years after the war! It may be admitted that abdominal surgery has been greatly advanced by certain experimental studies; but why claim more? One may grant much to modern surgery without admitting its potency to secure an immunity like this,—something, indeed, never imagined by any one but the prize essayist.

The poison of venomous serpents, he says, has been isolated,—a step necessary before "discovering an antidote to a poison which annually carries off twenty thousand victims." Evidently Dr. Macphail is referring to the mortality from snake bites in the only country where such mortality exists of which any statistical record is made, the average annual deaths in British India from bite of serpents during five years (1883-87) being 20,342. Now, I deny that the poison of serpents has been isolated. A writer on the subject in the last number of the English "Quarterly Review" says plainly that, "as to the venom of serpents, no distinct chemical principle has as yet been detected in it. . . . No effectual antidote has been discovered." It is over twenty-five years since Sir Joseph Fayrer began his experiments in Calcutta. They were in progress in India when I visited that country in 1882; and to-day, the best treatment there is precisely what it was in this country half a century ago, immediate cauterization or excision, and the free use of some alcoholic stimulant.

"The most brilliant vindication of vivisection is now under our eyes, the results that have attended Dr. Koch's experiments on animals, by which tuberculosis is likely to be stayed" (p. 33). This was written two years ago. To-day I hardly think even Dr. Macphail would care to bring forward as the most brilliant vindication of the practice of vivisection the generally discredited "consumption cure" of Dr. Koch. That he could make it then an argument for unlimited experimentation is significant.

In the presentation of arguments for a practice so liable to abuse, it seems to me of exceeding importance that the line of exact truth and precise statement should never be passed. What is there about vivisection that so frequently impairs scientific accuracy on the part of its advocates? This is a problem worth solution.

VIVISECTION IN MEDICAL SCHOOLS.

Upon no ethical question of our day is there a more striking difference of opinion than regarding the value or the righteousness of experimentation upon living animals. About this practice the atmosphere of controversy is thick with the dust of contradiction and dispute. "It is one of the foundations of medical science," asserts one authority. "The conclusions of vivisection are absolutely worthless," is the reply of one of the most eminent surgeons of our time.* "It is a mild, merciful, and, for the most part, painless interrogation of Nature, and her secrets of life," says a recent apologist and advocate of vivisection. "The experiments of certain physiologists are those of inhuman devils," says Archdeacon Wilberforce. Among contradictions like these one may well ask, where is truth to be found?

The solution of this strange divergence of opinion is not difficult; it lies simply in the absence of careful definitions of the words we use. "Vivisection" is a term which includes some kinds of operations upon living animals involving excruciating and prolonged torture; and some other operations which simply destroy life with the discomfort of induced disease; and yet other experiments which involve no pain whatever. It is a practice of almost infinite variety and complexity. To speak of it as inevitably involving the infliction of torture is to betray ignorance; to defend it on the ground that pain is never inflicted, and that alleged abuses rarely occur, is to state what every student of physiology knows to be false.

* The late Mr. Lawson Tait.

Atrocities of vivisection are facts of history. It is well perhaps at the outset to take a glance at some of them. What has been done by men without pity, in the hope to wrest from Nature something she has hid?

The abuses of research include every form of excruciating and lingering torment that can be conceived. In the august name of Science, animals have been subjected to burning, baking, freezing; saturation with inflammable oil and then setting on fire; starvation to death; skinning alive; larding the feet with nails; crushing and tormenting in every imaginable way. Human ingenuity has taxed itself to the utmost to devise some new torture, that one may observe what curious results will ensue. For instance, Dr. Brachet, of Paris, by various torments, inspired a dog with the utmost anger, and then, "when the animal became furious whenever it saw me, I put out its eyes. I could then appear before it without the manifestation of any aversion. I spoke, and immediately its anger was renewed. I then disorganized the internal ear as much as I could, and when intense inflammation made it deaf, then I went to its side, spoke aloud, and even caressed it without its falling into a rage." Of this one man, Dr. Elliotson, in his work on "Human Physiology," goes out of his way to say: "I cannot refrain from expressing my horror at the amount of torture which Dr. Brachet inflicted. I hardly think knowledge is worth having at such a purchase."*

Von Lesser, of Germany, made a long series of experiments in scalding animals to death. He "plunged a dog for thirty seconds into boiling water"; he "scalds another four times, at various intervals"; even animals which have just passed through the pangs of parturition do not escape.† Dr. Castex, of Paris, fastens a dog to the dissecting-table

* "Elliotson's Physiology," p. 448.

† "Virchow's Archiv," vol. lxxix, pp. 248-289.

and, discarding the use of anæsthetics, stands above it "with a large empty stone bottle. I strike with all my strength a dozen violent blows on the thighs. By its violent cries the animal shows that the blows are keenly felt." Of another victim: "I dislocate both the shoulders, doing it with difficulty; it appears to suffer greatly"*; and so on through the long series.

Chauveau "consecrated" more than eighty large animals, mostly horses and mules, worn out in the service of man, to almost the extremest torture possible to conceive, not, as he expressly tells us, "to solve any problem in medical theory," but simply to see what degree of pain can be inflicted through irritation of the spinal cord. Mantegazza, of Milan, devoted a year to the infliction of torment upon animals—some pregnant, some nursing their young—in a long series of experiments which had no conceivable relation to the cure of disease, and which ended in the attainment of no beneficial or even instructive results. To produce what he desired—the extremest degree of pain possible—he invented a new machine, which he calls his "tormentor," and in this fiendish device, little animals, which had been first "quilted with long thin nails," so that the slightest movement is agony, are racked with added torments; torn and twisted, crushed and lacerated, hour by hour, till crucified Nature will no longer endure, and sends death as a tardy release. Yet all these experiments, repeated day after day, were conducted, as Mantegazza himself asserts, not with pity or repugnance; of *that*, no admission is made; but "with much delight and extreme patience for the space of a year."† One stands in mute amazement at revelations like these. Dante in his "Inferno" never dreamed of torture so awful as certain refinements of tor-

* "Archives de Médecine," January, 1892, pp. 9-22.

† "Fisiologia del Dolore," di Paoli Mantegazza, p. 101.

ment which Professor Mantegazza invented and executed, of which the details cannot be told.* Is there any vivisection more awful to contemplate than a man like this who has succeeded in plucking from his heart every sentiment of pity or instinct of compassion? And how barren of benefit were the results of these experiments! Out of all these multiplied torments of Richet and Mantegazza, of Chauveau and Castex, of Magendie and Brown-Sequard, science has found not one single remedy to disease, not one discovery of the slightest value to mankind!

There is hardly an apologist for unlimited vivisection who will not admit that such cruelties are to be deplored, and that scientific curiosity has driven these men into unpardonable excess. But how did it happen? Were they by nature more brutal than other men? Probably not. On one point the teaching of History is uniform. Wherever is conferred power without responsibility, there will follow—there must inevitably follow—license and abuse. It is the relation of cause and effect. Perhaps we execrate unduly the heartlessness of a Nero or a Robespierre, a Magendie or a Mantegazza. They were but the natural product of the time which made them monsters of cruelty, by the gift of absolute power.

Not merely the absence of legal limitations, but the absence of all supervision, is another invitation to excess. Up to fifteen or twenty years ago, when agitation against cruelty had just begun, it was the custom not only to show results of experiments but to perform even the most excruciating operations on living animals before a class-room of students, as aids to memory. There was no special secrecy about them; anyone able to find his way to the lecture-room could observe everything. If there were indefensible cruelties, they were at any rate as unconcealed and

* "Fisiologia del Dolore," pp. 102-3.

as openly done as in Paris to-day. Now, all this is changed. Experimentation has vastly increased; but it exists largely in comparative secrecy, behind locked doors, guarded by sentinels. To the largest physiological laboratory of New York City, even the President of the Society for the Prevention of Cruelty to Animals cannot gain admittance during hours for "work."* Against reasonable privacy of this kind no criticism can be justly urged. An anatomical dissecting-room, for instance, ought not to be open to every passer-by. But if bodies for dissection were, to-day, as frequently the result of mysterious murder or violated graves as in the time of Burke and Hare, and yet all entrance to the dissecting-room, all inspection or oversight, were absolutely refused, we may be sure that an alarmed and indignant public sentiment would demand, not the publicity of dissection, but its supervision and control by the law. For the world does not like overmuch secrecy, and right doing never needs it. We are touched with a feeling of horror, to-day, not so much by the long procession in the Auto-da-fe as by remembrance of all the awful mystery which preceded it; the dim-lighted underground dungeons; the application of the "question" at midnight; the groans for mercy which met no response; the shrieks of agony which only the stone walls echoed. The Bastile rises without protest; but in course of centuries it becomes an interrogation-point which Paris cannot answer; then comes a 14th of July, and it is swept from the face of the earth. Even Science needs that Pity should stand by her side. True, from the standpoint of anti-vivisection, inspection is not demanded; it means, one

*The same secrecy now obtains in England. It appears that even physicians and members of Parliament may be refused admission to London Physiological laboratories. See Minutes of Evidence. Ques. 4161—4165.

says, "compromise and acknowledgment." But it means more than this; it means accurate knowledge of all the facts; the dispersion of error; illumination, enlightenment, certitude. "Misjudgment of vivisection exists," one complains. Well, how is it to be dispelled by all this concealment and secrecy?* No real impediment to any experimentation that is not abuse, can result from bringing laboratories and all their work under the inspection of qualified representatives of the Societies for protection of animals and the prevention of cruelty.

Upon the excesses into which a perverted zeal or cruel indifference has led experimenters, it is hardly necessary to dwell. Proofs are abundant enough; one needs only to study certain text-books of physiology, where the various experiments performed, "for teaching purposes," every year, are frankly related. Once we admit the right to torture a living creature simply as an aid to memory, and where shall we put bounds to the cruelty one may inflict? Is it an abuse of experimental science to cut out the stomach from a living dog—the "infamous experiment of Magendie," as Dr. Sharpey calls it? I have seen it done, not in Europe, but America. To cut down upon the spinal cord of a dog for the demonstration of its functions—an operation which Dr. Michael Foster* of Cambridge University, has never seen performed, from "horror of the pain." Where is there a medical college in America in which it has never been done? Is it an abuse of vivisection to freeze rabbits to death before a class of young men and young women merely to illustrate what everyone knew in advance? It is done annually. To divide the most acutely sensitive nerve in the whole body in order to prove what nobody doubts? It is one of the "regular experiments." To mutilate a living animal so severely that left to itself,

* The late Sir Michael Foster.

death might occur; to fasten it so that struggle is useless; to set in operation delicate machinery which shall cause it to breathe by artificial force, and so to keep it through a long night of terror and pain till "wanted" for the final sacrifice of demonstration before students on the following day? It is not of infrequent occurrence in certain laboratories. "It helps memory," says one. But what gain to memory can outweigh that blunting of compassion, that deterioration of pity, which all this familiarity with torture tends to induce? "What doth it profit a man" to see it all? Let Dr. Bigelow, late Professor of Surgery at Harvard University, reply: "Watch the students at a vivisection. It is the blood and suffering, not the science, that rivets their breathless attention. If hospital service makes young students less tender of suffering, vivisection deadens their humanity and begets indifference to it."

"But," somebody protests, "surely there should be no limitations or conditions regarding original researches?" Well, why not? Investigation in America has been absolutely unrestrained for forty years; has it accomplished anything of value? Have not even American scientists been subject to an enthusiasm that, during investigation, takes no account of the pain it inflicts? Look, for example, at that series of one hundred and forty-one experiments performed not long ago in Jersey City, opposite New York. The object of the experimenter was, as he tells us in his account of them, "to produce the greatest amount of injury" to the spinal cord and its attachments without killing the animal outright; and with this end in view a great number of dogs, with hobbled limbs, were dropped from a height of twenty-five feet, so as to effect all the severest injuries thus designed. Strange, indeed, it is to read the record of experiment after experiment, and to note that "even a few hours after they had been dropped, when the experimenter pre-

sented himself to their view, the dogs not severely injured never failed to greet their master with extravagant expressions of joy." Well, what judgment are we entitled to pass on these investigations? What valuable discovery for the benefit of suffering humanity accrued therefrom? The highest European authority upon medical questions shall tell us: "It is a record of the most wanton and stupidest cruelty we have ever seen chronicled under the guise of scientific experiments. If this were a type of experimental inquiry indulged in by the profession, public feeling would be rightly against us; for, apart from the utterly useless nature of the observations, so far as regards human surgery, there is a callous indifference shown in the descriptions of the sufferings of the poor brutes which is positively revolting. . . . Badly planned and without a chance of teaching us anything, and carried out in a wholesale cruel way, we cannot but feel ashamed of the work as undertaken by a member of our profession."*

This is the judgment of the British Medical Journal, the leading authority of Great Britain. Here we have criticism based upon knowledge of what constitutes an abuse of scientific research. It cannot be swept aside as the wailing of sentiment or the exaggeration of ignorance.

Take another instance of "original investigations." Crile, an American physiologist, has recently demonstrated to what extent experimentation may be carried on here in America, where, as he, himself, tells us, "there is no law governing vivisection." Experimenting upon 132 dogs, he subjected them to every form of conceivable injury;† cutting, tearing and burning the skin; cutting and crushing muscles; crushing the joints; puncturing the ear; crushing, tearing, cutting and burning the tongue; pouring

* "British Medical Journal," Nov. 15, 1891.

† Experimental Research into Surgical Shock. Philadelphia.

boiling water within the abdomen; manipulating vital organs; burning and crushing the paws; tearing and crushing nerves,—together with other operations too hideous for mention. To the scientific ardour of this young man, even pregnancy of the animal suggested no reason for excluding the creature from experimentation. We are told, indeed, that sometimes curare or morphia, sometimes chloroform or ether were used; but the extent of their employment is carefully withheld; and it is a significant fact that in not a single experiment is it claimed that by the use of anæsthetics, the animal, so crushed, torn and burned, was made insensible to pain. The use of it all? There was no use; the utility of the experiments was not even expected. "The present research had progressed but little, before it became apparent . . . that *a clearly satisfactory termination could not be hoped for.*"* He freely admits "the incompleteness of the research," which, at the cost of torment unspeakable, gave to medical science not a single new fact of any value in the treatment of injury or disease.

What may be done to prevent these abuses? Denounce the entire medical profession as in a league with "inhuman devils" of cruelty? That is folly; the man who has watched at midnight with some old family physician, by the bedside of his dying wife or child, will not hear you. But what shall we aim to do for our country, and to-day? Is not reform of abuse the first practical step? The duty of the hour, it seems to me, is the excitation of interest in this subject; the acquisition of accurate knowledge about it; the encouragement of intelligent personal investigation. "Is it true," one should ask, "that such awful agony has been repeatedly inflicted upon animals by physiologists, and that proof of their cruelties is based upon their own statements and reports? Can it possibly be true that not one of these

* Introduction, p. 7.

accursed experiments has yielded to medical science any discovery of the least practical value in the treatment of disease? Is it true that such painful experiments are unnecessary for the attainment of medical knowledge and skill; that every year a host of physicians and surgeons graduate from the medical schools of England, Ireland and Scotland who never once in the course of their studies are asked to see an animal tortured that lessons may be remembered? Decision upon questions like these is not difficult; but let it be conviction based upon solid facts; for that alone has chance to be heard, or opportunity to be effective in results. Men will differ regarding the justification of research where pain is not involved; but never need the advocacy of use bewilder us into blind condonation of revolting abuse. It is, then, solely to the creation of an intelligent public sentiment that we can look with hopefulness for the slightest mitigation or prevention of the evils deplored. Its evolution may be slow. But, once aroused, public sentiment is irresistible when based on Right; and before this tribunal no cruelty or abuse of scientific research can ultimately escape condemnation, and the stamp of atrocity and crime.

Thus far we have examined the question of unrestricted experimentation as a method of medical instruction. That it would be confined to this purpose no attentive observer of the modern scientific spirit could for a moment believe. Once let it be granted that sentient creatures may be subjected to any degree of pain for the simple illustration of well-known facts, and it is certainly difficult to say why the practice should not be so extended as to gratify the scientific curiosity of anyone who desires to investigate the phenomena of life. Within the past few years a new aspiration has become prominent—the wish to penetrate to the very heart of Nature, and to pluck from thence each

mystery which there lies hidden. Since for the future, one of the chief aims of scientific endeavour is to wrest from unwilling Nature her secret thought, we could have known for certainty, years ago, that this idea would not be confined within the walls of the medical school.

That which any careful observer of recent tendencies in thought might have foreseen, has actually occurred. Spurred by competitive rivalry into provision for the most advanced courses of instruction, hindered by no strong public sentiment, which should demand the least safeguard against danger or abuse, nearly every great educational institution in America is widening the opportunity for its young men and young women to invesitgate the phenomena of living things,—not as an adjunct to professional study, but merely as a phase of that scientific training which in future is to form a part of a liberal education.

The change has been gradual and unobtrusive. In the printed catalogues of colleges we may find little note of the study of physiology; that, to-day, is merely a department of Biology, which includes within its scope not only the functions, but also the structure and development of all living creatures. The American university of to-day has no thought of fashioning itself after the ancient models of Oxford and Cambridge; its ideals are found rather in Germany or France. No American college at present reckons itself completely equipped without its biological laboratory, and its staff of instructors, conversant with the newest methods of foreign investigation.

Nor is the modern aim simply to teach students the gathered facts of previous inquiries. The new ideal would inspire students, not to believe, but to investigate. "Every encouragement is afforded to those who show aptitude for original research," is the frequently-recorded promise to the young inquirer. But the complete study of animal functions

introduces the young student to another phase of investigation—*the observation of pain.* One may indeed learn all the truths of Physiology without this experience; but he must then be willing to accept facts upon others' testimony; and the new scientific spirit insists that personal investigation must supersede belief. For example, you may learn perfectly each and all of the functions of the nervous system, by the careful study of recorded facts. But suppose you demand that the recorded fact shall be emphasized "by experiment and opportunity for observation"? Then some creature must be put to an agonizing death to gratify your curiosity. Now how far is this method of study a permissible element in the training of young men?

Let us make this question as definite as possible. One of the principal European experimenters to-day is Dr. Simon Stricker, of Vienna. Not long since I was told by a professor in one of the leading medical colleges of New York, that he had himself witnessed the most horrible tortures conceivable inflicted by this man upon living monkeys,—animals specially selected because in their dying torments their facial expression became so like to human agony! A European journal recently describes one of his class-demonstrations, wherein he destroys the spinal cord of a dog by thrusting a steel probe into the spinal column, producing, we may say, the most atrocious torture it is possible to conceive. The animal evinced its agony by fearful convulsions; but it was permitted to utter no cry that might evoke sympathy, for previous to the demonstration its laryngeal nerves had been cut! No vivisection could be more utterly unjustifiable or more fiendish in atrocity. And yet with entire and perfect good faith this demonstrator might have repeated the well-worn formula, that he was "careful to inflict no *unnecessary* pain." "I know," said Herr Stricker, on one occasion, "that this experiment will

seem cruel; but it is 'necessary' that my hearers should have its effects impressed on their minds!" Surely, there was never more fit example of Milton's words:

> "So spake the fiend, and with Necessity,
> The tyrant's plea, excused his dev'lish deeds."

Now for this same reason, merely as a method of teaching, what prevents that demonstration-experiment of Stricker from being regularly repeated before young men and young women in the leading colleges and universities of the United States? Nothing but the will of the professor in control of the laboratory.

The freedom which prevails in the physiological laboratories at Vienna, Berlin, and Paris has quietly taken root in American universities. One hesitates to believe that the atrocities of torture which have no often stained methods of research on the Continent have been duplicated in the physiological laboratories of any American college; *but the opportunity is there.* As a method of teaching, no present impediment prevents their introduction at any time.

Nor is it reassuring to note the apparent unwillingness of teachers of Biology to have freedom of action limited by any restrictions hindering the infliction of prolonged or excruciating pain. This repugnance one might expect in medical schools; but it is startling to find it in schools of science and art, where no plea of "beneficent utility" can be brought forward. I do not understand this extreme sensibility. Doubtless the Czar of Russia prefers unlimited power to the restrictions of a written constitution; but absolutism, whether on the imperial throne or in the physiological laboratory, has not offered to the world any high type of conduct. What, for instance, would be thought of the president of a great and wealthy university who should proclaim that, as regards the expenditure of the

treasurer, no restraints or restrictions were ever imposed; that complete confidence in personal character took the place of all vouchers and receipts? What opinion should we hear of the college treasurer himself, who refused all demand for detailed statement of his accounts, as "a grave reflection upon his character?" There is not an institution in the land where such financial mismanagement would not be condemned. Yet why so many precautions against prodigality of money, and such acute sensitiveness toward the slightest impediment against prodigality of pain?

We are almost at the beginning of the twentieth century. Civilization is about to enter a new era, with new problems to solve, new dangers to confront, new hopes to realize. It is useless to deny the increasing ascendancy of that spirit which in regard to the problems of the Universe, affirms nothing, denies nothing, but continues its search for solution; it is equally useless to shut our eyes to the influence of this spirit upon those beliefs which for many ages have anchored human conduct to ethical ideals. Regret would be futile; and here, perhaps, is no occasion for regret. To the new spirit which is perhaps to dominate the future, this longing for truth, not for what she gives us in the profit that the ledgers reckon, but for what she is herself, this high ambition to solve the mysteries that perplex and elude us, the world may yet owe discoveries that shall revolutionize existence, and make the coming era infinitely more glorious in beneficent achievement than the one whose final record, history is so soon to end.

But all real progress in civilization depends upon man's ethical ideals. Infinite responsibility for the moral impetus of the next generation rests to-day on the shoulders of those who stand at the head of institutions of learning wherein are created and fashioned the aspirations of young men. What shape and tendency are these hopes and ambi-

tions to assume in coming years? What are the ideals held up before students in Universities? What are the names whose mention is to fire youth with enthusiasm, with longing for like achievement and similar success? Is it Richet, "bending over palpitating entrails, surrounded by groaning creatures," not, as he tells us, with any thought of benefit to mankind, but simply "to seek out a new fact, to verify a disputed point"? Is it Mantegazza, watching day by day, "*con molto amore e patienza moltissima*"—with much pleasure and patience—the agonies of his crucified animals? Is it Brown-Sequard, ending a long life devoted to the torment of living things, with the invention of a nostrum that earned him nothing but contempt? Is it Magendie, operating for cataract, and plunging the needle to the bottom of his patient's eye, that by experiment upon a human being he might see the effect of irritating the retina? Is it Stricker, making a tortured ape to mimic the agony of a dying man?

These men, it is true, Science counts among her disciples. They reached fame through great tribulation, through agony that never can be reckoned up, but it was not their own; through "sacrifice," indeed, but not self-sacrifice; through abnegation of compassion, by suppression of pity. Surely in these names, and such as these, there can be no uplift or inspiration to young men toward that unselfish service and earnest work which alone shall help toward the amelioration of the world. "The old order changeth," but are there not some ideals of humanity that do not waver with the passing years?

Perchance the curiosity of Science will one day spend itself. The last evasive and evading mystery of Life may not be wrested from nature by fire or steel. Then there may be names that Humanity will forget, or remember only to execrate. But whenever in time to come, men shall long to lessen in some way the awful sum of ache and anguish

in the world, will they not rather turn for their inspiration to those ideal examples of self-sacrifice which still encourage us; to Howard, risking life in prison and lazar-house, that by revelation of their infamy he might stir the conscience of Europe to the need of reform; to Wilberforce and Clarkson, toiling amid obloquy and abuse for more than twenty years to put down the African slave-trade; to Garrison, waging war for thirty years that he might help to free America from the stain of human bondage; to Shaftesbury, confronting the organized greed of England in his effort to protect children in coal mines and factories; to Arnold Toynbee, making his home amid the squalor and wretchedness of Whitechapel, that he might know by hard experience the bitterness of life for the London poor. Are not these better examples for the emulation of youth than those devotees of research whose pitilessness is their supreme title to the remembrance of posterity? Surely, from their eternal serenity, they would whisper to us, if they could, that the right path to the world's amelioration is not by way of torture; that our closing century will not see the end of great opportunities for helpful work; that while poverty, war, preventable disease and unmerited suffering yet afflict the world, it will not cease to need the sympathy, the devotion, and the self-sacrifice of earnest souls.

*AN ETHICAL BASIS FOR HUMANITY.**

Not long ago, I found myself in London, standing with uncovered head before what seemed the figure of an old and venerable man, seated in an armchair and dressed in the quaint costume of sixty years ago. Without close inspection the visitor would not suspect that behind that face was a human skull, or that beneath those faded garments was an articulated skeleton. Nowhere on earth is there a more singular tomb than this of Jeremy Bentham the English philosopher and philanthropist, to whom belongs the honour of having advocated the rights of animals forty years before the first step to their legal protection was taken by any government in the world.

It is a strange yet instructive story. The old man's life had been wholly devoted to humane ends. Approaching death at the ripe age of eighty-four, he found popular prejudice roused to the highest pitch against the study of human anatomy by the dissection of the dead. Graves were found desecrated, murders had been committed, doctors were mobbed, riots were frequent. The situation was peculiar. Here was a study absolutely necessary as the foundation of medical science, yet one which is regarded with abhorrence by the vast majority of those who are to profit by its revelations. The great objection in the popular mind was that Science paid respect to the prejudices of the rich, and sought material for her researches only among the bodies of the poor.

"But what right," asked Bentham, "have you or I to insist that the body of the poorest outcast shall be sub-

* Read before The Humane Congress of the World's Columbian Exposition, October 12, 1893.

jected to what we abhor? Upon what ethical basis shall I suggest the tacit demand that the pauper shall make a sacrifice to science which I decline to make myself?" And so the aged philosopher determined to undergo, for the benefit of his fellow-men, a renunciation which has few counterparts in history. By written directions, the philanthropist bequeathed his dead body to the investigations of science, in whose temple—and not the grave—it rests to-day.

It was in that presence, pondering on that strange abnegation, that unique sacrifice, that there came into my mind an answer to a problem which had long perplexed me. That perplexity I propose to state; and at the same time to define the doctrine under which, for myself, it wholly disappeared.

This is the problem: *To what ethical principle or rule of right and wrong may mankind, at all times, confidently appeal for the determination of the quality of conduct toward the lower animals?*

To make the question practical and definite, let me suppose myself a physiologist, an amateur investigator into certain curious problems of life and death, and that for a trifling sum I have become the possessor of a half-grown dog. Bone and sinew, brain and nerve, intelligence and sensibility—it belongs wholly to myself. Over it my power is nearly absolute; I may sell it, give it away, or kill it by ordinary methods whenever I please.

But suppose I wish to go farther. In my studies I have adopted a theory regarding the action of certain nerves, differing somewhat from that usually accepted; and I wish to demonstrate this hypothesis to a friend by means of an experiment upon my dog which will involve, necessarily, the infliction upon it of prolonged and excruciating pain. Perhaps it will be necessary to invoke human ingenuity in

order to protract, as far as possible, its suffering and existence. It is a custom sometimes to prepare for a physiological demonstration several hours in advance. There is to be made an experiment on Monday morning, let us say; and so on Sunday afternoon, while all the Sunday schools of a vast city are teaching children their duties to God, the man of science has been known to stroll to his laboratory, to cut at leisure through the living tissues, to set in motion the machinery for maintaining artificial breathing, and then to leave the creature, as in a vice, to a long night of suffering and fear until "wanted" the following day. This procedure also, I propose to copy. Now, what shall constrain me? To what influence will you appeal that I restrain myself?

Do you tell me at once that this is a "vivisection" and therefore must be wrong? But suppose I refuse to admit your conclusion? "Is it, then," I reply, "wrong for me to pull to pieces this flower which I have just plucked from the parent stem? Is it a sin to cut a living tree? These also are 'vivisections' in one sense."

"Ah, but the animal feels pain."

Is that your only objection? Do you, then, never cause an animal to suffer pain for your convenience?

"But in killing a seal for its fur, or a lamb for its flesh, the animal is subjected to no more pain than is necessary," you reply.

Very good; I also agree,—(and I smile to think how many feebly protesting and half-awakened consciences this very promise will put at once to sleep again),—I promise also to inflict no "unnecessary" pain.

"But your experiment will be absolutely useless."

Yes, so far as the treatment or prevention of disease is concerned; but suppose I do not admit that the gratification of my scientific curiosity on any point is absolutely useless

to myself, if a certain intellectual satisfaction is thereby secured?

Now what will you do? Will you invoke the law? But so long as I keep within certain easy formalities there is nowhere in America the slightest restriction to physiological experiments, no matter what degree of pain or prolongation of suffering they may involve.

Will you appeal to religion? Why there is not a creed in Christendom which clearly teaches as a dogma of religion, even the simple duty of mercy to animals! Where will you find it in the Thirty-nine Articles of the Church of England, or in the Westminster Confession of Faith? I once ventured to call the attention of Cardinal Manning to a statement of Philip Gilbert Hamerton, who had asserted that the Catholic Church denied the existence of any duties to creatures beneath us, and the Cardinal's reply was favourable only so far as this; that "the Catholic Church has never made any authoritative declaration as to our obligations to the lower animals." I do not dispute certain inferences we may be entitled to draw from the precepts of all religions; but in respect to positive obligations the creeds are silent, one and all.

Would you invoke public sentiment? It will fail you. Only let me use the pacifying shibboleth of certain writers, and claim that all of my investigations are in the general line of researches made to "mitigate human suffering and prolong human life," and there is hardly any extremity of torture which the public opinion of to-day will not sanction and excuse.

Shall pity be expected to restrain me? But suppose I have lost the capacity for pity, when my ambition to discover something is once aroused? It has happened to others. Like Dr. Klein, of London, I may have come to "have no regard at all" for the sufferings of my victim; "no

time for thinking what the animal will feel."* It is related by Dr. Latour of Magendie that at one of his public lectures a dog upon which he was making one of his most cruel experiments, twice escaped from under the implacable knife and threw its paws about Magendie's neck, pleading in the only language it knew for a little mercy; yet none the less was it sacrificed that the ambitious scientist might demonstrate for the hundredth time an abstract theory. Seneca tells us that when Parrhasius, the greatest of Grecian artists, was painting his "Prometheus torn by a vulture," he caused a captured prisoner of war to be tortured to death in his studio, that he might copy from nature the expression of agony; and musing above some mutilated victim whose sad eyes make mute appeal for pity, I can fancy some Mantegazza or Brown-Sequard to make reply:

> "Pity thee? So I do;
> I pity the dumb victim at the altar,
> But doth the robed priest for his pity falter?
> I'd rack thee though I knew
> A thousand lives were perishing in thine;
> *What were ten thousand to a fame like mine?*"

Will Science assist one? Not by any suggestion of ethical restraints, for she knows none. Her only function is to discover and reveal the hidden facts of existence—to sift the Knowable from the Unknown. Yet within the lifetime of most of us, has not science invested this whole question with a new aspect? For eighteen centuries of Christian civilization the wisest and best of mankind regarded the under-world of animated nature as beings not only different from ourselves, but infinitely beneath us in origin and destiny. Now modern Science has promulgated a new doctrine. No theory is more firmly held by biologists to-day than that

* Dr. Klein's answer before the Royal Commission, 1875-6 (Query 3,539).

hypothesis of Darwin which derives from the same far-distant ancestry both animals and man. Only a few thousand years ago, and your ancestors and mine were the lowest type of savage barbarians, dwellers in caves, clothed in skins; almost indistinguishable—except by the guttural elements of vocalized speech—from the animals they hunted and upon which they fed. But Science tells us even this was not the beginning.

"Carry your imagination still backward into the awful abyss of uncounted ages; and there was a time when even your ancestors, O professor of biology, and those of the dog beneath your knife, were of the same species of living creatures," speaks the Science of to-day. "Out of the same black darkness, struggling for existence, you have emerged—in far different form, but yet closely related, not only by origin but in every function of organized existence! That quivering nerve acts precisely as your nerves would behave under like excitation, and it will feel the same anguish yours would feel. That brain you are about to penetrate, hides in some infinitely mysterious way the germs of mind; the elements, at least, of intelligence, obedience, reverence, contrition, faithfulness and unselfish affection. Ah, sir! your keenest knife cannot lay bare these mysteries, nor find the chambers of the soul where these lie hid; your most potent microscope will somehow fail to reveal the substance of that love, devotion and fidelity which sometimes seem almost to surpass our own."

So much, indeed, Science may tell us. "These despised beings are your kindred," she asserts. Whether our conduct toward them is right or wrong is a question beyond her province to decide.

Yet if all these fail us, where shall we look? It seems to me that the decision of ethical questions like this can rest only upon some formula of absolute justice which mankind

shall gradually accept as the philosophical expression of the highest excellence. For, in the end, we are governed by our ideals. What is duty? Simply the highest ideal of action. In every age, there have been conceptions of righteousness nobler and better than the average of human conduct. Toward these ideals, recognizing their justice, Humanity gradually advances. The scoff of one period becomes the formulated law of another. No great reform has ever been carried through, which at the beginning was not greeted with derision and stigmatized as a glittering but impracticable dream.

Now I think it is a fact accepted by every school of philosophic thought, that in the determination of the ethical righteousness of our relations to one another, no higher test has ever been proposed than that golden rule, first formulated five centuries before Christ, which defines as the ideal of conduct that we treat others as we would have others treat us. In Book XV. of the Analects of Confucius we read that one of his disciples asked him, saying, "Master, is there one word which may serve as a rule of practice for all one's life?" The master answered: "Is not *reciprocity* such a word? That which you do not want done to yourself, *do not to others.*"

When, later, this precept was enunciated by the Founder of Christianity, who can begin to estimate its potency in the stimulation of that humane sentiment, that pity for suffering, which underlies our modern civilization? Imperial Rome was more magnificent than our grandest metropolis; but what an infinite chasm separates the Roman amphitheatre, where worn-out slaves were thrown to wild beasts, from the hospitals and dispensaries of London or New York! Under the Coliseum is one ideal; under the Maternity Hospital is another; the ideal makes the difference in the two forms of civilization. It is needless to say that our

lives do not wholly conform to our ideals; does that nullify them? Above the most selfish of our acts is ever the nobler possibility of unselfishness. "Strive to do good," says the preacher. But it does good to strive.

I believe, therefore, that with the increasing development of moral sensibility the time is approaching when humanity, accepting what science reveals of our common relationship and origin, shall make the ideal basis of conduct to the entire animal creation, some paraphrase of this same rule. Its expression as a formula will perhaps be something similar to this: —

"*Our moral duty to all living creatures, from the highest to the lowest form of life, is to treat them precisely as we ourselves should be willing to be treated for the same objects in view, were we instantly to exchange with them every limitation and circumstance of their condition and form.*"

Is this a practicable rule? How will it work in daily life? In the exercise of our supremacy over the animal world three phases of conduct are subject to question: their slaughter for our uses, as for food or fur; their torment or destruction solely for amusement and sport, and that experimentation upon them for scientific purposes, known as vivisection. How would each phase of conduct be affected were it governed by that formula of ethics I have ventured to suggest?

I. In the first place, it will not mean the abrogation of the right of the higher intelligence guided by ethical ideals *to decide what is best.* We do not regard it as a contravention of the golden rule that truant schoolboys are severely punished, or that the gaoler keeps well guarded his prison gates. Not what they might selfishly wish is the rule; but rather what, under clearer light, even the schoolboy or the criminal would acknowledge as justifiable and right. For this reason, I am disposed to think that man's right to

terminate painlessly the existence of beings below him for sufficient reasons, will not need to be abandoned. We think of death from the standpoint of personal deprivation; but to an animal it means cessation of no high purposes, of no great hopes, and, generally speaking, of no strong attachments. It is merely a slight abbreviation of existence; a termination which *may* be made far more painless than the exit by disease. Still I do not disguise from myself the hope that the time may come when the substitutes for flesh as food shall be so universally procurable, so cheap and abundant, that the human race will attain to a far higher ideal than is generally held to-day, and refuse to sacrifice any life merely for the gratification of appetite.

II. While I can easily bring myself to the conception of a willingness to yield mere existence for the actual necessities of beings almost infinitely higher than myself, yet it becomes quite another matter when I try to imagine a consent to suffer—even in the lowest forms of life—the least useless pain. I cannot do it. Judged from this standard of ethics, all forms of so-called "sport," all that destruction of animal life merely for savage amusement and delight in killing something—must be regarded as immoral; and, ceasing to minister to our depraved pleasure, will in time disappear. That cruel sacrifice of song birds to the evanescent fashions of feminine adornment is not one that woman can justify to herself by this ideal of right and wrong.

Much that to-day accompanies the killing of animals for food, will some time, be deemed unnecessary and morally wrong. If society decides that for man's benefit it must continue to take the life of animals, death will then be inflicted with the utmost precaution against the addition of one needless pang. Should it be impracticable to kill any

creature except by the possible addition of extreme agony, we shall cease to use it as food. When we have learned to govern conduct by some higher ideal than now, we shall not fry living crabs, or roast live lobsters. You tell me, laughingly perhaps, that such creatures do not feel pain very acutely; *but how do you know?* In their place would you take the chance? Science cannot do more than give a guess. To the possibility of such pain as death by fire implies, I do not think I have the ethical right to subject any living creature; for they are chances for suffering that for no conceivable gratification to another would I take on myself. And with butchery in other ways, there is vast need of reform; not only as regards the needless suffering of animals on cars or cattleships, in transit from the pasture to the shambles, but also at the shambles themselves. It will all assuredly be remedied as the conscience of humanity awakens at last to a keener appreciation of the evils that exist.

III. We come finally to the question of scientific investigation. How will it be affected by appeal to any standard of conduct based upon the golden rule?

It will be seen at once that the problem we have vainly attempted to solve by appeal to religion, to law and to science, finds immediate solution if tried by the suggested test. Can we imagine that the physiologist ever lived, who, under the form of "our humble cousin the orang-outang" (to use Professor Huxley's significant designation), would be willing to suffer prolonged agony and death, merely to demonstrate to students or others, facts which are beyond all question or doubt?

Changed by some magic wand of Circe to the similitude of a dog or cat, would not the most ardent investigator protest vigorously, if he could speak, against the injustice of using *his* nervous system for the torturing experiments

of Mantegazza or Brown-Sequard, when such investigations, however "original," have no conceivable connection with the alleviation of human ailments or the treatment of disease? When Chauveau "consecrated" to extremest torture more than eighty domestic animals, chiefly horses old and worn out in man's service, to gratify his curiosity, and confessedly without the slightest idea of any practical benefit, we cannot dream of *his* willingness to be sacrificed like his victims for a purpose so insignificant, for results so absolutely useless. In the physiological laboratories of Europe and America, I doubt not that myriads of sentient creatures are made to taste all the physical bitterness of death that can be felt or conceived, in experiments that before some future tribunal of conscience will be universally judged as crimes against justice and mercy, for which there exists no palliating excuse.

