



Saved by Antitoxin

*Which Shall Live—
Men or Animals?*

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WHICH SHALL LIVE—MEN OR ANIMALS?

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IF the United States were threatened with invasion by a foreign power, even if we knew that the invasion would be only temporary and that only a few thousand of our citizens would be killed, the whole country would be aroused in an effort to prevent that invasion. If necessary, millions of men would be drafted and trained to meet the invaders and billions of dollars would be expended to protect those few thousand people from the death that must otherwise overtake them. In such a case, every real man and every real woman in the country would be doing something to insure the defeat of that invading army. Yet such an army is like a box of tin soldiers compared with armies that threaten us all the time, but which cause scarcely an extra beat of the nation's pulse. I refer to the armies of disease. The army of bubonic plague alone, if permitted to effect a foothold on our shores, might at any time ravage our cities as it once ravaged the cities of Europe and Asia, leaving scarcely enough living to bury the dead. We read in DeFoe's "History of the Plague" in London in 1665 of "people in the rage of their distemper or in the tor-

ment of their swellings, which were indeed intolerable, running out of their own government, raving and distracted, and often times laying violent hands upon themselves, throwing themselves out of windows, shooting themselves, mothers murdering their own children in their lunacy." Indeed, we do not have to go back so far to realize what the plague can do. In 1905 in India alone there were 1,040,429 deaths from this one disease.

THE CONQUEST OF BUBONIC PLAGUE

In this country no layman loses any sleep on account of bubonic plague. Is that because it does not exist? Not at all. It comes to our waters, even effects a landing sometimes. But we have a small garrison of vigilant medical men on our coasts watching day and night for that enemy, ready to give him instant combat if he comes. We sleep in peace because we trust that garrison. Thirty years ago we did not know what caused this terrible plague, but in 1894 the germ (*Bacillus pestis bubonicae*) was discovered. Even then it was not known how the disease was carried or what caused it to spread so rapidly—and before it could be combated successfully, that must be known. A series of experiments on living animals, chiefly rats, guinea-pigs and monkeys, yielded the desired information and through these experiments we have been delivered from this terrible scourge. It was known that rats were subject to plague; conse-

quently attempts were made to find out how it was transmitted from one rat to another. The idea that it might be carried by parasites occurred to several investigators. Accordingly, healthy rats were placed in cages close to diseased rats; they remained perfectly well until a few fleas were introduced. Then, almost immediately, the hitherto healthy rats were stricken with plague. Cages containing healthy monkeys were suspended over cages occupied by diseased and flea-infested rats. At regular intervals the monkeys were lowered nearer to the stricken rodents. The monkeys were all right until they were brought within jumping distance of a flea, when they at once contracted the plague. These and other experiments left no doubt that rat fleas were the carriers among animals, and since rat fleas also feed on man when their natural prey is not available, it was an easy matter to show that the plague is spread by means of rat fleas. This led to a definite program for checking the spread of the disease, by relentless warfare on fleas and the rats that carried them. The rats were trapped, their breeding places destroyed, and diseased rats from infested ports were prevented from entering the country. For example, when it was found that rats frequently come ashore along the cables stretched between the ships and the wharves, metal cones similar to those used to prevent rodents from climbing into corn cribs were placed on the cables. The fact that

I wish to emphasize is that it is due to experiments on living mammals that this black death is no longer a terror to us.

EXPERIMENTAL STUDY OF HEALTH AND DISEASE

Until the middle of the last century very little had been done in the way of experimental study of physiology and pathology. Physicians depended almost entirely on bedside observations. Some of these physicians were wonderful men, and often their observations were remarkably shrewd. But the human body is a complex machine, the organs are so interdependent, that in the presence of any given set of symptoms and signs of disease, it was almost impossible to be sure just what caused them, and, consequently, what was best to do for the patient. When the experimental method was adopted disease could be observed systematically, conditions could be controlled, and the phenomena that resulted could be studied intelligently because the experimenter knew exactly what had produced them. In such experiments mammals are the animals chiefly used, because in most respects they most nearly resemble man, himself a mammal. Practically all the domestic mammals have been used, horses, cattle, sheep, goats, swine, dogs, cats, rabbits, guinea-pigs, and rats and mice; monkeys are also used. And all have made wonderful contributions to medicine or surgery or both.

