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Caldani concentrated his experimental work on the differential “irritability” of the various parts in the nervous system; his fame derives also from his *Institutiones* of physiology, pathology, and anatomy, which synthesized his own contributions as well as those of his contemporaries in pursuance of Haller’s “paradigm”. His exchanges with Spallanzani (1729–99), spanning three decades (1768–98), started when the latter sent him a copy of his *Prodrome di un’opera de imprimersi sopra le riproduzioni animali* (1768). Thereafter, the entire experimental work of Spallanzani, especially that on functions such as generation, circulation, and digestion, formed the background of a lively and friendly intercourse between the two scientists. As stated by Ongaro in his informative introduction: “Sono toccati così pressoché tutti i temi dell’attività e degli interessi scientifici dei due corrispondenti, dai problemi della generazione e dalle difficoltà che il preformismo incontrava per spiegare i fenomeni di eredità e de ibridazione, di rigenerazione parziale e di mostruosità, alla circolazione sanguigna e alla morfologia dei globuli rossi; dalle rigenerazioni animali sulle quali il Caldani esegue alcune esperienze richiestegli dallo Spallanzani, alla digestione.” (p. 15.) Abundant footnotes provide the necessary background to the scientific aspects of the exchanges. The correspondence bears testimony to the broader area of the cultural, social, and institutional setting for the activity of experimental researchers in late eighteenth-century Italy. But predominantly, the letters document the evolution of physiology in the Hallerian tradition, and the close connexion of observation and experience with the conflicting theories of that period. As an instance, one might mention the significant opinions expressed on Blumenbach’s notions of *Bildungstrieb* or *nisus formativus* and on his vitalistic recasting of the Hallerian paradigm in Caldani’s and Spallanzani’s letters from August to November 1787 (pp. 209–222).

Apart from the fact that a major part of the correspondence had not been previously published and that it deserved the type of scientific transcription Ongaro undertook, the present edition provides scholars with a useful tool for the historical understanding of the scientific achievements of Caldani, Spallanzani, and other eighteenth-century researchers, especially among Italians.

As an additional feature of the edition, Appendices I and II present the correspondence between Caldani and Nicolo Spallanzani, brother of Lazzaro, from the latter’s death in 1799 to 1807. The appendices are followed by an interesting ‘Iconografia’ and by the appropriate index and bibliography.

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JOHN E. LESCH, *Science and medicine in France: the emergence of experimental physiology, 1790–1855*, Cambridge, Mass., and London, Harvard University Press, 1984, 8vo, pp. viii, 276, £20.00.

Lesch maintains that “the challenge facing historians is to show how the sciences, while retaining this necessary degree of autonomy, have also been creatures of time and place.” In other words, he calls for an end to the false dichotomy between internalist and externalist approaches to the history of science, and for an awareness of the way in which the content, means, and ends of a science are shaped by the environment in which it operates.

Lesch does not, however, consider the impact of class interests or national politics upon the medical sciences in France at the turn of the nineteenth century. Instead, he focuses upon the scientist’s “immediate” environment: upon the institutions within which he acquires his skills and orientations and to which he looks for resources and approbation. The major theme of the book is how the combination of factors that made up the internal milieu of French medicine acted to promote the emergence of experimental physiology in a recognizably modern form during this period.

Around 1800, the precise connotation of “physiology” remained to be fixed. Although its ancient signification as the science of nature had largely been superseded by the more limited

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notion of a science of vital phenomena, several competing notions of the scope, aims, and methods of this life science persisted. On the one hand, the project of a comprehensive theory of organic beings in the tradition of Buffon was maintained by Lamarck and Geoffroy Saint-Hilaire. Cuvier used his immense influence to try to curb what he regarded as the excesses of these proponents of grand theory and to institute a more modest, more sober, more “positive” physiology. But like Geoffroy and Lamarck, Cuvier saw a wide-ranging comparative approach as the royal road to physiological knowledge. A third strand of thought was more medical in outlook and method. The human body was its principal, though not its exclusive object of study; anatomy and animal experiment its instruments. In addition to these resources, pathology played an important part in generating both research problems and corroborative data. Bichat’s works formed a monument to this concept of physiological endeavour.

Lesch describes how between 1800 and 1840 the term “physiology” came virtually to be identified with the experimental pathological programme. Bichat’s example made a major contribution to this development; but Lesch argues that the triumph of the experimental method was, above all, the achievement of François Magendie. The chief merit of this work, however, is that it transcends the “great man” approach to the history of science by asking what aspects of his context shaped Magendie’s activities and contributed to the success of his version of physiology.

Two institutions played an especially prominent part in this process: the Paris clinic which, after long gestation and a fraught labour, emerged at the turn of the nineteenth century; and the First Class of the Institut de France. Both Bichat and Magendie were creatures of the reformed system of medical education created under the Directory and perfected during the Empire; and this upbringing left a permanent mark upon their physiology. Above all, the strong *surgical* bias of the new Paris school of medicine (which has been well described by Toby Gelfand) provided them with operative skills that were crucial to the interventionist and manipulative style of physiological investigations that they undertook. Not only could non-surgeon successfully attempt the ablations, sections, and ligatures that were central to Bichat’s and Magendie’s method; but without a surgical background such experiments could hardly be conceived.