Before this ideal of conduct, then, would all scientific inquiries involving the death of animals, be wholly and unequivocally condemned? Do cases ever arise where living creatures, such as a rat, a rabbit, or a guinea-pig are subjected to experiments which the investigator could honestly be willing to endure for the same object, were his human shape and circumstances to dwindle to the limitations of the animal? The question is not an easy one; but, personally, I believe such cases exist. For while we arraign before every ethical ideal the cruel curiosity that forgets the pangs it inflicts, it is but justice to remember that all investigation is not synonymous with torture, nor even synonymous with death.

But how far are the leading physiologists of our time from even imagining the existence of limitations—and least of all, of any limitations founded upon a conception of the ethical rights of animals, or of altruistic ideals! In the presence of abuses which infiltrate the whole practice of scien-

tific research; in a land which tacitly sanctions the yearly repetition of the worst atrocities of vivisection, without supervision, without record, without control, simply that the sight of torture may help stupidity to remember what science affirms, it seems to me useless on this occasion to discuss the permissible limitations of a practice that thus far objects to submit to the slightest legal oversight. The great, practical need of the hour in regard to vivisection seems to me the creation of an intelligent public sentiment which shall at least recognize the existence of abuse, and upon that recognition build reform.

Can this ideal standard for the regulation of conduct toward the beings below us, be made practically applicable in our daily lives? May I suggest your personal experiment with it as far as you can go? Surely in the perplexities of decision between right and wrong, we shall not wander far astray if in our hearts we carry that sublimest prayer,

"Teach me to feel another's woe,
* * *
That mercy I to others show,
That mercy show to me."

Eighty years ago, when Lord Erskine arose in the British Parliament to suggest and advocate a law protecting domestic animals from wanton cruelty, he was greeted with shouts of derision and contemptuous applause. In remembrance of that mockery, which now seems so strange to us, one may take refuge, while suggesting that at some future day, man's highest ethical ideals may include within their scope the conduct of humanity toward the entire animated world.

*PHYSIOLOGY IN SCHOOLS.**

The AMERICAN HUMANE ASSOCIATION has recently issued a circular calling the attention of the public to certain methods of instruction in public schools, whereby the facts of physiology are set forth by means of actual experimentation upon living creatures, or by the dissection of such animals, killed for that purpose only, and often in the presence of the pupils themselves. The statement that any such practice really existed, met at first with general incredulity. Even if vivisection were practised, it seemed improbable that children of public school age should be required to become familiar with the process of mutilation and the phenomena of death.

The practice, we now know, has been actually introduced in certain schools. In one sense the motive was right enough. No doctrine has been more sedulously inculcated during the past twenty years than that the basis of all knowledge is observation and experiment. To accept any statement on another's testimony, when you can see the facts for yourself, is considered a sort of treason to the modern scientific spirit. No one thinks of teaching the phenomena pertaining to heat and light, to electricity and gravitation, for example, without illustration by some simple experiments. "Why, then," asks the enthusiastic young teacher, "should not all that varied phenomena of Life and Death which pertains to physiology be taught to young pupils in the same scientific way?"

These are two strong reasons why such methods of teaching should be strenuously prohibited in every school.

* From "Journal of Education," Boston, Mass.

First, Because of the danger of such instruction.

Second, Because everything needful or desirable to be imparted to the young may be clearly and adequately taught without ever once drawing near to the line of danger, or demanding the sacrifice of life.

Among men of science, the study of the mental and physical peculiarities of young children has excited, during recent years, no little interest. It has been discovered that if we take the pupils of any large public school and study them carefully as individuals physically, mentally and morally,—we shall find in each class a certain proportion below the normal standard. The sight may be imperfect, the hearing may be less acute ; there are malformations of body, or confusion of colours ; of all these defects, a certain number will be found in every class-room. Test the mental capacity. Every teacher knows that in scores of cases the bright pupil is not over-diligent or the dull scholar blameworthy for his stupidity ; that in quickness of perception, ability to grasp and comprehend, tenacity of memory, some scholars will be far above the average ; while on the other hand, some will be found abnormally below it, dull of apprehension, quickly forgetful, difficult to arouse, or to interest in any mental work. A step or two below the mental state of some pupil,—and the teacher admits that the border-line of simplicity or semi-idiocy would be nearly reached.

The difference in moral sensibility among the young is found to be equally well marked. No two pupils have precisely the same repugnance to wrong-doing in any direction, or manifest the same sense of honour and love of truth, the same hatred of cruelty, or the same tendency to sympathy. Just as a certain proportion of children are below the average in physical development or mental capacity, so, too, a definite proportion *are imperfectly developed morally ;* and in many cases need but slight excitement to

have aroused within them impulses to cruelty, vice and crime. They are "*psychopathics*"; a term which Prof. James of Harvard University employs to denote an inborn aptitude to immoral actions in any direction. This aptitude may not be always awakened; doubtless in many cases, by education and continual normal environment it is gradually outgrown; but if it be once fairly aroused,—so that a sense of gratification is incited by wrong-doing, there are no excesses of cruelty and crime to which these psychopathic children,—these moral imbeciles,—may not go. And curiously enough, it is very often in the direction of cruelty—the infliction of pain—that the first incitement is directed.

Now before a class of pupils in a public school, suppose you illustrate the lesson by dissection of a rabbit or a cat, killed at that time and for that purpose. It is possible that the majority of students might have their attention fixed only upon the facts of anatomy thus illustrated. But to some others,—children quite as likely as otherwise to have been most carefully trained, and to be the objects of most tender solicitude,—there will come slowly creeping into consciousness a vague, abnormal, horrible sense of satisfaction at the sight of this quivering flesh, yet ruddy with the warm blood of out-going life. Which are the pupils that experience this arousing emotion? Will they confess it to you? Not at all. Yet they may be nearest and dearest to you by every human tie. It is you who have put them to a danger from which they should have been spared. You have aroused within them a sensation that is oftentimes the very mother of every cruelty. For out of this awakened sensation of abnormal pleasure at the sight of blood is born the instinct of murder, and the lowest tendencies of viciousness and crime.

There is yet another aspect of these methods of instruction—their influence upon all children who are entirely

normal, but yet exceedingly sensitive to impressions. I do not hesitate to say that nothing such a child will learn by these lessons can ever compensate for the deleterious impression it may receive by the needless sacrifice of Life in its presence. Say what we will, there is a kind of moral deterioration inseparable from the act of killing anything which is doing us no harm. To put out of existence a noxious animal or insect is to obey the instinct of self-preservation; but to take a perfectly harmless creature, kin to the pet of many a child, and to deprive it of whatever joys come from living—simply that children may see how curiously Nature has constructed it—can hardly fail to give them a sense of wrongful complicity with deprivation of another's rights. Not long since I was talking with a young girl graduate of the principal female college of this country, and although she was greatly interested in the study of biology, she told me that a most distasteful impression was created among the girl-students by the fact that so many rabbits were killed to demonstrate what the sacrifice of a single life would have done equally well. Is it wise to blunt this sensibility regarding the sacredness of life? I am not referring to the psychopathic child, but to all children alike. There will come a time when, as young men and women, they should know how to prevent pain, by causing the painless termination of life; but for childhood, that lesson should be unlearned, and as far as possible delayed. The beauty, the grace, the excellence of all harmless living things is the lesson for children, rather than precocious intimacy with the mystery of Death.

Then, too, there is yet another danger. The desire, the ambition to imitate is one of the first instincts of conscious life. I question whether there was ever experiment in class-room that some child or children did not try to imitate it in private or by themselves. Suppose it is merely a dissection

of a rabbit just killed. Some child or children will wish to repeat it—and kill the rabbit themselves. Then you have initiated childhood into private vivisection. Is that advisable? Admit that the class is cautioned against such repetitions. But you cannot easily convince an inquiring mind that what it is right for the teacher to do in public may not also be copied in the privacy of his own room, and in the presence of his classmates.

But is not dissection of recently killed animals absolutely necessary to a right understanding of the text-book? Not at all. Such methods of instruction are not only dangerous, but wholly unnecessary.

What is the purpose of lessons in school-physiology? Is it to start boys and girls on the road to a medical school? Certainly not. The one great object—in fact the only practical object—is simply to enforce on the minds of the pupils the lessons of Hygiene. What are the plain rules for the preservation of health? What are the effects which may arise from use of tobacco, especially by the young? Wherein lies the danger of alcoholic stimulants? What injury to health comes from over-eating, from improper food, from bad ventilation, from construction of the body by unhygienic dress? How do people ignorantly injure their digestion, their breathing capacity, the heart, the brain? How may typhoid fever be prevented? How does a community help to stamp out scarlet fever, diphtheria, measles, small-pox, and other epidemic diseases? What shall one do in case of an accident, till the doctor comes? These are the lessons of practical hygiene which school children should be thoroughly taught. They are the lessons which instruction in physiology in schools was designed to impart, and the importance of which cannot be over-estimated. But surely it needs no killing of rabbits, cats or dogs, to make such lessons plain. Everything needful may

be illustrated by coloured charts and manikins. A quickly forgotten smattering of anatomy may indeed be learned by a child, dabbling its fingers in bloody tissues, but nothing which might not be better learned by other methods, without the danger of moral perversion, and at the cost of not a single pang.

Dangerous and unnecessary. These are the words which in the august name of Science herself, may we not stamp upon all methods of instruction in our public schools which make for the brutalization of childhood by inducing early familiarity with the sacrifice of Life?

DOES VIVISECTION NEED CONCEALMENT?

In the pages of an American periodical, *Light*, there recently appeared an article on vivisection from the pen of one of our rising young physiologists, Professor Wesley Mills, of Canada. In more than one respect it is a remarkable paper. Concisely expressed, carefully phrased, it gives us in few words the author's opinion regarding some of the common forms of needless cruelty in agricultural operations, while at the same time it touches with a light hand the alleged evils of scientific experimentation. One begins perusal of such a paper with an interest enhanced by the knowledge that no one better than a physiologist can know the real facts; that it is an expert in vivisection who has laid down the scalpel to take up the pen.

So far as Dr. Mills confines himself to pointing out the varied cruelties of the agriculturist and stock-breeder, he is on ground where every lover of humanity can agree with him. In the treatment of animals we doom to die for our food, there is undoubtedly room for reformation of manners, not only regarding their preparation for our repasts, but in the methods by which we take their lives. No one can visit a great slaughter-house without being saddened by the needless atrocity that seems now so often inseparable from the function of butchery. That the act of killing animals was of itself a danger, Ovid pointed out nearly two thousand years ago in lines which Dryden has paraphrased: —

> "What more advance can mortals make in sin,
> So near perfection, who with blood begin?
> Deaf to the calf that lies beneath the knife,
> Looks up, and from her butcher begs her life;
> Deaf to the harmless kid, that ere he dies
> All methods to procure thy mercy tries,
> And imitates in vain thy children's cries."

But, while agreeing entirely with the condemnation Professor Mills passes upon certain needless forms of cruelty, I must confess to disappointment in his treatment of vivisection. Here he writes as an expert, as a professional physiologist, as an authority to whom one might naturally turn for information. Does he throw light upon dark places? Not at all. Never was reticence more obvious, or, seemingly, more needless. There may be occasions when it is not fit that the whole truth be spoken; but this, certainly, is not one of them. "There is room," writes Dr. Mills, "for difference of opinion on certain points, as, for example, the extent to which vivisections at all painful are to be revealed for the sake of instruction." Very true; but one looks in vain for any expression of the writer's personal views. How far does the professor think it right to go in repeating before his classes of students experiments involving torture? The late Sir William Fergusson, surgeon to the Queen, told the Royal Commission of a case where "an animal was crucified for several days, and introduced several times in a lecture-room for the class to see how the experiment was going on."*

Does Professor Mills think that a case like this is one where "there is room for difference of opinion"?

As a physician, I have never been able to go to the extreme of denouncing all experimentation upon animals even though from first to last no pain be felt. Between the total abolition of all sacrifice of animal life for scientific purposes demanded by many humanitarians, and that absolute freedom to inflict torture without restraint claimed by some physiologists, there must be a middle ground. But to find it, we need to know the whole truth, the exact truth, without circumlocution. In the peculiar obscurity with which this writer seems to veil his opinion, one finds little

* Report of Royal Commission, Q. 1,057.

to assist toward discovery of the real facts. "The societies for Prevention of Cruelty properly attempt to punish the abuses of vivisection. The difficulty is in a number of unskilled persons attempting to determine what does really constitute an abuse." But who can assist these "unskilled persons" to solve that difficulty half so well as one whose profession is to vivisect? In fact, what *is* a physiologist's idea of an abuse of vivisection? It would be of the utmost interest to know. I confess I never saw it defined. Is it division of the fifth nerve, the most acutely sensitive in the whole body, the irritation of which always causes intense pain? Is it "an abuse of vivisection" to freeze rabbits to death before a class of young men and young women, merely to illustrate what every one knew in advance? Is it "an abuse of vivisection" to cut down upon the spinal cord of a dog, to demonstrate its functions for the thousandth time? Is the dissection of animals rendered motionless by curare "an abuse of vivisection?" These are all publicly performed in our country. What is the rule, the line of demarcation which, in this professor's opinion, separates use from "abuse" in the practice of animal experimentation?

Of still another statement in this essay I find difficulty in comprehending the true inwardness. "It is but rarely, nowadays," writes Professor Mills, "that vivisection is performed except under the influence of an anæsthetic." Well, how "rarely"? Revolutions are rare, parricides rarely happen, earthquakes rarely occur. Are we to understand that experiments involving pain are thus "rarely" performed? Why, experiments producing some degree of pain are a matter of daily occurrence in every pathological or biological laboratory. Then, too, what is meant by a "vivisection performed under the influence of an anæsthetic"? That the cutting operation is done while the

animal is unconscious? That is one meaning of the words. Or does the professor mean to imply that the animals subjected to various experiments are seldom conscious of any pain from first to last? This is the crucial point.

Suppose I take a dog and, putting it under the influence of chloroform, cut out its kidneys and close the wound. It recovers consciousness. Now I have "performed the vivisection under anæsthetics," have I not? The animal will live from three to five days,—suffering nothing, Professor Mills? Or suppose, upon another dog thus anæsthetized, I cut down to the spinal cord. Two or three hours after, when it has recovered from the shock of the operation, I bring the animal before my class of students, and by irritation of this great nerve trunk, I subject the dog to excruciating pain. Somebody objects to it. "Why, I gave this animal chloroform while I cut its flesh! It was *a vivisection under anæsthetics.* It suffered no pain while I made my incisions," I reply. In the opinion of Professor Mills, would not such an answer be an utter perversion of the truth?

I like to believe with Professor Mills that "Science begets a truthful state of mind, a desire to state truth, and that only," and that it is insulting to say that "biologists deliberately deceive the public." Nevertheless, is it not possible that the scientific instinct that tends to veracity is occasionally overborne by the seeming necessity to cover up disagreeable facts? Is the whole truth always told when a physiologist is called upon to describe and defend his experiments? In October, 1892, just after the debate in the Church Congress, there was cabled from London to various newspapers in this country a long interview with Professor Victor Horsley, a young physiologist, who had just achieved notoriety throughout England by insulting a venerable lady who was eminent as an English writer be-

fore he was born. The interviewer, Mr. Harold Frederic, the regular correspondent of the New York *Times*, graphically describes a visit to the physiological laboratory of University College, London, where he found Mr. Horsley engaged in vivisecting a cat. "I am delighted," said the physiologist, "to afford the public any opportunity to judge for themselves of the cruelty of our methods. We invite criticism." Nothing could be more hearty than such a welcome; and the intelligent correspondent at once began to satisfy his curiosity. What about the sufferings of animals after the operations made upon them? The genial professor smiled at the inquiry, and invited him to take a look at his menagerie "and judge for yourself." In this menagerie, Mr. Harold Frederic tells us, were to be seen "many cats and monkeys, all fat, cheerful, and jolly, playing one with another after their kind, the cats apparently altogether unconcerned as to their brain loss so recently incurred, *and the monkeys quite unaffected by the removal of a spinal cord!*"

Think of a statement like that put forth regarding animal experimentation! Just as truthfully Mr. Frederic might have described monkeys "quite unaffected by the loss of their heads." And yet this correspondent was a brilliant writer, a more than ordinarily gifted and intelligent man, and one far better qualified than most of us, to detect intentional equivocation and to distinguish truth from falsehood.

The entire two-column interview was filled with similar misstatements of facts. "One last question, Mr. Horsley," exclaimed the satisfied investigator. "Do you ever perform any painful operation on a living animal without the aid of anæsthetics?"

"Never! Neither I nor any of my colleagues!"

Now, what did Professor Horsley intend to imply by this most definite statement? That neither he, nor any of his

colleagues ever made an experiment causing pain? Such a statement as this, so deliberately and explicitly made as to be without possibility of equivocation or evasion, would have been a falsehood. Yet that is the meaning which even the editor of the New York *Times* drew from Professor Horsley's words; for in his paper he headed the interview, in small capitals, "ABSOLUTE PAINLESSNESS OF EXPERIMENTS!" That is the meaning which ninety-nine out of every hundred readers of the interview would unhesitatingly accept; that is the meaning which some one apparently intended to convey. It may be "excellent fooling"—this cheap deluding of the credulous public; but we may be sure that the true interests of science will never be permanently advanced by masquerading a lie under the guise of a truth.

*DOES SCIENCE NEED SECRECY?**

To what extent can scientific authority be implicitly received as the foundation of belief regarding the subject of Vivisection? It is certain that for the great majority of men and women, all statements concerning it are wholly beyond the possibility of verification by personal experience. Regarding its extent or its methods, its pain or painlessness, its utility to humanity or its liability to abuse, the world bases its judgment, not upon knowledge, but upon faith in the accuracy, the impartiality, the sincerity of the men who, standing within the temple of science, know with certainty the facts. One might suppose that here was the welcome opportunity to demonstrate that science can have nothing to conceal; that her symbol is a torch and not a veil; and that above all professional preference and all partisan zeal stands fidelity to accuracy, and the love of absolute truth.

Nevertheless, it is my purpose in this paper to question the wisdom of too implicit faith; to suggest the expediency of doubt; and to point out why statements which may have the support of eminent authority, should sometimes be received with great caution and careful discrimination.

It is not easy to perceive the slightest reason why everything that concerns a scientific method or purpose should not be plainly and accurately set forth. Generally this is the case. If a new telescope of unusual power is desired by a university, Wealth is not asked to give in order that wealth may be increased by lunar discoveries. When an

* The substance of this article was read before the Annual Meeting of the American Humane Association, Minneapolis, September 26, 1895, and was printed in the *Boston Transcript*, September 28, 1895.

astronomical station is established on the Andes, or an expedition fitted out for the North Pole, we all know that science only will be the gainer—not commerce or art. The one exception to an almost universal rule, the one point where truth is veiled in obscurity for the public eye, is when we come to the vivisection of animals. Everywhere else, science seems mindful of her mission, and asks only that with increasing radiance the light may shine.

Now why should vivisection offer an exception to this ideal? That it seems impossible for the professional vivisector to tell the whole truth about the practice, is evident to every person acquainted with the facts. The London *Lancet*, for example, recently praised a biography by Prof. Mosso, in which that Italian physiologist said—as the *Lancet* thinks—"*wisely*" said: "It is an error to believe that experiments can be performed on an animal which feels." A few weeks ago Professor Mosso sent me a manuscript copy of this same essay, in which the sentence appears in slightly different form: "It is an error to think that one can experiment on animals that have not lost sensation; the disturbance produced by pain in the organism of the animal is so great that it renders useless any observations." Here is the utterance of a man of science, trained in the accuracy of the laboratory, occupying one of the foremost positions in Europe as a physiologist, and his words are stamped with the approval of the leading medical journal of England. How is the average reader to question a statement like this? Nevertheless, it is absolutely untrue. One *can* perform experiments "on an animal which feels"; they have been done by the thousand by Bernard, Magendie, Mantegazza, Brown-Sequard, and others; I have seen scores of these myself. No more unscientific sentence was ever written that this statement that one *cannot* do what is done every day! What the Italian physiologist might truthfully have

written was this: "It is an error to believe that physiological experiments, requiring the aid of delicate instruments, can be performed upon an animal unless the creature is made unconscious, or rendered incapable of muscular effort." If he had then gone on to say to what extent this is done by means of anæsthetics, to what extent by the use of narcotics, and to what extent the poison of *curare* is administered to paralyze the motor nerves, leaving sensibility to pain untouched, we might have had a scientific statement of fact. As it is, we have—what? A falsehood? An untruth due to ignorance? An error due to carelessness? I do not know. Perhaps the physiologist was thinking too intently of his own special lines of inquiry to note the significance of his words; but what shall we say of a scientific journal like the London *Lancet* which could quote the untruth as "*wisely*" said? Is untruth ever "wise" where science is concerned?

There was recently given out by Dr. William Townsend Porter, the assistant professor of physiology in Harvard Medical School at Boston, one of the most astonishing statements concerning vivisection that ever appeared in public print. The accuracy of Dr. Porter's statement was vouched for by five other leading professors in the same institution—men whose scientific reputation would impart to their affirmations a very great authority throughout the country. They put forth what they asserted was a "plain statement of the whole truth" concerning experiments on living animals. He, perhaps, is a rash man who ventures to question any assertion supported by names like these. But it is the duty of every lover of scientific truth to point out errors wherever he may find them, no matter how shielded by authority or intrenched by public opinion; and I propose, therefore, to make use of this professional manifesto as an illustration of the fallibility of even the highest scientific

expert testimony. I think it can be proven that although this declaration rests on such authority, it is nevertheless permeated with misstatement and error; that certain assertions have been made without due authority, and certain facts of pith and moment most singularly omitted, or most carelessly overlooked. If full reliance cannot be given to assertions made by men like these, where can confidence be placed?

I. In the first place Professor Porter does not well when he denies (as he seems to do) that the practice of experimentation upon living animals has ever led to abuse. "The cruelties practised by vivisectors are paraded in long lists, with the assurance that they are taken directly from the published writings of the vivisectors themselves." Well, is this assurance untrue? "These long-drawn lists of *atrocities that never existed*,"—can these be the words of a devotee of scientific truth? What does Professor Porter mean by them? What other meaning is possible for the average reader to obtain than that he intended to deny that atrocious experiments were anything but a myth? "Never existed"? Why, both in Europe and America, but especially abroad, I have personally seen most awful cruelty inflicted upon living animals, simply for the purpose of illustrating well-known facts, or theories that had not the faintest conceivable relation to the treatment and cure of disease. No facts of history are capable of more certain verification than the tortures which have marked the vivisections of Magendie and Bernard, of Bert and Mantegazza, and of a host of their imitators. "It is not to be doubted that inhumanity may be found in persons of a very high position as physiologists; we have seen that it was so in Magendie." This is the language of the report on vivisection by a royal commission to which is attached the name of Professor Thomas H. Huxley. Says Dr. Eliotson, in his work on

Human Physiology (p. 448), "I cannot refrain from expressing my horror at the amount of torture which Dr. Brachet inflicted. *I hardly think knowledge is worth having at such a purchase.*" But take American testimony on this point. Dr. Henry J. Bigelow, for many years the professor of surgery in Harvard Medical School, of whom Dr. Oliver Wendell Holmes has said, that he was "one of the first, if not the first, of American surgeons," gave the annual address before the Massachusetts Medical Society a few years ago. Therein he called attention to the "dreadful sufferings of dumb animals, *the cold-blooded cruelties* now more and more practised under the authority of science! . . . . Watch the students at a vivisection. It is the blood and suffering, not the science, that rivets their breathless attention. . . . It is dreadful to think how many poor animals will be subjected to excruciating agony as one medical college after another becomes penetrated with the idea that vivisection is a part of modern teaching; that to hold way with other institutions they, too, must have their vivisector, their mutilated dogs, their chamber of horrors and torture to advertise as a laboratory." Does anyone imagine that Dr. Bigelow here refers to "atrocities that never existed"?

The American Academy of Medicine includes within its membership men who are as well informed as any in the medical profession. At the sixteenth annual meeting, held in Washington four years ago, Dr. Theophilus Parvin, one of the professors in Jefferson Medical College of Philadelphia, gave the Presidential address. Speaking of physiologists, he says that there are some "who seem, *seeking useless knowledge*, to be blind to the writhing agony and deaf to the cry of pain of their victims, and who have been guilty of the most damnable cruelties without the denunciation by the public that their wickedness deserves and

demands; these criminals are not confined to Germany or France, *but may be found in our own country.*" Is this the statement of an "agitator"? President Parvin graduated as a physician some years before Dr. Porter was born, and I fancy that he knows of what he speaks. And that physiological experimenter who, defending the utility of vivisection, forgets or denies the existence of atrocity, may be on dangerous ground. Cases have been known where merciless occupation has induced an atrophy of the sense of pity; and its first symptom is unconsciousness of cruelty, and blindness to abuse.

II. But quite as strange as any assertion in this "plain statement of the whole truth" is the implied suggestion that abuse is impossible because everything is so openly done! "These loud outcries to put an end to the frightful scenes daily enacted within the open doors of the most enlightened institutions of learning,"— surely there is a false impression conveyed by these words which their writer should hasten to correct. "*Within the open doors*"? To whom are the doors of the physiological laboratories open? Why, no feudal castle of the middle ages was ever more rigidly guarded against the entrance of an enemy than physiological laboratories are secured against the admission of unwelcome visitors.* To some of the largest laboratories in the United States, no physician even, can gain entrance unless personally known. If the Bishop of Massachusetts and the editor of any leading newspaper in the city were to apply for admittance at Prof. Porter's laboratory during a vivisection, would the doors swing open as to welcome guests? Would they be invited to come again and as often as desired, without previous notification? I commend the experiment. Of course a certain degree of this seclusion is

* See Minutes of Evidence, Parliamentary Commission, Queries 4066, 4161, 4162.

necessary and wise. That which I criticise is the implied denial that any secrecy exists and this reference to "open doors." And if doubt still lingers in the minds of any who read, a conclusive experiment will not be difficult to make. Let him but knock at these "open doors" when vivisection is going on.

III. We are informed, too, by these scientific authorities that by so simple a method as "a scratch on the tail of an etherized mouse" and subsequent treatment, "the priceless discovery was made which has at length banished tetanus from the list of incurable disorders." That is an unscientific statement simply because it is untrue. Tetanus, or lockjaw, was never in "the list of incurable disorders"— if uniform fatality is meant; and it certainly has not been taken out of the list by any "priceless discovery" whatever. Consult Aikin, Wood, Fagge, Gross—consult any medical authority whatever of ten years ago—and you find the recoveries from tetanus averaged at that time from ten to fifty-eight per cent. of those who were attacked. Now, what mighty change has been wrought by the "priceless discovery"? Well, I take up the London *Lancet* of August 10, 1895, and I find an English physician tracing "all procurable published and unpublished cases of tetanus treated by anti-toxine," and they number just thirty-eight, of which twenty-five were recoveries and thirteen were deaths. I take up the New York *Medical Record* for August 24, 1895, and I find a correspondent stating that he "can discover in the recent medical literature but six or seven cases in all where anti-toxine or tetanine has been used successfully, and they were all by foreigners." To call that a "priceless discovery," which is not in general use to-day, which in four years has made no better record than this, and with which the report of hardly a single cure can be found in American medical annals within the last five years,—is *that* a scientific state-

ment? Is it worthy of the reputation of men who allowed it to go forth to the world backed by the eminence of their names?

IV. "It is asserted," says Professor Porter, "that living animals, without narcotics, helpless under the control of poisons which, it is alleged, destroy the power to move while increasing the power to suffer, are subjected to long, agonizing operations, in the hope of securing some new fact, interesting to the scientific mind, but without practical value." This is one of the most curious and ingenious sentences I have ever read. Its inaccuracy depends on only two words, "without narcotics." No critic of vivisection ever made use of those words in any such statement; and I challenge Professor Porter for a single reference or quotation. *It cannot be given.*

But, if instead of the words "without narcotics," Professor Porter had written "without anæsthetics," then he would have made a precise, accurate and true statement of what undoubtedly has been charged. Could any reader imagine that such a charge was true, and that it might exactly apply to some operations carried on in the laboratories of Harvard Medical School? "Helpless under the control of poisons which destroy the power to move, while increasing the power to suffer," writes the physiologist, in seeming amazement at the mendacity that could coin such a lie! Yet that statement is entirely true. The name of that poison is *curari* or woorara; the orthography is not fixed. "Woorari," says Dr. Ott (who has personally made use of it in the physiological laboratory at Harvard Medical School), "is able to render animals immovable . . . by a paralysis of the motor nerves, *leaving sensory nerves intact.*" The properties of this singular poison have been carefully investigated by Claude Bernard, whose work on experimental science may be seen at the Boston Public

Library. "Le Curare," he says, "detruit le mouvement, en laissant persister la sensibilite" (p. 298); "Curare destroys the power of movement, although sensibility persists." Under the influence of this agent the animals upon which the physiologist may be working are "exactly as if solidly fixed to the table, are in truth chained for hours" (p. 310). Does it know what is going on? "When a mammal is poisoned by curari, its intelligence, sensibility or will-power are not affected, but they lose the power of moving" (p. 296). Do they suffer? Is it true, this statement which Professor Porter tells us is "asserted" (and which, by innuendo, he seems to deny) that animals are helpless under control of poisons which destroy the power to move while increasing the power to suffer? Well, Claude Bernard was one of the greatest physiologists of this century, and he shall tell us. Death by *curare*, he says, although it seems "si calme, et si exempte de douleur, est au contraire, accompagnee des souffrances, let plus atroces que l'imagination de l'homme puisse concevoir,"—sufferings the most atrocious that the imagination of man can conceive! "In that corpse without movement and with every appearance of death, sensibility and intelligence exist without change. The cadaver that one has before him *hears and comprehends what goes on about him, and feels whatever painful impressions we may inflict*" (p. 291). Is an animal ever "*curarized*" in the Harvard Medical School? Even more than this: did not Professor Porter himself, report the use of *curare*, in his own physiological experiments, for the very purpose which he now affects to ridicule?*

* The *Journal of Physiology* for September, 1893, contained an article by William Townsend Porter on the "*Results of the Ligation of the Coronary Arteries*," the small arteries which supply the heart itself with blood. Of these investigations Prof. Porter says:

"Dogs were used in my experiments. The second, third, fourth and

V. Throughout the entire manifesto the word "narcotics" is constantly used apparently as a synonym for "anæsthetics"; we read for instance of "a rabbit narcotized with chloral," a "narcotized dog," etc., but not once of an "anæsthetized" animal. Let us see exactly what these terms indicate.

In the physiological laboratory five different substances are largely employed for producing certain effects in animals used for experiment. Of curare I have just spoken. Chloroform and ether are known as "anæsthetics"; that is, agents which, pushed sufficiently far, produce a degree of the most absolute insensibility to pain. But the trouble with these anæsthetics in the laboratory is their liability to cause the sudden death of the animal experimented upon; and this is often most annoying and inconvenient. The temptation, therefore, is great to substitute for these anæsthetics certain "narcotics" which create a degree of torpor, though they do not prevent pain. Opium (or morphia) and chloral are the agents thus used. An animal treated with ether may be said to be "narcotized." But is the creature thus narcotized sensitive to the pain of cutting, for example? Take opium. Claude Bernard, the great French physiologist, asserts that sensibility exists even though the animal be incapable of movement; "il sent la douleur, mais il a, pour ainsi dire, perdu l'dee de la defense;" he feels the pain, but has lost, so to speak, the idea of defending himself. Do surgeons use morphia to prevent

fifth dog of the series of 32 recorded here, were given *a small quantity of morphia. Voluntary movements were prevented by curare.*"

Then follows a description of the method employed. The use of *curare* is admitted, and the reason for its employment. "The time occupied by these awful vivisections," says Dr. Berdoe, "varied from 18 to 100 minutes. In course of the investigation, fifty arteries were prepared for tying." How such experiments were of any utility whatever,—except "to minister to egotism,"—it is not easy to perceive.

the pain of a surgical operation? Or take chloral. It is a narcotic; it tends to produce sleep. Is it an anæsthetic? Dr. Farquharson of St. Mary's Hospital says in his "Guide to Therapeutics" (p. 195): "Recent observation goes to show that *chloral is in no sense a true anæsthetic.* . . . Chloral having no influence over sensory nerves, has no power, *per se*, of allaying pain." Dr. Wood of Philadelphia seems disposed to think that "in very large doses" chloral will produce insensibility to pain; but he adds that unless the amount employed be so large as to be almost poisonous, "this anæsthesia is in most cases very trifling."

For use in the physiological laboratory, the dose for a rabbit is fifteen grains, or one gramme. What shall we say of most painful experiments upon rabbits, "lightly chloralized" with one-tenth the ordinary dose? *Such investigations were made by Professor Porter himself, at the Harvard Medical School, and within the last two years.*

VI. And this brings me to a point upon which I am loth to touch, since it would seem to involve the most positive contradiction of statements made by scientific men of high repute. Speaking in the plural number for his five associates, Professor Porter has said of vivisections causing pain, that "such investigations are rare. *None such have been made in the Harvard Medical School within our knowledge.*" This assertion has been widely copied, and is almost universally accepted as true. The Boston *Transcript* doubtless echoed the sentiment of the public when it declared in its editorial columns that "the character and standing of the medical men whose names are given as responsible for this explanation to the Boston public *forbid any questioning of its statements of facts.*" What is the value of authority if one may assume to disbelieve in a case like this? Here is the assertion of six scientific teachers. For

the general public, nothing would seem to remain but unquestioning acceptance, and implicit belief.

But a great English thinker has said that doubt is the very foundation of science, since "without doubt, there would be no inquiry, and without inquiry, no knowledge." In the interest of scientific truth, I venture here to suggest doubt rather than credulity. We have an assertion which is either true or false. I doubt its truth. I affirm that evidence exists that experiments have been made in Harvard Medical School under the following circumstances:

1. Animals have been "*curarized*," and in that condition vivisected. Curare is not an anæsthetic, but simply prevents the animal from moving, while remaining entirely sensible to pain.

2. Animals have been "very lightly narcotized" and in that condition vivisected. There is no evidence that animals "lightly chloralized" are insensible to pain.

3. In the majority of published accounts of experiments, there is no mention whatever of anæsthetics being used. In a few instances only, there is reference to the administration of ether before the preliminary cutting, often followed later by use of *curare*.

4. The majority of these published investigations, so far as discovered, relate to curious questions in physiology, and have no perceptible relation to the treatment or cure of human ailments.

For proofs of these statements I refer to the published accounts of various experimenters themselves, concerning their own investigations. Most of them may be found in somewhat rare volumes entitled, "Collected Papers, Physiological Laboratory of Harvard Medical School."*

What judgment are we entitled to pass upon this mani-

* Details of these experiments are given at length in the American Edition.

festo? Was it, indeed, what it claimed to be—"a plain statement of the whole truth"?

No. A "statement of the whole truth" would not have carefully mentioned "a scratch of the tail of an etherized mouse," and make no reference to other investigations of infinitely greater import carried on in their own laboratory. A statement of the whole truth would not have spoken of "long-drawn lists of atrocities that never existed"—denying in one sweeping sentence some facts as certain as any in history. A statement of the whole truth would not have referred to "narcotics" as though they were identical with "anæsthetics"; it would not have left hidden the use and purpose of curare; it would not have referred to "open doors," when there are no open doors; it would not have proclaimed to the public as a "priceless discovery" for the cure of tetanus, an agent of which not five cases of successful employment in this country can be found in medical literature. And above all, a plain statement of the whole truth would never have declared that no painful vivisection had been made in Harvard Medical School in the face of the evidence given in the printed volume to which I have referred.

I am not an anti-vivisectionist, for I believe in the practice, when it is rigidly guarded against all abuses, limited to useful ends, and subject to public criticism and the supervision of the law. But I cannot believe that science ever advances by equivocation, or gains by secrecy. If, in the opinion of scientific experts, certain phases of vivisection must be kept from the world's judgment and criticism by evasion and suppression of truth, then I fear the time may come when society will question the expediency of all such methods, from higher considerations than those that affect man's relations to the animal world. For science could continue even if vivisection were to cease, but without veracity and good faith, Society itself cannot exist.

*SOME MISTAKES OF SCIENTISTS.**

It is a view widely entertained, that a scientist is no ordinary individual; he is a man set apart, as it were, in a peculiar priesthood, for the discovery and promulgation of scientific truth. To unveil for himself the great mysteries of Nature, and then to make his discoveries known,—these are the great objects to which he is thought to have devoted his life. Certain virtues are regarded as peculiarly his own, and as intrinsically connected with scientific pursuits. Other men may blunder into false affirmations through ignorant over-confidence; the man of science is supposed to be slow to make any statement, unless he is sure of his facts. Other men err through carelessness; he is trained in the laboratory where precision is considered as the first of the virtues, and inaccuracy is counted as a disgrace. Other men may be indifferent to veracity where commercial interests are at stake, or when private gain hints at the utility of deceit; but falsehood, fraud and equivocation are supposed to be foreign to every fibre of the nature of one devoted to scientific work. It is no slight advantage thus to enjoy the abounding confidence of the intellectual world. If almost universal faith is to-day accorded to the statements of a man of science, it is not merely because of trust in personal integrity and in honesty of purpose, but also because of belief that even from errors arising from ignorance or carelessness his assertions are peculiarly free.

So much for the popular conception of the influence of science-study upon the virtue of accuracy. Is this ideal based upon the truth? It is more than doubtful. There is abundant evidence that some of the most eminent men of

* From Senate Document 78, Fifty-fifth Congress, U.S.A. Revised.

science in America have made statements pertaining to matters with which they are supposed to be familiar, statements which have been proven to be wholly untrue. To suggest the causes that may have led to such erroneous assertions is not the purpose of the moment; rather it is designed from time to time, in the interest of Science herself, to point out the existence of wide-spread inaccuracy, and to suggest, as a just conclusion, that until it is explained, popular confidence in the bare assertions of certain scientific men is confidence misplaced. We need not imply that the untruths uttered were deliberately made. In their influence upon public opinion, blunders arising from ignorance or failing memory are no less harmful than when due to deliberate mendacity. The judgment appealed to is swerved simply by the false statements, and the evil done is not atoned for even by the honest intention—when such intention exists.

As examples pertinent to the present hour, let us look at certain statements made by the Surgeon-General of the United States Army, and by the President of the Medical Society of the District of Columbia, while they were opposing the bill before Congress which provided for the regulation and government supervision of the practice of vivisection.

