proven to have influenced the progress of the tubercular disease in a single case, although all were exhibited in maximal doses; indeed, many of the animals either died from the effects of the drug, or showed marked symptoms of poisoning.

A single case will serve as an example of the others. Acid corrosive sublimate was introduced into guinea-pigs in very large doses, the size of which can be better appreciated if we picture to ourselves the magnitude of proportional doses for man. Considered in this way, 25 c. c. to 250 c. c. of a 1 in 1000 solution of the sublimate were employed daily, but without any appreciable effect upon the progress of the disease. He would certainly be a bold therapeutist who would inject a half a pint of 1 : 1000 corrosive sublimate solution daily in the hope of obtaining such a saturation of his patient with the drug that he should be unfit ground for the existence of the germs already within him.

Before we can hope to introduce any very rational therapeutics in the majority of the infectious diseases, a more exact knowledge of the fate of pathogenic microörganisms in the body is necessary. As a result of the large amount of work which has recently been done in the endeavor to solve this problem, we can say little more than that in some way or other the tissues seem to be able to dispose of a certain number of microörganisms, and that there exists a certain relationship between the general vigor of the individual and his ability to dispose of them.

From these considerations the inexpediency of attempting any germicidal plan of treatment for tuberculosis must be apparent. It can only be weakening to the patient to introduce a large amount of poisonous material into the system, since this increases the amount of extraneous material which must be cared for by the tissues.

A knowledge of the fact that in certain parts of Austria, where much garlic is eaten, the proportion of phthisical persons is very small, has led Cornet to try the effect upon tuberculous animals of an infusion of the herb, but with the same negative result as in the other cases. The effect of high altitude (4800 feet) was also tried, but here again no positive result was obtained and Cornet was obliged to conclude that there is nothing in high altitude *per se* unfavorable to the progress of tubercular disease already established. J. S. E.

La Mort par la Décapitation. Par le Dr. Paul Loye, Préparateur du Laboratoire de Physiologie de la Sorbonne; Préparateur du Cours de Médecine légale à la Faculté de Médecine. Préface de M. le Dr. P Brouardel, Professeur de Médecine légale et Doyen de la Faculté de Médecine de Paris. 8vo. pp. x.. 285. Paris: Bureaux du Progrès Médical, 1888.

Death by Decapitation. By Dr. Paul Loye.

In the introduction to this volume, the author states that in view of the numerous discussions upon the subject of decapitation in the learned societies and in the press, and in view of the propositions looking to a change in the mode of punishment actually employed in France, he has

thought the opportunity favorable for collecting together all the facts, and for examining the value of the various opinions on this subject.

Dr. Loye has rigidly excluded everything that pertains to sentimentality and the right which society exercises of depriving a human being of his life, and has confined himself exclusively to the scientific consideration of the question whether consciousness survives decapitation, or whether intellectual death is really instantaneous. In order to determine this question, he has witnessed the execution of criminals and noted carefully every manifestation which succeeds the separation of the head from the body, and having been instructed on this point, he has endeavored to find in the laboratory an explanation of the facts observed, in order to determine their physiological value. He has demonstrated that, if by means of anæsthesia an animal is deprived of consciousness before decapitation, the contractions of the face, the grimaces which seem to indicate profound suffering, produce themselves with the same regularity and physiognomy. From this it is inferred that these appearances are unconscious, automatic acts. The facts which the author has collated and commented upon are numerous and scientifically precise. The conclusion arrived at will relieve society of the charge of inflicting upon the criminal a torture as horrible as that for which he is punished.

The first part of the work is devoted to an historical survey of the subject. Part second relates to experimental researches, whilst part third treats of death by decapitation in man.

After stating the medico-legal applications of the study, the author sums up his conclusions of a physiological, medico-legal, and moral and social order, substantially as follows:

1st. After decapitation, there is an absolute immobility of the body and an equally absolute immobility of the head, except in some cases where certain movements follow the initial calm. Death is calm, notwithstanding the presence of asphyxia (hemorrhage with arrest of respiratory movements), which would be supposed to excite convulsive movements. But under the influence of active irritation of the nervous system by the blade, or violent shock, there is a suspension, an immediate abolition of reflex and automatic action of the nervous centres. The excitability of the centres has disappeared; the peripheric irritations yield no response; and the asphyxiated blood can no longer exercise its convulsive effects. There can be no agony, no movements, no convulsions; death is calm, and both the head and the body remain immobile. This calm death, without agony, is caused by inhibition, which masks the effects of hemorrhage and asphyxia.