The hospital served also as a continuing research resource for the medical scientist. The starting-point of Bichat’s investigations on the interdependence of the major organ systems was his clinical experience at the Hôtel-Dieu. Magendie, too, was a clinician as well as an experimenter, and drew extensively upon his own hospital experience and upon that of his extensive network of medical contacts to provide physiologically relevant information. Disease was seen as a natural experiment which supplied information that vivisection alone could never achieve. Lesch does well to point out that Ackerknecht’s contrast between “laboratory” and “hospital” medicine is too sharp. For Bichat and Magendie, the hospital ward was itself an extension of the laboratory.

Hospital training and clinical experience both tended to reinforce the intimacy between physiology and medicine. In particular, Magendie’s often-stated aim was to make his physiology the basis of a “scientific medicine” as opposed to the blind “empiricism” favoured by many contemporary physicians. The wish to make science serviceable to medical practice was especially evident in his experimental pharmacology.

In contrast, the Académie des Sciences offered an ideal of pure science to which physiology could aspire. Physiology was not represented among the initial classes of the Académie—this is unsurprising given the protean state of the science at the time of the Institut’s inception. Nevertheless, Lesch convincingly argues that the concept of “good” or “real” science enshrined in the First Class had a decisive impact upon the course that French physiology took. In particular, the members of the Académie strongly endorsed the experimental approach as that which made physiological method approximate most closely to the model of the physical sciences. Magendie, Lesch claims, tried to win the approval of the First Class by making the experimental ideal dominate his own researches; and after 1821, when he was elected to the

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Académie, he himself became the chief arbiter within the Institut of what constituted methodologically sound physiology.

Lesch suggests that the zoology of Cuvier was another paradigm which Magendie sought to emulate. However, a note of caution needs to be sounded here. There is no doubt that Magendie sought Cuvier's support and patronage—as he did that of other influential members of the Académie; and it is also true that, on occasion, Magendie undertook comparative studies at Cuvier's instigation to complement his experimental researches. But these forays into the comparative field played at most “a subordinate and ancillary role” in Magendie's research programme, which depended overwhelmingly upon animal experiment and human pathology for its data.

In short, Magendie's physiology was narrowly based, not only in its methods, but also in its subject-matter. This process of restriction was accentuated by Magendie's determined attempts to eschew hypothesis and any general explanatory framework in favour of a phenomenalist account of particular functions, without reference to wider biological considerations. Magendie's pupil, Claude Bernard, inherited this bias, and had to disencumber himself of it before he would arrive at his concept of “general physiology”.

Even within France, there were protests at this form of tunnel vision; while foreigners complained that with their mania for vivisection the French were neglecting other no less important—and often more reliable—avenues to physiological knowledge. The obvious contrast is between Magendie and Johannes Müller and J. E. Purkyně, who, in addition to their experimental investigations, vigorously pursued comparative and embryological studies to great effect. Müller and Purkyně differed also in that they attempted to incorporate their particular results into a larger biological system.

Lesch is aware of these contrasts; but he only hints at possible explanations. An adequate account of these differences would have to include the institutional context in which physiology existed in France and in the German states; but also to review a much wider range of considerations, including the influence of societal forces upon science and the intellectual climate prevalent in the two countries. Rich and informative as Lesch's study is, vast areas of the physiology of the first half of the nineteenth century remain to be illuminated.

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A. J. C. MAYNE, *Fever, squalor and vice. Sanitation and social policy in Victorian Sydney*, St Lucia, London, and New York, University of Queensland Press, 1983, 8vo, pp. xviii, 263, illus., \$34.50.

This study contributes little to medical history. Focusing on the City of Sydney—the centre of a thriving metropolitan area in colonial Australia—between the cholera epidemic of 1875 and the outbreak of smallpox in 1881, this book goes beyond an examination of urban management to explore the dynamics of social policy, but it fails to recognize adequately or to integrate the role of medicine in public health.

Nothing is added to the all-too-familiar picture of overcrowding in unsatisfactory houses wedged between industrial plants and noxious trades; of filth, contagious diseases, and high mortality; of poverty, crime, and human degradation. Reform schemes, largely modelled on the British pattern, also encountered the typical problems of conflict between local and central government, official “bumblodm”, insufficient legislation, limited executive powers, overworked and poorly-paid officers, and, not least, the opposing tensions of humanitarian concern, vested interests, and public self-centredness.

By relying on newspapers for much of his primary evidence, Mayne tends to ignore aspects of disease control, other than sanitation and rehousing. His summary of medicine in the second half of the last century does no more than acknowledge that disease theories provided a rationale for efforts to reduce filth; his appreciation of medical practice is largely limited to the performance and poor public image of the City Health Officers. Did other doctors working in the area leave any records? How can we interpret the gradual improvement in overall death