

Instead of "experimenting" on patients, the effect of a new drug is tested upon the frog, rabbit, or dog. Its mode of action is exactly ascertained, and the physician knows what organs and structures will be affected, how they will be influenced, and the changes which will be produced by the progress of a disease. Even if the charge were true that vivisection had never added a drug to the pharmacopœia it would prove nothing, for it is the work of the vivisectionist to test the effects of existing drugs and define their uses. A few instances will suffice. If nothing were ever learned by vivisection but the action of digitalis upon the heart, the pain caused would be abundantly justified. Bromide of ethyl was brought forward as an efficient anæsthetic, but a vivisectionist by the death of a few dogs prevented a series of those dreaded accidents, death on the operating table, which would have followed its use. By operations on animals, Bernard discovered the hypodermic use of drugs, and Majendie of strychnine. Traube explained the real nature and use of digitalis, and Maure of saline purgatives. Luchsinger, following up the clue obtained from experiments on dogs, demonstrated the value of strychnine as a preventive of night sweats in consumptive persons, and by the same means nitrite of amyl was shown to allay the agony of angina pectoris, and pepsin to be of value in dyspepsia. In the same way jequirity was introduced in ophthalmic surgery, salicylic acid in rheumatism, jaborandi in dropsy, iodoform as an anti-septic, and the bromides, chloral, and paraldehyde as analgesics. All the new drugs—antipyrine, exalgine, and antifebrine—that have cooled so many fevers and alleviated so much suffering, were all tested and their effects proved on animals. Who would have dared to use cocaine on the human eye, like all anæsthetics, "God's best gift to his suffering children," with all the risk of inflammation, if its effects had not first been ascertained on animals?

But this charge is not true, for Dr. Lauder Brunton has shown that between 1864 and 1867 seven drugs were added to the pharmacopœia, and from 1867 to 1874 eleven were added.

Even commercially, vivisection has been of the greatest practical importance. Dr. George Fleming, in his work on Veterinary Science, makes some estimates of the results. In one district in France sheep to the value of £213,600 died in one year of anthrax, and in Russia 100,000 horses died annually till Braueil, followed by Delafond, Davain, Chauveau, Toussait, and Pasteur, perfected the knowledge of the poison and showed the means by which its energy may be abated. The desolating scourge of the cattle plague was stayed, and the silkworm disease was brought under complete control by Pasteur. Smallpox of sheep, the swine plague, dis-