TYPES OF EXPERIMENTS ON ANIMALS

I

There are several classes of experiments. Some are in the field of pure research, not having for their object any immediate benefit to man or animals. Experiments of this nature were carried on some years ago in work on bubonic plague among rodents in California. It was discovered that ground squirrels have a disease similar to plague and yet distinctly different. By a long series of experiments it was found that monkeys are susceptible to this disease, and it was predicted that eventually cases would be found in man. As a result of this work a bacteriologist in Cincinnati was able to identify the disease in persons in his own vicinity. Another investigator found it among persons in Utah, and showed that it is carried from infected rabbits and ground squirrels by biting insects. It also was shown that the disease is widespread over the United States. With this knowledge of the means of transmission of the disease it is comparatively easy to prevent the infection of man.

II

Another class of experiments is carried on by surgeons to develop dexterity before they attempt operations on man. Such experiments are usually carried out on dogs. The animals are invariably under complete anesthesia and usually they are killed by added ether at the end of the experiment.

Recently I attended the clinic of a throat specialist in the east. I saw child after child wheeled into the amphitheatre and relieved, usually in a few moments, of foreign bodies that they had sucked into the windpipe and that



Does this dog look unhappy? Ten years ago Buster had an operation performed on the stomach; the results have been of aid in the study of digestion. Buster has not suffered thereby, and she has saved much suffering to others. She is receiving a visit from the author.

a few years ago would in many cases have caused death, either directly or as the result of a dangerous operation. So dextrous is this man that his little patients do not need any anesthetic. After his work was done I had a talk with him, and he told me that the technic of

these operations had been worked out with great care on dogs that were always under an anesthetic. He also told me that by the use of two dogs he had trained fifty other men to do similar work.

III

In the Civil War if a man was shot through the bowels, he was doomed to death; the sur-



This is Whitey, about eight months after the complete removal of the parathyroid glands. These glands are quite often partly and accidentally removed during operations on the thyroid gland in man, with alarming and sometimes fatal results. Following complete removal of the parathyroid glands, carnivorous animals, including man, die within from four to six days. As a result of experimental work on this dog and other animals, three effective curative measures have been developed, which indefinitely preserve the life of such animals in normal health. Two persons are known to have been saved and several others have been rendered free from symptoms as a result of this study.

geons hardly dared to open the abdomen and if they did they didn't know how to join the ends of the bowel so that it would not leak. Of course the slightest leak meant infection and death. Then came along an experimenter who etherized about thirty dogs, shot them through the bowels, and practiced join-



These children at the Anna Durand Hospital, Chicago, have been saved from death from diphtheria by the use of antitoxin. The boy in the center has a squint as the result of his sickness.

ing bowel ends until he could make a perfect joint. It is safe to say that in the World War the lives of thousands of men were saved as a result of that series of experiments.

Lockjaw, tetanus, chiefly a disease of war, that threatened to take frightful toll of soldiers wounded on the tetanus-infected battlefields of

Europe, did little damage during the late war because of antitetanus serum made from the blood of immunized horses. Every wounded man received an injection of this serum at the earliest possible moment, and usually the length of time that had intervened determined



The homes of this boy and girl have to thank research workers and animals for the lives saved by antitoxin for diphtheria. Without antitoxin, developed by experimental work on animals, such children would have had slim chances of recovery.

whether the man would live or whether he would die a most distressing and horrible death.

The antityphoid vaccine, also worked out on mammals and tested on mammals, has practically abolished typhoid fever in soldiers' camps. It is estimated by the Surgeon

General's office that during the World War it saved the lives of 60,000 men in the American army alone.

BENEFITS OF EXPERIMENTATION TO MAN

These are only a very few examples from the long list of benefits that have accrued



On the roof garden of the Home for Destitute Crippled Children, Chicago. Suppose one of these victims of infantile paralysis were your child? Would you hesitate to sacrifice under ether one or more animals if through the knowledge gained the disease could have been prevented, or your child could have recovered without being crippled?

to humanity through the use of living mammals for experimental purposes. I must mention only one more—the recent discovery of a specific treatment for diabetes. Less than two years ago I invited a little girl to go for

a bird walk with me that I might give her the pleasure of stroking and feeding a wild bird in its nest. I was particularly eager that she should enjoy that day, because both she and I knew that she had not many days to live. She was doomed to die of diabetes within six months; as a matter of fact she died



