

A new look at the relation of epidemiology and bacteriology at the turn of the 20th century

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It is usually believed that epidemiology had a conflictual relationship with bacteriology when the latter emerged as a new science, that is, between 1880 and 1945. The belief is that the capacity of bacteriologists to identify the agents of the most important infectious scourges, such as cholera, tuberculosis, etc., stole the forefront of the scientific scene from epidemiologists. In a nutshell, Robert Koch had become more important than William Farr. Susser wrote that during the “era of the Germ Theory” epidemiology “rather than being the creative pace-setters of public health, served largely in the role of handmaidens applying the work of bacteriological colleagues”¹. In the present issue of SPM, Hardy presents evidence that the role of the germ theory may not have been that detrimental to epidemiology. The discordance is so great that Hardy comes to a conclusion opposite to that of Susser, that is, “in the earlier investigations of typhoid (about 1890–1900), bacteriology featured occasionally as a handmaid to epidemiology”². The solution to the debate seems to lie in answering the question of who, between epidemiologists and bacteriologists, were the handmaidens of whom?³

In order to address this question let us imagine the reaction of an epidemiologist in 1900 having to deal with an outbreak of diarrhea and fever in a small village. The clinical presentation of the cases strongly evokes typhoid fever. This epidemiologist may be aware that a now famous bacteriologist has identified the microorganism that causes the disease. This information is of very little help to understand how the microorganism produced the outbreak, how contagion evolved, how to stop the outbreak and how to prevent the next outbreak. Even if bacteriologic analyses of stools are available, their sensitivity is low (many false negative) and there is no standard interpretation of the positive find-

ings (e.g., number of microorganisms, presence of coli, etc.). To answer the relevant questions for prevention, the epidemiologist will have to develop a strategy in which bacteriology plays little or no role at all.

Indeed, the turn of the century (grossly 1880–1920) constitutes a period during which epidemiologists formalised the methods for investigating an outbreak of acute infectious disease. They discovered, for example, that the agent of typhoid fever could be transmitted by salad, oyster or shellfish. Hardy reports that in 1902, Timbrell Bulstrode, a Local Government Board inspector, established that oysters were the cause of a food poisoning outbreak using the now familiar menu surveillance technique in which diners were asked to tick on a list the food items they had consumed². These methods are still taught and used today. „Bacteriology played little part in these assessments“, says Hardy².

Another important evolution that took place at the turn of the century is the rise of epidemiology as a profession. After 1880, professional epidemiologists were hired in England to practice epidemiology (e.g., John Simon, William Frederick Barry, Theodore Thompson, H. Timbrell Bulstrode, Edward Ballard, William G Savage).

It is possible that in a country such as Germany, the germ theory may have resulted in a more bacteriological than epidemiological approach to disease outbreaks, focusing on the investigation of the victims and their immediate contacts rather than on the transmission process. But in England and the US, epidemiology did grow at the turn of century. The stimulating contribution of Hardy also reminds us that large fragments of the history of epidemiology still remain to be investigated.

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References

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- 2 *Hardy A.* Methods of outbreak investigation in the “Era of bacteriology”: 1880–1920. *Soz Präventivmed* 2001; 46: 355–60.
- 3 *Morabia A.* Epidemiology and bacteriology in 1900: who is the handmaid of whom? *J Epidemiol Community Health* 1998; 52: 617–8.