

are known". This was partly based on Schwann's researches on fermentation and putrefaction, and on Bassett Audouin's proof that the muscardin disease of silkworms was due to a *contagium vivum*.

The classic monument of this fourth level of analysis is, however, Virchow's *Cellular Pathology* (1858), in which he showed that disease may often be localized in cell-systems and cell-territories, and sought to express both morbid growths and morbid stages in terms of abnormal cell-multiplication and reaction. "Nothing", Prof. Greenfield says, "could have been further from the central idea of Virchow's teaching than the mere mechanical application of cellular structure to the elucidation of the phenomena of life and of disease. It is the living cell, endowed with vitality and with function, governed by laws of existence, capable of self-multiplication and propagation, and arranged in organic systems, which he studies. It is the cell as the living active agent in the production of disease, and the arrest or perversion of its action by disease-producing causes, which have the highest place in his thoughts." The author of the famous dictum, *omnis cellula a cellula*, has said of his own work, "I blocked for ever the last loophole of the opponents, the doctrine of specific pathological cells, by showing that even diseased life produced no cells for which types and ancestors were not forthcoming in normal life".

As with physiology, so here, there is still work being done, and much to be done, at the four different levels of interpretation which represent historical stages. We have still to do with the pathology of the entire *organism*—with the problem of attaching definite meaning to such phrases as "constitution", "congenital tendency", "diathesis", and the like. And it is not easy to avoid verbalism on the one hand, and a violation of the unity of the organism on the other. We have still to do with the pathology of *organs*, which has hardly passed beyond man and the more important domestic animals. Roux's suggestive conception of "the struggle of parts within the organism" remains but little worked, and the relations of disease-variations to those which form