On the 17th of April, 1896, the Senate committee gave a hearing to arguments for and against a Bill, the object of which was to place the practice of vivisection in the District of Columbia under the supervision and control of the Government of the United States. In his address before this committee, one speaker alluded briefly to certain revolting and cruel experiments made by Dr. Watson, which consisted in dropping no less than 141 dogs from a height of 25 feet in such a way as to produce the greatest amount of injury to the spine, consistent with the temporary

preservation of life. In regard to these American vivisections there have been vigorous expressions of condemnation, even by those who are among the strongest advocates of experimentation upon animals. In an address delivered before the American Academy of Medicine at Atlanta, Ga., May 2, 1896, Dr. George M. Gould, present editor of the *Philadelphia Medical Journal*, speaking upon Vivisection, said:

"At present the greatest harm is done true science by men who conduct experiments without preliminary knowledge to choose, without judgment to carry out, without true scientific training or method—and only in the interest of vanity. It takes a deal of true science and patience to neutralize with good and to wash out of the memory the sickening, goading sense of shame that follows the knowledge that in the name of Science, a man could, from a height of 25 feet, drop 125 dogs, . . . and for days observe the result, until slow death ended the animals' misery. While we have such things to answer for, our withers are surely not unwrung, and in the interest of Science,—if not from other motives,—we have a right to decide who shall be privileged to do them."

Referring also to the author's account of these same experiments, the *British Medical Journal*, a leading medical authority in England, in its issue of November 15, 1891, said:

"The present pamphlet calls for our strongest reprobation as a record of *the most wanton and stupidest cruelty we have ever seen chronicled under the guise of scientific experiments.* . . . Apart from the utterly useless nature of the observations, so far as regards human pathology, there is a callous indifference shown in the description of the sufferings of the poor brutes which is positively revolting. . . . He was not satisfied with a few of these cruel mockeries of scientific research, but indulged in one hundred and forty-one. . . . We can hardly wonder that the author was exposed to considerable annoyance at one time. We think he would have been exposed to more in most countries. What conclusions can be drawn from these unscientific experiments, that dogs falling from a height of 24 feet were liable to rupture or injure lungs, liver, kidneys, viscera, blood vessels, or bones? Is there anything new or useful in this grand discovery? . . . We trust no one in the

profession, or out of it, will be tempted by the fancy that these or such-like experiments are scientific or justifiable. Badly planned and without a chance of teaching us anything, and carried out in a wholesale, cruel way, we cannot but feel ashamed of the work as undertaken by a member of our profession."

It is difficult to imagine how a medical journal could use stronger language in regard to a scientific experiment than is here given. It embraces distinct charges of stupid, wholesale, revolting cruelty. To such characterization of these experiments, Surgeon-General Sternberg felt called to reply, if only to break the impression the Senate committee had evidently received. Referring to these investigations, and to other similar experiments on the spinal cord the Surgeon-General said:

"I would say that I have not seen the papers; but, in the first place, I do not believe that any surgeon or experimenter would think of making such an experiment without the use of anæsthetics. In the second place, *the spinal cord is not sensitive.* This idea that pain increases from the extremities of the nerves up to the brain is a fallacy.

Senator BACON. Have you demonstrated that by experiments upon yourself?

Dr. STERNBERG. *We have plenty of evidence.* I do not think it necessary to make an experiment upon myself. I have run my probe into a brain to see if it could be felt. *There is no sensitiveness of the spinal cord.*

Senator GALLINGER. To what extent would you carry that? Do you mean to say that an injury to the spinal cord would not produce pain?

Dr. STERNBERG. If you had pressure upon the spinal cord it would produce paralysis and prevent the feeling of pain.

Senator GALLINGER. But unless that paralytic condition were produced there would be pain, would there not?

Dr. STERNBERG. *I think not.*"*

To nullify the charge of "stupid and wanton cruelty" General Sternberg in the first place suggests a doubt whether such experiments would be made by any surgeon

* Report 1,049. Fifty-fourth Congress, p. 50. Italics ours.

or experimenter "without the use of anæsthetics." Dr. Watson's pamphlet describing these vivisections is to be seen in the library of the Surgeon-General, and it contains no intimation or suggestion of their employment.

In the second place, General Sternberg implies that these experiments could not have been so very cruel or revolting, because—as he distinctly tells the Senate committee—"the spinal cord is not sensitive." If Surgeon-General Sternberg had said that certain parts of the spinal cord appear to be insensible to irritation which generally produces pain, he would have been scientifically correct. That, however, would not have answered the purpose of the denial; and making no distinctions or explanations, he boldly informs the Senate of the United States, not only as an expert in vivisection, but also as the highest official authority on surgery in the country, that "*there is no sensitiveness of the spinal cord; . . . the spinal cord is not sensitive.*"

Was Surgeon-General Sternberg a trustworthy and reliable witness in his evidence on this point before the Senate committee? In regard to the sensibility or sensitiveness of the spinal cord, let us look at the testimony given by other experts in vivisection when they had no private interests to defend, and no object but the truth.

Dr. John C. Dalton, for many years the professor of physiology in the College of Physicians and Surgeons, New York, and at one time probably the preceptor of Dr. Sternberg himself, states in his text-book on physiology:

"Whatever minor points may remain in doubt, the principal fact is unquestioned that *the posterior parts of the spinal cord are sensitive to irritation.*

Both posterior and lateral columns near the entrance of the posterior nerve roots *are endowed with sensibility.*

The irritation of these columns by artificial stimulus, *according to all observers, produces signs of sensibility.*"

Dr. Brown-Sequard, of whom his brother vivisector, Dr.

Carpenter, has said that "he probably inflicted more animal suffering than any man of his time," has described the agony which he produced after cutting the posterior columns of the spinal cord. In the LONDON LANCET of July 10, 1858, he says:

"Before the operation in rabbits, the most energetic pricking produces agitation, but no shrieking; after the operation the least pricking produces shrieking and a much greater agitation. Sometimes the excessive sensibility is so great that the least pressure on the skin *makes the animal shriek. . . . It has been so in all the animals I have operated upon*, and I have already made this experiment upon animals *belonging to more than twenty species.*"

Dr. Flint instances some of his own experiments on this point, "made upon a living dog."

"The cord having been exposed in the lumbar region and stimulated mechanically and with an electric current, two hours after the operation *certain positive results were obtained*, which led to the following conclusions. . . .

The gray substance is probably inexcitable and insensible. . . . *The surface at least of the posterior columns is very sensitive especially near the posterior roots of the nerves.*"*

Here is evidence directly derived from vivisection, and stated by one of the most experienced of American vivisectors.

Another experimenter, Dr. A. Chauveau of France, has described a series of vivisections which he had made for the express purpose of determining "the excitability of the spinal cord, *and especially the convulsions and pain produced by working upon that excitability.*"† The study was made almost exclusively upon the larger domestic animals (horses, asses, etc.) because "they lend themselves marvellously to the localization of excitation by the great

* Flint, "Text-book of Human Physiology," Fourth Edition, p. 595.
† Journal de la Physiologie, Vol. IV.

volume of their spinal marrow. . . . I *consecrated* especially to this study more than eighty subjects"—enough certainly to prove his facts. After being immovably fastened, an incision about a foot long was made over the spinal column of the creature, "the vertebræ are opened with the help of a chisel, mallet, and pincers, and the spinal cord is exposed." No mention is made of any "anæsthetic," and, indeed, its use would be impossible in any study of sensibility. Let us quote some of these experiments upon the spinal cord which Surgeon-General Sternberg told the Senate committee was "not sensitive":

Exp. I. "Very large horse, aged 12 years, vigorous, but suffering from incurable disease in the foot. . . . The cord is exposed by removing the arches of the first and second lumbar vertebrae. *The operation takes a long time.* . . . We pass to the excitation of the left spinal cord. *The animal gives very lively signs of excitability.*"

Exp. VII. "A vigorous mule. . . . When the cord is pricked near the line of emergence of the sensitive nerves, *the animal exhibits the most violent pain. He groans and makes furious motions which are prolonged for a long time.*"

Exp. VIII. An ass. . . . "When we reach the external edge of the posterior cord, the scratching of the spinal cord provokes immediately *signs of the most violent sufferings.*"

Exp. X. "A small ass, very thin; pricked on the line of emergence,—*intense pain.*"

Exp. XI. Vigorous horse. (Pricking the cord as before.) "The animal exhibits *most evident signs of pain. He groans, and abandons himself to disorderly movements.*"

Exp. XII. Old horse. (Same irritation.) "*Signs of violent pain.*"

Exp. XIII. A goat. Spinal cord pricked at the usual place. "*Violent immediate pain exhibiting itself by piercing cries.*"

Exp. XX. An old white horse "lying on the litter, unable to rise, but *yet very sensitive.* . . . At whatever point I scratch the posterior cord, *I provoke signs of the most violent suffering.* . . . The animal agitates himself most violently."

Exp. XXV. An old mare, "very docile." "The electric excitors had hardly reached the edge of the posterior cord, when the animal made the most disordered movements, *uttered cries of pain, and manifested the violent suffering it experienced.* To produce these effects, it was only

necessary to make an almost imperceptible movement of the instrument. Nothing is more curious. . . . I *provoked the manifestation over and over again.*"

Exp. XXVI. "An old horse, thin and feeble." In addition to the usual phenomena, other manifestations of extreme agony were evoked: "The tongue is in constant movement, the globes of the eyes roll constantly in their orbits and the larynx opens and closes incessantly; the lower jaw meantime, is fixed open."

We need not go on with these awful experiments. What shall we say to evidence like this,—evidence based entirely upon vivisection? Eighty horses and other domestic animals, worn-out in the service of man, die in torment under the hands of Chauveau to prove the sensibility of the spinal cord; twenty species of animals, in unknown and unreckoned numbers, are sacrificed by the prince of vivisectors, Brown-Sequard; Dalton tells us, as the result of vivisections, that at certain points the sensibility of the spinal cord is "unquestioned"; Flint, reporting the "positive results" of his own vivisections, tells us that a certain part of the spinal cord is "very sensitive";—and yet, to break the force of a charge of cruelty in which he was not concerned, the Surgeon-General of the United States Army dared to stand up in the presence of a Committee of the United States Senate, and inform its members that "*the spinal cord is not sensitive, . . . there is no sensitiveness of the spinal cord!*"

Really, is Surgeon-General Sternberg a trustworthy witness upon matters pertaining to the vivisection of animals?

To what extent has vivisection beneficially influenced the present practice of medicine? In the formation of an opinion on this subject, the world relies principally upon the statements of practising physicians whose broad experience should have qualified them to know the truth, and in whose

integrity, accuracy and good judgment it is believed that confidence may be placed. Of all the statements upon this subject laid before Congress and printed in the Report No. 1049, there is none that would naturally exert greater influence than that of the president of the Medical Society of the District of Columbia. The official position of this writer, the high personal esteem in which he is held, and his half-century of medical practice, all combine to invest his opinions with an authority and a weight far beyond that of the average practitioner. Nevertheless it may be doubted whether in all the literature of pro-vivisection, there can be found in so brief a space an equal number of absurd, extravagant or untrue statements due to ignorance or misguided zeal.

In his eagerness to impress the Senate committee with the importance of animal experimentation, and to prevent if possible its control by the Government, the president of the medical society permitted a too vivid fancy to carry him far beyond the regions of scientific truth. The habit of mind which tends to exaggerate and magnify a fact is far more opposed to scientific progress than the mental scepticism which doubts, questions, debates, and yields credence only to overwhelming proof; and the mental attitude of this writer seems to be a natural leaning toward the marvellous. It is quite impossible to point out all the unscientific assertions and mistakes contained in this single paper, and put forth in all apparent seriousness by an educated physician. Think of the representative of medical science in the city of Washington soberly assuring the Senate of the United States that experiments upon living animals have opened such possibilities to surgery that people who were once "worse than dead, living simply as animals, have been restored to such life that they are again useful, and is leading up to the point that *we may be enabled to save the*

lives of that vast number of people who are suddenly stricken with apoplexy!"* Idiocy already cured,—apoplexy to be remedied by a surgical operation? A "vast number of lives" thus to be saved? Look for a moment at the facts. In England and Wales, during four years, 1894-1897, there died from apoplexy 68,325 men and women.† Of this great number no less than 53,527, more than three-fourths, were past the age of 55. I cannot bring myself to believe there is another physician in the District of Columbia who does not know that the apoplexy of people past the age of 55 is due for the most part to degenerative changes in certain vital organs, and especially in the circulatory system, degenerations utterly beyond the reach of any possible surgery to "cure." If such a statement, implying the future "cure" of apoplexy—a disease essentially of advanced life—by any medical or surgical means to be discovered through vivisection, was put forth, not to win a Senator's vote, but in all honesty and seriousness, then it reveals a condition of ignorant optimism almost inconceivable as existing outside the Middle Ages.

* Report 1,049, p. 94.

† The actual mortality from apoplexy in England and Wales is as follows:

	Men.		Women.	
	Over 55.	All Ages.	Over 55.	All Ages.
1894	5709	7372	6711	8725
1895	6220	7902	7400	9325
1896	6111	7811	7292	9353
1897	6449	8171	7635	9666
Total	24489	31256	29038	37069

For either sex, the proportion of deaths over 55 is almost exactly 78 per cent. of the total number.

But this is not the only instance of assertions concerning the potentiality of experimentation at which Science herself must stand aghast. When we are told that without animal experimentation "we could not have been able at any time to have determined what disease was, *or to have distinguished diseases*," I do not hesitate to say that not only is the assertion scientifically untrue, but that its untruth must be evident to every educated physician in the United States. Undoubtedly experiments upon animals, chiefly inoculations, have thrown light upon the origin of the infectious diseases; but the assertion goes far beyond this, and claims that "we could not have been able *at any time . . . to have distinguished diseases*," and that statement is absurd. Why, in barely eight consecutive lines there are no less than eight deliberate affirmations regarding vivisection and its potency, every one of which, from a scientific standpoint, is untrue! Referring to certain knowledge, to the sum of which inoculation experiments have no doubt contributed, Dr. Busey proceeds to say of it:

"Without this we would be utterly powerless *to treat any disease*. We might be even worse, utterly powerless to recognize the difference between diseases. Simply take that disease now so prevalent here, typhoid fever. Less than a hundred years ago, not farther back than 1830, it was confounded with typhus fever, which we now know, through experimentation, is a very different and *more curable* disease. In fact, *our whole knowledge of typhoid fever*, as to its cause, how to eradicate it, *and how to cure* it, is due to animal experimentation."

It would seem impossible for the wit of man to crowd into eight lines more unscientific exaggerations and perversions of fact than are here put forth by one of the leading medical practitioners of the national capital. "Utterly powerless to treat *any* disease," but for knowledge gained by vivisection! What, not even a case of mumps or measles? "Utterly powerless to recognize the difference between diseases"? Can any man of ordinary intelligence

believe, even on the authority of the president of the Medical Society of the District of Columbia, that but for vivisection, medical science could not to-day "recognize the difference between diseases" so as to distinguish epilepsy from whooping cough, apoplexy from smallpox, or cancer from convulsions? The absurdity of such a wide-sweeping statement is evident to everyone. "Through experimentation" the distinction between typhus and typhoid fever was learned? How was it possible for the president of a medical society to make a statement so absolutely untrue, merely to enhance the demand of professional vivisectors to be above control? Instead of being due to vivisection, it was by the careful study of symptoms at the bedside, or by the observation of post-mortem lesions, that Prost in 1804, Louis of Paris in 1828, Gerhard of America, and Lombard of Switzerland in 1836, Jenner of England in 1846, my old and revered masters, Drs. Murchison and Peacock of London, and others too many to name, discovered and made known the evidence which led to that distinction between the fevers which we recognize to-day. Typhus fever discovered "through experimentation" to be a "more *curable* disease"? Is it possible, at the close of the nineteenth century, after all the labours of Forbes and Bennett in England over half a century ago, of Bigelow here, and in defiance of a long array of leading medical authorities, that any living man can pretend to have learned, through vivisection or otherwise, how to "cure" a fever? Yet, in no less than three different sentences, the inference is put forth that we have learned by vivisection how to cure such a disease as typhus or typhoid fever!

I deny that such knowledge exists. When was the "cure" discovered? M. Louis, of Paris, writing in 1830, declared that "a well-marked case of typhoid is not capable of being broken up." Dr. Jacob Bigelow, in his address before the

Massachusetts Medical Society as far back as 1835, declared concerning typhoid, that once established "it cannot be eradicated by art, but must complete a certain natural course." Says Dr. Buchanan, of the London Fever Hospital: "Typhus fever, like other diseases of its class, *cannot be cured*, nor its duration shortened by any means at present known to medical science."* Dr. Austin Flint says: "The general principles of treatment in typhoid and typhus are essentially similar"; and that "the known resources of therapeutics do not afford reliable means for shortening the duration of the febrile career."† Dr. Wilson, of Jefferson Medical College, says in regard to the treatment of typhus, that "no drug or course of mendication is adequate either to arrest or to shorten the course of the primary disease. . . . *No cure for typhus is known.*"‡ In the face of such well-known scientific opinions as these, what can be the meaning of this representative of the medical profession, when he soberly informs Congress that by vivisection we have learned how to "cure" typhus or typhoid fever; that "how to prevent contagious diseases" and "how to cure them" is due to vivisection; or that "our whole knowledge of typhoid fever, as to its cause, how to eradicate it, and *how to cure it*, is due to animal experimentation"?

It was my fortune, a quarter of a century ago, to study at one of the principal hospitals of London under that great teacher of medical science, Dr. Charles Murchison, whose work on continued fevers is the basis of much of our present literature on this subject. As he passed from bedside to bedside, teaching as he went, surrounded by students who hung upon every word, I wonder what would have been his opinion of the statement that, in regard to typhoid fever,

* Reynolds's System of Medicine, Vol. I, p. 266.

† Flint's Practice of Medicine, p. 840.

‡ Wilson's Continued Fevers, p. 300.

his long years of private practice had taught him nothing; that his thousands of cases in hospitals had taught nothing; that the researches and hospital experience of others had added nothing to his knowledge of the disease, because "our *whole* knowledge of typhoid fever, as to its cause, how to eradicate it, and how to cure it, *is due to animal experimentation!*" Why, even the suggestion that typhus fever is less generally fatal than typhoid, is a blunder. Dr. Murchison collected the histories of 18,592 cases of typhus, and the mortality was 187 per 1,000. Of 18,612 cases of typhoid, also collected by him, the death rate was 186 per 1,000, a difference so small that, as Dr. Flint points out, it shows the death rate to have been almost exactly the same.*

In some parts of Dr. Busey's statement there is hardly a sentence which does not bear the stamp of extraordinary inaccuracy. When he tells us that "medicine has not advanced except through animal experimentation"; that "all the great advances which have contributed so much to health, to society, and to life found their origin in the results deducted from vivisection"; that Simpson discovered chloroform*; that the discovery was made as "the result of vivisection"; that chloroform has "saved *millions* of lives"; that Pasteur's discoveries have contributed to "the saving of *millions* of human lives"; that Galvani discovered "the application of electricity to nervous diseases," by a single experiment (when upon the very house in Bologna where Galvani lived is to-day an inscription that it was "DALLE MORTE RANE,"—upon a *dead* frog—that the experiment was made); that a fact known since man began to breathe,—the necessity of atmospheric air to the maintenance of life—was discovered by vivisection; that transfusion of blood is "a process by which we can convey blood from the *living animal into sick persons* and keep them

* Flint's Practice of Medicine, pp. 829, 837.

alive"; that any such process has "saved *an innumerable number from death* when every drop of blood had nearly run out of their bodies"; that Lister made surgery so safe that "there is little or no harm in it"; that Koch has "taught us how to diagnose tuberculosis long before it has reached the period when death is inevitable"—a statement wholly misleading as concerns human beings; that "preventive medicine is indebted exclusively and solely to the results which vivisection has taught us"*—in these, and in similar instances far too many, the speaker either allowed some vivisecting Bob Sawyer to impose on his Pickwickian credulity, or else permitted a too eager imagination to contradict the plain facts of science and history. How so many misstatements of fact could have been made by one occupying such a position is beyond comprehension. There is reason, perhaps, for believing that the real responsibility

* At the annual meeting of the British Medical Association, held in August, 1899, the President of the Section of State Medicine, George Wilson, M.D., LL.D., delivered an address on Preventive Medicine,—a subject upon which he is one of the greatest living authorities. Regarding the influence of vivisection upon preventive medicine, Dr. Wilson should know quite as much as Dr. Busey; and yet addressing members of the British Medical Association he said:

"Ever since the great Pasteur announced the results of his prophylactic inoculations, with respect more especially to fowl cholera and anthrax, I have been a close and, I hope, unbiassed, student of bacteriological literature. I may say, too, that my attitude towards these newer methods of treatment was at first one of expectancy. . . . The more I have studied them, the more firmly I feel convinced that they are based on errors, and are the outcome of illogical inductions, every one of them. . . . After all these long years of flickering hope, *I am prepared to contend that the indiscriminate maiming and slaughter of animal life with which these bacteriological methods of research and experimentation have been inseparably associated, cannot be proved to have saved one single human life, or lessened in any appreciable degree the load of human suffering.* I have ventured to make that pronouncement before, but in halting, academic fashion; I reiterate it here and now with the strongest and fullest conviction."

for statements so suggestive of ignorance, so coloured by exaggeration, or so void of truth, belongs to some one more directly interested in maintaining vivisection in the District of Columbia without control, than the physician whose medical education was completed long before the practice obtained to any extent on this side of the Atlantic.

What shall we say to all this evidence of ignorance or carelessness on the part of those who would teach us? At least this: that Science deserves better service than the sacrifice of accuracy to her imaginary interests. She stands in no danger except from such defenders; certainly the legal regulation of vivisection can do her no harm. Some day it will be seen that blunders of scientists themselves, work greater injury to Science than any assaults of honest ignorance; that fidelity to fact is the sincerest homage she can ever receive; and that no greater detriment could come to her than through the unreliability and disingenuousness of men who assume to defend her with exaggeration and untruth. She is then wounded in the house of her friends.

*IS SCIENCE ADVANCED BY DECEIT?**

Not quite two centuries and a-half ago, a writer whose name both in science and literature is linked to the immortality of genius, found himself engaged in controversy with a great religious order of his Church. In a series of letters, the literary merit of which has never been surpassed, he boldly charged the Jesuit casuists of his time with practical subversion of the foundation principles of Christian morality. But no charge of Pascal has so clung to reputation as that pertaining to the simple virtue of truthfulness. "How, for instance," he asks, "may a man avoid telling a lie when at the same time he is anxious to induce belief in what is false?" In such a case, he tells us, the Jesuit writer Sanchez lays down the doctrine that "it is permissible to use ambiguous terms, leading people to understand them in another sense from that in which we understand them ourselves."† This is the practice and doctrine of Equivocation. But if no equivocal terms come to mind or are available, what then may be done? In such a case one may take refuge in the practice known as Mental Reservation. Thus, says Sanchez:

"A man may swear that he never did such a thing, even though he actually did it, meaning within himself that he did not do it on a certain day, or before he was born, or understanding any other such circumstance, while the words he employs have no such sense as would discover his meaning. This is very convenient in many cases."

It must be said that the Jesuit order has always denied its responsibility for this kind of teaching, even though it was promulgated by casuist writers belonging to the

* Issued by the United States Senate as Document No. 78. Fifty-fifth Congress. 1899. Revised.

† Pascal's Provincial Letters, No. IX.

Society. Certainly, the practice of equivocation and mental reserve is no modern invention, but is as old as the race. Diplomacy so often makes use of words in a double sense that Talleyrand declared language invented to conceal thought. There are nations so imbued with mendacity that they have lost the confidence of their fellow-men. For, however productive of gain they may seem at first, duplicity and deceit have their drawbacks. No man, and no society of men, convicted of habitual resort to the practice of mental reservation or equivocation can permanently retain the trust and confidence of society. And the purpose of this paper is to ask whether this ignoble practice has not come to be, along certain lines, a part of the practical policy of certain scientists in their relations with the public? Is Science advanced by duplicity or honoured by deceit?

Let us admit at the outset that this practice of equivocation is by no means of universal or even general adoption among men of science. With the great majority of those whose object in life is to ascertain truth and to promulgate it, there is, happily, no temptation to depart from the strictest veracity. Scientific researches are, for the most part, heartily encouraged by the spirit of our age. Nobody questions the moral right of the geologist, the chemist, the botanist, the electrician, or the astronomer to follow lines of research in any direction desired. Their task is an honoured one. It is only when we come to that department of scientific investigation which deals with the phenomena of life that questioning murmurs arise. The morality of a practice engaging the time and energy of a large body of scientific men is questioned, impugned, or denied. There are charges of cruelty, and of a pitilessness which is closely allied to vice. Human nature would be different from what it is, if the men engaged in the habitual practice of vivisection as a means of earning their daily bread could remain

unmoved and indifferent. What is the reason, they ask, that the world should manifest such special curiosity regarding the methods of the physiologist or pathologist? Why should it be asked that their laboratories be made subject to State inspection any more than the observatory of an astronomer? Why should they be obliged to report what they do with dogs, any more than the chemist what he does with his drugs or the geologist with his specimens? The professional vivisector may come to be indifferent to the sight of suffering in an animal; but apathy ceases when he is charged with a vice, and when those whom he has met in society decline to recognize him on the public street.

Shall the whole truth about vivisection be freely admitted? That is not an unreasonable demand. But what if statement of the "whole truth" only intensified the demand for reform? Dr. Klein told the Royal Commission the whole truth in regard to his own practices, and doubtless has regretted ever since his unexampled veracity. One line of defence remains, but we may be sure that it is one to which no man of scientific training ever consciously resorted without loathing and self-detestation. It is the practice of exaggeration, Equivocation, and Mental Reserve. To the world at large they may seem to deny every charge of cruelty and uselessness, and may have their denials endorsed and supported by the principal scientific bodies of the United States, if only they will adopt the maxim laid down by the Jesuit casuist nearly three hundred years ago, declaring that when one desires to avoid telling a lie, and yet induce a belief in what is false, "*it is permissible to use ambiguous terms, leading people to understand them in another sense from that in which we understand them ourselves.*"

Has this been done? In the defence of the unlimited vivisection of animals, is it true that the names of scientific

men of the highest repute may be found attached to statements and denials of charges which apparently were meant to be understood by the general public in a sense contrary to the truth? Worse even than this, has equivocation been used in appeals made to the Congress of the United States solely to hinder and prevent any possible legislation on the subject of vivisection? We propose to examine a single document—Senate Report No. 1,049—and to point out some of the many misstatements, evasions, and exaggerations therein made by scientific men.

I. *Are Inoculation Experiments Painful?*

The MEDICAL SOCIETY OF THE DISTRICT OF COLUMBIA, without a dissentient voice, adopted a memorial to Congress in opposition to any regulation of vivisection. Therein they say:

"As a matter of fact, anæsthetics are habitually administered in experiments which involve an amount of pain worthy of consideration; but they are not considered necessary in trifling operations, such as the administration of a hypodermic injection or the vaccination of a calf." (p. 129.)

We could hardly have more emphatic assurance of the universal use of anæsthetics, except in trifling operations, than is here given on the good faith of the Medical Society of the District of Columbia.

The NATIONAL ACADEMY OF SCIENCES also unanimously assures Congress that—

"In modern laboratories anæsthetics are always employed, except when the operation involves less suffering to the animal than the administration of the anæsthetic, *as in the case of inoculations*, or in those instances in which the anæsthetic would interfere with the object of the experiment." (p. 128.)

Here, too we have the most explicit assurance that if anæsthetics are omitted in inoculation experiments it is only because the pain is too trivial to make it worth while

to use them. Are these assurances the truth, or are they, on the contrary, an ignoble equivocation?

What is an "inoculation"? In medical works it is defined as "the insertion of virus into any part of the body in order to communicate a disease." An experiment made by means of inoculation means, therefore, that the virus, the poisonous germs of some particular disease, such as cholera, yellow fever, tuberculosis, or rabies, has been inserted—usually by means of a hypodermic needle—into some part of the body of a living animal, beneath its skin, into the abdomen or the chest, within the eye, or upon its scraped surface. When the writer was at Calcutta, in India, a few years ago, they were inoculating monkeys with the venom of the cobra in a series of experiments that, after all, came to no practical result. Thus, in the *Journal of Physiology*, Sewell, of Michigan, tells us of inoculations made by him with rattlesnake poison, using pigeons as subjects, and recording that the head rests on the floor, the mouth open, the respiration gasping, and the body convulsed.* Thus Ernst, of Harvard, inoculated with the virus of rabies, by means of trephining the skull, some thirty-two rabbits, the animal becoming so changed in its natural disposition that from being "lively and affectionate, it becomes dull, sluggish, and even fierce," and so losing the power of swallowing that at first he supposed that they died of starvation.† Thus Cheyne, of England, tells us that "on many occasions I have inoculated portions of synovial membrane and pus from strumous joints, subcutaneously or *into the anterior chamber of the eye*, in rabbits and guinea pigs, and have invariably produced typical tuberculosis by this means." The animals in some of his experiments were not killed for weeks.‡

* Journal of Physiology, Vol. VIII, p. 206.

† Jour. Med. Sciences, April, 1887.

‡ British Medical Journal, April 11-18, 1891.

Thus Klein, of London, the scientist who affirmed that, for himself, he had "no regard at all" for the animals he vivisected, tells us of experiments made by inoculating the eyes of cats with the virus of diphtheria. He records that after such inoculations, in one case "the disease set in with great intensity," both eyes being closed and the animal living until the seventeenth day; that in another cat, which lived for fifteen days, a "deep, crater-like ulcer" had formed, the eye being much congested, swollen, and coated with purulent matter; that in a third cat the disease steadily increased until the middle of the third week, although great congestion began on the fourth day, and the experiment lasted till the eye became perforated.* Do we need to tell anyone that such "inoculations" were by no means "trifling" in the amount of pain they caused?†

While in Paris recently the writer visited the Pasteur Institute and was shown over the establishment. There were over 2,000 rabbits awaiting their fate. But neither the great number of victims to research, nor the vast iron cage with the dogs tearing at their chains so impressed memory, as the scores of rabbits lying in their compartments slowly dying, the result of inoculations which the AMERICAN ACADEMY OF SCIENCES informs Congress "involved less suffering than the administration of an anæsthetic"!

* Sup. to XIXth Annual Report, Local Gov. Board, 1889-1890.

† "Inoculations into the anterior chamber of the eye of rabbits and other animals have frequently been practised, and offer certain advantages in the study of the local effects of pathogenic organisms. . . . Inoculated animals should be carefully observed, and a note made of every symptom indicating departure from the usual condition of health, such as fever, loss of activity, loss of appetite, weakness, emaciation, convulsions, dilated pupils, the formation of an abscess, or a diffuse cellulitis extending from the point of inoculation."—A MANUAL OF BACTERIOLOGY, by George M. Sternberg, M.D., Surgeon-General U.S.A., pp. 97-99.

What we wish especially to emphasize is the fact that an inoculation experiment, so far from "involving less suffering to the animal than the administration of an anæsthetic," may produce severe and prolonged anguish for days and weeks. Was this fact known to the members of the scientific bodies whose statements to the contrary I have quoted? Every man knew it. How, then, did they dare to assure the Senate of the United States that an experiment of this character was "a trifling operation," and "involved less suffering to the animal than the administration of the anæsthetic"? Well, until somebody "rises to explain," we can only speculate. Let us imagine this memorial brought up for adoption before one of these learned societies. Suddenly a member finds himself on his feet. "Mr. President, I do not see how I can give my vote for that memorial as it stands. Every one of us present to-night is aware that an inoculation experiment involves far more suffering to the animal, as a rule, than the administration of the anæsthetic; that, sometimes, it means prolonged and extreme pain; and yet we, as a society, are assuring Congress and publishing to the world, upon our honour as scientific men, that in this class of experiments anæsthetics are not used because the pain is so trifling!* That, sir, is a falsehood; and I cannot

*A typical instance of equivocation, apparently, may be found in the use made of a quotation from a letter by Surg.-Gen. Sternberg, in the "Memorial from the Representatives of Medical and other Scientific Societies of Washington," printed in Senate Document 107, Fifty-fifth Congress. The italics are as in the original, and their purpose is but too evident:

"The experiments which have been conducted at the Army Medical Museum since I have been Surgeon-General of the Army and, so far as I am informed, previous to that time, relate principally to the cause and prevention of infectious diseases, and to the results of disease processes (pathology). *These experiments do not call for any painful dissections, but consist in the subcutaneous inoculation of cultures of various pathological bacteria, etc.*"

Could anything be plainer than the inference it was evidently designed that the Senate should draw from the words so carefully italicized?

vote for a lie." Then, we may fancy some sturdy vivisector, who perhaps drew up the memorial, rising to reply. "Mr. President, this is a matter of more than ordinary importance. At any cost, we must prevent the bill before Congress from becoming a law. Nobody has asked us to define what we mean *in the laboratory* by an 'inoculation experiment.' Suppose, for the present purpose, we define such an experiment as *the prick of the needle by which the virus is inserted* into the tissues. That, certainly is 'a trifling operation'; and I think, with this definition in his mind, even our moral young friend can vote for the memorial. There is no doubt that Congress will accept what we say as the truth, if only we are unanimous." Perhaps such debate never occurred, but only on some such hypothesis is it conceivable how men of science, without a dissenting voice, could give assurances so false.* Even in its best aspect, it was an

* In his Presidential Address in the Section of State Medicine at the last Annual Meeting of the BRITISH MEDICAL ASSOCIATION in August, 1899, Dr. George Wilson, LL.D., probably the leading authority in Great Britain upon Preventive Medicine, made the following indignant reference to these ignoble equivocations:

"I boldly say there should be some pause in these ruthless lines of experimentation. . . . I have not allied myself to the Anti-vivisectionists, but *I accuse my profession of misleading the public as to the cruelties and horrors which are perpetrated on animal life.* When it is stated that the actual pain involved in these experiments is commonly of the most trifling description, *there is a* SUPPRESSION OF THE TRUTH, of the most palpable kind, which could only be accounted for at the time by ignorance of the actual facts. I admit that in the mere operation of injecting a virus, whether cultivated or not, there may be little or no pain, but the cruelty does not lie in the operation itself, which is permitted to be performed without anæsthetics, but in the after-effects. Whether so-called toxins are injected under the skin into the peritoneum, into the cranium, under the dura mater, into the pleural cavity, into the veins, eyes or other organs—and all these methods are ruthlessly practised—*there is long-drawn-out agony.* The animal so innocently operated on may have to live days, weeks, or months, with no anæsthetic to assuage its sufferings, and nothing but death to relieve."

equivocation. Was it honourable dealing with the National Legislature? Was it in harmony with the ideals of Science? Rather, was it not in perfect accord with the maxim of Sanchez, that when one is desirous to induce belief in what is false, "*it is permitted to use ambiguous terms, leading people to understand them in another sense from that in which we understand them ourselves?*"

II. *Are Anæsthetics so used in Vivisection as Completely to Abolish Pain?*

We propose to show that statements, carefully calculated to convey such an impression, were made to Congress for the purpose of influencing legislation; that such impression is absolutely false, and that these statements are entirely in accord with the doctrine of Equivocation.

The Joint Commission of the Scientific Societies of Washington, in their memorial to Congress, asserts that "those engaged in research work . . . may be trusted to conduct such experiments in a humane manner, *and to give anæsthetics when required to prevent pain.*" (p. 130.) Here is a distinct implication that whenever "anæsthetics are required to prevent pain" they are given; and yet every member of the commission who knew anything whatever about vivisection must have known that such meaning of their words could not possibly be true.

The ASSOCIATION OF MILITARY SURGEONS OF THE UNITED STATES adopted without alteration the memorial of the AMERICAN MEDICAL ASSOCIATION, assuring Congress that "anæsthetics are *habitually administered to animals subjected to painful experiments*" (pp. 131, 132); the MEDICAL SOCIETY OF THE DISTRICT OF COLUMBIA affirms that "anæsthetics are *habitually administered* in experiments which involve an amount of pain worthy of

consideration" (p. 129); the NATIONAL ACADEMY OF SCIENCES declares that "the suffering incident to biological investigations *is trifling in amount*"; and, finally, the Surgeon-General calls for proof that "those engaged in experimental research do *not* administer anæsthetics to the domestic animals when they are subjected to painful experiments in this District" (p. 125).

And now, bearing in mind that each of these statements was drawn up by a man of science, trained to the use of accurate expression, and that it was put forth solely to influence Congress against legislation, what is the meaning that a plain man, unused to the subtleties of evasion and equivocation, would find in the passages here quoted? It is doubtful if he notes at first glance that nearly all these assertions are purposely indefinite, and that nowhere is it precisely stated that anæsthetics are effectively used, but only that they are "habitually" administered. What would seem clear to the average man is this: that some of the most eminent scientific men in the United States give their word of honour to the National Legislature that anæsthetics are so given in animal experimentation as practically to annihilate pain, or, if any pain be felt, it is so slight, so "trifling in amount," so similar to that which we endure every day without a thought of anæsthesia, that it is not "worthy of consideration." That is the inference which, apparently, it was intended that members of Congress should draw from the statements quoted. And that inference is false.

The exact truth in this matter was perfectly well known to every member of these distinguished societies.

FIRST. The effectual administration of an anæsthetic so as to abolish pain is, as a rule, utterly impracticable in that great class of inoculation experiments to which attention has just been called. Anybody can see that you cannot

insert virus into the eye or the abdomen of a cat, for instance, and then stand over it night and day administering an anæsthetic; the thing is never even attempted. When Surgeon-General Sternberg demonstrated by experiments upon over twenty-five rabbits his immortal discovery that his saliva, injected beneath the skin, set up all the symptoms of the severest blood poisoning, he certainly did not give them anæsthetics during the entire period of their torment, for he tells us they were "found dead or dying" the second morning after inoculation. But demonstration of the point is quite needless; the facts are admitted. The health officer of the District of Columbia has stated that "most of the experiments in bacteriology and a very large proportion of those for other purposes, require that the animal shall be kept alive sometimes for weeks *after the effect of the anæsthetic has passed off.*"* We are therefore indebted to him for revealing, that in the experimentation which goes on in this District, a large majority of the animals must be kept alive for a considerable time.

SECOND. In a large number of other experiments upon living animals, some of them involving prolonged and extreme pain, it is practically impossible to relieve suffering by anæsthetics, unless it be during the brief preliminary cutting operation, when that takes place. In the experiments of Luciani on the starvation of dogs; of Colin, in freezing animals alive; of Chauveau, who tells us that he "consecrated" some eighty horses and asses to experiments on the spinal marrow, producing "intense" and "most violent pain;" in experiments on the reflex action of sensory nerves; in experiments connected with the glandular secretions; in experiments with certain poisons and drugs; in

* Does Dr. Woodward mean to imply that in "experiments in bacteriology" anæsthetics are administered? Such is the impression conveyed by the above quotation.

many experiments upon the heart and the circulation, and, in short, whenever the evidence of pain is important to the investigation—complete and genuine anæsthesia throughout the experiment is quite impossible. There are many experiments in surgery where complete anæsthesia cannot be maintained. You may, indeed, confer some mitigation of pain by the use of narcotics, such as morphia and chloral, but neither of these is an anæsthetic. As the great experimenter, Burdon Sanderson, has said, "You cannot produce inflammation in an animal, and maintain a state of anæsthesia during the whole process."