Pacific and Atlantic

Not man alone, but animals also have benefited by experimental work. The best example of this is the conquest of hydrophobia.

in less than three months from the date of our walk. I remember thinking that I would give anything I possessed if I could by some miracle restore that child to health. Today, less than two years later, that miracle could be performed, because Dr. F. G. Banting of the University of Toronto, by a brilliant series

of experiments on dogs, has completed investigations begun on rabbits by Claude Bernard seventy-five years ago. The story of this wonderful discovery is long, but here are the outstanding facts. It was found that when the pancreas of a dog is removed, the animal at once develops acute diabetes and usually dies of that disease within three or four weeks. Under the microscope the pancreas is seen to be studded with countless little bodies, known as the islands of Langerhans, after the German scientist who discovered them. It was found that these islands secrete a substance quite different from that secreted by the rest of the pancreas, and that it is the absence of this substance, not the absence of the pancreas itself, that causes diabetes. A method was devised for obtaining an extract from these islands of Langerhans, and it was found that when this extract was injected into a dog whose pancreas has been removed it did not die, but got well and continued to be well as long as it was given injections of this extract. After these injections had been proved to be safe by repeated experiments on dogs, they were tried on human patients with startlingly beneficial results. Even when the disease is of long standing, when the patient has reached the very last stage and is in the coma that immediately precedes death, injections of this extract, now known to the world as insulin, will bring him out of the coma, snatch him from the very jaws of death, and restore him to health.

THE FALSE STAND OF THE ANTIVIVISECTIONISTS

We have seen that all these great advances in medicine and surgery have been made as the result of experiments on living mammals, and you will agree, I believe, that in all probability further advances in these fields must be brought about by the same means. This is the opinion of practically all eminent physicians and surgeons and veterinarians, and of all the great scientists and educators in other fields—in short, it is the opinion of all persons who have vast responsibilities for the health of men and of animals. The only persons who are opposed to these reasonable experiments are the antivivisectionists, who have no such responsibilities. Would any sane person think of going to the antivivisectionists for help if there were an epidemic of smallpox or diphtheria, or if there were an outbreak of hog cholera or of blackleg in cattle? We don't go to them because they know nothing about such matters. Yet they boldly contradict all competent authorities and tell us that experiments on animals are useless, that they have never accomplished anything. The antivivisection societies are composed largely of well disposed but woefully misinformed persons. And those who are responsible for the misinformation are the leaders of the antivivisectionists. I have been studying these leaders for some years, and I may say, without any danger of my statements being disproved, that among them may be found many of the most danger-

ous of the criminal insane to be found in this country today—and I have recently visited some of our largest penitentiaries and asylums. I have found some of these leaders of the antivivisection movement to be guilty of falsehood, slander, libel, perjury, forgery, and attempted bribery. Under false pretenses they obtain money from weakminded and unthinking people and, with this money, they wilfully and perennially attempt not only to prevent the advance of medicine and surgery, but also to break down the bulwarks of preventive medicine by teaching contempt of vaccination and of the use of antitoxins.

Few of the criminals in our jails are responsible for the deaths of more than a small number of persons; few of them have attempted widespread destruction of life. But it is the opinion of eminent physicians that through the pernicious teachings of the antivivisection leaders we shall in a few years have epidemics that will destroy the lives of many thousands of children. Unless we wish for a return of the plagues and pestilences that once devastated wide areas on this world before the introduction of modern methods, we should use every means in our power to discourage these dangerous fanatics. I believe that it is the duty of all good citizens who belong to antivivisection societies to send in their resignations at once, and to stand with our government, our great physicians, surgeons, veterinarians, agriculturalists, educators,

and divines in approving and supporting properly conducted animal experimentation and sane humane education generally.

After the presentation of this paper by Mr. Baynes before the American Society of Mammalogists, at its fifth annual meeting, May 15 to 17, 1923, in the Academy of Natural Sciences, Philadelphia, the Society unanimously passed these resolutions:

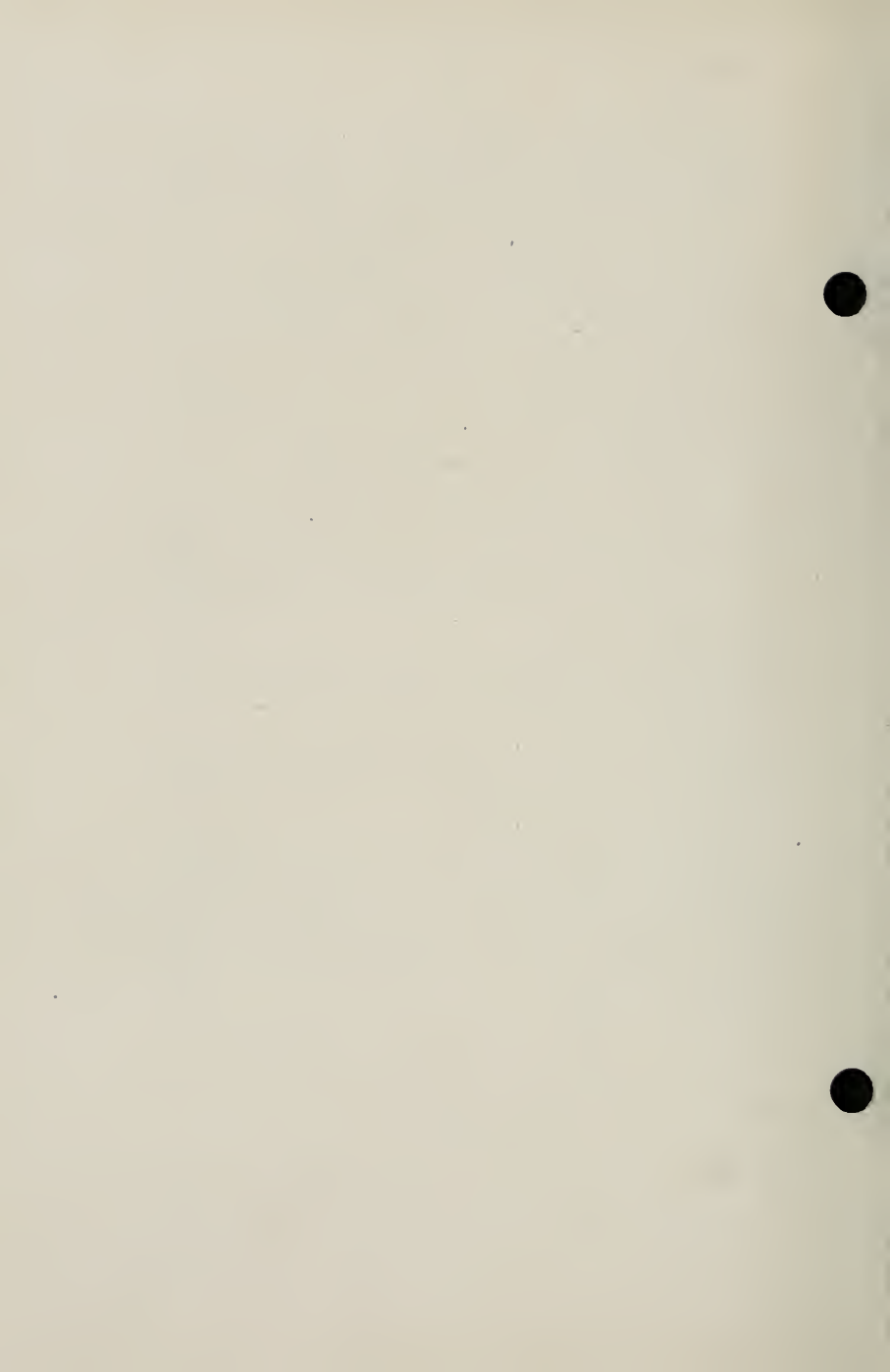
WHEREAS, It is a fact known to all thinking people that most of the great advances in medicine and surgery have been made as a result of experiments on living animals, especially mammals, and

WHEREAS, It is the belief of our eminent physicians, surgeons, and veterinarians, and all others having great responsibility for the health of human beings and of animals, that future advances in these fields will be made chiefly as the result of similar experiments, and

WHEREAS, It is known that these experiments almost invariably are conducted humanely and with a minimum of discomfort to the animals used, and

WHEREAS, There is an organized movement being carried on by certain misinformed and misguided individuals who seek to prevent or seriously interfere with such experiments, be it

Resolved, that we, members of the American Society of Mammalogists, in annual convention assembled in the city of Philadelphia, on the sixteenth day of May, 1923, are of opinion that, in the best interests of real humanity, animal experimentation, including vivisection, as practiced in our laboratories today, should continue unhampered.



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