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978-1-107-45660-0- Rabies: Its Place Amongst Germ-Diseases, and its  
Origin in the Animal Kingdom

David Sime

Frontmatter

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# RABIES

ITS PLACE AMONGST GERM-DISEASES,  
AND ITS ORIGIN IN THE  
ANIMAL KINGDOM

BY

DAVID SIME, M.D.

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INSCRIBED TO THE MEMORY OF MY BROTHER, THE LATE  
JAMES SIME (AUTHOR OF "LIFE OF LESSING" &c.),  
WHOSE NOBILITY OF CHARACTER BUT GLOWS THE  
MORE RADIANTLY THROUGH THE DARKNESS OF  
DEATH.

*D. S.*

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## PREFACE.

UNTIL the investigations of M. Pasteur threw light on the mystery surrounding rabies, it was not realised that there was a virus of the disease, or a rabific microbe as the *causa causans* of the virus. By keenest clinical observers the existence of either of these agents was viewed as at best problematic. Even where the germ-character of rabies was not denied, it was deemed most probable that, as surmised for untold ages, it was strictly of “spontaneous generation,” or that the virus-germ underlying the disease was itself a diseased product and in reality but a virulent growth of canine morbid conditions exclusively in the salivary gland. The typical character of the canine disease, with its unvarying stability of form as an originating rabies, was never doubted; and all the modifications of rabies in other animals were taken as but the stereotyped, well-known “furious madness” and “dumb madness” of the dog. On the other hand, the phenomena of *attenuation* and of *intensification*, as induced by a transmission of rabies through the animal kingdom, were unknown. That there were an intensifying and an attenuating division of the animal kingdom was never even remotely suspected. Nevertheless, it is hardly too much to say that this disclosure was one of the most important of M. Pasteur’s research. Nothing of real import was known to give any clue to the true nature of rabies, much less to its complete control. Both the clinical study of hydrophobia for centuries and the exploration of its morbid anatomy for generations had been altogether barren. The ignorance on the subject was as profound as it was universal.

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But its one hopeful feature was the fact that it was by the highest authorities everywhere frankly acknowledged. This could not be better realised than by turning to the text-books of only a decade or two back, as to the great work on Surgery of the late Sir John Erichsen. There was, in consequence, in the best and most desirable quarters little or no misknowledge or misconception to clear away. From first to last M. Pasteur had the unexplored realm practically to himself, only its fringe having been traversed by his immediate predecessors or contemporaries, and in well-nigh every direction he investigated the disease.

Apart from its value in treatment, the inoculation has proved itself, as a new instrument of investigation, one of the greatest in the history of research. Nor is it too much to say that by his experimental and comparative methods of using the inoculation M. Pasteur has inaugurated a new epoch in the history of medicine, having in the realm of germ-disease originated amidst the lesions and the dry bones of morbid anatomy a very *renaissance* itself. His research of rabies is that of a master-mind which has vitally influenced and moulded every subsequent investigation of germ-disease.

It has been a merit of first importance that it has turned scientific inquiry from the charnel-house to living nature. From the *post-mortem* table M. Pasteur returned once more to a face to face investigation of the disease itself in the living organism. But his attitude and motive were somewhat different from those of the masters of antiquity, or from those of any exclusively clinical study. The clinical characteristics, *per se*, were of subordinate interest to him. The attitude of the ancient masters was at best that of a fine observer with the view to a perfect delineation. It was, however, but an investigation which was wholly confined to the crisis or final explosion of a malady. With M. Pasteur, on the contrary, the latent, evolving stages of a germ-disease, from the earliest and obscurest beginnings of this evolution, interested him much more profoundly than its explosive-point. His attitude to the disease



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was that, not so much of an artist, as of an investigator of superb scientific imagination who is bent on a complete reproduction, *de ovo*, of the entire natural history of the malady and of its relationships. The latent and mysterious incubation-period of a germ-disease he lit up from beginning to end with a new significance. So much so that the incubation-period of every germ-disease may be aptly termed the Pasteurian Period; for he conclusively proved it to be the only important stage alike for investigation and for treatment. From first to last M. Pasteur had a single eye, not so much to the diagnostic features of rabies or to its identification from all other diseases, as to the points wherein it resembles many diseases, but, above all, to an identification of its pathogenic micro-organism with an elucidation of its seat of germination and its *modus vivendi* in the living organism and, through such commanding knowledge, its complete control.

To the positive, face to face study of the active disease of the ancients, M. Pasteur added the experimental methods of chemistry and physics. And he accomplished this achievement with such great results that, with Harvey, Hunter, Lord Lister and the greatest masters of medicine, he succeeded in converting medicine into one of the most fruitful of the “applied” sciences, having imparted to the investigation of germ-disease a thoroughly scientific method and a genuinely creative end. The experimental investigation of the “virus” of rabies, he supplemented with the comparative methods which have yielded such magnificent results in every other field of science from embryology to anthropology and theology, from Goethe’s superb generalisation on the unity of the vegetable and animal types to Darwin’s still grander generalisation on evolution. Perhaps there is nothing of the research more characteristic and more invaluable than this wide-ranging comparison at every step. This use of the inoculation has imparted to it a range of light beyond even its own intrinsic brilliance. Already the experimental investigation has involved a comprehensive study of rabies as it exists, not only in man and in the dog, as for many centuries so exclusively studied,

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but in the rabbit, the guinea-pig, the ape, the cat, the sheep, the fox, the wolf, the hyena, the horse, the cow, the deer, the pig, even the fowl. And before the method can be said to be exhausted or its disclosures at an end, the disease has yet to be studied, if possible even more minutely, in each of these and probably other classes of animal, and likewise in its relationship to, and in the light of, every allied malady, however apparently remote.