THIRD. In addition to these, there are various other experiments, which, if done at all (and their utility is very questionable), must be done under the influence of *curare*, a poison which simply makes the victim incapable of the slightest muscular movement, although conscious of what goes on about it and sensible to every pang.

"An animal under its influence," says Professor Holmgren, the professor of physiology at Upsala University, "it changes instantly into a living corpse, which hears and sees and knows everything, but is unable to move a single muscle; and under its influence no creature can give the faintest indication of its hopeless condition." This venom is, he says, "*the most cruel of poisons.*"* The French vivisector, Claude Bernard, tells us that it "destroys the power of movement, but permits sensibility to exist"; that the "cadaver one has before him hears and comprehends what goes on about him, *and feels whatever painful impressions we may inflict.*"

To illustrate its use in laboratories, let us examine the experiments of Dr. H. G. Beyer (a Government employee at the United States National Museum), made upon a large number of dogs. Morphia being administered, the animal

* Holmgren's Physiology, p. 231.

is fastened in a "dog holder," tracheotomy performed, a vein dissected out, and "about half a dram of a one per cent. solution of *curare* is injected, after which artificial respiration is begun." The animal is now as solidly fixed to the table as if it were chained, though entirely sensible to pain, and conscious of whatever goes on about it. We need not go into all the details of his experiments—the dividing of nerves, the dissecting out of arteries, the insertion of cannulas, until finally "the whole front and sides of the thorax are cut away and the right subclavian artery dissected out and tied."* They are mentioned only to show that animals, twenty-five or thirty in number, may be slowly dissected alive without anæsthetics; that their death under *curare* may be accompanied, as Claude Bernard puts it, "by sufferings the most atrocious the imagination of man can conceive"; that all this may be done by one of the paid servants of the United States, and yet the Medical Society of the District of Columbia can soberly assure Congress that "as a matter of fact, anæsthetics are habitually administered in experiments which involve an amount of pain *worthy of consideration!*" No wonder an English experimenter once declared that "anæsthetics do more to lull public opinion than to mitigate animal suffering."

And now, why was the truth concealed from Congress in this matter of anæsthetics? If, in so much of animal experimentation it is impossible to give complete immunity from pain, why was not the fact admitted? The reason is not difficult to guess. To admit that in a vast number of cases the practice of vivisection as carried on to-day necessarily implies torment, would be to admit the reasonableness of some measure of State inspection and control. Might not that admission be avoided? In one way only. With juggling of words it might be possible to conceal the

* American Jour. Med. Sciences, April, 1887.

truth. Unfortunately for the true interests of Science and for the honour of those who assume to speak in her behalf, that course of equivocation was followed out.

III. *Is there any Cruelty in Vivisection?*

Within the past hundred years the ethical ideals of civilization have so far advanced that cruelty to animals, so long a matter of indifference, is to-day regarded as the manifestation of depravity and vice. To the charge of cruelty, therefore, the vivisector is justly sensitive; and his sensitiveness finds frequent expression. Wherein lies the possibility of equivocation? In the definition of the word "cruelty." That word has one meaning for the general public, but an entirely different significance for the vivisector. It is very easy to assert that no cruel experiments occur, simply because *as cruelty is defined by the professional vivisector, it is practically impossible for him to perform a cruel experiment.*

Let us study certain cases of what persons, without scientific training, might be greatly inclined to stigmatize as cruel experiments. In an address delivered before the MASSACHUSETTS MEDICAL SOCIETY, the professor of Surgery in Harvard Medical School,—Dr. Henry J. Bigelow,—gave a description of certain phases of experimentation he had witnessed in a foreign country and which, he declared, "transcended but little the scenes witnessed in a physiological laboratory." A wretched horse,—one of many hundreds,—"broken with age and disease resulting from life-long and honest devotion to man's service, was bound upon the floor, his skin scored with a knife like a gridiron, his eyes and ears cut out, his teeth pulled, his arteries laid bare,

his nerves exposed and pinched and severed, his hoofs pared to the quick, and every conceivable and fiendish torture inflicted upon him, while he groaned and gasped, his life carefully preserved under this continued and hellish torment, from early morning until afternoon." Why was this done? "For the purpose, it was avowed, of familiarizing the pupil with the motions of the animal!" Was it *cruelty?*

Or suppose some vivisector in one of our laboratories desires, out of scientific curiosity, to repeat the atrocious and perfectly useless experiments of that distinguished scientist, Professor Mantegazza. His problem was to create intense pain and at the same time to compel the creature to keep motionless in an attitude that would not interfere with its breathing. The ingenious scientist devised two methods of accomplishing his end, "either by exasperating the pain, so that its influence overcame the action of the muscles of motion, or by planting sharp and numerous nails through the soles of the feet in such a way as to render the animal nearly motionless, because in every movement it would have felt its torment the more acutely." To exasperate the pain he invented a machine, which he aptly called "a tormentor." With it, he explains, "I can take an ear or a paw and, by turning the handle, squeeze it beneath the teeth of pincers. I can lift the animal by the suffering part. I can tear it or crush it in all sorts of ways." One experiment was on a guinea pig nursing its young. A rabbit, after two hours' torment and a few moments' rest, has nails stuck into its feet in such a way that "a pain much more intense" than in some previous experiment is produced. Two little creatures are subjected for two hours to the tormentor, then "larded with long, thin nails in their limbs." They "suffer horribly, and, shut up in the machine for two hours more, they rush against each other and, not having the strength

to bite, remain interlaced, with mouths open, screaming and groaning." *

All these experiments, extending over a year, were conducted, he tells us, not with repugnance, not with dislike, but "*con multo amore*"—with extreme delight. We do not mention these experiments as examples of the average investigations going on in laboratories; doubtless they are extreme instances. The point we desire to make emphatic is this: if such experiments as these of Mantegazza can be performed to-day in Washington laboratories, free from any restriction or criticism of any sort; and if, notwithstanding their daily performance, the men at the head of the various vivisecting laboratories could sign memorials to Congress, asserting that "so far as we know, no *cruel* experiments have ever been made in this District;" if all this is possible, then all these denials of cruelty—of cruelty as the world understands it—are absolutely valueless. For certainly if these experiments are not cruel, there is no cruelty in scientific research.

The "cruelty" of such experiments could be denied. One of the leading scientific societies of Washington defines cruel experiments as those in which "there is an unjustifiable infliction of pain." What, to a vivisector, is an unjustifiable infliction of pain? It is the infliction of more pain than is necessary for the success of the experiment. "Cruelty" as defined by six vivisectors of Harvard University, "is the intentional infliction of *unnecessary* pain." But who is to judge how much or how little pain is "necessary"? Who is to decide whether the subjection of the animal to prolonged torture is of the slightest value? Who, according to the scientific societies of Washington, should be the supreme and only judge of the vivisector? *The vivisector himself!*

* Fisiologia del Dolore, di Paulo Mantegazza, pp. 101, 106, 107, etc.

You say that this is impossible? You cannot believe that any scientific society would so juggle with a question of right or wrong as to make the morality of an act depend solely on inclination of the person who does it? Incredible as it may seem, that is precisely what has been done. In the report to Congress from which quotation has been made, there appears a statement signed by the leading vivisectors of the United States. "As to whether or no, under given circumstances of research or teaching, an experiment involving pain should be performed, *is a matter which should rest with the responsible expert by whom, or under whose direction the thing would be done*" (p. 60). "We believe that those engaged in scientific investigation are the best judges of the necessity for experiments made by them, . . . and of the methods to be employed," says the PHILOSOPHICAL SOCIETY OF WASHINGTON (p. 133). The joint commission of the scientific societies of Washington affirm that those engaged in vivisection investigations "*are the best judges of the character of experiments required, and of the necessity for using anæsthetics*" (p. 130). The reader is horrified, perhaps, at some of the experiments herein described; but we have only touched the outer edge of the infamy which stains the record of so-called scientific research. Yet it is all permitted, sanctioned, and approved by the scientific societies of Washington, if only it is done by a scientific vivisector! According to the new ideal of scientific morality, the only person in this universe who has the right to say whether any vivisection is right or wrong, cruel or otherwise, is the man who performs it! "Unnecessary and offensive in the highest degree would it be . . . to attempt to dictate or control *how, and by whom, and for what purposes and under what conditions . . . experiments shall be made*" (p. 135). To that horrible sentiment, unanimously approved by one of the great

associations of professional vivisectors and their friends, is attached the name of Surgeon-General Sternberg.

Some years ago, in the city of Washington, Prof. Theophilus Parvin, M.D., of Jefferson Medical College, Philadelphia, delivered the presidential address before the American Academy of Medicine; and, calling attention to the subject of vivisection, he asserted that there were investigators "who seem, seeking useless knowledge, to be blind to the writhing agony, and deaf to the cry of pain of their victims, and *who have been guilty of the most damnable cruelties, without the denunciation of the public and of the profession that their wickedness deserves and demands.* These criminals are not confined to Germany or France, to England or Italy, but may be found in our own country." "Criminals" and "damnable cruelties" are strong words to be used by the president of the Academy of Medicine in regard to American physicians or the practice of vivisection in American laboratories!

Take another expression of opinion. In his recent work on "The Meaning and Method of Life," Dr. George M. Gould, late editor of *The Medical News*,* and a strong advocate of vivisection, declares nevertheless that it "must be regulated by law." . . . "The practice carried on by conceited jackanapes to prove over and over again already ascertained results, to minister to egotism, for didactic purposes—these are not necessary, and must be forbidden." Well, that is what we are asking by this Bill, that qualified men, and not "conceited jackanapes," shall have the right to vivisect. Sometimes it is asserted that no "unnecessary" pain is ever inflicted. Talking on this subject with an amateur physiologist, he told me that on one occasion he was in a laboratory when the professor desired a bit of animal intestine to use in one of his experiments.

*At present the editor of AMERICAN MEDICINE.

It would have been easy to have had an assistant kill a rabbit by knocking it first on the head, but that would have occupied half a minute's time. "Give me a rabbit," he called to the assistant, and, taking in his grasp the struggling creature, he plunged the blade of a pair of scissors in the abdomen, cut it open as one would cut a piece of cloth, thrust in his hand, tore out the entrails, cut off what he wanted, and flung the writhing and mutilated creature under the table to die in agony. This is what comes from unrestricted vivisection; and that cruelty is possible in any laboratory in Washington to-day, so far as any law is concerned that alone could make it a crime.

And now we should like to ask Members of Congress if they understood that all this denial of cruelty in the laboratories of Washington was put forth with the mental reservation that nothing a vivisector might do would ever be "cruel" unless he called it so himself? Did you fancy that hidden in high-sounding phraseology was the claim, that the vivisector alone is qualified to pronounce upon the moral quality of his own actions? Of what value are all their denials of cruelty? Sanchez shall tell us: "*A man may swear that he never did such a thing, though he actually did it, . . . while the words that he employs have no such sense as would discover his meaning.*"

IV. *Is the Utility of Vivisection Exaggerated?*

Notwithstanding the opinion of that eminent surgeon, Lawson Tait, of England, that "nothing whatever has been gained by vivisection,"* it has always seemed to us more

* The late Prof. Lawson Tait, F.R.C.S., one of the most brilliant surgeons of this century, not only affirmed that vivisection was useless,

probable that in certain directions, vivisection within limitations is sometimes of such practical and potential utility as to justify its use. But in their eagerness to prevent the slightest degree of Government supervision in the District of Columbia, is it true that certain scientists have made claims of usefulness far beyond the actual truth? One sees nothing of the kind in European countries. There, the idea of utility to humanity as a reason for vivisection is laughed at. Says Professor Hermann, of Zurich University: "The advancement of knowledge, and not utility to medicine, is the true and straightforward object of all vivisection. Science can afford to despise this justification with which vivisection has been defended in England," and he might have added, "in the United States." But public sentiment in this country at present will not sanction the torment of animals unless behind it is the claim of utility or benefit to humanity. Has this claim been pushed, even by men of scientific training, beyond the limits of scientific truth? To those unacquainted with medical phraseology it is difficult to make evident such exaggeration; but the task at least shall be attempted.

Perhaps the most imposing array of names attached to any memorial to Congress in regard to vivisection is that of the ASSOCIATION OF AMERICAN PHYSICIANS, a body which embraces in its membership, as before poinfed out, some of the best known experts in vivisection in the

but also declared that it led to erroneous conclusions. In a letter to the *Birmingham Daily Post*, Dec. 12, 1884, he says:

"Like every member of my profession, I was brought up in the belief that by vivisection had been obtained almost every important fact in physiology, and that many of our most valued means of saving life and diminishing suffering had resulted from experiments on the lower animals. I now know that nothing of the sort is true concerning the art of surgery; and not only do I believe that vivisection has not helped the surgeon one bit, but I know that it has often led him astray."

United States. They are men of science, trained in the exactitude which science is supposed to instil. What do they tell us of the benefits which have resulted from vivisection during recent years? We may be sure in so important a document nothing has been omitted which by any possibility could be claimed.

"To mention only a few of the results obtained within recent years by animal experimentation, attention is called to the discoveries which have revolutionized surgical practice by the introduction of antiseptic methods of treatment, which have rendered infrequent the occurrence of childbed fever, which have made it possible to prevent the development of hydrophobia after the bite of rabid animals, which have furnished an efficacious method of cure of the otherwise incurable disease, myxœdema, and which, by the antitoxin treatment, have greatly lessened the fatality of diphtheria" (p. 135).

Now, admitting that experimentation has helped to teach surgery the infinite importance of the exclusion of germs by the most absolute cleanliness; and that in other directions, along lines of experimentation in nowise prevented by the limited regulation which we advocate, experiments are throwing light on other matters—admitting all this,—are the claims here made supported by facts? It may be questioned. Here in America we have no national system of registration of deaths such as exists in every other civilized country on the globe, and we cannot appeal to any national statistics of our own land. We may be sure, however, that any improvement in way of medical or surgical treatment wherever devised, is at once utilized by the physicians and surgeons of Great Britain, and that if such wonderful discoveries have been made as are claimed above, we shall find evidence thereof in the annual reports of English mortality.

Is it due to animal experimentation that results have been obtained "which have rendered infrequent the occurrence" of puerperal fever? The ASSOCIATION OF

AMERICAN PHYSICIANS so affirms. On the contrary, it can be proven:

(1) The basis of our knowledge concerning this disease was due to observations in hospitals; and not to animal experimentation.

(2) The disease is not yet "infrequent," judging by the statistics of a nation's mortality.

When the history of medical practice shall one day be written, there is no page we would more willingly have blotted out than that which relates to the causes and treatment of this terrible scourge. It is not only that for twenty centuries medical science was absolutely ignorant of the principal cause of this malady, and that the treatment only added to horror and increased mortality; the tragedy is that the physician himself was, in so many instances, the source of infection. One shudders at the contemplation of the slaughter that went on year after year in the great hospitals of great cities, in Europe and America as well, while medical practitioners, instead of bringing assistance, were often spreading the causes of death throughout the community.

To whom came the first glimmer of truth regarding the causes and prevention of this scourge of maternity? Was it some Mantegazza, bending with delight over his crucified victims? Was it a Goltz, watching agony mingled with maternal love? To none of these came the truth. It was to a young man who, in 1847, was an assistant in the Lying-in Hospital at Vienna, that medical science owes not only the first teaching of the real facts, but, as Dr. Lusk says, "a large part of what is now the current doctrine concerning the nature and prevention of puerperal fever."* Because Semmelweis pointed out that the awful scourge was due, not to an "inscrutable and mysterious Providence," but to

* Lusk's Science and Art of Midwifery, pp. 653, 654.

the carelessness of physicians and their ignorance of the necessity of surgical cleanliness, his discovery was received with ridicule; he was hated and despised in his lifetime, and he died, Dr. Lusk tells us, "with no other reward than the scorn of his contemporaries." To-day justice is rendered to his name; and although he did not see the whole truth, although experimentation, acting upon his theory, has broadened our knowledge in many directions, it was primarily to observations in hospitals, and not to any researches in the laboratory, that the beginnings of all we know regarding the methods of prevention were first brought to light.

Nor is it yet scientifically true that puerperal fever is "infrequent," if we test infrequency not by individual experience or by the records of this or that hospital, but by the mortality of an entire nation. When one considers the terrible mortality which prevailed in the large lying-in hospitals, up even to a quarter of a century ago, it would be impossible that the recognition of the value of surgical cleanliness should not make evident its influence in lessening the disease. In Bellevue Hospital, New York, for example, the rate of mortality from this disease in relation to confinements was, in 1872, more than *one hundred times as high* as that which prevailed during the same year throughout England and Wales.* The fact that such awful mortality as this has been decreased gives no warrant for the claim that the disease is now infrequent. What has been the experience of England before and since the discoveries to which the Association of American Physicians makes allusion?

* Lusk tells us that "in the year 1872 puerperal fever destroyed 28 women of 156 who were confined in the Bellevue Hospital" (p. 692), or 18 *per hundred* of the women confined! It was only 17 per 10,000 births in England, the same year, 1872.

During thirteen years, from 1860 to 1873, in England and Wales the death rate of puerperal fever to each 10,000 births varied annually from 13 to 20, only once reaching the highest figure. This was during the period long before any knowledge of antisepsis. Coming to our own time, we find that from 1883 to 1896, inclusive, when methods pertaining to antiseptics were in full sway, there was but one year in which the mortality rate from this cause was as low as 20—the highest rate during the earlier period. The rate for 1893 was twice as high as during any of the eight years, 1860-1863 and 1866-1869, and with but one exception, higher than any time in thirty years. Even in 1896, the mortality from puerperal fever was actually higher than at any time during the period 1860-1873—a quarter of a century ago! Let us compare four years of English experience.

ENGLAND.	1877.	1878.	1892.	1893.	1905.
Total births	888,200	891,906	897,957	914,542	929,293
Deaths from puerperal fever	1,444	1,415	2,356	3,023	1,734
Rate of mortality to each 10,000 births	**16**	**16**	**26**	**33**	**19**

These statistics are peculiarly interesting and valuable. Do they support in the slightest degree the assertion that the occurrence of puerperal fever has been "rendered infrequent"? Are they not, on the contrary, absolutely contradictory of that claim? What, we may well ask, is the use of a scientific association,—what is the value of its testimony, if, when scientific facts are so easily accessible, it cannot tell us the truth?

We are told that experiments "have furnished an efficacious method of cure of the otherwise incurable disease,

myxœdema." Possibly this is true. But the disease is of such exceeding rarity that it is not even described in any but the most recent medical works, and there is nothing in the Bill before Congress that would have prevented the alleged discovery.

And finally it is said that experimentation has led up to the antitoxin treatment, which has "greatly lessened the fatality of diphtheria."

If it took centuries of experience to determine the uselessness of the lancet and of other methods of treatment so generally in vogue but a little time ago, it is not easy to perceive how the value of this new method of treatment can be absolutely determined until, after many years' trial, it shall be seen that the actual mortality from this disease has steadily decreased during a number of years in each country where it is tried. All statistics based upon the number of "cases" concerning an alleged remedy in which there is a commercial interest, should be viewed, at least, with suspended judgment. Says Dr. Herman of Brooklyn: "Until antitoxin brings down the diphtheria death-rate to a point lower than it ever was before it must be considered a failure."

Now, no fact is more certain than that antitoxin has failed to meet this test. In Boston, in Baltimore, in St. Louis, in Philadelphia,—as Dr. Herman points out,—there were years before the introduction of antitoxin during which the mortality-rate, based upon population, was lower than during other years since its use. In St. Petersburg, the deaths were 378 in 1893, and in 1897, after antitoxin was introduced, the deaths from diphtheria rose to 1,905. The antitoxin treatment in England, so far from lessening the mortality of the disease, has been wholly unable to prevent its vast increase. During five years 1877-1881, inclusive) when antitoxin was wholly unknown, the deaths

from diphtheria to each million population of England and Wales were 111, 140, 120, 109, and 121, or an average, roughly, of about 120 per year. How was it after the introduction of antitoxin? The corresponding mortality for 1895 became 260, for 1896 it rose to 292, and in 1897 it was 246—more than double the mortality of certain years when antitoxin was unknown. The Registrar-General, calling attention to the subject, says that with only two exceptions "the death-rate referred to diphtheria alone *in 1896 was higher than in any previous year since 1861.*"* Even if we take the death-rates of diphtheria and croup together, the mortality of 1896, the Registrar-General tells us, has been exceeded only seven times in thirty-three years.

What shall we say of all these exaggerations of utility, these petty evasions, these cunning tricks of equivocation and suppressions of the truth? Can we possibly regard them as an honour of science? Could any more saddening disillusion come to those who love learning and who yet cherish faith in the honour of their fellow men, than the conviction that scientists are given to paltering with veracity; and that whenever personal interests are touched, their word cannot be believed?

There is a sphere of activity, no doubt, where honour is unknown. But above that lower world of fraud and pretense, there must be a region of purer and diviner air, where higher ideals are cherished, where truth is held sacred, where falsehood is supremely scorned. If men of science as a class have apparently been far too trustful of their vivisecting brethren, too willing and eager to vouch for their statements, it may be well that they learn by experience the necessity—even here—for scientific doubt. Per-

* In 1905, there were in England and Wales 5,456 deaths ascribed to diphtheria.

haps the time is ripe for some new expression of the scientific creed. We are quite sure that the great body of scientific workers would therein protest as leading articles of faith, that Science, rightly understood, means only the simple truth; that intentional deception is always a dishonour; and that the sacred cause of learning can never be permanently advanced by exaggeration or deceit.

THE VALUE OF LIFE AND TRUTH.

One of the greatest blessings which the scientific spirit of the last hundred years has conferred upon the human race seems to be a vivid appreciation of the value of accuracy. To be exact and precise in the statement of a fact, or the description of an event; to keep one's self from exaggeration and misstatement; to tell the truth as it is—and not as we wish it were—that is the first lesson of a scientific man. Science has lifted precision from the realm of fancy to that of the commonplace; she could have no existence were it not for this keen desire to state facts as they are; she demands truth from her servitors, and if she sometimes excuses a blunder, she never pardons a lie.

Are there any boundaries within which a purely scientific curiosity should be restricted? There is a wide-spread sentiment which distinctly disapproves the search for physiological facts which have no conceivable relation to the treatment of human ailments, whenever such investigation implies the torment of animals. Suppose, however, that we admit that research may be unrestrained; shall Science be content with the lower forms of life? Granting that the highest aim of pure science is the pursuit of truth for truth's sake, and that the agony of inferior organizations may ever subserve this end, why should we hesitate to make use of human beings in these researches? "Is a life for a line too dear a price to pay for additions to our knowledge?" "The aim of Science," says Professor Slosson,* "is the advancement of human knowledge *at any sacrifice of human*

* *New York Independent*, December, 1895.

life." "If cats and guinea-pigs can be put to any higher use than to advance science, we do not know what it is. We do not know of any higher use *we can put a man to.*" "*A human life is nothing compared with a new fact.*" Well, I think the world is under obligations to any scientist who proclaims that creed so openly; it has been long enough cherished in secret; but never was it more openly proclaimed. This is the doctrine held by Dr. Bargigli, who, having purchased from unnatural parents the privilege of experimenting on their children, inoculated these little ones with matter from a leprous tumour, that he might see whether he could thus infect them with an incurable disease. Such is the doctrine held by certain pathologists of France and Germany, who in hospitals have been experimenting upon patients to see whether cancers could not be grafted upon them.* Nor are these the worst instances of the practical application of that theory which Professor Slosson enunciates, that the aim of science is not "the cure of disease or the saving of human life," but "the advancement of human knowledge at any sacrifice of human life." Not very long ago there appeared in one of the leading medical periodicals of the United States an article by an American physician,—a graduate, by the way, from a college rather renowned for its extreme vivisection,—giving a long and detailed account of certain "experiments" he had made while in charge of a "Free Dispensary." A number of little children, twenty in all, were deliberately inoculated with the most horrible disease that afflicts the human race to-day, without the slightest thought of benefit to his victims, and *solely as an experiment.* They were already suffering from one incurable disorder, and the object of the investigation

* For an account of these experiments in cancer grafting, see *British Medical Journal*, August 29, 1891, and the *Medical Press*, of December 5, 1888, p. 583.

was to see whether, with another, and even worse disease, they might not be infected and poisoned. I shall not quote the full account of his experiment, because, unless this statement is questioned, I do not care to expose him, and a few words must suffice:

"On November 14, 1883, I inoculated with virus six . . . girls under twelve years of age. On December 14, *I repeated the experiment.* . . . The last time I inoculated fourteen; no result followed in any of the twenty experiments. For the suggestion of *this experiment*, I am indebted to my friend, Dr. Pontoppidan, of Copenhagen."*

Did he prove his theory to be correct? Not at all. "While the twenty cases . . . are not absolutely conclusive, still it is a point worth consideration." The result, then, of these twenty "experiments" upon little outcast girls is merely a point worth consideration! I agree heartily with that conclusion; it *is* worth our most serious consideration.

For myself, there are no words in the English language sufficiently strong to phrase my abhorrence of such human vivisections, and the doctrine upon which they rest; and I believe this abhorrence is shared by the vast majority of the men and women in the medical profession to-day. Before a man can begin experiments like these upon innocent and unsuspecting children, there must be a kind of atrophy of the moral sense. Noble, indeed, is that spirit which inspires men to risk health, comfort, life itself, for the good of humanity; but it is *self*-sacrifice,—not the sacrifice of others, it is recognition of the intrinsic value and sacredness of human life,—no matter how poor or wretched—which underlies religion and morality alike.

There is a story told of Passerot, a French scholar of the last century, which has present application. In his last days,

* New York *Medical Record*, September 10, 1892.

dying of a mortal disease, he was brought unrecognized into the Charity Hospital of Paris—a city, then as now, celebrated for pitiless devotion to scientific curiosity. As the attending surgeon looked down upon the miserable being, he bethought him, perhaps, that "a human life is nothing as compared with a new fact in science," and speaking to his associates in Latin—the language used by learned men—he remarked: "*Fiat experimentum in corpore vili.*" At these words, the eyes of the dying man slowly opened; and then, to the physicians' unbounded astonishment, in the same language they had used to conceal intent, came from one they had taken to be a beggar, a scholar's reply: "*Corpus non vile est, domini doctissimi, pro quo Christus ipse non dedignatus est mori!*" In our own day, is the world ready to make the attainment of a new fact in science, superior to the teaching of religion, or the precepts of morality?

*SOME LESSONS OF GREAT REFORMS.**

For what will posterity,—looking backward from the vantage of five hundred years hence,—hold in chief remembrance the wonderful Nineteenth Century in whose closing hours we are living to-day? We need hardly to be reminded that in material progress, in great and useful discoveries and inventions, this age has contributed more than all the centuries which have preceded it, from the dawn of civilization, down to a hundred years ago. And yet, I venture to doubt whether our material progress will so greatly impress the future historian of our times, as the fact that only during the nineteenth century has the ideal of humaneness as a practical principle of morality found expression in human laws.

Nearly fifty years ago, Macaulay, contrasting the England of the past with the England of his own time, declared that there is—

"scarcely a page of the history or lighter literature of the seventeenth century which does not contain some proof that our ancestors were less humane than their posterity. Masters, well born and bred, were in the habit of beating their servants. Pedagogues knew no way of imparting knowledge other than by beating their pupils. Husbands, of decent station, were not ashamed to beat their wives. The implacability of hostile factions was such as we hardly can conceive. Whigs were disposed to murmur because Stafford was suffered to die without seeing his bowels burned before his face. . . . As little mercy was shown by the populace to sufferers of an humbler rank. If an offender was put into the pillory, it was well if he escaped with his life from the shower of brick-bats and paving stones. If he was tied to the cart's tail, the crowd pressed round him, imploring the hangman to

* Address delivered at the Meeting of the AMERICAN HUMANE ASSOCIATION, at Pittsburgh, Pa., October 12, 1900.

give it him well, and make him howl. Gentlemen arranged parties of pleasure to Bridewell on court days, for the purpose of seeing the wretched women who beat hemp there, whipped. A man pressed to death for refusing to plead, a woman burned for coining, excited less sympathy than is now felt for a galled horse or an over-driven ox. . . . The prisons were hells on earth, seminaries of every crime and disease. At the Assizes, the lean and yellow culprits brought with them from their cells an atmosphere of stench and pestilence which sometimes avenged them signally on bench, bar, and jury. *But on all this misery, society looked with profound indifference.* Nowhere could be found that sensitive and restless compassion which has, in our time, extended a powerful protection to the factory child, to the Hindoo widow, to the negro slave; which pries into the stores and watercasks of every emigrant ship, which winces at every lash laid on the back of a drunken soldier, which will not suffer the thief in the hulks to be ill-fed or over-worked, and which has repeatedly endeavoured to save the life even of the murderer."*

But that which appals the student of history is not only the ferocious brutality of the seventeenth century, as pictured by Macaulay; it is the seeming utter indifference to suffering which characterized all classes of society down to little more than a hundred years ago. Crime was punished with a savage atrocity out of all proportion to the heinousness of the offence. In no Christian land was human life then so cheap as in England; during twenty-two years (1749-1771), in the city of London alone, no less than 600 persons of both sexes met death on the scaffold in the presence of the rabble, for offences which are not to-day punishable by death; the poor woman who stole a bit of cloth valued at five shillings to buy food for her starving children, was sent to the gallows without compunction, for the benefit of the London shopkeeper, and as an example to others who might be tempted to steal. In 1773, John Howard, a country gentleman of England, journeyed through his native land, visiting its prisons and jails, and discovering in them a state of misery and cruelty

* History of England, Chap. III.

surpassing belief. The jailors were generally without pay, except such as they were able to extort from the wretched victims within their power. Stagnant sewers festered beneath cells, and fever claimed scores of victims every year. Prison windows were found blocked up, because at that time, sunlight was taxed to furnish the revenue for England's wars. Some jails were the property of ecclesiastics. When the prison of Ely became insecure from age, the jailor adopted the expedient of chaining his prisoners on their backs to the floor,—their necks in iron collars,—so that the proprietor of the prison, the Bishop of Ely, might be spared the expense of repairs ; and by no persuasion could Howard induce the bishop to make a change. Another dungeon belonging to the Bishop of Durham, had but one little window ; and here Howard found six wretched prisoners chained to the floor. "In that situation they had been for many weeks ; they were very sickly ; the straw on the floor was worn to dust." In Plymouth, Howard found a dungeon, the door of which had not been opened for five weeks ; and in this living tomb, so low that one could not stand erect, without fresh air, and without light, were three human beings. In another "horrid dungeon," as Howard calls it, entered only by a trap-door, he found a woman, who, with a child at her breast, had been sentenced to confinement in that place a year before. The child had died. It must be remembered that imprisonment, at this period, was the penalty of minor offences only ; for hundreds were sent to the gallows, who are to-day sent to the workhouse or the jail. Yet the revelations of Howard seem to have excited only a throb of indignation that was soon forgotten ; and the abuses he exposed lasted far into the present century.

The condition of the insane in England at the beginning of the nineteenth century was equally shocking. Almost

anybody, for instance, could get a license to keep "a mad-house,"—as asylums were significantly called. The lunatic was treated as in a hopeless condition, beyond the possibility of recovery, to whom the only duty of Society was effectual restraint. In 1814, a report was issued by the British Parliament, giving results of a Government inquiry regarding the "State of Mad-houses in Great Britain." During the investigation, it was found that ignorant and ferocious keepers had been accustomed to indulge in almost every species of cruelty, insult and neglect. Sometimes exposed in cages like wild beasts, and excited to rage for the amusement of visitors; more often loaded with chains, and kept in solitude and darkness, their beds but a little straw; half frozen in winter time, and half naked at all times; treated with a brutality beyond expression, and from which there was no possibility of redress,—that was the lot of the lunatic of England almost within the memory of living men. Some cells were on the bare earth; some were supplied with clean straw but once a week. At Bethlem Hospital of London, women were found naked, chained to the wall by an arm or a leg; and among them one was discovered, perfectly quiet and composed, and bitterly sensible of her surroundings. Were all these chains and fetters necessary? The highest scientific authorities of that day, men of the longest experience in the treatment of insanity, sanctioned their use. Dr. Thomas Monroe, physician-in-chief to Bethlem Hospital of London for over thirty years, testified before the Parliamentary Committee that "in a hospital for the insane, *there is no possibility of having servants enough to watch a great number of patients without the use of irons.*" No man in England at that time seemed better qualified to express a scientific opinion on the treatment of lunatics. Well, there it is. Of what value is it? Enter to-day, any great asylum of America or Europe, and you

will find, in the present treatment of insanity, how utterly worthless may be the judgment of a scientific man,—even with thirty years' experience,—when he attempts to justify a cruelty, or seeks to perpetuate and uphold an abuse.

It was in 1828, that a young man, whose name, from that time, during more than half a century, was associated with nearly every great philanthropic movement of the age,—became one of the commissioners in lunacy with authority to inspect the condition of the insane. He visited asylums and retreats in various parts of England and personally observed the abuses that existed. He saw for himself the custom of chaining lunatics to their beds, and leaving them in that situation, from Saturday afternoon until Monday morning, with only bread and water within their reach; he saw the violent and the peaceable, the clean and the filthy shut up together in dark and disgusting cells; he saw for himself all the horrible customs then pertaining to the care and treatment of the insane. But the fact that astonished him more than anything else,—the mystery of every reform,—was this: *that the great mass of people knew nothing and cared nothing about these cruelties;* and it was only with the greatest difficulty that he could obtain from any outside source the slightest information, or expression of opinion. So horrified was he with the misery and cruelty thus revealed, that he vowed he would never cease pleading the cause of those helpless victims of man's cruelty, until abuses should cease by legal enactment; and the Earl of Shaftesbury kept his vow.

History, it is said, is merely philosophy teaching by example. What lessons of caution and encouragement may we gather by the study of abuses and of great reforms? We, too, are contending for the wider acceptance of humanitarian ideals, and their application to existing evils. Against us are marshalled the same forces of cruelty and

indifference ; the same selfish interests ; the same ignorant reliance upon the statements of men, who, by all means possible, are endeavouring to uphold the systematized abuses by which they live. Their opinions confront us ; their authority is cited against us. But what weight will their judgment have on that day when reform is accomplished? What value should be ascribed to their opinions to-day? Let us glance somewhat in detail at the history of one or two of the great humanitarian movements of the past, noting not only the infamy of the abuse, but the greater infamy of its defence ; pointing out how the most hideous cruelties have been shielded and upheld, and great wrongs excused and defended,—in the past as they are to-day,—by well-meaning but misguided men ; wrongs which, despite the support of respectability and the advocacy of selfish interests, fell at last before the outraged conscience of humanity and passed away for ever.

It may be doubted whether in human history there has ever existed a more hideous form of injustice, or a more shameful blot upon civilization than was the African Slave Trade of a century and a-quarter ago. Beginning (so far as England is concerned), by Sir John Hawkins in 1562, it lasted during two and a-half centuries of English history without hinderance or restraint. No pen can picture, and no tongue describe the agony endured in a single slave-ship out of the thousands that, during three centuries, brought Africa to our shores. "So much misery condensed in so little room," said Wilberforce, "the imagination never conceived." The vessels as a rule were from 80 to 200 tons burden, and some of them were even smaller than this. Proceeding from Liverpool or Bristol, from Boston, Providence or Newport, with a cargo of rum, a few trinkets and bundles of cloth, the master of the slave-ship came to anchor off the coast of Guinea, and began to bargain for his cargo

of human beings. One by one they were brought to him in canoes, sometimes at night; and no questions as to rightful ownership ever prevented acceptance, or hindered trade. Villages, a hundred miles inland, were attacked at night, without regard to cost of life, in order that the young and vigorous might be captured, and sold to the Christian traders in human flesh and blood. The slaves when brought on board were at once ironed and taken below. Here, on a deck sometimes but four feet high, where it was impossible to stand erect, they were packed so closely, that at night, they could not even turn from side to side; "they had not so much room," said a witness before the Parliamentary Committee, "*as a man has in his coffin.*"* When the ship was filled, then began the two months' voyage known as the Middle Passage. Under a tropical sky, in fetid air so horrible that the odour of a slave-ship could be recognized for miles at sea; in quarters so poorly ventilated, that some slaves died of suffocation nearly every night, and were found when morning came, shackled, the living to the dead; half starved; suffering often terribly from loathsome disease; tortured without mercy if in agony they resisted or protested in any way; sometimes with bones protruding from the skin, from lying in fetters upon the bare planks;† dying so fast that often a quarter of their number perished before the shores of America were reached; so enfeebled by their torments that another large number died soon after reaching land; and in many cases, deliberately worked to death after their arrival,—this was the fate of thousands of human beings at the hands of Christian men, under the sanction of Christian society, two centuries ago!

* Evidence of Surgeon Falconbridge before Parliamentary Committee, 1790.

† Surgeon Falconbridge testified that even the sick had nothing but bare planks to lie upon.

What awful tragedies lie buried in the forgotten secrets of that trade! What cruelties were enacted in mid-ocean, by the side of which the atrocities of war and piracy seem almost to fade into insignificance! Sometimes, in their despair, the slaves sought refuge in suicide; and cases were reported where,—having sprung overboard,—they smiled back at their tormentors as though they would cry: "We have escaped you at last!" On one voyage, a young woman, torn from her family, refused to eat or to speak. Every attempt was made by the captain of the slave-ship to break her will; thumb-screws, capable of causing exquisite agony, were applied; she was suspended in the rigging and there flogged and tormented, but all to no effect; in three or four days she was dead. After the lacerated body had been thrown to the sharks, some of the slave-women told the surgeon that she had spoken the night before she died. "What did she say?" was his inquiry. "She said that she was going to her friends," was their answer.

On another voyage, a child less than a year old, having refused to eat rice mixed with palm oil, a Captain Marshall flogged it himself; ordered its feet put into hot water, with so little care that they were scalded, and the skin came off; and again and again during four days tortured it in the sight of its mother, till at last the child was dead. Calling its mother forward, Capt. Marshall ordered her to fling overboard the body of her babe. She refused. He cruelly flogged her, until at last, she took up the dead child; went with it to the side of the ship, and, turning her head so that she need not see its body swallowed up by the sea, let it sink beneath the waves, and then "wept for hours."

