

Book Reviews

Daniel P Todes, *Pavlov's physiology factory: experiment, interpretation, laboratory enterprise*, Baltimore and London, John Hopkins University Press, 2002, pp. xix, 488, illus., £40.00 (hardback 0-8018-6690-1).

Before I read this much awaited book I had intended to write an essay review but having finished it I can only call to mind Tolstoy's famous observation in *Anna Karenina* that "All happy families resemble one another, but each unhappy family is unhappy in its own way". In other words, to write an essay review requires at least some points of contention and preferably large areas of disagreement between reviewer and author. Some unhappiness is necessary. In this case, however, Todes has written a marvellous book with which I can find no quarrel. He is, as far as I can judge, so in control of his primary material and so informed historically about how to use it that admiration rather than engagement seems the appropriate response.

Todes concentrates here on Pavlov's early years, up until his receipt of the Nobel Prize in 1904. This was awarded for his work on digestive secretions and before his more celebrated studies of conditional reflexes. In the years covered by this book the mind was still "black-boxed". From 1891 Pavlov was head of the Physiology Division of the Imperial Institute of Experimental Medicine in St Petersburg. Todes begins with the history of the foundation of this institution and then turns to the core and most original part of this book: the factory system of physiology production. Todes deals with both how knowledge was produced and what knowledge was produced. To summarize in this way does Todes some injustice because the core of his argument is that the nature of the physiological knowledge made in Pavlov's laboratory was constituted by its mode of production. The two are scarcely separable. Essential to the story are the *praktikanty* and the dogs. The *praktikanty* were the labour force, the incessant stream of medical graduates seeking

doctorates. Pavlov organized them, set them their tasks and oversaw their data collection. This was no random collection of workers, craftsmen pursuing their own interests. All projects were related to the same end and dictated to a great extent by the machines with which the *praktikanty* worked: the dogs. Pavlov perfected surgical techniques for producing salivary, gastric and pancreatic fistulas that enabled the workforce to collect over many long, tedious hours the secretions of these glands. Of course many dogs were sacrificed along the way. Those that survived, however, were invariably reported as happy and contented.

In the star chapter in this volume, Todes discusses what Pavlov did with this data. The key here is Claude Bernard, Pavlov's hero. Pavlov never stopped reciting Bernard's mantra that physiological knowledge was determined. This was relatively easy for Bernard to say given the conditions under which he produced knowledge. His experiments were acute and lethal. Whatever happened could be deemed determined and if the result was not what was expected the experiment could be dismissed on the grounds that the determining conditions had been changed somehow. Hence Bernard could be dismissive of statistics and averages. It was not like this for Pavlov. Pavlov's experiments were not sudden and final, they were chronic and often resulted in the survival of the animal. Pavlov had to face the fact that his experimental objects produced masses of statistics. However hard he tried to control the environment, no dog produced the same amount of gastric juice two days running. Pavlov squared this circle by producing curves. These were ideals and as Todes shows could have been constructed in other ways. Pavlov, however, appeased his Bernardian conscience by finding one dog whose secretions more or less conformed to the ideal curve. The general physiological law then, the product of a statistical curve, was instantiated in the behaviour of a single creature. Todes' explication of this is a wonderful contribution to the debate about scientific knowledge that began decades ago and I fear his

work, which would have been invaluable once, may not be noticed by communities whose interests have moved on.

The dogs did not only make knowledge, they made material goods. In a fascinating and funny chapter, Todes follows the marketing of pure, dog gastric juice as a remedy for digestive upsets. This leads him to explore the very hard work that Pavlov did to demonstrate the relevance of physiological knowledge to clinicians. Subtly and diplomatically (and quite unlike Bernard), Pavlov wooed the medical community by praising clinical experience as harmonizing with laboratory observations. Finally, Todes pursues Pavlov's nomination for the Nobel prize. Cruelly, it might be said, he got it only just in time. The great edifice of nervous control of digestion which his physiology factory was designed to support was beginning to crumble in the face of the discovery of secretin and humoral methods of digestive integration. This is a magnificent book: a very happy family indeed.

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Maureen K Lux, *Medicine that walks: disease, medicine, and Canadian plains native people, 1880–1940*, Toronto and London, University of Toronto Press, 2001, pp. xii, 300, illus., £35.00, US\$50.00 (hardback 0-8020-4728-9), £12.00, US\$22.95 (paperback 0-8020-8295-5).

Disease played a role in the decimation of North America's aborigines from early contact. What role did medicine play and did it change with medical professionalization? The North American drive westward, leading to extinction of the buffalo on the prairies around 1870, promptly threatened native inhabitants with starvation. The Canadian government stepped in with emergency rations and also, in exchange for the old hunting grounds, it agreed to settle aboriginal peoples on reserves and aid them in becoming farmers. The food and support was so niggardly that it failed to prevent either starvation

or a rebellion in 1885, but none the less the principle was recognized: the government bore some responsibility for the life of these displaced people. But did it owe them health?

The government made almost no provision for medicine in the early days. Despite massive illness, most of it due to poverty, doctors were not part of the package offered to native peoples in the late nineteenth century. Governments did not owe their tax-paying, Euro-Canadian voters health: these voters paid for doctors themselves or received religiously-inspired charity. The same would have to do for the Indians on the prairies. Most missionaries sent out by the Catholic and Protestant churches claimed to possess "a moderate and practical knowledge of medicine". Moreover, the doctor-patient encounter was irrelevant to the "Indian problem". Indians were dying out as a species because their culture was maladaptive, so it was claimed, and they had to be doctored as a species by ideological and social engineering, at the hands of bureaucrats. If Indians still fell ill and died, that only proved they had failed to assimilate to Western standards of hygiene and industry and their assimilation should be further expedited.

Doctors, thus, barely figure in Maureen Lux's bleak account of the events and the discourse surrounding the reduction of the prairie population in Canada up to the turn of the twentieth century. Their absence does not reflect any ignorance on the part of the officials and missionaries as to the importance of medicine. On the contrary, they made it their lives' work to root out the medical practices and knowledge prevalent among the aboriginal populations. According to Hayter Reed, deputy superintendent of Indian Affairs in 1896, "The 'medicine men,' the guiders of thought and action and the inspirers of fear in all but the very boldest, had to be fought. To win Indians from such a thralldom, and to get them to disregard the influences of generations, required no small amount of courage and skill in management." Indian medicine, which is to say culture, stood between the bureaucrats and assimilation. But rather than replace Indian medicine with white medicine (bad enough as that might have been),