

## CORRESPONDENCE

*This department is provided for the publication of informal communications which are of interest because they are informative or stimulating, and for the discussion of controversial matters.*

### THE PLACE OF HANSEN IN THE HISTORY OF MICROBIAL DISEASE

TO THE EDITOR:

In a series of recent contributions to THE JOURNAL the role of G. H. A. Hansen as the discoverer of the causative organism of human leprosy has been firmly established on the basis of the work published by him in 1874<sup>(8, 9, 10)</sup>. It is also true that he discovered the first example of the group of microorganisms later to be classified as the genus *Mycobacterium*, since the tubercle bacillus was first seen in tissue sections four years later by Baumgarten and obtained in culture by Koch in 1882<sup>(11)</sup>; the other species of this genus were found later still. However, there seems to be a tendency at present to suggest or imply that Hansen's discovery entitles him to priority of a wider kind in the field of microbial disease. This tendency is exemplified by the three quotations which follow:

"Armauer Hansen's discovery of the leprosy bacillus in 1873 is recognized as marking an epoch. He made his discovery in the infancy of bacteriology . . . it was not until 1882 that the tubercle bacillus was identified . . . the typhoid bacillus in 1883, the diphtheria bacillus and cholera vibrio in 1884, the tetanus bacillus in 1886, and so on."<sup>(6)</sup>

"*M. leprae* is accepted as the specific cause of leprosy. It was first opinioned by Dr. G. Armauer Hansen in 1874 . . . At that period in history . . . the teaching that bacteria cause disease was in its infancy and no disease was known to be of bacterial origin."<sup>(2)</sup>

"Hansen has the distinction of having discovered the first pathogenic microorganism followed 10 years later by Koch's discovery of the tubercle bacillus."<sup>(5)</sup>

The first two statements quoted above seem to imply very much what is categorically and sweepingly stated in the third, or at the very least that Hansen was the first investigator to establish a connection between a bacterium and *human* disease. Quite a brief study of the historical sections on the microbiology of disease in the standard textbooks by Bulloch<sup>(1)</sup>, Zinsser and Bayne-Jones<sup>(11)</sup> and by Dubos<sup>(4)</sup> shows that even the lesser claim cannot be upheld, let alone the wider one contained in the third quotation.

It is quite clear that priority in the identification of specific microorganisms as the cause of disease in man and lower animals lies with the mycologists. The first pathogenic microbe to be described was a fungus, shown by Agostino Bassi between 1835 and 1837<sup>(4, 11)</sup> to be the cause of a disease of silkworms ("muscardine" or "mal del segno"), and later named *Botrytis bassiana* in his honor. Bassi, among others at that time, predicted that microscopic organisms would be found to cause human disease. In 1839 the fungal cause of the human skin disease favus was discovered by Schoenlein, and the

causative agent, now known as *Trichophyton schoenleinii*, was used by Remak in 1840 to reproduce the disease (3). Other fungal infections of man were identified at about the same time.

In the field of bacterial causation of disease the most important investigations from the point of view of medical microbiology were undoubtedly those concerned with anthrax, since the early findings in this disease, which affects both man and lower animals, led to the later investigations of Pasteur and Koch; their work provided the first extensive study of the etiologic and immunologic relationships of a bacterium isolated in pure culture. The microscopic rods of *Bacillus anthracis* were seen in the blood of infected animals by Pollender in 1849 (reported in publication in 1855), by Rayer and Davaine in 1850 (1), and by Brauell in 1857 (11). In a series of reports between 1863 and 1868 Davaine, stimulated by Pasteur, demonstrated the experimental transmission of anthrax with infected blood and suggested that the rods it contained were the cause of the disease. Koch isolated the bacillus in pure culture in 1877 and established the infectivity of the *in vitro* isolate.

Finally, it might be claimed that Hansen was the first worker to find in material from a human source the bacterium causing a human disease. However, even in this respect the priority lies elsewhere. In 1857 and 1858 Brauell (1) found anthrax bacilli in the blood of a human case of anthrax, and transmitted the disease to sheep. Furthermore between 1868 and 1873 Obermeier observed the spiral organisms later designated *Borrelia recurrentis* (or *obermeieri*) in the blood of a patient with relapsing fever and reproduced the disease in man by the injection of infected blood (1, 7, 11).

Although the discussion of scientific priorities is usually sterile and invidious, it seems wrong that incorrect statements or implications of the kind quoted above should go unchallenged, since they deny credit to those to whom it is justly due. The name of Hansen can rightly be honored as that of the discoverer of the leprosy bacillus; adulation above and beyond this is inappropriate, however, particularly since Hansen's own attitude to his discovery was a properly cautious one (10). He worked in times which were indeed epochmaking for microbiology, but the chief protagonists of the period were Louis Pasteur and Robert Koch, with their respective schools of Paris and Berlin. If the memory of anyone is deserving of more honor that has been awarded hitherto, it is perhaps that of the little-known Agostino Bassi, truly the first discoverer of a pathogenic microorganism.

Dept. of Microbiology  
St. George's Hospital Medical School  
University of London  
London, S. W. 1, England  
June 23, 1965

G. R. F. HILSON, M. D., M. C. PATH

## REFERENCES

1. BULLOCH, W. A history of bacteriology. *In* A System of Bacteriology in Relation to Medicine, Vol. 1. Ed. by P. Fildes and J. C. G. Ledingham, London, H. M. Stationery Office, 1930, pp. 55, 59, 78.
2. CARPENTER, C. M. and MILLER, J. N. The bacteriology of leprosy. *In* Leprosy in Theory and Practice. Ed. by R. G. Cochrane and T. F. Davey. Baltimore, Williams and Wilkins, 2nd ed., 1964, p. 13.
3. CONANT, N. F. Medical mycology. *In* Bacterial and Mycotic Infections of Man. Ed. by R. J. Dubos and J. G. Hirsch. Philadelphia and Montreal, J. B. Lippincott, 4th ed., 1965, p. 862.
4. DUBOS, R. J. The evolution of medical microbiology. *In* Bacterial and Mycotic Infections of Man. Ed. by R. J. Dubos and J. G. Hirsch. Philadelphia and Montreal, J. B. Lippincott, 4th ed., 1965, p. 6.
5. [EDITORIAL] Facts you should know about Hansen's disease. *The Star (Carville)* **24** (1965) May-June (inside back cover).
6. ROKSTAD, I. Gerhard Henrich Armauer Hansen. *Internat. J. Leprosy* **32** (1964) 64-70.
7. TURNER, T. B. The spirochetes. *In* Bacterial and Mycotic Infections of Man. Ed. by R. J. Dubos and J. G. Hirsch. Philadelphia and Montreal, J. B. Lippincott, 4th ed., 1965, p. 591.
8. VOGELSANG, Th. M. The Hansen-Neisser controversy, 1879-1880. *Internat. J. Leprosy* **31** (1963) 74-80.
9. VOGELSANG, Th. M. Hansen's first observation and publication concerning the bacillus of leprosy. *Internat. J. Leprosy* **32** (1964) 330-331.
10. WADE, H. W. First observation of the leprosy bacillus. *Internat. J. Leprosy* **32** (1964) 325-329.
11. ZINSSER, H. and BAYNE-JONES, S. A Textbook of Bacteriology. New York and London, Appleton-Century, 8th ed., 1939, p. 699.