Now and then a sick child wailed so much at night that it annoyed the captain,—and it was torn from the mother's breast and flung overboard to the sharks. On one occasion some slaves made a little noise at night, disturbing the

captain's slumbers; and in punishment, he ordered up eight or ten; tied them up in the rigging and flogged them with a scourge of wire; clapped on the thumb-screws, and left them to writhe in torment while he went back to sleep. "I have seen," said the witness, "the ends of their thumbs mortified, from having been thumb-screwed so violently," and some of them died.*

In 1783, a Captain Collingwood of the slave-ship "Zong," with many sick slaves on board, found himself, after a long journey near the coast of America. If the negroes should die on board the ship, the owners of them would have to bear the loss; if on the other hand, under pressure of circumstances, the captain cast the cargo overboard, then the loss, provided he had sufficient excuse, would by English law, fall upon the underwriters. On the plea that he was short of water, Captain Collingwood threw alive into the sea 132 of his slaves, and on returning to England, demanded payment for their loss! The insurers naturally refused; but the law was plain, and the courts actually compelled them to pay for the murdered slaves.

These are incidents of that traffic, of which Wilberforce said: "If the wretchedness of any *one* of the many hundred negroes stowed in each ship could be brought before his view, and remain within the sight of the African merchant, —*whose heart could bear it?* Never was there a system so big with wickedness and cruelty."† "Even if the objects of this traffic," said Charles Fox, "were brute animals, no humane person could expose them to be treated with such wanton cruelty. This nation will not long permit the constant commission of crimes that shock human nature, for the sake of the West Indies." "Why ought the slave-trade to be abolished?" thundered William Pitt; *"Because it is*

* Testimony of Henry Ellison.

† Speech in House of Commons, May 13, 1789.

incurable injustice." It was, he declared, "the greatest practical evil that ever has afflicted the human race; the severest and most extensive calamity recorded in the history of the world."*

How insignificant seem sometimes the beginnings of a great reform! In 1785, the University of Cambridge offered a prize for the best essay on the academic question "whether it be allowable to hold human beings in slavery?" A young man, Thomas Clarkson, decides to compete for the prize; and among the scanty literature of description and protest, he finds a book, written by Anthony Benezet, an obscure Quaker of Pennsylvania, and published in Philadelphia in 1771. Its revelations excite his horror; he studies the question yet more completely; and finally determines to devote his life to that agitation for abolition which lasted over twenty years. Then, to the soul of a woman came the thought that popular agitation is not sufficient; that before any effective work can be done, the question must come up before the British Parliament; a member of the House of Commons, a young man not yet thirty years old, consents to bring up the question in debate; and so William Wilberforce makes the abolition of the Slave Trade and the cause of the oppressed the work of his life. In 1788, a Committee was appointed to take evidence; and so, gradually, the whole infamous traffic was brought to the light of day.

More than one man who had been engaged in the Slave Trade testified to enormities of which he had been aware. How familiar to all of us are the hymns of John Newton: "*One there is above all others,*" "*Amazing grace! how sweet the sound,*" "*Safely through another week,*" "*How sweet the name of Jesus sounds,*" and others found in every modern collection. Yet it was the author of these hymns,

* Speech in House of Commons, April 2, 1792.

then a venerable clergyman nearly seventy years of age, who told the Parliamentary Committee of what he had seen forty years before, when he had been captain of a slave-ship, and had landed cargoes of negroes on American shores. "Unlimited power," says Newton, "when the heart by long familiarity with the suffering of slaves is become callous and insensible to the pleadings of humanity, *is terrible.* I have seen them sentenced to unmerciful whippings, until the poor creatures had not power enough to groan. I have seen them agonizing for hours,—I believe for days,—under the torture of the thumb-screws." He stated that often he had heard a captain boast, that after repressing an attempt of his cargo of slaves to escape, "he studied with no small attention how to make the death of the leaders as excruciating as possible." Four times did Newton cross the Atlantic in command of a slave-ship. Of his cargo about one-fourth were children; and in selling them upon their arrival in South Carolina or the West Indies, the idea of keeping children with their parents "was never even thought of; they were separated as sheep and lambs are separated by the butcher."*

Against personal testimony of eye-witnesses to its cruelty, how did those who were pecuniarily interested in maintaining the slave-trade manage to prevent all legal interference for nearly twenty years? How may an infamy be defended? We wonder sometimes what words of apology could possibly be uttered in support of so atrocious

* In addition to his testimony before the Parliamentary Committee, Rev. Mr. Newton, in 1788, published a little book: "*Thoughts upon the African Slave-Trade*," in which he gave a relation of his experiences. He says: "I hope it will always be a subject of humiliating reflection to me that I was once an active instrument in a business at which my heart now shudders." For a transcript of personal experience, read his hymns beginning: "In evil, long I took delight," and "Amazing grace."

a system of cruelty. Yet the task is not difficult. It was done precisely as it is done to-day, in the matter of vivisection. The American Humane Association has asked,—not that animal vivisection be abolished, but simply that it shall be placed under such Government supervision as may prevent wanton cruelties and abuse. The American Humane Association's proposals are met by the same methods which were adopted a century ago in regard to the slave-trade,—by a denial of cruelty and by evasion of the truth; by claim of necessity, and by favourable testimony of eminent men in support of the system. Let us note the character of the evidence which was brought forward in support of the slave-trade.

Mr. John Fountain, called upon to testify before a Parliamentary Committee, June 15, 1789, stated that he had lived on the African coast for eleven years, and had never even heard of such a thing as kidnapping a slave! On several occasions he had made trips to the West Indies on slave-ships, and he declared that the negroes were treated "exceedingly well indeed." He had mingled with them on the main deck, and found them "perfectly satisfied, and at all times very cheerful,"—just as the late Harold Frederick, describing in the *New York Times* his visit to Prof. Victor Horsley's laboratory in London, declared that he found the animals, "all fat, cheerful, and jolly; the cats apparently unconcerned as to their brain-loss; *and the monkeys quite unaffected by the removal of a spinal cord!*"* Another witness testified that on slave-ships, "the song and dance were promoted,"—neglecting to explain that by "singing" he meant the wailing of the slaves; and that by "dancing" he referred to the custom of bringing the negroes on deck,

* London correspondence of *New York Times*, October 30, 1892. The same interview was also published in the *Pall Mall Gazette*, London, about the same time.—SIDNEY TRIST.

once or twice a day, and forcing them by the lash, to jump up and down in their chains. Other witnesses declared that "the abolition of the slave-trade would be an act of cruelty to the negro himself." "The total abolition of the trade by all nations," testified Mr. Fountain, "would produce a scene of carnage from one end of the African coast to the other." "The abolition of the slave-trade," said another witness, "would be the ruin of the colonies, destructive to the slaves already in them; and be the most impolitic act, *the greatest inhumanity and breach of faith which this country could ever pass.*"* an absurd statement equalled only by that of Dr. William W. Keen, who gravely declared that the Senate Bill for the supervision of vivisection in the District of Columbia was "a most cruel and inhuman effort to promote human and animal misery," and a serious menace to "*the cause of humanity!*"†

Of course there was the usual appeal to selfish interests. If the slave-trade were abolished in England, it would simply be carried on by the Americans with whom of late years it had "particularly increased." Admiral Hotham declared that "the African slave-trade is a nursery for British seamen; without doubt, it is important to keep it up." Commodore Gardner said: "I consider that if the slave-trade is abolished, *there is an end to the colonies!*" Sir John Dalling, formerly governor of Jamaica, declared that if the slave-trade were abolished, "by degrees, it would be the ruin of every proprietor, and produce beggary to his descendants; and by degrees also, I am afraid,—commercially speaking,—bankruptcy in this country." Mr. Jenkinson, a member of Parliament, asserted that "the cause of Humanity is against abolition."‡ Another member of Par-

* Testimony of Alex. Campbell, Esq.

† See editorial in *Journal of the American Medical Association*, Dec. 23, 1899.

‡ Speech, House of Commons, April 2, 1792.

liament admitted that it was "an unamiable trade," but he "would not gratify his humanity at the expense of the interests of his country; and we should not too curiously inquire into the unpleasant circumstances by which it was attended." Lord Rodney, a Vice-Admiral in the British Navy, declared that the abolition of the slave-trade "would greatly add to the naval power of France, and diminish that of Great Britain in proportion." Admiral Sir Peter Parker gave it as his opinion that the abolition of the slave-trade "must, in time, destroy nearly half our commerce, and take away from Great Britain all pretension of being the first Maritime Power in the world,"*—just as Dr. Kober of Washington told the United States Senate, that a Bill bringing the practice of vivisection under the inspection of the United States Government "would be simply one step, and that an important one,—in the direction of dealing a death-blow to the progress of American medicine!"† Col. Tarleton, in sneering tones with which we are all familiar, referred in the House of Commons to "that philanthropy which the abolitionists fallaciously esteem to be *their* vantage ground,"—precisely as the president of Harvard University, with equal accuracy and good taste, asserted that the advocates of anti-vivisection laws "consider themselves more humane and merciful than their opponents." "By abolition," continued Col. Tarleton, "several hundred ships, several thousand sailors, *and some millions of industrious mechanics* will lose their employment, and be rendered worse than useless. If I were an enemy to the constitution of England, I would vote for the abolition of the African slave-trade!"

How singular all this seems to us to-day! The slave-trade was abolished eighty years ago. Did "carnage from

* Testimony, March 29, 1790.

† Hearing on Vivisection, Feb., 1900, p. 111.

one end of the African coast to the other" ensue? Did England then fall from her position as a great maritime power, and did France step into her place? Did several "millions" of mechanics find themselves without employment and worse than useless? Was half the commerce of England destroyed? May it not be more than probable that when posterity shall look back upon those who to-day oppose any reform to the abuses of vivisection, they will regard their opposition with the same contempt with which we esteem all this evidence for the slave-trade, given a hundred years ago?

But the strongest argument advanced in favour of slavery or the slave-trade was that which is so familiar to us regarding vivisection,—the denial of any abuse. England desired to know the condition of the slaves in the West Indies. Were they deliberately worked to death under the lash, and their places supplied by new arrivals?

That assertion had been made. Never is it difficult to obtain evidence in defence of cruelty when selfish interests are concerned; and slavery in the West Indies was defended by some of the most distinguished men of the time, with the same emphasis and eagerness evinced in our day by illustrious personages in support of the practice of unrestricted vivisection. Witness after witness, summoned before the British Parliamentary Committee, testified that the condition of the negro in the West Indies was far superior to that of the labouring poor upon English soil. Gilbert Franklyn of Antigua, West Indies, declared that the lot of the negro slave "is to be envied by the poor of all countries I have seen." Sir Ashton Warner Byam, the Attorney-General for Granada, said: "The condition of slaves who are industrious is comfortable and happy, and they appear perfectly contented with their lot. . . . A negro slave in general has fewer wants unsatisfied, and

enjoys more of the comforts of life than the English labourer." Mr. John Castles, a surgeon and slave-owner who had resided in the West Indies for over twenty years, declared that compared with the condition of the labouring poor of England, the negro slave was "much more comfortable"; and that he had an occasion to remark this fact in a journey which he had just taken through England and Scotland. Mr. Robert Thomas, who had resided in the West Indies for nine years, comparing the condition of the common labourers and poor people in England with those of the slaves, emphatically declared that "the slaves have a decided superiority with respect to every comfort of life." Dr. Samuel Athill, of the Island of Antigua, said: "I think the situation of the negro and his family is much more free from cares, miseries and mortifications than that of the peasant in many parts of this country."

But even higher testimony was sought; and the commanders of great fleets and navies which had made the West Indies the base of their operations, were summoned to give evidence. "What has your Lordship observed of the behaviour of masters toward their negro slaves in those islands where you have commanded?" was asked of Lord Admiral Shuldham. "It has been mild, gentle and indulgent in all respects; equal to what masters generally show to their servants in this Kingdom." The negroes, Admiral Shuldham said, "in general, appear perfectly satisfied. I can remember when I was a midshipman that I envied their condition, *and often wished to be in the same situation!*"* The Honorable Admiral Barrington being asked the same question, declared that the slaves were treated with "always the greatest humanity"; that when rather disconsolate himself,—"I have seen them so happy that *I wished myself a*

* Evidence given March 23, 1790, p. 404.

negro!"* Vice-Admiral Arbuthnot had "never observed the smallest cruelty towards slaves." Rear-Admiral Hotham had known the West Indies ever since boyhood; had noticed that the treatment of slaves was generally "mild and humane; very much so"; and he declared that "slaves were always very well satisfied with their condition, and very cheerful." Sir Ralph Payne, formerly Governor of the Leeward Islands, averred that he never saw a slave, "the severity of whose labour was by any means comparable with that of the day-labourer in England." Admiral Sir Peter Parker declared that "from the best observation I could make, their treatment was mild, lenient and humane; I never heard of even one instance of severity toward a slave; they not only appeared to me to be properly fed, clothed and lodged, but were in my opinion in a more comfortable situation than the lower class of any people in Europe, *Great Britain not excepted.*"† And finally, Vice-Admiral Lord Rodney, who had resided in Jamaica over three years, never saw any instance of cruelty, and asserted that slaves "at Jamaica appeared to be much better fed than the common labouring people here."‡

How curious all this testimony seems to us to-day! How shameful, you say, how infamous it was for men standing so high in the esteem of England, to stoop to cast the weight of their national reputation in favour of slavery and the slave-trade! Infamous, does one call it? That is too harsh a term even for so great a blunder. Wherein do these old warriors differ from the men of high position and national repute, who, in our time in America have not hesitated to cast the glamour of their names over the practice of vivisection carried on to any possible extent, without

* Evidence of March 23, 1790, p. 405.
† Evidence of March 29, 1790, p. 479.
‡ Evidence of March 29, 1790, p. 468.

legal restriction or restraint? In imagination, we see these bronzed and scarred heroes of England's navy, giving their evidence regarding cruelties which they had "never seen," and which therefore they were certain did not exist,—Admirals Shuldham and Barrington ridiculously declaring that the lot of the negro slave in the West Indies was so full of exuberant felicity and content as to excite their envy, Hotham affirming the slaves to be "always very well satisfied with their condition," Arbuthnot stating that he never observed "the smallest cruelty,"—why are these opinions a whit more shameful or absurd than posterity will regard those of the chemists, geologists and astronomers of the National Academy of Sciences who declared without a dissenting voice (and with no better opportunities for judgment), that "the suffering incident to biological investigations *is trifling in amount!*"* Does it seem almost like a play, the strange folly of it all? There, in fancy, we see the two chief commanders of England's navy, Admiral Sir Peter Parker and Vice-Admiral Lord Rodney, each bending under the weight of many years spent in his country's defence; each hastening to put himself on record for all time to come, as a defender of the greatest infamy the world had ever known,—the "incurable injustice" of slavery and the slave-trade! Well, side by side with this picture of Sir Peter Parker, impartial history may one day place that of the President of Harvard University, who wrote to a committee of the American Senate to the effect that a scientific vivisector must needs be the supreme and only judge of his own actions, since "the Government *cannot* provide any board of officials competent to testify to (his) fitness"; protesting against "all such legislation"; allowing that vivisection should not be permitted "before College classes for purpose of demonstration only,"—evidently

* Senate Report No. 1,049 (Fifty-fourth Congress), p. 128.

ignorant that it is so used in the University over which he presides.* There stands my Lord Rodney; and by his lordship's honoured name, posterity may place that of the Right Reverend Bishop of Massachusetts, hastening to Washington to help impede the passage of a Bill,—not for the abolition of vivisection,—but simply for the restriction of its abuses; vouching for the humanity of his vivisecting friends as my Lord Rodney vouched for the humanity of the slave-masters of Jamaica; and making charges, for the support of which,—when their accuracy was challenged,—he had not a particle of proof! The dust of the old Admirals moulders beneath their marble tombs under the dome of St. Paul's Cathedral; men remember what they did for England, and forgive them their mistakes. Perchance a century hence, when humane ideas are realized in law and custom as they are not to-day, History, in its review of our generation, will find occasion for the same strange contrast of noble character with dishonouring advocacy; the same opportunity for forgiveness; the same pity and regret.

I do not propose to tell the story of that long struggle; it was an agitation that in the British Parliament lasted nearly twenty years. Hopeless, indeed, it must have seemed that moral ideas, based upon unselfish principles, could ever prevail against the opposition of cruelty and greed. Year after year, in the British Parliament, Wilberforce brought forward his resolution for the abolition of the Slave-trade, only to have it meet repeated defeat. Sneers at his philanthropy became the fashionable jest; the Duke of Clarence in the House of Lords denounced him by name as a fanatic and hypocrite; even George the Third, in some moment of

* Hearing before Senate Committee on the District of Columbia, Feb. 21, 1900, on Bill for the further Prevention of Cruelty to Animals, page 219.

lucidity, whispered one day in his ear: "How go your black clients, Mr. Wilberforce?" Judging from the strength of the forces in opposition, the public indifference, the long delays, the scorn and contempt so freely outpoured, even friends of the movement could not but fear at times that he would never succeed. From his death-bed, John Wesley wrote to Wilberforce, in probably the last letter which ever came from his pen: "Unless Divine Power has raised you up to be an *Athanasius contra mundum*, I do not see how you can go through with your glorious enterprise, in opposing that execrable villainy which is the scandal of religion, of England, and of human nature. Unless God has raised you up for this very thing, you will be worn out by the opposition of men and devils; but if God be for you, who can be against you?" Triumph at last came to the cause for which he had so faithfully laboured. In 1807, Parliament abolished the slave-trade, and made it illegal after the following year. In 1811, it was made a felony; in 1820, it was made piracy, and punishable with death. Where now in the world's esteem are they who testified that to the maintenance of the power of England, it was necessary to keep up that sum of all villainies,—that curse of mankind? Where in the world's esteem a century hence, will be the opinions of those, who in our day are not ashamed to assert that for the maintenance of Medical Science and the benefit of mankind, it is necessary to permit vivisection to be absolutely without limitation or control?

Let us glance now at the history of another of the great humanitarian movements of this century; the agitation which led to the reform of factories and coal-mines in Great Britain. The horrors pertaining to them at the beginning of the century we can but faintly conceive; indeed, in some respects they probably surpassed in enormity even

the abominations of slavery. Child-labour had become profitable; and the horrible custom grew up in England of sending pauper children from agricultural districts to be literally worked to death in the factories of the North. Packed in wagons like calves or sheep, they went unconsciously to their doom. I wish there were time to dwell somewhat upon the conditions, which even then,—and for many years afterwards,—prevailed in English factories where boys and girls were employed. One of the worst abuses revealed by Parliamentary inquiry, was the brutality of overseers exhibited toward the little children, who, from utter weariness and lack of sleep, were physically unable to perform their tasks. Living thus in a state of constant apprehension and acute suffering; beginning work at five o'clock in the morning and ending after seven at night; steeped in ignorance and want; dwarfed alike in soul and body; without the slightest redress from cruelty, without hope of escape from their slavery; dying long before their time,—human sacrifices to avarice,—this was the condition of the child-slaves of England less than sixty years ago. Then it was that, writing to Lord Ashley, the poet laureate Robert Southey declared: "I do not believe that anything more inhuman has ever disgraced human nature in any age. Was I not right in saying that Moloch is a more merciful fiend than Mammon? Death in the arms of the Carthaginian idol was mercy to the slow waste of life in the factories!" Then from the heart of another English poet came that indignant cry of sympathy and anguish:

"Do you hear the children weeping, O my brothers,
Ere the sorrow comes with years?
They are weeping in the playtime of the others,
In the country of the free.

They look up with pale and sunken faces,
And their look is dread to see;
"How long," they say, "how long, O cruel nation,
Will you stand,—to move the world,—on a child's heart;

Stifle down with a mailed heel its palpitation,
And tread onward to your throne amid the mart?
Our blood splashes upward, O gold-heaper,
And your purple shows your path;
But the child's sob in the darkness curses deeper
Than the strong man in his wrath."*

"Ah," you say, "who had the heart to withstand this bitter cry of the children? Who could object to making their working time in the factories but ten hours a day?" Well, among those who made reform impossible for twenty years were some of the noblest and best men in England; men such as Richard Cobden and John Bright and John Arthur Roebuck, to whom in no small degree, the English people owe the abolition of the Corn Laws, the vote by ballot and Parliamentary Reform. Cobden and Bright stood for peace when nearly all England were clamouring for war; they were the firm friends of freedom in those dark days of our civil war, when official England was almost ready to recognize the southern confederacy; yet neither Cobden nor Bright could be made to see that anything in the factory system demanded Parliamentary interference. They were not alone in their blindness; Gladstone, whose long after-life was in so many ways devoted to humanity, opposed the ten-hour bill for women and children; O'Connell, who knew well the wrongs of Ireland, could see none needing redress in the factories of Lancashire; the venerable Lord Brougham, zealous as he had been for popular education, the Catholic Emancipation, for suppression of the Slave-trade, the abolition of slavery, and other reforms,—nevertheless spoke strongly in the House of Lords as late as 1847, against the Bill for factory reform. Sometimes we marvel how great and good men of our own

* I have given only a few detached sentences from Mrs. Browning's pathetic poem.

time can be so blind to the cruelties of unregulated vivisection as to oppose the slightest measure of State supervision. But nothing that Harvard's president has ever said against the legal regulation of scientific experimentation upon living animals can begin to equal, in either bitterness or emphasis, the speeches made by Cobden and Bright against factory reform. They lived to see the principle of State supervision regarding labour carried to an extent that even its friends had not dreamed possible; "so that dangerous machinery had to be fenced; so that children and young people were forbidden to clean it while in motion; so that their hours of labour were not merely limited, but fixed by law; so that their continuous employment was forbidden to exceed a certain number of hours;—they lived to see all this, and to see England greater, and happier and more prosperous than ever before."

There came a time, after reform was accomplished, that one man had the rare courage to confess his mistake. In 1860, Mr. Roebuck arose in the House of Commons and acknowledged that he had been wrong in his opposition to factory reform, but declared that it had been based on the statements of the millowners of Lancashire. "They declared," said Mr. Roebuck, "that it was the last half-hour of work performed by their operatives, which made all their profits; and that if we took away that last half-hour, we should ruin the manufacturers of England. I listened to that statement,and trembled for the manufacturers of England! Parliament passed the Bill. From that time down, the factories of England have been under State control, and I appeal to this House whether the manufacturers of England have suffered by this legislation?"* In a letter to the Earl of Shaftesbury,—whose efforts for reform he had so long and so violently opposed,—Mr. Roebuck referred to

* *London Times*, March 22, 1860.

the influences by which he had been so grievously misled :

"The present state of these poor women and children is a serious lesson to all legislators. It teaches us in a way not to be mistaken, that we ought never to trust to the justice and humanity of masses of men whose interests are furthered by injustice and cruelty. The slave-owners in America, the manufacturer in England, though they may be individually good men, will nevertheless, as slave-owners and masters, *be guilty of atrocities at which Humanity shudders; and will, before the world, with unblushing faces, defend cruelties from which they would recoil with horror, if their moral judgments were not perverted by their self-interest.*"

There is the secret of the opposition to reform! Whether on the deck of the slave-ship, or in the dungeons of the madhouse and the jail, in the factories of Lancashire or in the private laboratory of the physiologist,—cruelty is ever the offspring of unlimited and irresponsible power, and ever able to summon to her defence those who "would recoil with horror, if their moral judgments were not perverted by their self-interest."

Another phase of the same great humanitarian movement, was that relating to the coal-mines of England. The conditions pertaining to them previous to the present century, we can never know. Now and then we find the record of some awful explosion, some terrible loss of life ; but only the great accidents were reported ; and every day, human beings, young and old, were drowned, suffocated or crushed, and no record made. It was not until 1833, that some of the real facts concerning coal-mining began to be generally known, although full comprehension of the truth did not come for several years. What was the condition of affairs here discovered when the light of inquiry was fairly thrown on ?

It was a state of things that one would almost hesitate to believe could exist in a Christian country. In the first

place, the coal-mines of Great Britain, like laboratories for the vivisection of animals,—were entirely free from official inspection of any kind; and within them, anything was possible. Working from twelve to fourteen hours a day; confined in narrow spaces, breathing air mixed with gas and dust, and in heat so great that sometimes the candles would melt; liable at any moment to be crushed or wounded, or imprisoned to die of slow starvation,—these,—the ordinary circumstances of the miners' daily lives,—caused them to become especially subject to disease, deformity and premature death. It was found that children were taken into the mines at a very early age, that the workhouses of London sent down batches of orphans to be "broken in"; and if the unhappy child survived his treatment till he was nine, he was apprenticed to the miner and forced to serve him until he was twenty-one. Sometimes a small child's task was sitting in pitchy darkness, twelve to fourteen hours a day, and at intervals, opening and shutting a gate; sometimes the little apprentices were forced by their masters to enter places so dangerous, that the miners themselves did not dare to go, till they had tested the extent of the risk, by first sending their little slaves. Some of the passages were less than two feet high; and along these, tiny children were forced to push or drag little wagons laden with coal. With backs bruised and cut by knocking against the roofs of the narrow passages; with feet and legs often covered with ulcers; so hungry, that they were often glad to pick up and devour the tallow candle-ends which the miners had thrown aside,—exposed to every kind of fatal accident, and never seeing the sunshine except on Sunday,—this was the fate of child-slaves in England, within the memory of living men!

There were yet even darker shadows. In many parts of England and Scotland it had become the custom to have

girls and young women work in the coal-mines, performing every description of labour, from hewing out the coal to dragging it in tubs, and in some places, carrying it on their backs up the rickety ladders to the surface of the ground. Girls, naked to the waist, harnessed with leathern girdles about their hips, hitched to iron chains, and crawling on hands and feet in the darkness of the pit, subjected to every peril, associating with the worst and most degraded men, constantly witnessing blackguardism and debauchery, listening to blasphemy and obscenity, working under these surroundings from long before daylight until long after dark, ruined in body, ruined in mind, and in time bringing bastard children upon the parish,—*this* was the picture—revealed to Christian England in the nineteenth century,—of the white slavery on British soil!

It was not until 1842, that Lord Ashley,—afterwards the Earl of Shaftesbury,—succeeded in bringing the first Bill for reform into the British Parliament. He proposed, in the first place, to prohibit the employment of boys before the age of thirteen; to abolish the apprentice system of pauper orphans, and to take women and girls from the coal-pit altogether. Perhaps you will imagine that after revelations which I have ventured only faintly to outline, such a measure would meet with general approval on the part of every rational person? On the contrary, these suggestions of change aroused the most bitter opposition. From whom do you ask? Why, chiefly from the proprietors of the coal-mines,—acting precisely as the proprietors and directors of laboratories for vivisection in this country act in regard to all measures for legal regulation. Owners of collieries in every part of Great Britain poured petitions into Parliament, beseeching the rejection of the Bill,—just as Congress has been besieged with similar requests from almost every vivisection laboratory in the United States. Their

arguments were precisely those with which we are familiar. In the first place, they asserted that no abuses existed; or, if there were any, they had been vastly exaggerated; just as certain Harvard Professors once referred to printed evidence concerning the abuses of vivisection, as "long lists of atrocities that never existed,"—denying in one sweeping sentence facts as certain as any recorded in history.* It was said that if women and children were taken out of the mines, they would only be driven into the workhouse, or become a public charge. One member of Parliament declared that some seams of coal "could only be worked by women,"—beyond which absurdity could hardly go further. Another member of Parliament insisted that the occupation of a coal-miner was generally considered "a remarkably pleasant and cheerful employment!" The motives of Lord Shaftesbury and those who urged reform were ascribed to "hypocritical humanity,"—precisely as a leading vivisector in the Agricultural Department at Washington, writing to a public journal of that city, referred in terms of customary courtesy to "the so-called Humane Society," which, he said, "*prates so loudly* about Altruism, morality and ethical principles generally."† Altogether, in the opinion of the owners of coal-mines, any legislation affecting them was as unwise and uncalled-for, as the State supervision of vivisection is regarded by President Eliot and by every vivisector in this country.

But no section of the proposed law aroused such fierce antipathy as the clause providing for the legal and systematic visitation of coal-mines by inspectors appointed by the Government, just as no section of the Bill before the United States Senate for the regulation of vivisection

* Statement in *Boston Transcript*, July 13, 1895.

† Letter of Daniel E. Selmon, D.V.M., in the *Washington Post* of Feb. 4, 1896.

excites such angry protests as that which opens the doors of the Government laboratories to an inspector appointed by the President of the United States. All such supervision of coal-mines was declared by the owners to be "a useless and mischievous prying into private affairs," precisely as various distinguished vivisectors and their friends have declared that the proposed governmental supervision of vivisection would be "*unnecessary and offensive in the highest degree.*"* Speaking in the House of Commons, Lord Radnor insisted upon the principle that "it was not the duty of the State to enforce moral obligations." Lord Brougham, one of the most eminent men in the House of Lords, distinguished alike for his learning, eloquence and philanthropy, declared that this legislation was "mistaken humanity";—precisely as those eminent American vivisectors, Bowditch, Porter, Stiles, Sternberg and others, refer to the legal regulation of vivisection as "one of the least wise of the agitations which beset modern society." Lord Londonderry went so far in his opposition to State inspection of mines in Great Britain as to declare that he would say to an inspector, "You may go down into the pit as best you can; and when you are down, you may remain there!" Even Lord Ashley, the promoter of the Bill, was inclined to question whether subterranean inspection of coal-mines would be quite safe. Yet, when,—with some modifications,—the Bill became a law, not one of the terrible results, so fearfully prophesied, ever came to pass. The coal-mining industry was not ruined. Women and girls, taken from the coal-pits, found other and more decent avocations. Children, no longer forced to be slaves in the darkness of the pit, did not flock to the workhouse, or become beggars on the street. The Government Inspectors went down into the mines and found no one so reckless as

* Report on Vivisection, No. 1,049 (54th Congress), p. 185.

to lift a finger against them, or hinder them in the discharge of their duties. The law was obeyed.

It is a significant fact that all subsequent legislation on this subject resulted from evidence made known through that inspection of mines by Government officials, which had been so long and so strenuously opposed. For instance, over a thousand lives of coal-miners had been sacrificed in coal-pits every year. "You cannot prevent such accidents as these," cried the owners of the mines; "they are but the mysterious visitations of an inscrutable and All-Wise Providence." "You can lessen them by suitable legislation; for they are largely the result of your carelessness and indifference," was the rejoinder. And when the awakened humanitarian sentiment of England came to realize that only wise legislation was needed to make human life safer in the mines, it was not very long before such laws found their place on the Statute-book. What was the outcome? Every law that was passed, tending to make inspection more efficient, and the mine-owners more careful of human life, had the almost immediate effect of decreasing the number of fatal accidents. During ten years (1851-1860), for every million tons of coal raised to the surface, the loss of human lives in the coal-mines of Great Britain averaged 14 per year. During the next ten years (1861-1870), the annual sacrifice of human life fell to 11; from 1871 to 1880, it came down to 9; and from 1881 to 1889,—although the mines were continually getting deeper and, in that respect, more dangerous,—the mortality had fallen to only 6 deaths per year, to each million tons of coal raised to the surface. You see it is only necessary to get at the facts through evidence that cannot be disputed,—and the reform of abuse is simply a question of time. This is why Government inspection,—whether of factories, coal-pits or laboratories for vivisection—is always so stubbornly resisted: it opens

the door for reform.* It is a significant fact that from the first Bill of 1842 down to the last, of all measures introduced into Parliament providing, by the more thorough inspection of coal-pits, for the greater protection of human life, there was not one,—not one,—which did not encounter the strenuous antipathy of the men who had an interest in the coal-mines, and in concealment of their defects. History repeats itself, and we have no reason for wonder at the opposition that confronts us on this point.

It is because I think that such records of the past are profoundly encouraging to us, that I have brought them again to mind. What can they teach us? In the first place, it seems to me that History inculcates no clearer lesson than the duty of disregard for the eminence of names, when they are put forward in defence of systematized cruelty, or for the hindrance of reform. Men point to some ripe scholar, adorning the presidency of a great institution of learning; to some ecclesiastic, representing the highest dignity of his Church; or to some official at the head of a Government laboratory; and because such men are against us, we are told to cease all agitation for reform. And then History lifts a curtain, and we see Daniel Webster standing in the United States Senate Chamber on March 7, 1850, advocating the passage of the Fugitive Slave law, under which poor slaves who had escaped could be handed back to bondage; we see the venerable Lord Brougham in the British House of Lords, using his vast influence to keep women and children in the coal-mines; we see Cobden and Bright and Gladstone palliating and defending the awful atrocities of the factory system; we see some of the wisest and best men in the American pulpit

* The inspection however, must be *real;* note the perfunctory observation which the Royal Commission on Vivisection 1906-7 shows has obtained in England, for many years.

of fifty years ago, defending the infamy of American slavery. For never was there a great cruelty or abuse that could not enlist the championship of respectability, or bring to its support the influence of illustrious names.

And the next lesson which History teaches us is patience. In that promulgation of humane ideals to which this Association is devoted, progress seems sometimes very slow. We call attention to that cruelty of fashion which demands for feminine adornment the sacrifice of song-birds almost by the million,—and the vast majority of fashion-worshippers pay no heed. We denounce the brutalities incident to cattle-transport, and no great outburst of popular indignation demands their suppression. Year after year, some of us ask, not that vivisection be abolished, but only that it be placed under the supervision of the State, so that abuses which have repeatedly evoked the condemnation of the most eminent men of science in Europe and America, may be somewhat lessened. It seems as little to ask as the demand, made over fifty years ago, that coal-mines should be made safer, or that hours for child-labour in factories should be reduced; yet the same selfish interests, helped and supported by the complaisance and ignorance of well-meaning men, rise in opposition, and the years of agitation seem almost fruitless of result. But, was it not always so? Never in the world's history was there speedily accomplished the reform of an organized injustice which depended for support upon the selfish interests of mankind. From the day when Anthony Benezet began his agitation against the "incurable injustice" of the slave-trade, till the accursed traffic was made piracy by English laws,—almost half a century rolled by. From the time when John Howard first penetrated the gloomy dungeons of England, till its prison system was reformed, more than sixty years passed, and Howard was in his grave. The keepers of

private mad-houses in England as fiercely resisted inspection and legal supervision as those who are opposing it to-day; but the light at last penetrated the private dungeon, as one day it will penetrate the private laboratory. Against the inhumanity and greed of the owners of coal-mines, it took long and weary years of agitation to accomplish any appreciable reform. For twenty years, the factory-owners of England were enabled to prevent reduction of the hours of toil for women and children; but the great forces of humanitarian sentiment prevailed at last. Courage and patience,—these are the words for us. Nature takes her time; she will not be hurried; and we too, working faithfully, can wait with confidence for the sunrise of that higher civilization, which is yet to dawn upon a suffering world. Are we in a minority? So once were Wilberforce and Clarkson, Shaftesbury and Howard. There is no slavery more degrading to character than the ignoble fear of standing for truth and justice without the multitude's clamouring approbation and support.

> "He's a slave who dare not be
> In the right with two or three;
> He's a slave who dare not choose
> Hatred, slander and abuse,
> Rather than in silence shrink
> From the truth he needs must think."

In a struggle with the forces of ignorance, cruelty and self-interest, let us not be wanting in that fidelity to truth which was the consolation of Spinoza in his solitude, and which helped Galileo to stand alone; in that hatred of injustice which animates our work; in that devotion to Humanity and humane ideals, which has ever been the inspiration of all conflict with oppression and cruelty; which has ever carried to eventual victory all great reforms.

THE RISE OF THE VIVISECTION CONTROVERSY.

Of the ethical agitations which interested humanity during the nineteenth century, none has been more seriously misapprehended by educated men than the one which questioned or impeached the morality of animal vivisection. To the present generation of scientific teachers or medical practitioners, the origin and purpose of the agitation seem, doubtless, very clear; it is but another evidence, they tell us, of that blind hatred of Science which in every age seeks, vainly, to prevent the advancement of the human intellect and the conquest of the Unknown. The vivisection of animals, we should perhaps be told, is a practice as old as the first questionings of the human mind regarding the phenomena of life. Sometime during the past half century, there arose in England an irrational outcry against physiological research, a sentimental clamour concerning "cruelties" that had no existence except in the heated imaginations of ignorant men. Against this misguided agitation stood, of course, the entire medical profession, and with them the teachers of science throughout Great Britain. Year after year, they doubtless fought for the maintenance of scientific liberty, and for the right of physiologists to do what they wished; and they yielded at last to legislation which was without justification, and most serious in its detrimental effects upon the cause of learning and the advancement of medicine. Something like this is undoubtedly the way that the origin of the Vivisection controversy appears to the present generation of college graduates, of scientific teachers, and of medical men; in some such in-

accurate and visionary form it has been represented more than once, for their condemnation and contempt.*

And yet such a view is absolutely false to the facts of history. They were not ignorant men who first raised protesting voices against the cruelties of vivisection. Strange as it now seems, it was the medical profession of Great Britain that first denounced the atrocities of research, and held them up to the execration of the English people. It was the medical press that year after year questioned the morality of practices which then were abhorrent to the vast majority of English medical men. The story which these facts imply appears to me worth telling, and worth remembering. The voices to which we shall listen seem, as it were, echoes from the tomb, for the men who, forty years ago, represented the English race in all that concerns the advancement of medical science, have, for the most part, passed beyond the gates. The denunciations of cruelty that they uttered so forcibly are now no longer heard; other voices are now resonant; other ideals dominate. But the

* An example of the vague and inaccurate notions entertained regarding the beginnings of the vivisection agitation, may be found in the address delivered June 10, 1896, before the Massachusetts Medical Society, by Dr. Henry P. Bowditch, Professor of Physiology at Harvard University. The speaker said: "The first serious attack upon biological research in England seems to have been in an essay entitled 'Vivisection: Is it necessary or justifiable?' published in London in 1864 by George Flemming, a British Army veterinary surgeon. This essay is an important one, for . . . its blood-curdling stories, applied to all sorts of institutions, have formed a large part of the stock in trade of subsequent antivivisection writers.

"A fresh stimulus to the agitation was given by the publication in 1871 of a work . . . entitled 'Handbook for the Physiological Laboratory.' This book was intended to be used by students of physiology under the guidance of their instructors. . . . Unfortunately, however, it fell into the hands of excitable men and women, who were ignorant of many things that had properly been taken for granted in writing for members of the medical profession."

eternal verities do not vary; and what was the truth yesterday, is the truth to-day.

The history of the Vivisection agitation has yet to be written. In the following sketch, I shall only attempt to outline one peculiar phase of the controversy: *the attitude toward it and the part borne in it by the medical profession.* It will be of interest to note how this agitation took its rise, and to what revelations and denunciations it was primarily due.

In reviewing the controversy, at least three different views of vivisection may be clearly discerned. As constant reference must be made to them, let us at the outset define some of their distinguishing characteristics.

