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THE PATHOLOGY OF CERTAIN VIRUS DISEASES¹

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THE term "virus diseases," as used in this title, has reference to that group of acute infectious diseases whose etiological agents have not yet been cultivated with certainty on artificial media but have the common property of filterability through earthenware or porcelain filters.

Notwithstanding the fact that a very great number of infectious agents, both bacterial and protozoan, have been demonstrated and cultivated during the past fifty years, there remains a surprisingly large residuum of infections which may be included under the term "virus diseases."

There is a very wide distribution of the virus infections both within the animal and plant kingdoms. For example, among the diseases of man belonging to this group are such important examples as smallpox, poliomyelitis and rabies. The group may be represented among the lower animals by such instances as foot and mouth disease, rinderpest and hog cholera. In plants there is the mosaic disease of tobacco and numerous others. It is probable also that the bacteriophage of D'Herelle belongs in the same category. The biological importance of the filterable viruses may be further illustrated by the fact that certain tumor-like diseases are known to be caused by these agents, namely, Rous's chicken sarcoma and fowl leukemia.

It is of particular interest from the standpoint of pathological and cytological studies that the lesions of many virus diseases are associated with specific cellular inclusions, the nature of which has not as yet been determined with certainty. The inclusions may be situated either within the cytoplasm of the cells involved, within the nucleus or within both. As examples of intra-cytoplasmic inclusions may be mentioned those of rabies, smallpox, vaccinia, trachoma and molluscum contagiosum of man. In the fowl characteristic inclusions occur in epithelioma contagiosum. Inclusions confined within the nucleus have been demonstrated in herpes simplex, herpes zoster and varicella in man, and in the nuclei of cells of the central nervous system in the encephalitis of horses, known as Borna's disease.

These inclusions from time to time have been considered to be protozoan parasites, or the products of

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