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and then infected nonradioactive bacteria with these viruses. Analysis of the infected bacteria showed that, whereas the phage DNA entered the cells, most of the protein remained outside in the phage heads and tails attached to the cell walls. The phage therefore acted as a microsyringe that injected its DNA, encased in the head, into the cell. Thus the genetic material turned out to be DNA, which replicated in the bacterial cytoplasm and directed its hosts' protein-synthesizing apparatus to make phage head and tail proteins instead of its own.

This was a discovery of great importance that convinced the phage group, but it was not original. As early as 1944 Oswald Avery and his colleagues at the Rockefeller Institute, New York, had reported transfer of the ability to synthesize a specific polysaccharide capsule from one bacterial type of *Pneumococcus* to another by means of extracted and highly purified DNA. Avery suggested, very tentatively, that DNA might be the genetic material. Both Delbrück and Luria knew of this work some time before its publication and found it interesting but failed to see its significance. This was understandable at the time since, although it had been known from the end of the last century that DNA and protein were closely associated in the chromosomes of higher organisms, the chemical structure of DNA, unlike that of protein, appeared to be too simple to carry complex information. Moreover, Avery's phenomenon seemed remote from the problems presented by phage and had been revealed by biochemical techniques with which most phage workers were out of tune.[17]