First, we may take the Continental view; vivisection for its own sake, without supervision, legal regulation or restrictions of any kind; vivisection as it has been carried on for centuries by experimenters on the Continent of Europe. The advancement of knowledge and not the utility of medicine is admitted to be the true object of the practice.* In performance of a vivisection, an experimenter is under no obligation to consider the question of pain.† Whether an experiment be right or wrong, useful or useless, cruel or otherwise, are matters *for the experimenter alone to decide:* and any legislation which attempts to define under what conditions or for what purposes an experiment may be made, seems to the physiologist of the Continental school "unnecessary and offensive in the highest degree."‡ He insists that he cannot be subject to legal supervision, because no one is competent to testify to his fitness; in other words, he holds himself superior to law that elsewhere

*Dr. Hermann: "Die Vivisectionsfrage." Leipsic, 1877.

† Dr. Emanuel Klein; see testimony following.

‡ See Senate Doc. No. 31, 54th Cong., p. 3. This is a statement of American vivisectors.

determines and regulates the conduct of mankind.* He resents the imputation of "cruelty," but holds that it is the privilege of the vivisector to define the term.† Magendie, Bernard, Brown-Sequard, Mantegazza, and a host of their imitators and adherents in Europe and America may be said to represent this school of physiological theory and practice. Doubtless, there are shades of opinion and differences in practice. Upon one point, however, all are agreed: that the vivisector must be at liberty to do as he likes, and free from every restriction or restraint.

A frank statement of the practices and opinions of this Continental type of physiologists was given, in 1876, in the evidence of Dr. Emanuel Klein before the Royal Commission on Vivisection. The evidence is the more important from the fact that now, for over thirty years, Dr. Klein has been one of the leading physiologists of England.

(Chairman.) "What is your practice with regard to the use of anæsthetics in experiments that are otherwise painful?—Except for teaching purposes, for demonstration, I never use anæsthetics where it is not necessary for convenience.

When you say you only use them for convenience sake, do you mean that you have no regard at all to the sufferings of the animals?—*No regard at all.*

You are prepared to establish that as a principle that you approve?—I think that with regard to an experimenter, a man who conducts special research, and performs an experiment, *he has no time, so to speak, for thinking what the animal will feel or suffer.*

As an investigator, you are prepared to acknowledge that you hold as entirely indifferent the sufferings of the animal which is subjected to your investigation?—Yes.

Do you believe that that is a general practice *on the Continent*, to disregard altogether the feelings of the animals?—I believe so.

Have you, since you have come to this country, had any proof of what you state now with regard to the different feeling that pervades the inhabitants of England with regard to the feelings of the animals on which you operate?—*Yes, there is a great deal of difference.*

* See Letter of President Eliot; Report of Hearing, 1900, p. 219.

† See Minutes of Evidence, Roy. Com. on Vivisection, 1906; Ques. 2613.

Would you give the Commission an instance . . . ?—I mean in regard to the journals; the outcry and agitation carried on in the different journals against the practice of vivisection. There is no such thing abroad; there the general public does not claim to pronounce any criticism or any judgment about scientific teaching or physiology in general.

But you believe that, generally speaking, there is a very different feeling in England?—Not among physiologists; I do not think there is.

If you were directed to perform an operation . . . with reference to the nerves of a dog, and it became necessary to cut the back of the dog severely for the purpose of exposing the dog's nerves,—for the sake of saving yourself inconvenience, you would at once perform that without the use of anæsthetics?—Yes.

You say that *a physiologist has the right to do as he likes with the animal?—Yes.*

And you think that *the view of scientific men on the Continent is your view*, that animal suffering is so entirely unimportant compared with scientific research that it should not be taken into account at all?—*Yes, except for convenience sake.*"*

A second opinion regarding vivisection is that which almost universally obtained in England up to 1870. For purposes of distinction from that which prevailed on the Continent, we may call it the English view, although to-day, we should find it largely pushed aside by its more vigorous competitor. But up to a third of a century ago, as we shall see, the medical profession of England regarded with detestation and abhorrence the liberty of vivisection which prevailed on the Continent of Europe. They maintained, indeed, the right of animal experimentation for purposes of scientific discovery, but they condemned in no measured terms the repetition of experiments simply for the demonstration of well-known facts. Sir Charles Bell, who made the greatest physiological discovery of the nineteenth century, thus alludes to some experiments made by him:

"After delaying long on account of the unpleasant nature of the

* Testimony, somewhat abbreviated, from minutes of Royal Commission on Vivisection, p. 183 et seq. (Italics ours.)

operation, I opened the spinal canal. . . . I was deterred from repeating the experiment by the protracted cruelty of the dissection. I reflected that the experiment would be satisfactory if done on an animal recently knocked down and insensible."*

Again, in a letter to his brother, he says :

" I should be writing a third paper on the nerves ; but I cannot proceed without making some experiments which are so unpleasant to make that I defer them. You may think me silly, but I cannot perfectly convince myself that I am authorized in Nature or Religion to do these cruelties. . . . And yet, what are my experiments in comparison with those which are daily done, and are done daily for nothing !"†

Such extreme sensitiveness, such tender-hearted hesitancy to inflict torment would be laughed at in every Continental laboratory. It is typical, however, of the sentiment which once everywhere prevailed in the medical profession of Great Britain.

A third phase of opinion, representing uncompromising hostility to every phase and form of animal experimentation, is that known as Anti-vivisection. Fifty years ago, as a form of party belief or ground of agitation, it had no existence. It sprang into being because of the revelations made by the medical journals of England regarding Continental cruelties ; it exists from a belief that like cruelties will always be possible wherever any form of vivisection is sanctioned by law.

The following extract from the editorial columns of the leading medical journals of England tell their own story. We see where the agitation against the cruelties of vivisection first began. Arranged in chronological order, they

* Nervous System of the Human Body, London, 1830, p. 31. Of interest, in this connection, is a paragraph from the *Lancet* (London) of Dec. 17, 1881 : " Prof. Schiff has lately pointed out that under certain conditions vital functions can be studied by dissecting freshly-killed animals."

† Letters of Sir Charles Bell, London, 1875, p. 275.

give us a clear idea of the views regarding animal experimentation held by the medical profession of England from 1858 down to the passage of the Vivisection Act of 1876.

MEDICAL TIMES AND GAZETTE, LONDON (EDITORIAL), SEPT. 4, 1858.

" In this country we are glad to think that experiments on animals are never performed, now-a-days, except upon some reasonable excuse for the pain thus wilfully inflicted. We are inclined to believe that the question will some day be asked, whether any excuse can make them justifiable? One cannot read without shuddering, details like the following. It would appear from these, that the practice of such brutality is the every-day lesson taught in the veterinary schools of France.

" A small cow, very thin, and which had undergone numerous operations,—that is to say, *which had suffered during the day the most extreme torture, was placed upon the table*, and killed by insufflation of air into the jugular vein."

This fact is related by M Sanson of the veterinary school of Toulouse, *merely incidentally*, when describing an experiment of his own upon the blood. The wretched animal was actually cut to pieces by the students! . . . M. Sanson adds (merely wanting to prove that the nervous system of the animals upon which he operated was properly stirred up), " Those who have seen these wretched animals on their bed of suffering—'*lit de douleur*,'—know the degree of torture to which they are subjected, torture, in fact, under which they for the most part, succumb !"

LONDON LANCET (EDITORIAL), AUG. 11, 1860.

After pointing out the utility of physiological investigations in the past, the editor adds:

" On the other hand,when at any moment the practice overpasses the rigorous bounds of utility, when its object is no longer the pursuit of new solutions of scientific problems, or the examination of hypotheses requiring a test; when vivisection is elevated into an art and this art becomes a matter of public demonstration, then it is degraded by the absence of a beneficent end, and becomes a cruelty. Thus the exhibitions of experiments which aim only at a repetition of inquiries already satisfactorily concluded, and the demonstration of functions already understood, appear to us to rank among the excesses which must be deplored if not repressed. The displays in these amphitheatres* are of the most painful kind; and it is to be most deeply regretted that curiosity should silence feeling and draw spectators to mortal suffering. . . . The

* Of the medical schools of Paris.

Commission [of the Societies for Prevention of Cruelty] asks for nothing which the most zealous devotees of science cannot,—and ought not—to grant. It demands only the cessation of experiments which are *purely repetitive demonstrations of known facts.*"

MEDICAL TIMES AND GAZETTE (EDITORIAL), OCT. 20, 1860.

"Two years ago, we called attention to the brutality practised at the veterinary schools in France, and gave a specimen of the kind of torture, there inflicted upon animals. *We are very glad to see that the public are now occupied with the subject*, and we are sure that the Profession at large will fully agree with us *in condemning experiments which are made simply to demonstrate physiological or other facts which have been received as settled points and are beyond controversy.* We consider the question involved as one of extreme interest to the Profession; and we shall gladly throw open our columns to any of our brethren who may wish to assist in framing some code by which we may decide under what circumstances experiments upon living animals may be made with propriety."

THE LANCET, LONDON (EDITORIAL), OCT. 20, 1860.

"The moment that it (vivisection) overpasses the bounds of necessity; when it ceases to aim at the solution of problems in which humanity is interested, and becomes a new means of public demonstration, having no benevolent end, then it is degraded to the level of *a purposeless cruelty.* The repetitive demonstration of known facts, by public or private vivisections, is an abuse that we deplore and have more than once condemned."

FROM LETTER TO THE LANCET, JAN. 12, 1861.

"'Prof. Owen,* one of the first physiological authorities of the present day, observes, 'That no teacher of physiology is justified in repeating any vivisectional experiment, merely to show its known results to his class or to others. *It is the practice of vivisection*, in place of physiological induction, pursued for the same end, *against which, humanity, Christianity and Civilization should alike protest.*'"

MEDICAL TIMES AND GAZETTE (EDITORIAL), LONDON, MARCH 2, 1861.

"VIVISECTION. We have been requested to pronounce a condemnation of vivisection . . .

We believe that if anyone competent to the task desires to solve any question affecting human life or health, or to acquire such a knowledge of

* Sir Richard Owen.

function as shall hereafter be available for the preservation of human life or health, by the mutilation of a living animal, he is justified in so doing. But we do not hesitate to condemn the practice of operating on living animals for the mere purpose of acquiring coolness and dexterity; and *we think that the repetition of experiments before students, merely in order to exhibit them as experiments, showing what is already known, is equally to be condemned.*"

British Medical Journal (Editorial), May 11, 1861.

"The Emperor of the French has received a deputation from the Royal Society for the Prevention of Cruelty to Animals. We sincerely trust that this interview may be the means of putting an end to the unjustifiable brutalities too often inflicted on the lower animals under the guise of scientific experimentation. *It has never appeared clear to us that we are justified in destroying animals for mere experimental research under any circumstances;* but now that we possess the means of removing sensation during experiments, the man who puts an animal to torture, ought, in our opinion, to be prosecuted."

[Referring to the experiment upon a cow mentioned in Dr. Brown-Sequard's "*Journal of Physiology*," and already described, the editor adds:]

"We are not disposed, in a question of this kind, in which some of the highest considerations are concerned, to allow our opinion to be swayed by the opinions or the proceedings of even the greatest surgeons and the greatest physiologists. That such authorities performed vivisection is a fact; but it does not satisfy us that the proceeding is justifiable. Under any circumstances, this much, we think, is evident enough: that *if vivisections be permissible, they can only be so under certain limited and defined conditions.* We need hardly add that these conditions have not yet been laid down. Altogether, the subject is one well worthy of serious discussion; and gladly would we see the interests of medical science in the matter properly reconciled with the dictates of the moral sense."

British Medical Journal (Editorial), Oct. 19, 1861.

"The brutalities which have been so long inflicted upon horses, etc., in the veterinary schools of France under the name of Science, are perfectly horrible. Some idea of what has been daily going on in those schools during many past years, may be obtained from such a statement as the following, taken from a paper by M. Sanson in the *Journal of Physiology* [edited by Dr. C. E. Brown-Sequard]. M. Sanson is speaking incidentally of the condition of the animals upon whose blood he was himself experimenting: 'A small cow,' he writes, 'very thin, and

which had undergone numerous operations,—that is to say *which had suffered during the day, the most extreme torture*, was placed upon the table,' etc. M. Sanson adds: '. . . Those who have seen these wretched animals on their bed of suffering,—*lit de douleur*,—know the degree of torture to which they are subjected; torture, in fact, under which, they for the most part succumb!' *The poor brutes are actually sliced and chopped, piecemeal, to death*, in order that the *élèves* (students) may become skilful operators!"

MEDICAL TIMES AND GAZETTE (EDITORIAL), AUG. 16, 1862.

"No person whose moral nature is raised above that of the savage would defend the practices which lately disgraced the veterinary schools of France, or in past years the theatre of Magendie.* Prof. Sharpey in his address to the British Medical Association has accurately drawn the required limits, by asserting that where the result of an experiment has been fully obtained and confirmed, *its repetition is indefensible;* and 'as the art of operating may be learned equally on the dead as on the living body, operations on the latter for the purpose of surgical instruction are reprehensible and unnecessary.'"

BRITISH MEDICAL JOURNAL (EDITORIAL), SEPT. 6, 1862.

After stating that some restrictions should be imposed regarding vivisection, the editor says: "We will venture to suggest that these restrictions should be well and clearly defined; that some high authority like Dr. Sharpey himself should lay down certain rules on the subject, and for the very purpose of preventing, if possible, any needless suffering from being inflicted experimentally on the lower animals. All of us must be well aware that many needless experiments are actually performed, and until some clearly defined rules on this head are laid down, we venture to think such needless suffering will still continue to be inflicted on animals. If, for example, it were publicly stated by authorities in the profession that experiments of this nature, made for the mere purpose of demonstrating admitted physiological facts, are unjustifiable, a great step would be gained, and a great ground of complaint cut from under the feet of the enthusiastic Anti-vivisection societies. The very fact of an authoritative declaration on this point would go far toward giving an authoritative sanction to the legitimate performance of such experiments. . . ."

BRITISH MEDICAL JOURNAL, MAY 2, 1863; QUOTED FROM EDITORIAL IN "L'UNION MEDICALE," OF PARIS.

"Vivisection is often useful and sometimes necessary and therefore not to be absolutely proscribed; but I would gladly petition the Senate

* i. e., the lecture room.

to forbid its performance on every animal which is useful to, and a friend of man. The mutilations and tortures inflicted upon dogs are horrible. The King of Dahomey is less barbarous than these merciless vivisectors. *He* cuts his victims' throats, but without torturing them, while *they* tear and cut to pieces these wretched dogs in their most sensitive parts. Let them operate on rats, foxes, sharks, vipers and reptiles. But no; our vivisectors object to the teeth, the claws, the beaks of these repulsive animals, they must have gentle animals; and so like cowards, they seize upon the dog,—that caressing animal, which licks the hand, armed with a scalpel!"

BRITISH MEDICAL JOURNAL (EDITORIAL), AUG. 22, 1863.

"We are very glad to find that the French medical journals are entering protests against the cruel abuse which is made of Vivisection in France. *L'Abeille Médicale* says:

"I am quite of your opinion as to the enormous abuses practised at the present day in the matter of vivisection. . . In the laboratories of the *College of France*, in the *Ecole de Médicine*, eminent professors, placed at the head of instruction, are forced to the painful sacrifice of destroying animals in order to widen the field of science. In doing so they act legitimately, and suffering humanity demands it of them. Those experiments are performed in the silence of the private study, and the results obtained are then explained to the pupils, or treated of in publications. . . . But to repeat the experiments before the public, to descend from the professional chair in order to practise the part of a butcher or of an executioner, is painful to the feelings and disgusting to the sentiments of the student. . . . Such public exhibitions are ignoble, and of a kind which pervert the generous sentiments of youth. An end should be put to them. Ought we to allow the *élite* of our French youths to feed their eyes with the sight of the flowing blood of living animals, and to have their ears stunned with their groans, at this time when society is calling for the doing away of public executions? Let no one tell us that vivisections are necessary for a knowledge of physiology. . . . If the present ways, habits and customs are continued, the future physician will become marked by his cold and implacable insensibility. Let there be no mistake about it; *the man who habituates himself to the shedding of blood, and who is insensible to the sufferings of animals is led on into the path of baseness.*"

So writes *L'Abeille Médicale*. But here *L'Union Médicale* takes up and comments on the tale:

"This is all excellently said; but we must correct a few errors. Magendie, alas! performed experiments in public, and sadly too often at

the *College de France*. I remember once, among other instances, the case of a poor dog, the roots of whose spinal nerves he was about to expose. Twice did the dog, all bloody and mutilated, escape from his implacable knife; and twice did I see him put his fore paws around Magendie's neck and lick his face! I confess—laugh, Messieurs les Vivisecteurs, if you please,—that I could not bear the sight. . . . It is true that Dr. P. H. Berard, professor of physiology, never performed a single vivisection in his lectures, which were brilliant, elegant and animated. But Berard was an example of a singular psychological phenomenon. Toward the close of his life, so painful to him was the sight of blood and the exhibition of pain, that he gave up the practice of surgery and would never allow his students to witness a vivisection. But Berard was attacked by cerebral hæmorrhage, and the whole tone of his character was thereby afterward changed. The benevolent man became aggressive; the tolerant man, irritable. . . . He became an experimenter, and passed whole days in practising vivisections, taking pleasure in the cries, the blood and the tortures of the poor animals."

LONDON LANCET (LEADING EDITORIAL), AUG. 22, 1863.

"If we were pressed simply for a categoric answer to the question whether such a practice (as vivisection) were permissible under proper restrictions and for the purpose of advancing science and lessening human suffering, we need hardly say that the answer would be in the affirmative." It is asserted, however, that the practice of Vivisection and such investigations as are implied by this term, "have spread from the hands of the retired and sober man of matured science into those of every-day lecturers and their pupils"; and that such experiments "are a common mode of lecture illustration" . . .

"We will state our belief, that there is too much of it everywhere, and that there are daily occurring practices in the schools of France which cry aloud in the name both of honour and humanity for their immediate cessation. About two years ago, our Royal Society for Prevention of Cruelty to Animals became possessed of the knowledge that it was still the practice in the schools of Anatomy and Physiology in France for lecturers and demonstrators to tie down cats, dogs, rabbits, etc., before the class; to perform upon them operations of great pain, and to pursue investigations accompanied by most terrible torture. *This, too, for the purpose only of demonstrating certain facts which had been for long unhesitatingly admitted* and for giving a sort of meretricious air to a popular series of lectures. It learned, moreover, that at the Veterinary schools of Lyons and Alfort, live horses were periodically given up to a

group of students for anatomical and surgical purposes, often exercised with . . . extra refinements of cruelty." . . .

It appeared, that at Paris the whole neighbourhood adjoining the medical school—including patients in a maternity hospital, "were constantly disturbed when the course of physiology was proceeding at the school, by the howling and barking of the dogs, both night and day." The dogs were silenced. "The fact was the poor animals were now subjected to the painful operation of dividing the laryngeal nerves as preliminary to the performance of other mutilations! And what were these dogs for? Simply for the vain repetition of clap-trap experiments, by way of illustrations of lectures for first-year students! These facts becoming known, the general public has at length interfered, and we think, with very great propriety. *The entire picture of vivisectional illustration of ordinary lectures is to us personally repulsive in the extreme.* Look, for example, at the animal before us, stolen (to begin with) from his master; the poor creature hungry, tied up for days and nights, pining for his home, is at length brought into the theatre. As his crouching and feeble form is strapped upon the table, *he licks the very hand that ties him!* He struggles, but in vain, and uselessly expresses his fear and suffering until a muzzle is buckled on his jaws to stifle every sound. The scalpel penetrates his quivering flesh. One effort only is now natural until his powers are exhausted, a vain, instinctive resistance to the cruel form that stands over him, the impersonation of Magendie and his class. "I recall to mind," says Dr. Latour, "a poor dog, the roots of whose spinal nerves Magendie was about to expose. Twice did the dog, all bloody and mutilated, escape from his implacable knife, and twice did I see him put his fore-paws around Magendie's neck and lick his face! I confess,—laugh Messieurs les Vivisecteurs, if you please,—I confess I could not bear the sight."—But the whole thing is too horrible to dwell upon. Heaven forbid that any description of students in this country should be witness of such deeds as these! We repudiate the whole of this class of procedure. Science will refuse to recognize it as its offspring, and Humanity shudders as it gazes on its face."

BRITISH MEDICAL JOURNAL, AUG. 29, 1863.

"The atrocities of vivisection continue to occupy the attention of the Paris papers. The *Opinion Nationale* says: "The poor brutes' cries of pain sadden the wards of the clinic, rendering the sojourn there insupportable both to patients and nurses. Only imagine, that when a dog has not been killed at one sitting, and that enough life remains in him to experiment upon him in the following one, they put him back in the

kennel, all throbbing and palpitating! There the unhappy creatures, already torn by the scalpel, howl until the next day, in tones rendered hoarse and faint by another operation intended to deprive them of voice."

THE LONDON LANCET (EDITORIAL), AUG. 29, 1863.

" . . . As a general rule, neither our (British) students nor teachers are wont to carry on experiments upon living animals even in a private way. The utmost that can be said is that perhaps some two, or three, or at the most six, scientific men in London are known to be pursuing certain lines of investigation which require them occasionally during the year to employ living animals. . . . Whilst the schools of medicine in this country are, as a rule, not liable to the charge of vivisectional abuses as regards the higher animals, we cannot altogether acquit them from a rather reckless expenditure of the lives and feelings of cold-blooded creatures. . . . The reckless way in which we have seen this poor creature (the frog) cut, thrown and kicked about, has been sometimes sickening. . . . We cannot help feeling there is both *a bad moral discipline for the man*, as well as an amount of probable pain to the creature, in such a practice."

BRITISH MEDICAL JOURNAL (LEADING EDITORIAL), SEPT. 19, 1863.

" Our readers are aware that the French Minister of Commerce submitted to the Academy of Medicine documents supplied to him by a London society. . . . A committee of the Academy examined these questions and issued a report; but they did not answer the simple questions put to it. A discussion on the report has naturally taken place in the Academy itself, and has given rise to some very interesting remarks. M. Dubois . . . refused to draw up the report because he differed somewhat in opinion on the subject of vivisections from many of his associates. He therefore reserved the liberty of speaking his mind freely on the subject before the Academy. His conclusions are well worthy serious attention. They seem to us to contain all that can be rightly said in favour of vivisection and to put the matter on its true and proper footing. The greatest praise is due to M. Dubois for having had the courage to express his opinion so boldly and openly . . .

In the first part of his speech, M. Dubois demolished the work of the report, showing that it did not answer the questions of the government, and left things exactly in their previous state. He then proceeded to give his opinion as to what reforms should be made in the practice of vivisection. The greatest physiologists, he remarked, such as Harvey, Asselli, Haller, were parsimonious and discreet in their use of vivisection. To-

day we have before our eyes a very different spectacle. "Under pretence of experimentally demonstrating physiology, the professor no longer ascends the rostrum; he places himself before a vivisecting table; has live animals brought to him, and experiments. The habitual spectators at the *School of Medicine*, the *College of France* and *the Faculty of Sciences* know how experiments are made on the living flesh, how muscles are divided and cut, the nerves wrenched or dilacerated, the bones broken or methodically opened with gouge, mallet, saw, and pincers. Among other tortures there is that horrible one of the opening of the vertebral canal or of the spinal column to lay bare membranes and the substance of the marrow; *it is the sublime of horror.** One needs to have witnessed that sight thoroughly to comprehend the real sense of the word vivisection; whoever has not seen an animal under experiment *cannot form an idea of the habitual practices of the vivisectors.* M. Dubois drew an eloquent picture of these practices, become usual in the physiological amphitheatres in the midst of blood and of howls of pain, and he showed that under the dominant influence of the vivisectors, physiological instruction has gone out of its natural road. Himself an eminent pathologist, he treated without ceremony the unjustifiable pretensions of those innovators, who, regardless at once of the principles of physiology and those of pathology, try to transport clinical surgery to the table of vivisection.

M. Dubois, indeed, was so pungent in his censures that some of the Academicians left the hall without awaiting the end of his discourse. The veterinary part of his audience heard him to the end, and it is to be hoped, profited by the picture he drew of the sight that met his eyes on his first visit to Alfort. M. Renault, the director of the establishment, took M. Dubois into a vast hall where five or six horses were thrown down, each one surrounded by a group of pupils, either operating or waiting their turn to do so. Each group was of eight students, and matters were so arranged that each student could perform eight operations, so well graduated that although the sixty-four operations lasted ten hours, a horse could endure them all before being put to death. Although unwilling to hurt the feelings of his host, M. Dubois could not help letting slip the word "*atrocity.*" "Atrocities, if you please," replied M. Renault, "but they are necessary."—"What!" exclaimed M. Dubois,—"*sixty-four operations, and ten hours of suffering?*"—M. Renault ex-

* Reference was undoubtedly to Brown-Sequard, who probably inflicted more torment upon animals by his experiments on the spinal cord than any vivisector who ever lived. In 1864 he came to America and was made a professor in Harvard Medical School. His influence in that institution is still manifest.

plained to him that this was a question of finance; that if more money were allowed, the horses might be kept only three or four hours under the knife. M. Dubois stated that, it was true, fewer operations are now performed, and that horses are kept less time under the hands of experimenting students. But, he declared, he should never forget the sight he witnessed at Alfort. Some of the horses were just begun upon; others were already horribly mutilated; they did not cry out, but gave utterance to hollow moans. M. Dubois, supported by the authority of many veterinary surgeons, demands that these practices should be discontinued. Dr. Parchappe, who spoke afterward, agreed with M. Dubois. He said: " . . . Experiments on animals are in no way indispensable to completely efficacious instruction in physiology."

(The following were the resolutions proposed by M. Dubois as amendments to the report):

1. The Academy, without dwelling on the injurious form of the documents that have been submitted to it, acknowledges that abuses have been introduced into the practice of vivisection.

2. To prevent these abuses, the Academy expresses the wish that henceforward vivisection may be exclusively reserved to the research of new facts, or the verification of doubtful ones; and that consequently, they may no more be practised in the public or private courses of lectures for the demonstration of facts already established by science.

3. The Academy equally expresses the wish that the pupils at the schools of veterinary medicine may henceforward be exercised in the practice of operations on dead bodies, and no more on living horses."

The discussion on vivisection was concluded by the passage of a resolution . . . which leaves the matter where it was. "The Academy declares that the complaints brought forward by the Society for the Protection of Animals are without foundation; that no notice need be taken of them, and that the performance of vivisections and of surgical operations as practised in the veterinary schools, *should be left to the discretion of men of science.*"

Everyone who has followed this debate must be aware that the resolution is . . . entirely opposed to the facts elicited in the discussion. Almost every speaker, except the veterinaries, put in a protest, more or less strong, against the practice of surgical operations in veterinary schools, and again and again was the word "*atrocious*" applied to them. We learn, moreover, that this mode of instruction was adopted in 1761, so that for more than a century these "atrocious" operations have been practised on animals in French veterinary schools; and yet the Academy decides that complaints on this score are without foundation and that men of science in this matter need no interference! . . .

At all events, we may be sure that however much the Academicians may snub the affair, the discussion cannot fail to have beneficial results."

BRITISH MEDICAL JOURNAL (EDITORIAL), OCT. 10, 1863.

"M. Dubois has published a discourse . . . on the subject of vivisection in answer to objections made to the amendments proposed by him. It is a brilliant summary of the whole subject, and utterly condemnative of the amendments carried by the Academy. M. Dubois showed to demonstration that . . . physiological demonstrations on living animals in the public [Medical] schools *are utterly unjustifiable and a scandal to humanity. In all this, we most thoroughly agree with him.* He said:

"If we are to carry out the wishes of certain *savants*, we shall make every one of our professional chairs a scene of blood. . . . Let us tell the Minister that vivisections are necessary for the advancement of science, and that to suppress them would be to arrest the progress of physiology; but let us also say that *they are unnecessary in the teaching of this science and that recourse ought not to be had to them, either in public or private lectures.*"

BRITISH MEDICAL JOURNAL (EDITORIAL), JAN. 16, 1864.

"The conditions under which,—and under which alone,—vivisections may be justifiably performed seem to us to be clear, and easily stated. . . . We would say then, in the first place, that those experiments on living animals, and those alone are justifiable, which are performed for the purpose of elucidating obscure or unknown questions in physiology or pathology: that whenever any physiological or pathological fact has been distinctly and satisfactorily cleared up and settled, all further repetition of the experiments which were originally performed for its demonstration are unjustifiable; that they are needless torture inflicted on animals, being in fact, performed not for the purpose of elucidating unknown facts, *but to satisfy man's curiosity.* . . .

And in the second place, we would say that only those persons are justified in experimenting upon living animals who are capable experimentalists. . . . All experiments made by inexperienced and incapable observers are unjustifiable, and for an obvious reason. The pain in such case, suffered by the animal, is suffered in vain. . . . Pain so inflicted is manifest *cruelty.*"

BRITISH MEDICAL JOURNAL (EDITORIAL), JUNE 11, 1864.

"Far be it from us to patronize or palliate the infamous practices, the unjustifiable practices committed in French veterinary schools, and in many French Medical schools, in the matter of vivisection. We repudiate

as brutal and cruel all surgical operations performed on living animals. *We repudiate the repetition of all experiments on animals for the demonstration of any already well-determined physiological question.* We hold that no man except a skilled anatomist and a well-informed physiologist has a right to perform experiments on animals."*

In 1864, The Royal Society for the Prevention of Cruelty to Animals offered a prize for the best essay on these questions:

Is vivisection necessary or justifiable for purposes of giving dexterity to the operator (as in veterinary schools)?

Is it necessary or justifiable for the general purposes of science, and if so, under what limitations?

The committee which decided the merits of the essays submitted, included some of the most distinguished scientists of England, among them Professor Owen (better known as Sir Richard Owen), and Professor Carpenter, physiologists of eminence and experience. The first prize was accorded to Dr. George Fleming, the leading veterinary authority in Great Britain for many years, and a second prize was given to Dr. W. O. Markham, F.R.C.P., one of the physicians to St. Mary's Hospital of London, and formerly Lecturer on Physiology at St. Mary's Hospital Medical School.

Dr. Fleming's essay was undoubtedly of great utility in calling attention to the abuses pertaining to Continental physiological teaching. That which makes his essay of chief value is not so much the presentation of arguments, as the long array of unquestionable facts for which the authorities are given. There is hardly a physiological writer of distinction, from whose works he did not quote to illustrate the excesses he condemns.

It is Dr. Markham's essay, however, which for us, at the

* The writer then defends vivisections made by skilled men in way of original research.

present moment, has principal significance. It is the argument of a professional physiologist, defending the right of scientific research within limits which then seemed just and right to the entire medical profession of the United Kingdom. Every physiologist or physician upon that committee which examined the essays, is said to have marked with approval this presentation of their views; and Professor Owen,—(probably then the most distinguished man of science in Great Britain)—appended a note significant of his especial agreement. And yet Dr. Markham's essay is never quoted at the present day by any advocate of free vivisection.

The reader of Dr. Markham's essay will not find it difficult to comprehend the cause of this significant silence. Although the essay was in no way sympathetic with anti-vivisection, it represented the Anglo-Saxon ideal in marked distinction from the doctrines which then prevailed in the laboratories of Continental Europe, and which since have become dominant throughout the United States. Defending the practice of vivisection as a scientific method, Dr. Markham freely admitted the prevalence of abuses to which it was liable when carried on without regulation or restraint. Under proper limitations, it was at present necessary that some vivisection should be allowed; but with the advance of knowledge, he believed that this necessity would decrease, and the practice of animal experimentation gradually tend to disappear. Some quotations from this essay will be of interest.

"The proper and only object of all justifiable experiments on animals is to determine unknown facts in physiology, pathology and therapeutics, whereby medical science may be directly or indirectly advanced. When, therefore, any fact of this kind has been once determined and positively acquired to science, all repetition of experiments for its further demonstration are unnecessary and therefore unjustifiable.

All experiments, therefore, performed before students, in classes or

otherwise, for the purpose of demonstrating known facts in physiology or therapeutics are unjustifiable. And they are especially unjustifiable because they are performed before those who, being mere students, are incapable of fully comprehending their value and meaning. *They are needless and cruel;* needless, because they demonstrate what is already acquired to science and especially cruel, because if admitted as a recognized part of students' instruction, *their constant and continued repetition, through all time, would be required.* I need hardly say that courses of experimental physiology are nowhere given in this country, and that these remarks apply only to those schools in France and elsewhere, where demonstrations of this kind are delivered."*

"Especially cruel!" Little could Dr. Markham have imagined that this "especial cruelty" which he thus so emphatically denounced in 1864, would spread from the Continent of Europe, and become, within the short space of a single generation, the accepted method of physiological instruction in Great Britain and America.

Dr. Markham evidently fancied that with the larger acquirement of facts, the vivisection method would gradually become obsolete. He says:

"A consideration of the conditions here proposed as requisite for the rightful performance of experiments on living animals, shows that experiments of this kind must ever be very limited, because those persons who are fitted for the due performance of them are of necessity few in number; and that in proportion as new facts are added by them to our knowledge, *the experiments must diminish in number.*" . . .†

"Thus, then, we have seen, that in the case of experiments legitimately performed on living animals, . . . such experiments must always, from their nature, be comparatively few; that they must gradually diminish with the advance of scientific knowledge, so that *a time may come when experiments on living animals will cease to be justifiable.*"‡

. . . Very different, on the other hand, is the character and objects of physiological demonstrations performed in French Schools of Medicine. . . . These most painful practices are unjustifiable because they are

* Experiments and Surgical Operations on Living Animals: One of two Prize Essays. London. Robert Hardwick, 1866.

† Op. cit., p. 102.

‡ Op. cit., p. 106.

unnecessary. . . . They afford no instruction to the student which may not be equally well obtained in another way. The pain, moreover, attendant on such proceedings is unlimited and unceasing. If they are to be accepted as a necessary part of the systematic instruction of the student, then must every veterinary student practise these experimental surgical operations, *and every medical student be made a witness of physiological demonstrations on living animals.* In all veterinary schools, under such conditions, an incalculable amount of pain inflicted an animals becomes a part of the regular instruction of students. At such a conclusion, Humanity revolts."*

"Experiments performed on living animals for the demonstrations of facts already positively acquired to science, are unjustifiable; and especially unjustifiable are such experiments, when made a part of a systematic course of instruction given to students."

Here then, we have a view of vivisection, presented forty years since by a professional teacher of physiology in a London medical school. That the author was mistaken in his outlook, that the practice of vivisection instead of diminishing, has a thousand times increased, and that operations then regarded as "especially cruel" have become the prevalent methods of instruction, are matters evident to all. Peculiarly significant is the fact that a creed, once almost universally held, may be so thoroughly obliterated by its antagonists within so brief a time. One may safely assert that not one young physician or surgeon in England or America, not a single student of physiology in any institution of learning to-day, has ever been told that the practice of animal experimentation was once thus regarded by a large majority of the English-speaking members of the medical profession. So completely has the Continental view of the moral irresponsibility of science established itself in England and America, that the former preponderance of other ideals has passed from the memory of the present generation of scientific men.

The subject of vivisection does not again appear to have

* Op. cit., pp. 106-107.

engaged the attention of the English medical press for several years. The abuses and cruelties on the Continent, against which it had so vigorously protested, continued as before. In a brief editorial, the London *Lancet*, during 1869, again referred to the subject:

"VIVISECTION. The subject of vivisection has been again brought on the *tapis*, owing to some remarks made by Prof. (Claude) Bernard . . . at the *College de France* . . . He admits on one occasion having operated on an ape, but never repeated the experiment, *the cries and gestures of the animal too closely resembling those of a man.*

As the *Pall Mall Gazette* remarks, M. (Claude) Bernard expatiates on the subject with a complacency which reminds us of Peter the Great, who wishing, while at Stockholm, to see the *wheel* in action, quietly offered one of his suite as the patient to be broken on it . . .

We consider that vivisection constitutes a legitimate mode of inquiry when it is adopted to obtain a satisfactory solution of a question that has been fairly discussed, and can be solved by no other means . . .

We hold that for mere purposes of curiosity, *or to exhibit to a class* what may be rendered equally—if not more—intelligible by diagrams or may be ascertained by anatomical investigation or induction, *vivisection is wholly indefensible*, and *is alike alien to the feelings and humanity of the Christian, the gentleman and the physician.*"*

At the annual meeting of the British Association for the Advancement of Science, which convened in September, 1870, a significant resolution was offered. It authorized the appointment of a committee who were requested

"to consider from time to time, whether any steps can be taken by them, or by this ASSOCIATION, which will tend to reduce to its minimum the suffering entailed by legitimate physiological inquiries; or any which will have the effect of employing the influence of this ASSOCIATION in the discouragement of experiments which are not clearly legitimate, on living animals."†

The resolution was carried "by a large majority." It undoubtedly was presented by some one aware of the extent to which the practice was secretly increasing in Great

* The Lancet (Editorial), April 3, 1869.

† The Medical Times and Gazette, London, Sept. 24, 1870.

Britain. One may question, nevertheless, whether it prevented a single experiment, "not clearly legitimate," which any physiologist desired to perform.

For the hour was approaching when all England was to be aroused, not as before, with indignation concerning atrocities in Paris or Alfort, but with well-founded fear of the introduction of Continental vivisection on British soil. On January 7, 1871,—the first week of the new decade,—a leading medical journal began the report of a course of lectures delivered "in the Physiological Laboratory of University College" in London, and illustrated by the vivisection of animals. During one of these discourses, the lecturer, a professor of physiology, Dr. J. Burdon Sanderson, made the following statement of his views:

"With respect to what are called vivisections, I assure you that I have as great a horror of them as any member of the Society for the Prevention of Cruelty to Animals. The rules in respect to them are these: First, no experiment that can be done under the influence of an anæsthetic, ought to be done without it. Secondly, no *painful* experiment is justifiable for the mere purpose of illustrating a law or fact already demonstrated. Thirdly, whenever for the investigation of new truth, it is necessary to make a painful experiment, every effort should be made to insure success, in order that the suffering inflicted may not be wasted. For the question of cruelty depends not on the amount of suffering, but on its relation to the good to be attained by it."*

The lecturer contended that no experiment should be performed by an unskilled person with insufficient instruments, and argued, therefore, in favour of the establishment of Physiological Laboratories, equipped with all modern devices and instruments for vivisection.

Some of his demonstrations were doubtless unproductive of pain, but in view of the fact that in other experiments no anæsthetic was employed, it may be questioned whether his second "rule" was always very strictly observed. In one

* Medical Times and Gazette, Feb. 25, 1871.

lecture, he referred to his demonstration "as the first time that we have applied electrical stimulus to a nerve," and explains that when the experiment is made on an animal paralyzed with *curare*, the effect is more complicated when a sensory nerve is irritated, since then "the arteries all over the body contract, because the brain is in action."* No plainer confession of the existence of sensibility could be made, yet for obvious reasons, the lecturer carefully avoids admitting the presence of pain. During the following year there appeared articles describing "the teaching of practical physiology in the London schools." At King's College in London, for example, demonstrations were made by the lecturer, but "experiments on animals are never given to the ordinary student to do; Professor Rutherford's experience on this point is that such attempts result only in total failure."† On the other hand, at University College, the Continental method of teaching was to be found. "Students perform experiments on animals. Frogs, *curarized* or chloroformed, are given them, and the experiment which has been fully explained and demonstrated by the professor, is performed by them as far as practicable."‡ Here, then, we find introduced into England (and perhaps there existing in secret for some time before), that vivisection of animals in illustration of well-known facts, which, but a few years earlier, every leading medical journal of Great Britain had so emphatically reprobated and denounced.