These and many more disclosures of M. Pasteur's research are of as lasting validity in comprehending rabies as of immediate value in mastering it. For these reasons M. Pasteur's communications on rabies are invaluable as a working basis. Any explanation, not only of the preventive treatment, but of rabies itself as a germ-disease and of its relationships to other germ-diseases, much more of its possible origin in the animal kingdom, to be at all satisfactory must be grounded on the fundamental facts and the far-ranging results of the experimental research, and even built of them. Unfortunately, M. Pasteur's communications have been somewhat sparse, mere droppings, so to say, from the crucible, but of purest gold. The chief of them appeared in the *Comptes Rendus* and in *Annales de l'Institut Pasteur*. But perhaps the fullest exposition is M. Pasteur's own Address to the International Medical Congress at Copenhagen. In like manner the works of Magendie, Galtier, Bouchard, Nocard, Brown-Séguard, and, above all, of Metschnikoff, are most important and have proved of much value. Not less suggestive are the Reports of the special Commissions to the French Government, and, on the other hand, Koch's researches on tubercle and on malarial fever which are works of great genius. In England, the able investigations of Sir Victor Horsley and of Mr Dowdeswell are extremely valuable; and not less important are the various Reports to the Government. The Report in respect of the rabbit in Australia, and the Report to the House of Lords regarding the surgical treatment of rabidised wounds are as exhaustive as they are practical. But of still greater importance is the extremely interesting Report on the outbreak of deer-rabies at Richmond

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Park during 1886–7. Above all, the Report on M. Pasteur's treatment of hydrophobia to the Local Government Board by a very special Committee of experts is the most masterly and the most authoritative statement which has appeared; it has been most helpful.

On the basis of these wide researches, the following work has been grounded. It is a study of rabies in a threefold direction, its causation in the individual organism; its place amongst germ-diseases with the end of bacterial agency in the animal economy; and, lastly, its origin in the animal kingdom. The treatment of the subject is from a series of standpoints which, in view, are far-ranging through the realm of bacterial life and activity, and which are perhaps not the least important features of the work. Thus, in the causation of the disease, the sensory rather than the motor nerve-roots of the cerebro-spinal axis are viewed as the specific nidus of the rabies-microbe, the pathogenic irritation of which is the prime lesion of the malady and underlying all the lesions. The rabies-microbe itself is described as of the simplest to the most complex structure. Far from being always simple and amorphous, it is viewed as in reality multiform, the quantity in the cerebro-spinal axis, and how it is organised, constituting the determining factor of every form of rabies. The paralytic element is taken as much the most important in canine-rabies itself, or in that of even the most attenuating division of the animal kingdom. In like manner the rabies of the sympathetic system is viewed as by far the most serious form of the disease, constituting the rabies characteristic of the intensifying division of the animal kingdom. It is taken as the sole factor of paralytic-rabies with its implication of the secreting system and of every infective form of the malady or of any paralytic element even in canine madness itself. In the consideration of the place of rabies amongst germ-diseases, the malady is treated and expounded as essentially a preventive rather than a prophylactic disease, these being described as the two great orders of the entire realm of germ-disease. Moreover, the particular

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tissue which forms the exclusive germinating ground of the prophylactic order, on the one hand, and likewise of the preventive orders, centric and peripheral, on the other hand, and as the formative factor of the order, is carefully examined. The very special prophylaxis of the prophylactic type of germ-disease and the general immunity of the preventive type are discussed and explained in detail, and as indicating how far the specific germinating tissue of the particular order of protection induces the protection. On the other hand, the end of bacterial agency in the germinating tissues of the living economy is also carefully examined, and its vast importance in the origin and establishment of secreting-organs and as a factor of evolution itself. The following study of rabies is largely a revelation of this growth, or of the development of the pathological into the physiological. Again, in the consideration of the origin of rabies in the animal kingdom, the canine source of every form of the malady which presents itself is gravely doubted; and the instability and fading, final character of canine-rabies, as that of the entire attenuating division, is demonstrated. The malady is viewed as, primarily, a germ-disease of the intensifying rather than of the attenuating division of the animal kingdom; and the universally excellent results which follow the use of the dog-muzzle are accounted for and explained. These are problems of very profound practical not less than of theoretic interest, which are worthy of consideration in spite of their novelty; and the following work is a study of rabies in this triple cycle of relationships.

Lastly, I am indebted for valuable criticisms to the scientific expert who read the MS. for the Syndics of the Cambridge University Press. I also desire to thank the staff of the University Press for their aid whilst the work was being printed.

DAVID SIME.

HARRINGAY, LONDON, N.  
*November 1903.*

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