Centers and Peripheries: The Development of British Physiology, 1870—1914

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In 1860, experimental physiology was virtually unknown in Britain. In contrast to the well-equipped laboratories of Germany and France, where many physiologists produced large numbers of scientific papers, little research was carried out anywhere in Britain. By 1900, however, the physiology departments of Cambridge, University College London, and Oxford had become internationally recognized as centers of excellence. Several historians have focused attention on these institutions, which became central to the British discipline. In this essay I broaden the geographical scope to consider the developing structure of the discipline on a national scale after 1870— for although physiology departments outside this metropolitan-Oxbridge axis did not become well known, by 1900 provincial medical schools did employ a number of full-time physiologists who were expected to carry out research as well as to teach. I will explore the question of why these provincial laboratories failed to develop into research schools, and why, in contrast, the departments in Cambridge, London, and Oxford were so successful.

Judgments about success and failure are inevitably contentious. I am indebted to the analytical structure suggested by Jack Morrell in his comparison of Justus Liebig's and Thomas Thomson's schools of chemistry. Although critics have indicated how idealized the notion of "research school" becomes in Morrell's study,
his characterization of the departments of Liebig and of Thomson provides historians with a useful checklist for analyzing disciplines at the level of individual laboratories. In this study I have considered a successful research enterprise to be both the source of original ideas that are communicated in publications to colleagues in the discipline, and a training ground for those who later achieve important academic posts. I will use a number of parameters to compare successful against less-successful departments: the financial provisions available to researchers; the entrepreneurial skill of the laboratory director; and the supply of research manpower. This paper is divided into several sections: the developing structure of British physiology is outlined in the first part; the research programs established in departments in Cambridge, University College London, and Oxford are then compared to those developed in Manchester, Liverpool, and Leeds; and the funding and organization of the laboratories are outlined before, finally, exploring the source of research manpower.

THE ESTABLISHMENT OF BRITISH PHYSIOLOGY

Although physiology was taught at all medical schools in Great Britain from 1815, as part of the instruction required for the Licence of the Apothecaries’ Society, there was virtually no institutional support for experimental research. The teachers were generally young practitioners who offered lectures in order to supplement their incomes and advertise their professional skill. Students were not required to attend laboratory classes; most medical schools in the mid-nineteenth century were run on a shoe-string economy and had little capital to invest in extensive laboratory equipment. Those British doctors who did pursue physiological research, such as Charles Bell and Marshall Hall, were forced to provide their own laboratories and meet their own expenses.

This lack of institutional support explains, in part, the so-called stagnancy of British physiology. There were other reasons also. In Britain throughout the nineteenth century, physiologists, following the tradition established by John Hunter, believed that function could be explained by structure. Many physiological studies thus