The Continental school of English physiologists seemed confident of victory. But the leading exponents of English ideals in medicine were not inclined to surrender at once; now and then we find them vigorously maintaining their ground, and disposed to contrast the science gained in the

* Medical Times and Gazette, June 17, 1871.

† Medical Times and Gazette, July 20, 1872.

‡ Medical Times and Gazette, July 27, 1872.

laboratory with that gathered by experience and fortified by reflection. Some extracts from a leading editorial in the *Medical Times and Gazette* are extremely suggestive of the conflict of opinions:

"The relation of physiology to practical medicine is a subject which has been brought prominently into notice by the address of Dr. Burdon Sanderson . . . at the recent meeting of the British Association. That address may be considered as the first authoritative and public announcement made in this country that *it is the aim and intention of the Physiological school of thought* and work to separate themselves more and more from the school of practical Medicine; no longer to consider themselves auxiliary to it except as other sciences,—for instance, chemistry and botany—may be considered auxiliary to it, but to win a place in public estimation for their science as one which shall be cultivated *for its own sake*. . . .

The teaching of experience is more reliable than physiological theories and opinions. . . . The history of the advance of the cure of disease is the history of empiricism, in the best sense of that much-abused word. The history of retrogression in the art of curing disease is that of so-called Physiological Schools of Medicine. . . . Physiological theory, based on experiments on dogs, wishes us to believe that mercury does not excite a flow of bile; but here, the common-sense of the Profession, educated by experience, has refused to be led by physiological theory. . . . Modern physiological science has taught us little more than the necessity of pure air, water and food, good clothing and shelter, moderation in eating and drinking, and regulation of the passions,—things in fact which are as old as the Pentateuch. If we go beyond these we get into the domain of practical medicine. We may safely assert, that all the experiments made on luckless animals since the time of Magendie to the present, in France, America, Germany and England, have not prolonged one tithe of human life, or diminished one tithe of the human suffering that have been prolonged and diminished by the discovery and use of Jesuits' bark and cod-liver oil."*

Early the next year (1873), was published the "Handbook of the Physiological Laboratory," compiled by leading men of the physiological party, among whom were Professors Sanderson, Foster and Klein. Describing the method of performing various experiments upon animals,

* Medical Times and Gazette (Editorial), September 7, 1872.

it included a particular account of some of the most excruciatingly painful of the vivisections practised abroad. So atrocious was one of the experiments thus described in this hand-book for students, that Prof. Michael Foster, who wrote the description, afterwards confessed that he had never seen or performed the experiment himself, partly "from horror of the pain." Reviewing the work, a medical journal justly declared that "the publication of this book marks an era in the history of Physiology in England. . . . It shows *the predominant influence which Germany now exercises in this department of science.*"* A professor of physiology, Dr. Gamgee, about the same time refers to the physiological laboratories of Edinburgh, Cambridge and London, and the part they sustained "in what I may call —the Revival of the study of experimental physiology in England."†

Emboldened by continuing success, the advocates of Continental vivisection in England determined to advance yet another step. The annual meeting of the British Medical Association for 1874 was to be held that year in August, in the city of Norwich. A French vivisector, Dr. Magnan, was invited to be present, and to perform in the presence of English medical men, certain experiments upon dogs. On this occasion, however, the public demonstration of French methods of vivisection did not pass without protest; there was a scene; some of the physicians present,—among them Dr. Tufnell, the President of the Royal College of Surgeons of Ireland, and Dr. Haughton, Dublin, denounced the experiments at the time they were made as unjustifiably cruel. Public attention was beginning to be aroused; it was decided to test the question whether such exhibitions were protected by English law, and a prosecution was instituted

* Medical Times and Gazette, London, March 29, 1873.

† Medical Times and Gazette, London, October 18, 1873.

against some who had assisted in performing the experiments. Dr. Tufnell appeared to testify in regard to the cruelty of the exhibition, and Sir William Fergusson, surgeon to the Queen, who had only just retired from the presidency of the British Medical Association, not only stigmatized one of the experiments as "an act of cruelty," but declared that "such experiments would not be of the smallest possible benefit.* The magistrates decided that while the case was a very proper one to prosecute, yet the gentlemen named as defendants were not sufficiently proven to have taken part in the experiment. The decision was not unjust; the real offender was safe in his native land.

It is not my purpose to trace the course of the English agitation against vivisection, except as it may be seen in the medical literature of the time. Three parties opposed one another: first, the anti-vivisectionists, who called for the total suppression by law of all animal experimentation; second, the physiological enthusiasts, few in number, but favourable to the introduction of the Continental irresponsibility, and eager to free vivisection from every semblance of restraint; and thirdly, the great body of Englishmen and of the medical profession, whose views we have seen reflected in medical journals of the day. The popular attack upon all animal experimentation became so pressing, that for a time the entire medical profession seemed to unite in its defence; and editorial space once filled with denunciation of vivisection in France was now given over to criticism of the anti-vivisectionists of England. Yet, even at this period, there appeared no repudiation of those humane principles, so long professed by English medical men. One leading journal, the *Medical Times and Gazette*, thus suggests that very oversight of vivisection which Pre-

* British Medical Journal, December 12, 1874.

sident Eliot of Harvard University tells us cannot be made:

"Just as the law demands that a teacher of anatomy should take out a license, and be responsible for the bodies entrusted to him, so a teacher of physiology might be required to take out some such license as regards the teaching of practical physiology. We have never been of those who advocate the wholesale performance of experiments by students, especially on the higher animals, if they are of such a kind as to require any degree of skill for their performance. When the medical public seemed bitten with what was called "practical physiology," many were ready to advocate the performance of all kinds of experiments on living animals by uninstructed students. Against this notion, we were first to protest, as being at once cruel and worse than useless; for an experiment performed by bungling fingers is no experiment at all, but wanton cruelty."

After explaining his position in favour of scientific research, the editor refers to a recent discussion on vivisection in London.

" Dr. Walker declared that his desire was not to stop scientific research, but the abuses which were connected with it. In the first place he would not allow vivisection to be practised by incompetent students. This was nothing but wanton and unrighteous cruelty. *Therefore he would oblige each vivisector to obtain legal permission from competent authority.* Another abuse related to operations performed merely to demonstrate physiological phenomena already verified and established. Again, the number of animals vivisected was shamefully high. Persons unacquainted with physiological laboratories could form no idea of the lavish way in which animals were made to suffer days and weeks of anguish and acute pain. If the people knew of these sufferings, they would insist that the number of animals annually vivisected should be limited; and that no animal rearing its young, should be experimented upon. Nor should it be allowable to operate on an animal more than once. . . . Lastly, every licensed vivisector should be obliged to send in an annual return, showing the number of vivisections performed, and the scientific results attained, which would prevent repeated operations with the same object. Nothing in any of these proposals, urged Dr. Walker, could interfere with the progress of science; they would simply stop the abuses which existed."*

In January, 1875, we find the London *Lancet* also suggesting legal supervision and restriction:

"We are utterly opposed to all repetition of experiments for the purpose

* Medical Times and Gazette, London (Editorial), June 27, 1874.

of demonstrating established doctrines. . . . We believe an attempt might be made to institute something in the way of regulation and supervision. *It would not be difficult, for example, to impose such restrictions on the practice of these experiments* as would effectually guard against their being undertaken by any but skilled persons, for adequate scientific objects.''*

A month later the *Lancet* devotes its leading editorial to a discussion of the ethics of vivisection. After criticizing the position taken by the anti-vivisectionists, the writer says:

"On the other side, the discussion has been conducted as if it concerned physiologists alone, who were to be a law unto themselves and each to do what might seem right in his own eyes; that the matter was one into which outsiders had no right whatever to intrude; in fact, that '*whatever is, is right*,' and so unquestionably right as to stand in no need of investigation or restriction. We have, from the first, striven to take a middle course, not because it was safe, but because it seemed to us the sound and true one. Without disguising the difficulties, we have nevertheless expressed our conviction that the subject was one about which it was impossible not to feel a sense of responsibility, and a desire to ascertain whether the line between necessary and unnecessary could be defined; and whether any attempt could be made to institute something in the way of regulation, supervision, or restriction, so as to secure that, while the ends of science were not defeated, the broad principles of Humanity and duty to the lower animals were observed. Animals have their rights every bit as much as man has his. . . ."

Admitting the probable necessity of some repetition of experiments in research, the writer continues:

It is for the purposes of instruction, however, that it becomes questionable, whether and to what extent experiments of this kind should be performed. A chemical lecturer teaches well, in proportion to the clearness with which he can demonstrate the correctness of his statements by experiment; and there is no doubt it is the same with a lecturer on physiology. Some persons seem to regard the advance of knowledge as the whole duty of man, and they would, perhaps, consider experimentation as justifiable in the one case as in the other. We cannot so regard it, for the simple and sufficient reason (as it seems to us) that the element of Life and Sensibility being present in the one case and not in the other, carries a responsibility with it. We contend that in any case

* The Lancet, London (Editorial), January 2, 1875.

where certain phenomena are known to follow a given experiment; when the fact has been established by the separate and independent observation of many different persons, a lecturer is not justified in resorting to it *for the purpose of mere demonstration where its performance involved suffering to the animal.*"*

It is an instructive and interesting fact that one of the first steps toward the legal regulation of vivisection in England was taken by scientific men. The *Lancet* of May 8, 1875, contains the following paragraph:

"Some eminent naturalists and physiologists, including Mr. Charles Darwin, Professor Huxley, Dr. Sharpey and others have been in communication with members of both Houses of Parliament to arrange terms of a Bill which would prevent any unnecessary cruelty or abuse in experiments made on living animals for purposes of scientific discovery. It is understood that these negotiations have been successful and that the Bill is likely to be taken charge of by Lord Cardwell in the House of Lords, and by Dr. Lyon Playfair in the House of Commons."

A week later, the *Lancet* gives an outline of the proposed Act:

DR. LYON PLAYFAIR'S VIVISECTION BILL.

"The Bill introduced by Dr. Lyon Playfair, Mr. Spencer Walpole and Mr. Evelyn Ashley, '*To Prevent Abuse and Cruelty in Experiments on Animals, made for the purpose of Scientific Discovery*' has been printed. It proposes to enact that painful experiments on living animals for scientific purposes shall be permissible on the following conditions:—

"That the animal shall first have been made insensible by the administration of anæsthetics or otherwise, during the whole course of such experiment; and that if the nature of the experiment be such as to seriously injure the animal, so as to cause it after suffering, the animal shall be killed immediately on the termination of the experiment.

Experiments without the use of anæsthetics are also to be permissible provided the following conditions are complied with: That the experiment is made for the purpose of new scientific discovery and for no other purpose; and that insensibility cannot be produced without necessarily frustrating the object of the experiment; and that the animal should not be subject to any pain which is not necessary for the purpose of the experiment; and that the experiment be brought to an end as

* The London Lancet, Feb. 6, 1875.

soon as practicable; and that if the nature of the experiment be such as to seriously injure the animal so as to cause it after suffering, the animal shall be killed immediately on the termination of the experiment.

That a register of all experiments made without the use of anæsthetics shall be duly kept, and be returned in such form and at such times as one of Her Majesty's principal Secretaries of State may direct.

The Secretary of State is to be empowered to grant licenses to persons provided with certificates signed by at least one of the following persons: the President of the Royal Society, the President of the Royal College of Surgeons or of the Colleges of Physicians in London, Edinburgh or Dublin, and also by a recognized professor of physiology, medicine or anatomy."*

The Bill, though introduced in Parliament, was not pressed. Another, and more stringent measure for the regulation of vivisection had been introduced a few days earlier, through the efforts of Miss Frances Power Cobbe and the Earl of Shaftesbury. In the conflict of opposing statements and opinions, the Government wisely concluded that more light on the subject was necessary, and a Royal Commission was appointed to investigate and report.

But if the Continental party was to conquer in England, its members undoubtedly felt that it must be through audacity quite as much as by silence and secrecy. At the annual meeting of the British Medical Association, therefore, Prof. William Rutherford delivered an address, wherein for the second time an English physiologist openly advocated the vivisection of animals as a method of teaching well-known facts. Commenting upon this address the editor of the *Lancet* remarks:

"We confess that we think Dr. Rutherford presses his principle too far when he argues that,—teaching by demonstration being the most successful method,—we are thereby always warranted in having recourse

* The Lancet, May 15, 1875. It is evident, however, from Prof. Huxley's letters, that he did not approve the clause of this Bill confining vivisection solely to original research, but favoured also painless demonstrations.

to it. Physiology and Chemistry are both experimental sciences. The chemical lecturer can have no hesitation in employing any number of experiments, or repeating them indefinitely to illustrate every step he takes; but we may fairly assume that the physiologist would be restrained by the thought that the materials with which he has to deal are not so much inert, lifeless matter, but sentient, living things. We hold, therefore, that it would be both unnecessary and cruel to demonstrate every physiological truth by experiment, or to repeat indefinitely the same experiment, simply because by such demonstrations the lecturer could make his teaching more definite, precise and valuable."*

Again, somewhat later, the same journal brings into prominence one of the greatest difficulties attending all discussion of vivisection,—the lack of agreement upon the meaning of words:

"It is extremely difficult to get at the exact meaning of the terms used. The physiologist would be ready to declare his utter abhorrence of all "cruelty," *but then he would have his own definition of the word.* We hope Sir William Thompson was not justified in stating that revolting cruelties are sometimes practised in this country, in the name of Vivisection, although we may concur with him in reprehending the performance of experiments on animals in illustration of truths already ascertained. . . . When the Cardinal (Manning) laid it down as the expression of a great moral obligation that we had no right to inflict *needless* pain, he begged the whole question. By all means, lay down and enforce any restriction that will prevent the infliction of *needless* pain."†

We see how valueless, therefore, is the assertion, so frequently made, in this country, that "no *needless* pain is ever inflicted." The physiologist has his own interpretation of the word.

The testimony given before the Royal Commission was of the utmost value. Leading members of the medical profession, such as Sir Thomas Watson, physician to the Queen, and Sir William Fergusson, surgeon to the Queen, gave evidence against the unrestricted practice of animal

* The Lancet, London (Editorial), Aug. 21, 1875.

† The Lancet, London (Editorial), March 25, 1876.

experimentation. Physiologists after the Continental school stated their side of the controversy, usually, with significant caution, but one of them, Dr. Emanuel Klein, with an honest frankness of confession that astounded his friends, and made him for ever famous in the history of the vivisection controversy. It is hardly accurate to say that no cruelty was uncovered by the Royal Commission. Everything depends on the meaning of words; but the evidence of Dr. Klein, who, in the closing quarter of the nineteenth century, was one of the most noted physiologists in England, as to his own personal practices in vivisection, was quite sufficient to justify the legislation that ensued.* How seriously Dr. Klein's evidence was regarded at the time, is clearly shown in an extract from a confidential letter of Prof. Huxley to Mr. Darwin, dated Oct. 30, 1875:

"This Commission is playing the deuce with me. I have felt it my duty to act as counsel for Science, and was well satisfied with the way things are going. But on Thursday, when I was absent,———— was examined; and if what I hear is a correct account of the evidence he gave, I may as well throw up my brief. I am told he openly professed the most entire indifference to animal suffering, and he only gave anæsthetics to keep the animals quiet!

I declare to you, I did not believe the man lived, who was such an unmitigated, cynical brute as to profess and act upon such principles; and I would willingly agree to any law that would send him to the treadmill.

The impression his evidence made on Cardwell and Foster is profound; and I am powerless (even if I desire, which I have not), to combat it."†

The result of the Commission's report was the introduction by the Government of a bill placing animal experi-

* For an extract from Dr. Klein's testimony, see page 174.

† Huxley's Life and Letters, Vol. I, p. 473. This characterization of Dr. Klein seems by no means fair, and probably, it would have been so regarded by the writer in calmer moments. Is indignation chiefly directed to the "indifference to animal suffering," or to the "*open profession*" of the feeling? For men, perfectly familiar with Continental indifference, to condemn with holy horror a young physiologist because he "openly professes" the generally prevalent sentiment of his class, is very suggestive.

mentation in Great Britain under legal supervision and control. As first drawn up, it appears to have been regarded by the medical profession as unduly stringent and unfair. Protests were made; amendments of certain of its provisions were requested; concessions were granted; and at the close of the Parliamentary session, Aug. 15, 1876, the practice of vivisection,—like the study of human anatomy by dissection,—came under the supervision of English law.

It is curious to observe how those who had vehemently opposed the Act, were able to approve it when once the law was in operation, and criticism could no longer serve any purpose of delay. The *British Medical Journal* of Aug. 19, 1876, announcing to its readers the passage of the Bill, says:

"Taking the measure altogether, we think the Profession may be congratulated on its having passed. . . . So far, the Act facilitates the prosecution of science by competent persons, while it protects animals from the cruelty which might be inflicted by ignorant and unskilful hands. *The act is a great step in advance, toward promoting kindness to animals generally.* . . ."

The *Medical Times and Gazette* also regained its equanimity, and an editorial referring to the Act admits that "the Profession may regard it without much dissatisfaction."* There are even advantages to be discerned:

"It gives scientific inquirers the protection of the law; it protects animals from cruelties which might be inflicted by unscientific and unskilled persons, and it satisfies to a great extent a demand made by a hypersensitive . . . portion of the public."

Nor did further experience with the working of the Act appear greatly to disturb this favourable impression. For instance, after the law had been in operation nearly three years, the London *Lancet* editorially remarked:

* December 30, 1876.

"There is no reason to regret the Act of 1876 which limits vivisection, except on the ground that it places the interests of science at the arbitration of a lay authority. . . . *Meanwhile, the Act works well, and fulfils its purpose.*"*

There can be no doubt, however, that the law has always been regarded with marked disfavour by the extreme vivisectionists of Great Britain. They had planned, as we can see, to introduce in the United Kingdom the freedom of vivisection which obtained on the Continent. They had failed; and instead of liberty to imitate Bernard, Magendie, and Brown-Sequard, they saw between them and the absolute power they had craved and dreamed of obtaining, —the majesty of English law. Among American representatives of the same school,—the strenuous opponents of all legal supervision,—it has been the fashion on every possible occasion to cast discredit upon this Act. For obvious reasons, they have sought to represent it to the American public as having proven a serious detriment to medical science, and an obstruction to medical advancement. The idea is absurd; English physicians and surgeons are as well educated and equipped in every respect as the graduates from American schools; nor has the freedom of unlimited vivisection in all the laboratories of the United States during the past thirty years, yet resulted in a single discovery of generally admitted value in the treatment of disease.

But it was not only among the advocates of Continental freedom that the English law found determined enemies; by the anti-vivisection party in Great Britain the passage of the Bill was viewed with distrust, and now for more than a quarter of a century, these opponents have strenuously and consistently worked for its amendment or repeal. Their aim has not been realized; and yet by fixing public atten-

* The Lancet, July 19, 1879.

tion upon its defects,—upon the lax and inadequate supervision of laboratories, for example, or the ease with which the legal requirements concerning use of anæsthetics may be evaded by unscrupulous men,—they have performed a service of great value in the promotion of reform. No one claims that the Act is a perfect measure. Possibly, along certain lines, and in non-essential details, it might, without detriment, be more liberally construed in the interests of science; on the other hand, it seems certain that in other directions, the law needs far more careful administration in the interests of the sentient beings it aims to protect. But whatever be its defects, it cannot be doubted that the Act of 1876, legally regulating the practice of vivisection, constitutes a vast improvement upon the unbridled license which elsewhere prevails in Europe and America; that it acts as a check to the indifferent and the cruel, that it stands on the Statute-book, a monument to the humane sentiment of the English people. It is true that the advocates of Continental vivisection have gained ground during the past quarter of a century. The Continental ideal of scientific irresponsibility is probably held to-day, by a large majority of the younger members of the present generation of scientific teachers. Is it, then, to be the final conclusion of the English-speaking world? We do not believe it. A change will come. To the medical profession, humanity owes the first exposure of the horrors of animal vivisection, the first protest against their atrocity. If the old ideals seem now to be forgotten, we know that they are not dead; and we believe that some day they will awaken to inspire the world.

*THE VIVISECTION PROBLEM.**

A REPLY TO DR. CHARLES S. MYERS.

(Of Gonville and Caius Colleges, University of Cambridge).

The defence of the practice of vivisection which appears in the INTERNATIONAL JOURNAL OF ETHICS for April, 1904, suggests conclusions with which some of its readers are not inclined to agree. By a process of reasoning, based, we think, upon an imperfect acquaintance with the facts, the writer has apparently come to believe that animal experimentation is so carefully and humanely carried on, so free from all abuse and so productive of benefit to humanity that it should be permitted to continue, untouched by the criticism of the "sentimentalist" and unhindered by restriction or restraint. What defects are to be found in Mr. Myers' line of reasoning? Why do arguments, such as those which he has so ably presented, fail to convince some whose regard for the progress of science is as genuine as his own? Against the suggestion or claim that vivisection is, in effect, altogether right, how is it that some intelligent men believe that certain phases of the practice are unjustifiable and wrong? Within the limits of a brief paper it is, of course, impossible to bring forward all the reasons for dissent; but some outline may be given, sufficient to define the differing standpoint of those who believe that without definite limitations, the practice of vivisection is sometimes carried to an extent which is not ethically just.

* From the INTERNATIONAL JOURNAL OF ETHICS, January, 1905.

Is vivisection ever painful? Does it sometimes imply prolonged agony? This seems to us a matter of no little importance. We think that the decision regarding the morality of the practice rests almost entirely upon the answer to this one question. Could it be demonstrated beyond doubt that a dog undergoing vivisection suffers no more of what we call pain, than a tuft of grass torn out by its roots, or a flower pulled to pieces, the justifiability of animal vivisection would be assured. The impeachment of unlimited vivisection rests wholly upon the conviction that in some of its phases it is productive of agony. A few years ago hardly anybody in the medical profession questioned the fact. To-day, nearly every apologist for the method, attempts, as Mr. Myers has done, to show the absence of any great degree of discomfort. Every effort, he assures us, is made to diminish pain; "an anæsthetic is always administered"; the pain of certain inoculations is but that of a needle-prick; and even the cries and contortions of a vivisected creature are to be regarded for the most part, as an illusion. "When an animal manifests the appropriate signs, the sentimentalist at once leaps to the conclusion that the behaviour that he observed in others implies the presence of the same state of feelings in them as would induce the same behaviour in himself." But this, Mr. Myers assures us, is an error of the kind known as the "psychologist's fallacy"; we really know nothing about it. "Considerations of this kind only show what control the layman should exercise over the springs of his natural pity, when he reads of seemingly painful, but really painless experiments upon the internal organs of living animals." That during such operations (which, by the way, are sometimes extended over weeks and months) the animals are put under the influence of an anæsthetic; that in England this is demanded by law, that in other countries it is the

voluntary custom of physiologists—all this he most confidently and fervently seems to believe. It is not denied that occasionally some pain may ensue; but to Mr. Myers, this apparently seems of such a trifling character that he passes it without criticism. That the pain inflicted in vivisection ever amounts to torture, is not once admitted or implied.

Now we are far from being satisfied with the comfortable conclusions which Mr. Myers has apparently reached, and which he desires to impress upon his readers. He tells us at the outset that he is not a practical vivisector; and his statements regarding the practice must therefore rest upon the exculpatory assertions of the very persons against whom the charge of inhumanity has been made. Do all of these persons invariably tell us *the whole truth* about a practice whereby they earn their daily bread? Is it in accord with what Mr. Gladstone happily designated "the delicate sense of the reasonableness of things" that some of the men charged with cruelty should not attempt to defend themselves by distorting the truth? It seems to us that, while the statements of experimenters are entitled to all consideration which character and motives imply, a little hesitancy in granting absolute faith may be excusable; and that "laymen and sentimentalists" have some reason to doubt. That vivisected animals sometimes suffer, is a charge that rests wholly upon the evidence of men who are neither "sentimentalists" nor "laymen," but members of the medical profession. Speaking before the British Medical Association at its annual meeting in 1899, the President of one of the sections, Dr. George Wilson, LL.D., made this remarkable charge:

"I boldly say there should be some pause in these ruthless lines of experimentation. . . . I have not allied myself to the anti-vivisectionists, but *I accuse my profession of misleading the public as to the*

cruelties and horrors which are perpetrated on animal life. When it is stated that the actual pain involved in these experiments is commonly of the most trifling description, there is a suppression of the truth, of the most palpable kind. . . . The cruelty does not lie in the operation itself, which is permitted to be performed without anæsthetics, but in the after effects. *Whether so-called toxins are injected under the skin into the peritoneum, into the cranium, under the dura mater, into the pleural cavity, into the veins, eyes, or other organs—and all these methods are ruthlessly practised—there is long-drawn-out agony. The animal so innocently operated on may have to live days, weeks, or months, with no anæsthetic to assuage its sufferings, and nothing but death to relieve.*" [Italics ours.]

And yet Mr. Myers would have us believe that even in these experiments the pain "cannot exceed that of a poisoned rat or mouse." How does he know? Do poisoned rats and mice live in agony "for days, weeks, or months"?

Take another medical witness. In his presidential address before the American Academy of Medicine, Dr. Theophilus Parvin, LL.D., a professor of Jefferson Medical College in Philadelphia, protested warmly against the cruelty of certain vivisectors. There were men, he declared, both in America and Europe, "who seem, seeking useless knowledge, to be blind to the writhing agony, and deaf to the cry of pain of their victims, and who have been guilty of the most damnable cruelties, without the denunciation by the public and the profession that their wickedness deserves." Is not this remarkable language, coming—not from a "layman,"—but a professor in a leading medical college, regarding a practice wherein Mr. Myers finds nothing worthy of criticism? It was no sentimentalist, but rather one of the most distinguished surgeons that America ever produced, and for many years a professor in Harvard Medical School—Dr. Henry J. Bigelow, LL.D., who in a paper read before the Massachusetts Medical Society, protested against "*the cold-blooded cruelties* now more and more practised under the authority of science," producing

results which he declared were "contemptible, compared with the price paid in agony and torture." Elsewhere the same eminent medical authority says:

> The ground for public supervision is that vivisection immeasurably beyond any other pursuit, *involves the infliction of torture to little or no purpose.* Motive apart, painful vivisection differs from that usual cruelty of which the law takes absolute cognisance, mainly in being practised by an educated class, who, having once become callous to its objectionable features, *find its pursuit an interesting occupation under the name of Science.* . . .
>
> "*The law should interfere.* There can be no doubt that in this relation there exists a case of cruelty to animals far transcending in its refinement and in its horror anything that has been known in the history of nations.
>
> "There will come a time when the world will look back to modern vivisection in the name of Science as it now does to burning at the stake in the name of religion." [Italics ours.]

Quotations like these, from the writings of medical men might be indefinitely multiplied. They are the utterances not merely of physicians, but of medical professors familiar with what goes on about them. We cannot afford to dismiss them with a shrug and a sneer. If their tones seem more resonant than those of the majority in their profession, it may be because success and assured eminence have gained for them the inestimable privilege of absolute fearlessness regarding the criticism of lesser men. But of the existence of these "cold-blooded cruelties," of this agony and torture, of this pain to which death by burning alive is a happy release—where do we find the slightest reference in Mr. Myers' paper? Not a hint of its existence is there to be found! Why? Is it because he accepts with implicit faith the word of the experimenter? That is his privilege. We admit that it may be a matter of choice. But upon whom is reliance most safely placed in our attempts to penetrate to the truth,—upon men grown old in the medical profession, connected with institutions of learning, men who cannot have the slightest reason for adverse criticism, but every

inducement for discreet silence—or, on the other hand, the practical experimenter who may feel that his position is dependent upon the maintenance of absolute freedom to do whatever he likes within the walls of his laboratory?

If space permitted, it would be of interest to follow all the ramifications of Mr. Myers' remarkable argument. In certain directions, it seems to us to denote a peculiar tendency to credulity wherever vivisection is in question. Bichat, he tells us naïvely, once saw dogs "tearing their peritoneum and devouring their own intestines which had protruded from a hole in the abdominal wall." But does Mr. Myers seriously consider such an action as the painless and contented gratification of the animal's appetite? Once, in a physiological laboratory, we witnessed precisely the same thing; an animal, during vivisection, partly escaped from its bonds, and with the utmost fury of despair, bit and tore its own bleeding wounds. Had Mr. Myers been present at that experiment, we hardly believe he would have contended for its painlessness. "Again and again," he assures us, "dogs have been observed to wag the tail or lick the hands of the operator, even immediately before the beginning of the operation!" What inference would he have us draw from the fact? That it betokens the happiness of the animal? Observers have drawn a far different conclusion. "I recall to mind," said Dr. Latour, "a poor dog, the root of whose spinal nerves Magendie was about to expose. Twice did the dog, all bloody and mutilated, escape from the implacable knife, and twice did I see him put his forepaws around Magendie's neck and lick his face! I confess I could not bear the sight." It was a phenomenon recorded also by the editor of the London *Lancet* in a description of what once was done in the physiological laboratory. "Look," says this editor of the leading medical journal of England, "at the animal before us, stolen (to begin with)

from his master; the poor creature, hungry, tied up for days and nights, pining for his home, is at length brought into the theatre. As his crouching and feeble form is strapped upon the table, *he licks the very hand that ties him!* He struggles, but in vain, and uselessly expresses his fear and suffering. . . ." We need not go on with this picture of past experimentation. It is merely of interest to show how the same fact impresses different men. Strange it is, that a dog, licking the hand of "the operator immediately before the beginning of the operation" should seem to any man to betoken the absence of all apprehension—a sign of happy animal indifference to its fate, rather than the mute, instinctive and vain appeal for sympathy to a being in the human form.

But the most painful part of Mr. Myers' essay, and in one sense its most significant inference, pertains to his unqualified approval of the attitude taken by Dr. Emanuel Klein. When this distinguished vivisector was examined before the Royal Commission (1875-6) regarding his practices and opinions, he frankly and honestly admitted that he never used chloroform or any other anæsthetic, except in public demonstrations, unless necessary for his personal convenience; declared that a physiologist had the right to "do as he likes with the animal"; that to save himself inconvenience he would perform even one of the most painful of operations on a dog's nerves without the use of anæsthetics; that he held himself "*entirely indifferent to the sufferings* of the animal," and had "*no regard at all*" to the anguish of the creatures experimented upon. Quoting the last sentence, Mr. Myers does not hesitate to declare that "*Dr. Klein is perfectly right.*" We are not particularly surprised at this assurance of his agreement; but unless very much mistaken, Mr. Myers is the first Englishman who, during the past quarter of a century, has openly con-

fessed his sympathy with such sentiments. Certainly, they were very far from meeting the approval of scientific men at the time they were uttered. One of the most eminent scientists of the last century, writing to another man of equal eminence, thus referred to this profession of indifference to animal suffering:

"This Commission is playing the deuce with me. I have felt it my duty to act as counsel for Science, and was well satisfied with the way things are going. But on Thursday, when I was absent, ——— was examined; and if what I hear is a correct account of the evidence he gave, I may as well throw up my brief. I am told he openly confessed the most entire indifference to animal suffering, and he only gave anæsthetics to keep the animal quiet!

"I declare to you, I did not believe the man lived, who was such an unmitigated, cynical brute as to profess and act upon such principles; and I would willingly agree to any law that would send him to the treadmill."

We must ask pardon for the quotation of these forcible and far-reaching denunciations. They occur in a letter written to Charles Darwin by Professor Huxley. More than a quarter of a century has elapsed since the great English biologist thus made known the feeling which such sentiments inspired. The times have changed. To-day, a writer in defence of this attitude of indifference, tells us that Dr. Klein "is perfectly right."

The utility of animal experimentation is a question too great to be discussed now. The trouble with most of the advocates for vivisection without limitations is that they go far out of the way to glean and gather what they hope may be fresh evidences of its utility. Even those who regard vivisection in its milder aspects with a favourable eye will not care very much for the evidences of its usefulness that Mr. Myers presents us. Hardly a single claim made rests upon generally acknowledged facts. What, for example, has "the value of vaccination in smallpox"—however

"widely recognized"—to do with vivisection of animals? Mr. Myers brings it into his catalogue of utilities, seemingly unconscious that with Jenner's discovery the practice of vivisection had nothing to do. Where are the proofs that the mortality from typhoid fever in any country has been reduced by the general use of the "appropriate antitoxin"? Where are we to look for similar evidence regarding mortality from "the Mediterranean fever" in France and Italy? We venture to say that official statistics proving any marked reduction in the mortality from these causes of death through use of such antitoxin cannot be produced. It is interesting to know that for the first time in its history, "Havana is practically rid of yellow fever." What has this to do with experiments upon animals? Perhaps the most surprising assertion of utility is that which concerns the mortality resulting from the venom of serpents; we are told that "hardly a failure is on record from the treatment of snake-bite." Of course a statement like this may mean anything—or nothing at all. Of any number of imaginable drugs or appliances it might very truthfully be said that there is "no record of failure,"—simply because they have not been tried. But if Mr. Myers believes, and desires to convey the impression that a specific and almost certain cure for the poison of venomous serpents has at last been discovered through experimentation upon animals, and that its claims of efficacy are amply evinced by *a decrease in the mortality from this cause* in the countries where venomous serpents abound, he is entirely mistaken. Every year, in British India alone, over twenty thousand men, women and children lose their lives from this one cause That was the record up to five years ago. Has this mortality been diminished in any appreciable degree by the employment of the new remedy regarding whose use we are assured that there is "hardly a failure on record"? If so, *where are the*

statistics? There are none. It is a claim of the laboratory. No such specific, the value of which has been demonstrated by a steady decrease of mortality as shown in the statistics of any country, can be said to exist. This is not criticism of this phase of experimentation. It is not denial that certain laboratory experiments have been apparently successful. But the claim should have stopped there. We cannot but think that the suggestion of a far wider utility should never have been made in view of the present practical impotency of every alleged discovery of the kind.

What may we say of the moral aspect of unlimited vivisection? Every man's attitude toward this question will depend in great measure upon certain primary intellectual concepts. Behind a thinking man's judgment of what is right or wrong in human conduct must be his personal conviction regarding the meaning of the Universe in which he dwells. The creed of the vivisector is not always beautiful. Writing for the *Popular Science Monthly* a few years since, a leading American biologist, Professor Hodge, of Clark University, declared that "God clearly gives to man *every sanction to cause any amount of physical pain which he may find expedient to unravel His laws.*" Seldom, if ever, has the supremacy of science over the ordinary conceptions of morality been more definitely announced. If this doctrine be true, then the experiments with poisons, made by Ringer and others upon patients in a London hospital, the experiments upon dying children and the incurably insane, made in certain American institutions—would all find equal justification with every phase of animal experimentation; for it could then be said that "they were expedient to unravel His laws." And if the elucidation of a new fact makes right any method by which it may be torn from the secrecy wherein Nature has concealed it,—if this be the meaning of the message which modern science is to

proclaim to Humanity, then, in more senses than one, we are at the beginning of a new era. One may, indeed, imagine a Universe wherein the idea of Justice does not exist, where compassion and pity and sympathy are unknown, and where Might makes Right. In such a world, no thought of the uprightness of an action would come to mind. In such a world—unchecked except by fear—would flourish whatever tyranny might desire and force compel, the prostitution of woman, the slavery of the weak, the murder of the helpless, the causation of any amount of physical pain upon animals or children, if thereby what is hidden by Nature could be brought to light. It would be the reign of selfishness and greed, of lust and force, of cruelty—and utility. That to-day, we are not living in a world, ruled supremely by claw and tooth and nail; that with us, power does not mean equity; that cruelty is infamous, and injustice is ignoble, and pity is divine, this world of ours owes to teaching far different from that of the biologist who, in his imagination, creates a "God" that hides facts, and gives torture the right to find them.

What may we hope to accomplish in the reform of vivisection as it exists to-day? Considerations of space forbid anything but the briefest of outlines; and yet certain lines of possible activity would seem apparent. It seems to us, that first of all, there must be the gradual creation of public sentiment which shall be eager, not so much to condemn all vivisection, or to approve it all, *as to know with certainty the facts.* Take, for example, the question of vivisection in institutions of learning. To what extent is it carried on merely to demonstrate what every student knows in advance? If one may judge from authoritative statements put forth for general information, it would appear that certain lines of experiment are now permitted in America and in England, which hardly more than a generation ago were

condemned as cruel by the medical profession of Great Britain. We ought to know if this is true; and if found so we ought to inquire why it is that experiments which scarcely thirty years ago were almost universally condemned, are less abhorrent to-day. The removal of the secrecy that so generally enshrouds vivisection is the first and most important step toward any true reform.

And when secrecy is removed, and we know the facts, then must there be a yet wider promulgation of the truth about it than is possible to-day. By the propaganda of the press, by the advocacy of the principles which underlie our opposition to irresponsible and unrestricted vivisection, by the contrast of views, by the incitement of interest in a subject which is naturally most distasteful to the average mind, there must gradually be created a public sentiment that will be heard when it asks for some measure of reform, for some method for preventing what ought not to exist.

And finally, there must come the regulation of vivisection by law. This does not mean the abolition of all physiological investigation, as they who clamour for non-interference so often assert. It need not imply a single impediment to any scientific inquiry that is of potential value to humanity and possible without anguish. But the law certainly should forbid all cruel and all useless experiments. It ought to bring upon official records the number of experiments performed, the objects which were in view, the results which were attained, the species of animals upon which the investigations were made, the anæsthetics which were administered, and everything that pertains to the prevention of pain. We may say that all this is but little more than the drawing aside of curtains and the admission of the light. It is so little to ask that one is amazed at the resistance which the laboratory makes to the demand. Will that resistance be perpetually effective? We doubt

it. No human institution has yet been able to keep hidden what the world wishes to know; and when all is known we may be sure that in the matter of vivisection the distinction will be very clearly drawn between what is permissible and what is to be condemned by the conscience of mankind.

