

Du Bois-Reymond, the eminent physiologist of Berlin. The former owed much of his scientific training to the school of Ernst Heinrich Weber in Leipzig, the latter to that of Johannes Müller in Berlin. Both agreed in denouncing the conception of a vital force—as it was then called—as illogical, and moreover as scientifically useless. But whilst Lotze distinctly stated that his criticisms on this subject were only addressed to scientific thinkers, and promised a further philosophical

says, "correctly saw that the work of Bichat had to be remodelled on the foundations laid by Schleiden and Schwann," an undertaking in which von Kölliker himself laboured with the greatest success. But above all must be mentioned the appearance of Rud. Virchow's 'Cellular Pathology' (1858, Engl. transl. by Chance, 1860), "in which he himself explains that he does not give a system but a general biological principle," and in so doing lays the foundation for the entire exact treatment of pathological cases. It is, however, well to note that Virchow does not regard life as a purely mechanical problem. The works of such authorities as Henle and Virchow give as much or as little philosophy and discussion of general principles as physiologists of the exact school required for about thirty years. Those masters, indeed, had themselves grappled with the philosophical problem, and had arrived at a formulation which sufficed to lead research into fruitful paths for a new generation of experts who themselves were not philosophically educated. The term vital force disappeared, and in the specialist medical literature of a lengthy period even life itself was hardly any longer discussed. Thus a firm basis was laid on which

mechanics, physics, and chemistry could be usefully applied. A similar silence as to general problems reigns in the great school which for two centuries built on the principles laid down by Newton in natural philosophy. Similarly in chemistry, the foundations laid by the atomic theory sufficed for the greater portion of the century following its enunciation. We have seen in earlier chapters of this work how, even in these much more firmly established mechanical sciences, our century has witnessed before its end discussions again arising as to fundamental questions and leading principles. A similar fate has come over biological science, and with it a renewed interest in the writings which stand at the entrance of that epoch which was so rich in the unravelling of definite and special problems. Authorities like Prof. O. Hertwig warn us now of that "other extreme which sees in vital processes nothing but chemico-physical and mechanical problems, and thinks it finds the true science of nature only in so far as it is possible to reduce phenomena to the motions of attracting and repelling atoms, and to submit them to calculation" ('Die Lehre vom Organismus,' an Address, Jena, 1899, p. 8).