The effects of inhibition may be permanent, or only transitory. In the first case, the centres are definitively shocked, and death overtakes them in the midst of their insensibility. In the second case, the properties of the centres are only momentarily suspended; they may reappear in the course of time. But, in order for them to regain their activity, the centres must have preserved the conditions of their nourishment, they must have received the blood which is necessary to their support. If, during inhibition of the nervous centres, the blood has completely disappeared, their return to activity is evidently impossible. This is the state of the medullary centres of the decapitated trunk. If, on the contrary, during the state of insensibility they have retained a certain quantity of blood, they may recover some activity until the moment when the blood becomes in quality improper and insufficient. This is probably

what takes place in the case of the encephalic centres, when, in the decapitated head, they manifest some signs of excitability after an inhibition of one or two minutes.

2d. These researches are of some value in medico-legal inquiries. They assist in determining the conditions of deaths of certain victims after section of the soft parts of the neck, and even after the spinal cord has been severed. In the former case, death has probably occurred from asphyxia; in the latter, by inhibition. They demonstrate, further, that great reserve should be maintained in selecting the sign which serves to mark the moment of death. The heart of the decapitated sometimes does not cease to beat until one hour after decollation. From a legal point of view, it seems strange to regard the corpse separated from the head as living all this time. The arrest of the heart should not then be considered as the termination of life.

3d. It has been shown that after decapitation intellectual death, the loss of consciousness, is immediate and final. It is of no consequence whether the heart continues to beat, the nerves remain excitable, the contraction of certain muscles produces movements more or less disordered; if the mental functions are abolished, if the return of consciousness is impossible, the other manifestations of life should neither interest nor disturb the criminalist or moralist. There can be no doubt that the punishment is painless.

Of the modes of punishment employed by different people, the proof is incontestable that the one by decapitation is that which presents in the highest degree the guarantees of the immediate destruction of mental life and the impossibility of return of conscious activity. This cannot be said of other forms of capital punishment. For this reason search has been made for an ideal form of punishment capable of suddenly and definitively destroying life. Most naturally, attention has been turned to electricity as a means of accomplishing the desired end. Public opinion has inclined toward the substitution of *fulguration* for the guillotine. But our knowledge of the mechanism of death by electricity is still imperfect, and for this reason we are not justified in substituting it for a mode of punishment well known and definite in its application and effects. Death by it cannot be produced more rapidly or more surely than by decapitation. It is by its inhibitory action on the nervous system that electricity causes death; but decapitation possesses this influence in the highest degree. Decapitation has this advantage, that by relieving the nervous centres of the necessary blood, their restoration to activity becomes impossible; while after fulguration it is possible for consciousness to return. The only advantage of electricity over decapitation is, that it leaves the body intact.

There is another point to be considered; it is, that the separation of the head from the body offers a public proof of certain death; while in the other methods, especially in fulguration, simulation of death may occur. The only suffering connected with the mode by decapitation is moral agony which the fear of death may cause.

We have endeavored to sketch, as briefly as possible, the principal contents of Dr. Loye's interesting work. The subject is one of particular interest at the present time in France, and, in some of its bearings, has elicited discussion on this side of the Atlantic. The physiological features of the study are of special interest to the medical profession. The historical account of the subject is complete and full of interest.

The views of different writers are carefully presented and commented on. The results of the author's observations and experiments, and those of other investigators, are clearly described. Though the subject suggests the sensational, the investigation has been confined strictly within scientific bounds. The results obtained, besides advancing our knowledge of certain questions in human physiology, will help to relieve society of unnecessary disquietude, and enlighten popular opinion upon a subject concerning which there has been more or less misinformation.

W. H. F.

THE MOVEMENTS OF RESPIRATION. By MAX MARCHWALD, M.D. With an INTRODUCTORY NOTE by J. G. M'KENDRICK, M.D., LL.D. 8vo. pp. 171. London: Blackie & Son, 1888.

So seldom is it that a monograph originally published in German upon a physiological subject is reproduced in English that the book before us is a treat to those who wish to get an insight into foreign original research without taking the time to labor through an entire work in a foreign tongue.

The book before us is devoted not so much to the movements of respiration as to the respiratory innervation, and the author has, in conjunction with Hugo Kronecker, of Bern, certainly reached very instructive results from interesting studies. It is impossible in this short notice to give the results even as briefly as Marchwald sums them up at the end of the work. He supports the theory that the automatically acting respiratory centres send out impulses which if ungoverned produce simply incoördinated respiratory movements, and believes that the vagus nerve is endowed with the function of regulating these impulses, coördinating them and so directing them as to fully utilize them. The impulses, in other words, are sent out by the centre spasmodically and not rhythmically.

The book is wonderfully well illustrated by tracings and its value is greatly enhanced by their clearness and careful execution. One cannot help feeling surprised that a work so purely physiological should be republished, particularly in view of the labor of translation. The interest of Dr. M'Kendrick in such subjects undoubtedly is responsible for the effort made to give English readers a high-class original treatise, and we sincerely hope that all interested in nervous mechanisms, even elsewhere than that of respiration, may show their appreciation of the work. Many lines of original research open themselves after a perusal of its pages and questions of vital interest are answered with clearness and exactitude.

H. A. H.