COMMENTS ON MR. MYERS' REJOINDER.*

Mr. Myers refers to certain "quotations" (there was but one) "attributed to the editor of the *Lancet*, which, *after special inquiry*, I have good reason for doubting." It will be very easy to remove his doubts. The leading editorial in the *Lancet* of August 22, 1863, is a vigorous arraignment of vivisection as a method of teaching well-known facts. Said the editor of the *Lancet*: "The entire picture of vivisectional illustration of ordinary lectures is to us, personally, *repulsive in the extreme.* Look, for example, at the animal before us, stolen (to begin with) from his master"; and then follow the words which Mr. Myers imagined it was safe to doubt. "We repudiate the whole of this class of procedure," adds the writer of the *Lancet* editorial. And while Mr. Myers is verifying the accuracy of this quotation, if he will also take the trouble to look up the editorials on vivisection which appeared in the *Lancet* of August 11, 1860; October 20, 1860; February 6, 1875, and August 21,

* In a brief rejoinder to the foregoing paper, Dr. Myers appears to have an inadequate conception of what is meant by the statistics of a nation. He suggests that the use of calf-lymph in vaccination proves the relation between smallpox and vivisection; that certain *data* derived from the Boer War by Dr. Wright furnished statistics about antitoxin in typhoid fever; that in a certain medical work are to be found a list of cases successfully treated by antivenene; and that Dr. Klein was not permitted by the Royal Commission to amend his testimony as he desired. The quotation from the *Lancet* concerning the vivisection of a stolen dog appears to have been brought to the attention of someone on the editorial staff to-day, for Dr. Myers says that "*after special inquiry*, I have good reason for doubting" it. The reference to Ringer's experiments also inspired Dr. Myers to declare "I unhesitatingly declare such abominable accusations to be false." A somewhat broader acquaintance with medical literature would have been of value in inducing hesitancy before making these denials.

1875; in the *Medical Times and Gazette* (London) of March 2, 1861, and August 16, 1862; in the *British Medical Journal* of May 11, 1861; October 19, 1861; September 6, 1862; August 22, 1863; September 19, 1863; January 16, 1864, and June 11, 1864, he will see how the horrible cruelties that sometimes pertain to scientific experimentation upon animals were regarded by the medical profession of England a generation ago. Mr. Myers calls these "past opinions." Since they relate to ethics, how do they cease to be of value because forty years old?

In my paper there was a line referring in the briefest way possible to Ringer's experiments in a London hospital, upon his unfortunate patients. Apparently Mr. Myers never heard of them; but he says, "I unhesitatingly declare such abominable accusations to be false," with a fervour that certainly does credit to his heart. But suppose the abominable accusations are proven true, in what position does Mr. Myers then find himself? Nothing is more certain than that Dr. Ringer, in his work on "Therapeutics" and in medical journals like the *Lancet*, stated that he had made such "experiments"; among other poisons thus experimented with, and duly described, were muscarin, gelsemium and ethylatropium. In the *Medical Times* (London) for November 10, 1883, the editor thus refers to certain of Dr. Ringer's experiments:

"In publishing—and, indeed, in instituting *their reckless experiments* on the effect of nitrite of sodium on the human subject, Professor Ringer and Dr. Murrell have made a deplorably false move. . . . It is impossible to read the paper in last week's *Lancet* without distress. Of the eighteen adults to whom Drs. Ringer and Murrell administered the drug in ten-grain doses all but one averred that they would expect to drop down dead if they ever took another dose. One woman fell to the ground and lay with throbbing head and nausea for three hours. The next series of experiments was with five-grain doses. The same results followed in ten out of sixteen cases. . . . Whatever credit may be given to Drs. Ringer and Murrell for scientific enthusiasm, it is impossible to acquit

them of grave indiscretion. There will be a howl throughout the country if it comes out that officers of a public charity are in the habit of trying such useless and cruel experiments on the patients committed to their care."

"*Such useless and cruel experiments on patients*"—that is the charge made against Dr. Ringer by a leading medical journal of his own land. I did not stigmatize these experiments in any way; it was done by his own countrymen.

In bringing forward the fact that the Royal Commission of 1875-6 declined to permit Dr. Klein to substitute his amended remarks for his actual statements, I cannot see that Mr. Myers renders any great service to his physiological friend. A writer takes accepted testimony, not rejected and discredited inventions. The inquiring reader should procure a copy of Dr. Klein's testimony, so far as it related to his personal practices, and see if in Dr. Klein's replies to the questions asked him, he can discern the slightest evidence of inadequate comprehension.

If Mr. Myers thinks that reference to some army surgeon's experience during the Boer War supplies the statistics of a country, for which I asked; if he does not know that vaccination was carried on for nearly seventy years, independently of calf-lymph, and that the vivisection of animals contributed nothing to Jenner's discovery; if he fancies that the freedom of Havana from yellow fever,—by no means so assured as when he wrote,—may be attributed to experiments on birds; if he believes that reference to certain alleged cures of snake bite by antivenene furnish me with evidence of decreased mortality in a nation like that of India, where 20,000 deaths from this cause annually occur,—then I fear that no amount of reasoning, within space available here, would convince him of his errors.

If this discussion must close here, let it be on my part with an appreciation. Of Mr. Myers' sincerity and intellec-

tual honesty I can have no doubt. Thirty-five years ago I should have written as he writes to-day, inspired by the delusion that science can make ethical laws for herself. And yet it is possible that were ours the opportunity of an extended contrast of views, we should find not a few points of agreement. He would certainly discover that I am not an anti-vivisectionist; and that everything in the way of painless experimentation seems to me as unobjectionable as to himself. On the other hand, I think I should be able to point out to him lines of vivisection, the cruelty and wickedness of which are so manifest, that, convinced of their existence, he could not fail to condemn them as severely as did the editors of the *British Medical Journal* and the *Lancet* forty years ago.

THE ROYAL COMMISSION OF 1906.

As the revised edition of the Vivisection Controversy is passing through the press, there has come into my hands the first volume of the Minutes of Evidence taken before the Royal Commission on Vivisection during the last three months of 1906. To one familiar with the vivisection controversy, this volume presents matter of the utmost interest. Better than ever before, we now know how the Act of 1876 has been administered, and the present attitude of British physiologists regarding researches of this kind. It is not possible at the present moment to review the final conclusions of the Royal Commission; but some of the evidence is so clear and illuminating that conclusions it suggests to the reader are not likely to be disturbed by subsequent testimony. A few comments by one who has watched the controversy for more than thirty years are perhaps permissible.

In the first place, one is impressed by the absolute inutility of Government inspection of laboratories so far as concerns the protection of animals liable to vivisection. To the present writer, the proof of so startling a fact has come as a revelation. For many years, the system of Government inspection in England was held up for the emulation of American states. One could not have suspected that the Act of 1876 had been so curiously administered. Naturally, very much depends upon the individuals appointed to carry out the provisions of the law. When, as in Ireland, the Government inspector is a man in sympathy with every effort for the prevention of cruelty to animals, we find conditions widely different from those

which prevail where the interests of the vivisectors are predominant. It appears, for instance, that in England, during three years, a total of 6893 experiments of a certain kind were made in registered laboratories, of which one Government inspector saw 68, and the other 25,—a rate of about *13 experiments per thousand performed!* Concerning the conditions under which nearly 99 per cent. of these experiments were performed, the Government inspectors take the word of the men who made them. No inquiry concerning the humanity of a physiologist appears ever to be made; (400)* and although inspectors are expected to visit each laboratory thrice a year, they are given to understand that such visits are not for the purpose of detecting violations of the law (530). Nothing can surpass the confidence of certain officials in the absolute integrity of the persons they are to supervise. That any physiologist would venture to make an unauthorized experiment in a registered laboratory is regarded as most improbable, because "somebody would be sure to tell of him."

We are not surprised therefore, to find that the law of 1876 as now administered, is highly satisfactory both to the inspectors and the inspected (566; 1699; 2616). "I am quite satisfied," says Sir James Russell, "with the amount of inspection; I think it about the right amount." (604). Mr. Thane sees no need for more inspection; the amount given, he thinks "has been sufficient to keep us well acquainted with what goes on in the laboratories." (1188). Will the English people as a whole, accept this professional optimism? Can we say that men who are informed by their superiors that they are not to detect infractions of the law, and who see nothing to criticise, are affording the slightest

* The figures in parentheses indicate the number of the question in the Minutes of Evidence.

protection to animals? I confess I cannot discern any value whatever in the services rendered by the official inspectors in England. If, for every 99 experiments out of a hundred, we are to depend upon the good faith of the experimenter, why not depend upon it altogether? A night-watchman appointed to look out for fire, whose duties exacted only a ten minutes' vigilance during the night, might as well be allowed unbroken slumbers, and permanent release from his watch.

Another fact brought out by the testimony is the secrecy with which vivisection in England is now carried on. Nothing is more significant than the precautions which are taken to prevent public or private criticism concerning methods of scientific investigation of which we are so often assured that "there is nothing to conceal." In America, where there are no legal limitations in a majority of the States, such secrecy might be expected; but we had not imagined that in England, the laboratory had been so completely protected from the possibility of criticism or discovery of abuse as the evidence reveals. Dr. Thane, the Government inspector, insists that although medical students can enter any laboratory for vivisection, it would not be practicable to permit a similar privilege even to medical men, not in sympathy with vivisection; "I see no way of doing it," he insists. (1420). He is not even certain that one of the Royal Commissioners would be permitted to enter a laboratory. Dr. Wilson asks the question: "Students see all these operations. I can go and see them; I suppose I would have no difficulty?" Dr. Thane's reply is not reassuring. "*I do not see how it could be done*," he replies; and thus leaves it doubtful whether even a member of the Royal Commission could gain entrance to a physiological laboratory. (1413).

It must be confessed that some of the replies given are

more suggestive of tactics pertaining to warfare or diplomacy than to scientific research. An attempt to give the impression that no secrecy exists would almost seem apparent in some instances. Sir James Russell being questioned, informed the commissioners that he never encountered any difficulty in obtaining entrance to the various laboratories; "I simply walk into them, and have always found the doors open." (534). Dr. Starling is asked whether there is anything to prevent a physician from attending his physiological demonstrations, even if his views were unfavorable to vivisection? "There is nothing," he replies, "to prevent the attendance of any medical man at these advanced lectures"; (3554). "In these advanced lectures, there is no means by which we can prevent them from attending." (3550). "One hears a good deal," says another questioner (Mr. Ram), "about experiments conducted with closed doors. *Is there anything of that sort at all?*" (4066). This inquiry is peculiarly significant; the very form of the interrogation indicates almost entire disbelief in the charge of secret vivisection. Assuredly, here was an opportunity for a plain and straightforward statement of the whole truth regarding the privacy of his vivisection. The physiologist, however, seems to have preferred another course. His reply undoubtedly states the truth, and yet, somehow,—so far as the whole truth is concerned,—it was not a little misleading. "I have never come across a laboratory where there were any closed doors. In my laboratory, any student wanting to speak to me, walks straight in. The door of my laboratory *is always open to the passage* . . . . . they can walk straight in and talk to me as I carry out the experiment." (4066).

Certainly, this would seem clear enough. Apparently, all these suggestions of closed doors and secret vivisections are explicitly denied in the frankest manner. The

questioner appeared entirely satisfied with the information given. But presently another member of the commission takes the witness in hand. "You have told us," he says, "that any medical man on presenting his card, can obtain admission at once to a laboratory?" Here at last, is a question which can be answered in but one way. "No," replies the physiologist, "to the advanced physiological lectures which are given in the University of London." (4161).

"Not to witness any operation?"

"*No, only to witness the demonstrations that are given in those lectures.*" (4162).

But the public mind might be more satisfied if a layman had the right of entry to an operation in the laboratory,—say, for instance, a member of Parliament, or anyone whose position is assured? Would he be admitted? Here was an opportunity to give an unqualified and emphatic reply. The opportunity, however, was not embraced. "I should be only too pleased to see any Member of Parliament or any layman who had any doubt about it, but *I should have to be satisfied of his bona fides!*" Anyone who is "*keen on the question*" Dr. Starling would admit, but apparently he draws the line at newspaper correspondents, "and people like that." It is a pity that somebody did not inquire of Dr. Starling in what way he expected a member of Parliament to prove his "good faith" before he could enter the doors open to every Bob Sawyer in the University. Sir William Church came to the rescue by suggesting that Dr. Starling would admit anyone "vouched for by a person whom you know, or whose position you know"; but the monosyllabic consent was quite different from the conditions which the physiologist had just laid down. We are assuredly under obligations to Dr. Starling for revealing —however unwillingly,—the privacy which surrounds the

physiological laboratory where even a member of Parliament must prove his "good faith" before he may hope for admittance, and where even a medical man may be refused. We see that the doors are "open," but only to those in whose discretion one may trust. Is it by such precautions against any possible criticism of abuse or disclosure of cruelty that the modern Laboratory hopes to put to sleep the conscience of England for another thirty years?

But the chief question is the problem of Pain. If the absence of sensation were a certainty, there could be no reasonable objection to the vivisection of the vast majority of creatures which are now subjected to it. Of course it was impossible to hope that any witness before the present Commission would state his experience or his opinions with the frankness exhibited by Dr. Klein, when, thirty years ago, he declared that he had "no regard at all" for the pain inflicted upon a vivisected animal; that except for teaching purposes or demonstrations, "I never use anæsthetics where it is not necessary for convenience"; and that an experimenter "has no time, so to speak, for thinking what the animal will feel or suffer." The position taken to-day, is not profession of indifference, but the apparent denial of the existence of any pain. There is of course, repudiation of cruelty; that is a word which anyone may define to suit himself. Mr. Stockman, a Government officer, doubtless echoed the prevailing view when he declared: "*I do not think anyone does any cruel operation; one which could be said to be frivolous or cruel,*" (2610).

"You think that no cruel operations are ever inflicted on animals in the pursuit of Science?"

"My view is that the operation is not necessarily *cruel,*" (2611).

"That an operation for the advancement of science is not cruel?"

"*It is not cruel;* it is not done with a cruel purpose. I would rather say it is done for science . . . *It depends how you define cruelty.*" (2612, 2613).

We see that the language of the ordinary world does not suffice to convey ideas in the sense in which they are understood in the modern laboratory. If cruelty in experimentation be everywhere indignantly denied, may it not be because every scientist, like Mr. Stockman, has his own definition of the term?

It is through the evidence given by the professor of physiology in the University of London that we are enabled to obtain the clearest conception of the methods and theories which pertain to physiological research in England at the present time. At first thought, the evidence of Dr. Starling seems quite conclusive regarding the painlessness of modern research. The introduction of anæsthetics, new narcotics and asepsis, he tells us, "has well-nigh abolished pain from our physiological laboratories." (3445). During his seventeen years of experience, on no occasion has he seen "pain inflicted on a dog or cat or rabbit in a physiological laboratory in this country." (3451). "*A physiological experiment which is painful is thereby a bad experiment,*" says Dr. Starling,—certainly a very sweeping condemnation, from a scientific standpoint, of scores of most eminent men. Pain, he insists, "*would spoil the experiment*"; and on being asked if there are any operations performed under circumstances in which the animal is necessarily and intentionally sensitive to some pain, he replies without hesitation, "*No, NEVER.*" (4063). These are most astonishing statements. The witness is not speaking of his own laboratory merely, but, for anything one can see, of the laboratories of the world, and of vivisection since 1850, at which time anæsthetics first came to be generally used. All painful experimentation

since that time, by English and French and German physiologists has been "bad"; and the pain inflicted has spoiled the experiments they made. We are by no means disposed to quarrel with this expert opinion; and yet one cannot but question whether the obvious import of these assertions was scientifically true. If one could only be convinced that in animal experimentation, pain has been for ever abolished for the reasons stated by Dr. Starling, assuredly, for the majority of us, the fact would nullify every objection. Why, in the midst of so many admitted cruelties, should attention for one moment be directed to laboratories if there it has ceased for ever?

There are other witnesses to the painlessness of modern research, who speak with equal confidence. Dr. Thane, for example, assures us concerning certain curious investigations upon the nervous system of monkeys, cats and dogs, that "the *results* of these are not painful." But what is here meant by the word "results"? The extreme agony caused by experimentation upon the spinal cord and nerves was never denied by the old experimenters,—Magendie, Bernard, Brown-Sequard and others in times past. Thirty years ago, Sir Michael Foster declared of one experiment upon the nervous system that he had never performed it, nor seen it performed, partly "from horror at the pain." Are we now to be told of such an experiment as this, that "the *results* are not painful," and have such assertion satisfy our doubts?

It would appear, however, that even the evidence of Dr. Starling is not quite as conclusive as at first it seemed. Under the skilful questioning of certain members of the Commission, we find that—as in the case of the "open doors,"—we have been getting only part of the truth. Gradually, we learn that vivisection is not quite so free from pain as Dr. Starling's evidence led us first to suppose.

We find him admitting that "in a pathological laboratory, a certain amount of suffering might be an essential part of the experiment, so that although the animal was suffering, it would not be right to kill it" (4019); that in certain experiments which have not turned out as intended, "peritonitis would be caused, and that would probably be attended by pain" (4087) and before its condition was discovered, "*it might be in pain for a few hours.*" (4089). Sir James Russell tells us that he has seen animals suffering what he considered pain (541), animals "which seemed to me miserable and dying, evidently in suffering." (543). Even Dr. Thane who almost as confidently as Professor Starling claimed the painlessness of vivisection, finally was induced to admit that some animals experimented upon "do suffer" while under observation after conclusion of the experiment* (1550); that "in some cases, there is suffering" (1550), and that in the matter of making reports, "the Inspector never could distinguish exactly which experiments were painless and which were painful; *and the experimenters and observers themselves cannot distinguish in a very large number of cases.*" (1335). Such admissions as these at once destroy confidence in that serene complacency which seemed to deny the existence of pain in experimentation. Is there any other department of Science where one needs to be on the look-out lest he be deluded by statements which may be understood in a double sense? We fancy that we are distinctly informed that laboratories are always open to proper investigators, that no doors are closed, and that there is nothing to conceal; and presently we find all this was an error, and that admission to a physiologist's work-

* That in certain cases, the infection "*is followed by great pain and suffering.* (457).

rooms may be denied even to physicians or to members of Parliament. We are told of the absolute painlessness of modern research and the happy contentedness of vivisected animals; that pain has been well-nigh abolished in the modern laboratory, and that "a painful experiment is bad"; and then, under a little closer questioning, the same witnesses confess that in certain investigations, pain exists and may be a necessary part of the experiment. So difficult is it to get at the truth in regard to a scientific process about which "there is nothing to conceal"!

The pith of the matter lies in the degree of insensibility, which by recognized anæsthetics, an animal about to undergo vivisection is permitted to enjoy. Is it a fact that in all experiments involving a cutting operation or a painful procedure, the consciousness of pain is always and entirely obliterated? So we are emphatically assured. Dr. Thane informs us that the giving of anæsthetics is a matter of routine; that animals experimented upon "were always effectually anæsthetized." (450). Dr. Starling is equally emphatic; "nobody ever thinks of doing any cutting operation without thorough anæsthesia . . . and maintaining it"; (3603, 3604)—and he asserts that the "intention" of British physiologists is in this matter the same that his own "intention" would be: "that is to say, *to prevent throughout the whole experiment the animal from feeling pain; to make the whole thing painless.*" (3605). Never, in this country, had he seen *curare* used "without simultaneous and adequate anæsthetization." (3624). All the difficulties experienced by others in the way of maintaining animals, like the dog, in a state of complete insensibility for a long period of time, are declared to be without foundation; Dr. Starling insists that "there is no serious difficulty in anæsthetizing any animal, and keeping it perfectly anæsthetized" (4156); that "*there is no*

difficulty in keeping an animal under anæsthetic as long as you like." (3633) Dr. Thane adds the emphasis of his experience: he never "even heard of an operation, a procedure that was seriously painful being performed without anæsthesia" (450); there is no difficulty about keeping dogs under anæsthetics; he has "seen dogs kept under a very long time." (1620). What is the average man to say to testimony like this? In the face of such evidence from men so eminent, can scepticism longer exist? Is it possible for a reasonable man to doubt the painlessness of research when it is so definitely affirmed?

We must confess, however, that scepticism exists. We are not entirely satisfied that the asserted insensibility of all vivisected animals is a scientific fact. The testimony which creates doubt is that of the men who are entirely favourable to vivisection. In some cases, but one inference may be drawn from their testimony. Then, under the skilled examination of Dr. Wilson and other members of the Commission an entirely new light is thrown upon the methods in vogue.

In the first place, we see that the general use of the poison *curare* is admitted and excused. The peculiar properties of this singular poison are well known. Under its influence, an animal is wholly deprived of the power of movement, retaining meantime, its sensibility to all painful impressions. The professor of physiology in Upsala University calls it "*the most cruel of poisons.*" An animal under its influence, says Professor Holmgren, "it changes instantly into a living corpse, which hears and sees, and knows everything, but is unable to move a single muscle, and under its influence, *no creature can give the faintest indication of its hopeless condition.*"* Death, by this

* Holmgren's Physiology, p. 231.

poison, said the great French vivisector, Claude Bernard, "is accompanied by sufferings the most atrocious that the imagination of man can conceive." Its peculiar properties are admitted by witnesses before the Royal Commission. Dr. Thane tells us that it would put an end to the usual signs of the animal not being properly under anæsthesia; "it would stop all struggling," he says. (1605). "It would paralyse all the motor nerves, and therefore it would paralyse the voice as well as other movements," says Dr. Starling. (3626). When an animal has had an anæsthetic administered, and also a dose of *curare*, if the anæsthetic passed off, the animal,—Dr. Starling admits,—would be unable to move, or to show any sign of suffering. (4053). Its employment, Dr. Starling insists, is justifiable; "its use is essential to certain parts of physiology." (3975). Any legal checks against the use of this poison by inexperienced or unqualified experimenters Dr. Starling does not like; nobody now uses it but highly qualified persons; "I think that every precaution is taken that the use of *curare* is only in the hands of people *who are competent to deal with it.*" (3976). This assurance is very vague. To be "competent to deal with it" implies no more than a knowledge of its effects and an ability to administer it; we might say the same of any poison in the hands of a professional criminal. "How many times has *curare* been used in your laboratory during the last year or two years?" (3980). To this most interesting inquiry, Dr. Starling's reply is far from enlightening. We do not learn from him how often it was used. He simply tells the commission that two papers issued from his laboratory during 1906, which referred to "some experiments in which *curare* was used." During the year before, only two papers contained experiments involving the use of *curare.* (3980). Yet each of these papers might have referred to scores of

experiments of this kind; we can see no reason for so indefinite a reply. Even a legal restriction of the use of this poison to persons holding a medical qualification, Dr. Starling does not approve. (3979).

Another disturbing circumstance is the fact that the present-day methods of administering anæsthetics to animals are quite different from those in vogue but a few years since. There was a time when ether or chloroform was given in a laboratory much in the same way as when used for surgical operations upon human beings. To-day, it appears that reliance is placed upon a mixture of alcohol, chloroform and ether,—the "A.C.E. mixture" of which we read. What is the use of the alcohol? It certainly does not increase the potency of the chloroform or ether. One may imagine a reason for its employment, but it is not in the direction of increasing the insensibility of the animal to whom it is given. It is a well-known fact that the dog, for example, is so susceptible to the vapor of chloroform, that death frequently occurs during its administration. Sir W. Thornley Stoker, the President of the Royal Academy of Medicine in Ireland, and for many years a teacher of science, testified before the Commission that "a dog's heart, as you know, is very weak and irregular and susceptible to the poisonous influence of chloroform;" (836). "I am never sure if I give a dog chloroform that I will not kill it." (813). "I fear," he says, "that particularly in the case of dogs, *anæsthesia is not always pushed to a sufficient extent*, as these animals often die from the effects of the anæsthetic, if given to a full extent" (761); "the anæsthesia cannot be complete if the dog lives as long as is necessary for some of these experiments." (815). Now when Dr. Starling tells us that there is no difficulty "in keeping an animal under an anæsthetic as long as you like" (3633), there may be no discrepancy in the two views

here presented. The one is speaking of chloroform; of a substance whose properties are well known and the dangers of which are understood; the other speaks of a "mixture" of chloroform diluted by alcohol; a preparation not approved for surgical operations upon human beings; a mixture which is administered to the animal undergoing vivisection "mechanically, by means of a pump or tube arrangement," wherein "if you once get the proper setting of the apparatus, it goes on automatically." (695). We are not told the proportion of chloroform in the mixture. It is, however, quite possible to imagine a mixture, diluted, perhaps with the carelessness of the "laboratory boy," which could not possibly endanger the life of the wretched creature to which it was administered.

We touch here the most important of problems,—the evidence of insensibility to pain as anæsthetics are now given. When chloroform is administered in the old-fashioned way, an animal, coming from under its influence during a vivisection gives abundant evidence by its struggles and its cries that consciousness is returning, and that it feels the pain. Under the new methods, how is it possible for anybody to know this, if at the same time, the creature is under the influence of *curare?* The dog may be entirely conscious, yet unable to make its consciousness manifest by the slightest sign. The vivisector could go on with his work, assured that the death of the animal would not interrupt his investigation, and that equanimity would not be disturbed by any manifestation of pain. Let it be conceded that the creature may be in happy unconsciousness. On the other hand, for anything we know, it may be suffering the torments of the damned, at the very time the physiologist is asserting that "it could not feel pain, because it was under an anæsthetic automatically administered."

The evidence elicited before the Commission brings into very clear relief all these uncertainties. When we find Dr. Thane admitting that this poison puts an end to the usual signs of consciousness (1606), and Dr. Starling confessing that under such circumstances, there would be no possibility of a dog whining or moaning ("*it could not under curare*," he says), we are perplexed by the positiveness with which they nevertheless maintain that no suffering is caused. Again and again, the physiologists were confronted with the question: "How can you tell that an animal experimented upon while under *curare*, suffers no pain?" As Dr. Wilson put the question, it precisely expresses our own uncertainty: "You may *hope* and *believe*, but how can you tell that during the whole of a long, and, what I may call, a terrible experiment, the animal suffers no pain; that it may not be having a nightmare of suffering, for all you know?" The only reply that could be given is a reiteration of personal faith in the accuracy of the method in use, and the apparatus by which insensibility is presumed to be secured.

"The whole thing is regular; accidents do not occur in those cases," is the physiologist's confident assurance. Dr. Thane is asked how he can tell an animal is not suffering when by the poison of *curare*, every sign of consciousness is suppressed; and he, too, proclaimed faith in the accuracy of the instruments, declaring that if the apparatus broke down, the animal would die of suffocation. "Yes," rejoined Dr. Wilson, "it may die; but so long as it is alive, *he* could not say, *you* could not say, *I* could not say,—if I were present,—that the animal was properly under anæsthesia, *if there are no signs by which you can tell*. . . . . The curious thing to me is that you or anyone else can say positively that an animal which cannot, by moving, give any indication that it is not completely anæsthetised

during all this time,—an hour or more, that it is under a terribly severe operation,—*does not suffer*. . . . I cannot understand such a positive statement." (1608, 1617).

We think that the doubt expressed by Dr. Wilson will be shared by the majority of intelligent men. There would seem to be but one conclusion possible, an attitude of scientific uncertainty. The physiologist may continue to claim that his work is painless, although his doors are shut to the outer world, and every evidence of anguish is made impossible. He may be right; *but we cannot be sure.* The man trained to scientific doubt will not share the confidence thus expressed. It is not necessary to impugn the good faith of the distinguished men who have testified in defence of the present methods of vivisection in England. But surely it is not impossible that, occasionally, by some mistake of the laboratory boy, the proportion of chloroform may be far less in the "A.C.E. mixture" than would suffice to maintain an insensibility to pain. It is surely not impossible that the same result might be due to intent on the part of an unscrupulous student. Then it may well happen that a curarised dog undergoing vivisection, will be in no danger of death from an over-dose of chloroform, but, while enduring the utmost conceivable agony, be unable to evince it by the slightest movement, by the faintest moan.

We have by no means exhausted the subjects of interest in this first instalment of evidence. When a distinguished physiologist tells us that an inflamed organ is not painful (3679),—a statement directly contradicted by his own subsequent evidence (4104, 4108), or thinks that the poison of conium has no effect on man,—though for that matter, he "does not know anything about it" (3840, 3841); or ventures to declare that in England, before 1876, "there were *only one or two physiologists*" (3715); or that morphia

may be regarded as an anæsthetic producing the same kind of insensibility as chloroform (3612),—a conclusion directly contrary to the experiments and views of Claude Bernard, the chief vivisector of modern times—we are impressed with astonishment indeed, but it is not at the erudition which inspired such replies. The testimony of Sir W. Thornley Stoker and of Dr. Herbert Snow is most valuable; for it shows us that every knee has not bent to the worship of ideals, which once were everywhere repudiated by the Medical profession of England, and which we believe will one day be repudiated again.

It is premature perhaps, at the present time, to venture a surmise regarding the outcome of the Royal Commission. That it will recommend any marked change in the practice of vivisection does not seem probable, and one may question whether any measure will be advised (except by a minority), which will secure the greater protection of animals, or the lessening in any degree of the inflicted pain. But no matter what the report of the Commission may be, much of the evidence it has elicited will be of value for many years to come. It has shown how vast are the strides which have been made during the last thirty years in England, in the practice of vivisection. It has demonstrated the uncertainty of the methods in use for securing to vivisected animals an immunity from anguish. It has shown the employment of *curare*, and that sentiment which now approves and justifies its use. It has made plain the entire uselessness of Government inspection of laboratories in England by inspectors who are wholly in sympathy with the vivisector, and apparently without the slightest interest in those humane purposes and objects which such inspection, it was hoped, would secure. It has proven the secrecy in which vivisection may now be carried on in English laboratories,—a privacy

which even members of Parliament have no right to invade. The Royal Commission of 1906-7 may not greatly change matters so far as legislation is concerned; but the contributions it has made to public enlightenment can hardly be gainsaid. By disclosing the mental attitude of defenders, the doubts of critics, the scientific uncertainties and contradictions which pertain to the practice of animal experimentation in England at the beginning of the Twentieth century, it has indicated, to some extent, the defects which for many years to come will continue to call upon Society for continued and searching investigation, for condemnation of abuses, and for wise and unwearied efforts for attainable reform.

APPENDIX.

CORRESPONDENCE.

I.

[FROM PROFESSOR GRAHAM LUSK, PROFESSOR OF PHYSIOLOGY IN UNIVERSITY AND BELLEVUE HOSPITAL MEDICAL COLLEGE.]

Albert Leffingwell, M.D.

Dear Sir:—"Is science advanced by deceit?" Does not morphia destroy sensitiveness to pain? Do you consider your writing entirely free from exaggeration and deceit?

Yours truly,

GRAHAM LUSK.

[*Prof. Lusk enclosed a page from the essay: "Is science advanced by deceit?" referring to experiments of Beyer on the isolation of the heart, during which the whole front and side of the thorax were cut away, the dogs being under morphia and curare. He underscored the words, "morphia being administered."*]

II.

Prof. Graham Lusk, Ph.D., Professor of Physiology,
University and Bellevue Hospital Medical College, N. Y.

Dear Sir:—Your note without date has but just come into my hands. I am so accustomed to receiving anonymous letters of a similar character, that your favour is a welcome change.

Referring to my brief account of certain extreme vivisections by Beyer, wherein morphia was used with *curare*, you ask in a tone of triumphant confidence: "*Does not morphia destroy sensitiveness to pain?*"

Such a question, not from a layman or a medical student, but from the professor of physiology in one of the leading medical schools of this country, deserves more than a brief reply. It is an astounding revelation. You are alluding to some of the severest of all mutilating vivisections; you are supposed to be perfectly familiar with all that pertains to that art to which you have devoted your life; and you put the question in a way that affords no doubt of your own belief. It is true that such inquiry might be put by some men with intent to suggest as true what the inquirer knew to be false; but that dishonour, I will not for a moment impute. I shall assume, then, that you asked the question in good faith; and it merely serves to demonstrate how much ignorance in high places science has yet to combat.

Permit me to refresh your memory a little. To a professional vivisector like yourself, I dare say that no array of mere opinions or

statements would be at all valued in comparison with evidence based upon animal experiments. Let me call your attention therefore, to the works of one who, perhaps, was the leading physiologist of his time, Claude Bernard of Paris. You know, of course, how France honoured him while living as the foremost representative of one branch of scientific workers; how she gave him a public funeral at the expense of the State, in the draped cathedral of Notre Dame, and how to his memory, she has erected a monument on one of the public streets. It was Bernard's custom when I saw him in Paris, to illustrate his lectures by vivisections, and by repeated demonstrations to establish his statements of fact. Let me call your attention to the following quotation from one of his lectures at the College de France to be found in his "*Leçons sur les Anesthesiques;*" the italics being mine.

His opening words are significant: "*Commençons par établir les faits*, et nous raisonnerons ensuite sur eux en déduire les propriétes des alcadoïdes de l'opium . . Voici un chien qui a reçu avant la séance la dose indiquée. Vous voyez qu'il reste inerte, et sans mouvements. Nous allons répétir l'experience *sous vos yeux* sur un autre animal. . . Vous voyez que l'animal est tombé dans un état de stupeur qui le laisse absolument immobile, car il est évident que, s'il n'avait pas reçu de la morphine, il ne resterait pas ainsi étendu sur cette table sans chercher à s'echapper. Il a donc perdu la conscience du lieu où il est; il ne reconnaît plus son maître. *Cependent la sensibilité persiste.* . . Toutefois, *loin de supprimer complétement la sensibilité comme le chloroforme*, la morphine provoque, chez nos animaux une sorte d'exaggeration de l'excitabilite, ou, plutôt une epéce de sensibilité particulière au bruit." (p. 196).

In another case, Bernard experiments upon a dog which he had previously used in like manner a day or two before:

"Ce chien retombe dans le même état de torpeur qu'il avait déja subit. Mais, je ferai remarquer que, ainsi que je l'ai déja dit, *malgré cet état de torpeur, l'animal n'est pas insensibible, comme le serait devenu sous l'influence du chloroforme.* Bien que dans un état de torpeur, *l'animal est donc excitable et sensible.*" (p. 222).

"Notwithstanding this condition of torpor," says Bernard, "the animal is not insensible, as he would be under the influence of chloroform,"—but on the contrary he "is excitable and sensible." That is the answer that science, based upon experimentation, makes to your question.

Over and over again, Bernard affirms this. Take, for instance, another course of lectures, comprised in his book: "*Leçons de Physiologie Opératorie,*" wherein he again refers to the use of morphia. After administering morphine to a dog, he goes on to say:

"*L'animal reste encore sensible:* en touchant la cornée, on provoque l'occlusion des paupieres; mais il est très-calme, et se prête sans réaction aux opérations les plus délicates. Placé à terre, le chien peut encore se mouvoir, marcher, aller se cacher; placé dans la gouttière à vivisection, il y demeure immobile et stupéfié; jamais il ne cherche à mordre, quelque operation qu'on lui fasse subir; *il sent la douleur*, mais il a pour ainsi dire, perdu l'idée de la defense." (p. 155).

It is unnecessary to multiply such quotations. Repeatedly Bernard demonstrated and declared that, while morphia stupefies or reduces to a state of torpor, it does not—in vivisection—"destroy sensitiveness to pain." This conclusion he based, not upon authority, but solely upon that special evidence which you so highly esteem,—experimentation upon living animals.

Performing his experiments before the eyes of his students, he demonstrated that the animal is "not insensible, as it would be under the influence of chloroform," and that "*it feels the pain.*" And yet at the very close of the century, in which he lived, the professor of physiology in the "UNIVERSITY AND BELLEVUE HOSPITAL MEDICAL COLLEGE" is ignorant of the work of the leading physiologist of his age; is teaching his students, that animals when vivisected under this narcotic, are without sensibility to suffering, and,—referring to one of the severest of vivisections,—not only asks me with a sneer,—"Does not morphia *destroy* sensitiveness to pain?" but imputes deception because that information was withheld!

You suggest introspection regarding my work. Let me assure you, that no man can do me any greater service than to point out my mistakes. Of the value of his own work, no one can rightly judge. To me, at any rate, it seems worth doing. By maintaining that a scientific method should stand on its own merits; by condemnation of its abuses and by advocacy of their reform; by exposure of the ignorance or mendacity of some so-called scientists; above all, by protesting that falsehood, equivocation or exaggeration on the part of a scientific teacher with intent to delude a confiding public, is dishonourable to the man and dishonouring to the cause he claims to serve, I am doing what little I can to defend Science from her worst foes and to maintain the sanctity of scientific truth.

Sincerely yours,

ALBERT LEFFINGWELL.

Hamilton Club, Brooklyn, N. Y.,
Dec. 31, 1900.

Surgeon Lieut-Col. E. LAWRIE, M.B., I.M.S., Retired, the Medical Officer who presided over the Hyderabad Chloroform Commission in India in 1889, gave evidence before the Royal Commission on Vivisection, sitting in London, on the 20th of November, 1907.

Questioned as to the action of curare and of morphia, he answered as follows :—

Q. 17089. Have you any experience of the action of curare ?—No.

17090. Or the use of it ?—No.

17091. Have you an opinion about it ?—I really have not, because I have no experience of it at all.

17092. But you know, I suppose, generally, what its effect is ?—Yes.

17093. Do you hold any strong view as to the necessity of the advantage or the propriety of administering curare in company with other anæsthetics ?—No ; I cannot see what is to be gained by it myself.

17094. It is rather a leading question, but should you have any fear that its paralysing effect would prevent the animal from showing signs of pain, although it might feel it ?—I should think it might, but I really do not know.

17095. (Dr. Wilson) Were these morphia experiments carried out at Hyderabad on dogs to render them or to attempt to render them completely insensible to pain ?—We carried them out really to see whether they deepened the anæsthesia or not.

17096. With chloroform ?—Yes.

17097. Have you operated on dogs with morphia alone as an anæsthetic ?—No ; we never used it as an anæsthetic ; but it had no effect in deepening anæsthesia.

17098. Can you give me an idea of the dose that would prove fatal to an ordinary sized dog ?—I should think you would have to give it at least five or ten grains.

17099. But it would vary very considerably, I suppose, according to the idiosyncracy of the animal, and possibly the breed of the animal ?—Yes.

17100. But you could not be guided by the body weight ?—No.

17101. Did you experiment with any other narcotics besides morphia ?—We experimented with various drugs administered in order to ascertain whether they had any effect in modifying the action of chloroform ; such as atropin, morphine, nicotine, and so on.

17102. But with your knowledge of morphia or morphine, would you say that it was an unreliable anæsthetic for experiments on animals?—It is not an anæsthetic at all.

17103. I mean an abolisher of pain, then?—It would not abolish the pain of a cutting unless you poisoned the animal with it.

17104. But supposing that an animal gets what is called a lethal dose, how long would it live do you think under an operation?—That I cannot tell you. It might live some hours.

17105. But it would be completely insensible to pain all the time?—Yes, quite, if it were comatose.

Col. Lawrie's evidence will be found to corroborate the view of Dr. Leffingwell.

SIDNEY TRIST (Editor English Edition),

Dec. 17th, 1907.

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