fat content is a well regulated premigratory change.

Mrosovsky considers two categories of rheostasis, programmed rheostasis and reactive rheostasis. Programmed rheostasis (such as oestrus cycles or diurnal changes in temperature) are often cyclical, but need not be so. Reactive rheostasis occurs in response to stimuli. Fever is a classical example of reactive rheostasis; the higher body temperature level in fever is defended.

The two longest chapters in this short book deal with these two categories of rheostasis. They contain numerous examples of widely different physiological phenomena, some convincing and many less persuasive.

No doubt many of the examples qualify as rheostasis, but do they all? The criteria for considering a phenomenon as an illustration of rheostasis are not always clear, and in many cases a more plausible explanation may exist. In fact, the greatest weakness in the book is that rheostasis is presented "in terms of observed phenomena, rather than in terms of underlying mechanisms".

The lack of well defined criteria for rheostasis blurs the appropriateness of many of the examples and makes the overall presentation vague. With such uncertainty one may ask if the term 'rheostasis' is necessary or whether a new term is even desirable. The reasons for the choice of the word 'rheostasis' are discussed, but I find the term not well chosen. It grates on common sense that the meaning of a new term is not intuitively clear; in rheostasis there is an inherent conflict in combining the root 'rheo', meaning stream and flow, with a word, 'stasis', that emphatically implies standstill.

The value of Mrosovsky's ideas is that they provide a reasoned counter-measure to the ingrained, almost dogmatic assumption that constancy is the ultimate objective of physiological regulation. His book provides new perspectives that, I believe, will be a helpful basis for further discussions of the physiology of regulated change. □

Knut Schmidt-Nielsen is in the Department of Zoology, Duke University, Durham, North Carolina 27706, USA.

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Bohr's institute

Jeremy Bernstein

Redirecting Science: Niels Bohr, Philanthropy and the Rise of Nuclear Physics. By Finn Aaserud. *Cambridge University Press: 1990. Pp. 356. £25. $47.50.*

WHEN one thinks of The Institute for Theoretical Physics, created by Niels Bohr in Copenhagen, one inevitably thinks of the photographs taken of conferences at the Institute, showing 30 or 40 of the world's best physicists. One is led to imagine that this is what it was like all the time at the Institute — a milling hive of intellectual activity. One of the values of this fine book, written by the Acting Director of the Niels Bohr Archive in Copenhagen, is to show how misleading this impression is. In the early 1930s, in a typical year, the Institute had ten visitors or less, and the group as a whole produced less than 30 scientific papers a year. To put this in perspective, the theory division at CERN has, at any given time, more than 120 visitors, to say nothing of a permanent staff that is larger than Bohr's entire Institute was at this time: each of these people produces at least one, and often several, papers a year.

Mary Evans

IMAGE UNAVAILABLE FOR COPYRIGHT REASONS

Niels Bohr — intellectually dominant.

During this period the work being done at the Institute was not in the mainstream of physics. Bohr, whose intellectual dominance determined the nature of the work being done there, was, on the one hand, thinking about philosophical problems in biology which, from the present point of view, seem of marginal interest and, on the other hand, doing physics that was actually wrong. He had come to the erroneous conclusion that nuclear beta decay violated the conservation of energy and was thus unable to accept the correct Fermi theory of beta decay which assumed the existence of the neutrino, invented by Pauli. The heart of *Redirecting Science* is the description of how, in the mid-1930s, Bohr changed his course, and that of the Institute, by going whole heartedly into experimental and theoretical nuclear physics.

Finn Aaserud's thesis is that this change of direction was much influenced by the nature of scientific funding. Bohr, it turns out, was an excellent fund raiser and was able to throw himself into this activity with the enormous energy he expended on anything that really interested him. The mind boggles when one tries to imagine Einstein writing a funding proposal to the Carlsberg Foundation — Carlsberg of the breweries — or the Rockefeller Foundation to ask for money for research. Both of these entities contributed heavily to Bohr's Institute. From reading *Redirecting Science*, my feeling is that the criteria used by these foundations were quite different. Bohr was a national hero in Denmark and I suspect that if he had asked the Carlsberg Foundation for money to support research in self-levitation he would have got it. On the other hand, as much as the Rockefeller people wanted the prestige of Bohr's name, they were fairly rigid about what their money could be used for. They were interested in biological applications. By coincidence, due to the racial policy of Adolf Hitler, several brilliant young scientists became available at this time, and George Hevesy came to the Institute from the University of Freiburg. Hevesy's programme to use radioactive isotopes as biological tracers fitted perfectly with the Rockefeller criteria, although it took some persuasion by Bohr to make the Foundation aware of this. In the event, the Rockefeller Foundation provided much of the funding for a cyclotron in Copenhagen. By the mid-1930s, Bohr's interest was focused almost entirely on nuclear physics where it remained for the rest of his active scientific life.

Although *Redirecting Science* may be of more direct interest to scholars of contemporary physics history, it is so agreeably written that it may find a wider audience. For me, it created the feeling of a truly elite institution of which my own personal aquaintance was a brief visit one summer in the 1960s. The elitism was one of intellect; the worst fate one could have was to have ideas that were uninteresting. Bohr would simply disengage, and that would be that. For the few who had the 'right stuff', being at Bohr's Institute was an unforgettable experience. This book teaches us that running such an institution required entrepreneurial skills as well as scientific genius. Bohr had an abundance of both. □

Jeremy Bernstein is at 2 Fifth Avenue, 18-L, New York, New York 10011, USA.