THE INFINITELY SMALL IN BIOLOGY

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Infectious diseases and contagion were recognized many centuries before the causes of these phenomena were known or understood. Bacteria, which are considered to have been discovered by Leeuwenhoek in 1675, were known and had been studied for nearly two centuries before they were definitely associated with disease. The names of DuJardin, Davaine, Ferdinand Cohn, Koch and Pasteur stand out in the consciousness of every one as being associated with the proof that microorganisms are the cause of infectious maladies. Indeed, the labors of bacteriologists between the years 1840 and 1890 so clearly established the fact that microscopic animals and plants are the cause of infectious diseases that it became heresy to hold that such diseases might be produced in any other way.

In 1872, Ferdinand Cohn reported that Chaveau and Klebs had passed pus through compact filters consisting either of clay cylinders or membranes and that the material passing through the filters was not capable of producing disease. In other words, the contagious elements in the pus which were considered to be bacteria were retained by the filters. Later, Pasteur, because of his inability to see anything of causative or etiological significance in material capable of producing hydrophobia, suggested that there might be infectious agents smaller than visible bacteria. In 1892, Iwanowski, working with tobacco mosaic, passed juice from an infected plant through a filter and noticed that the filtrate was capable of producing disease in healthy plants. At the time little attention was paid to this observation, but in 1898 Beijerinck made a similar observation. He was impressed by its importance because he could see nothing in the filtrate...
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