

**ON SNAKE-POISON.
ITS ACTION AND ITS
ANTIDOTE**

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On Snake-Poison. Its Action and Its Antidote by A. Mueller

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BY
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PREFACE.

Since the method of treating snakebite-poisoning by hypodermic injections of strychnine, discovered by the writer and published but a few years ago, has already been adopted by the medical profession throughout the Australian colonies, and practised even by laymen in cases of urgency with much success, it has been repeatedly suggested to him that the subject calls for further elucidation at his hands; that the morbid processes engendered by the snake venom and the *modus operandi* of the antidote should be explained by him in a manner satisfying the demands of science, and at the same time within the grasp of the intelligent, moderately educated layman. When the latter, in a case of pressing emergency and in the absence of medical aid, is called upon to administer a potent drug in heroic doses, the aggregate of which would be attended by serious consequences in the absence of the deadly ophidian virus, an intelligent insight alone into the process he is about to initiate will give him that decision and promptitude of action, on the full exercise of which on his part it may depend whether, within a few hours, a valuable and to him probably dear life will be saved or lost.

The foregoing applies, not to Australia only, but to all other countries infested by venomous snakes. The introduction of the writer's method in every one of these countries is merely a question of time, for snake-poison acts everywhere according to one uniform principle, however different the symptoms it produces may appear to the superficial observer. The antidote, therefore, that cures snakebite in Australia will as surely cure it elsewhere if properly and efficiently applied.

To his Australian confrères, more especially to those who adopted his method but had to practise it more or less empirically, the writer also owes a more elaborate explanation of his theory of the action of snake-poison in all its bearings on the various nerve centres than is to be found in the scattered writings he has from time to time published in our periodical literature. His warmest thanks are due to them for the records of cases they have furnished to the *Australian Medical Gazette*, and to the Hon. J. M. Creed, its able editor, for the ample space he has invariably allotted to the subject, and the valuable support he has given him throughout. By our united efforts we have reared in a dark and hitherto barren field of research a column of solid knowledge, and on this column Australia now occupies the highest and will ever occupy the most prominent place.

Not the least pleasing feature in the history of this discovery is the fact that it has been made without an elaborate series of experiments on animals, that

it is a peaceful conquest not attained by means of doubtful justification, and which have hitherto invariably failed in their object. This object—the discovery of the coveted antidote—instead of being brought nearer, was, in fact, further removed by every succeeding series of experiments. However fruitful in results this mode of research has been in other domains, in this particular one it has not only been a failure but an actual bar to progress. Nature invariably refused to yield her secret when thus interrogated. The tortured animals, like the victims of Torquemada, either did not answer at all or they answered with a lie, and the baffled experimenter abandoned his task in despair.

Still, these negative results notwithstanding, the writer is confronted by a certain class of would-be rigorous scientists, who tell him that his theory of the action of snake-poison, though it explains all the phenomena, cannot be accepted as correct until it has been proven so by strict test experiments on animals, and that the successful administration of the antidote is proof only of the fact of neither antidote nor snake-poison having killed the patients, who, probably, might have recovered if left to themselves. This may be strict logic, but common sense replies to it that if recovery takes place after proper administration of the antidote in cases which, according to all our previous experience, would have ended fatally, it is not illogical to assume that antidote and recovery stand in the relation of cause and effect. This sceptical

attitude of the scientific mind can justly be maintained only with regard to cases limited in number and in which the symptoms left room for doubt as to their final result, but in view of the formidable and constantly increasing records of cures from snakebite during the last three years, it is, to say the least of it, unreasonable.

The demand for experiments on animals, in proof of the correctness of his theory, the writer does not feel called upon to satisfy, for, apart from the theory proving itself by explaining all the symptoms the snake-poison produces, it has also stood the test of practical application. It is proven to be correct by the success of the antidote to which it led, and which is the logical outcome of it. After finally attaining a goal one has striven for, it is quite unnecessary to retrace one's steps with a view of ascertaining whether the road that has led up to it is the right and proper one.

By a fortuitous concurrence of circumstances, however, even this demand for experiments shall be satisfied in these pages. The writer published his theory of the action of snake-poison in May, 1888, after having practised the strychnine treatment for some years and thoroughly satisfied himself of its efficacy. In the latter part of 1888 accounts of Feoktistow's researches reached this country. His final conclusions to the effect that snake-poison is solely a nerve poison, that it does not destroy protoplasm, and has no effect whatever on the blood to which its destructive potency

on animal life can be ascribed, were in complete harmony with the writer's views, in fact, a re-statement of his theory. It was a strange coincidence, or whatever it may be called, that, independent of each other, at almost opposite parts of the globe, and by opposite methods, we had arrived at almost identical conclusions. Those of Feoktistow were drawn from 400 elaborate experiments on animals, both vertebrates and invertebrates, made in the laboratory of Professor Kobert at the University of Dorpat and in that of Professor Owsjannikow at the Imperial Academy of Sciences of St. Petersburg. The writer's conclusions, on the other hand, resulted entirely from a careful and happy analysis of the symptoms observed at the bedside of his patients suffering from snakebite. On one point only, but the most important one, he differs from Feoktistow. The latter shared the fate of all previous experimenters on animals. Though his experiments with snake-poison led him to the correct theory of its action, and even to the correct antidote, his experiments with strychnine and snake-poison were a failure. The animals experimented on died, and, falling into the error of his predecessors, mistaking the functional analogy that exists between the nerve centres of the lower animals and those of man for absolute identity, which does not exist, especially not when they are under the influence of the two poisons, he concluded his researches with the confession that a physiological antidote for snake-poison cannot even be thought of at the present state of science. Although,