BOOK REVIEWS

Temperature, Volume 3. Its Measurement and Control in Science and Industry. Charles M. Herzfeld, ed. Part 3 of Biology and Medicine, edited by James D. Hardy. 683 pp. (Chapman & Hall, London) Reinhold, New York, 1963. $22.50.
Reviewed by ***Joseph G. Hoffman,*** *State University of New York at Buffalo.*

The creation of actual means for measuring heat or temperature in living systems is especially difficult. The 56 papers given in the seven chapters of this volume give a good survey of technical problems encountered. Moreover the reader is made aware that the complex techniques for measuring purely physical aspects of life are a source of new ideas about the mechanisms of life. Take for example, the problem on nonshivering thermogenesis. Shivering is a mechanical response of the musculature leading to the production of heat. There is however, in dogs, rats, and man also, a chemical response manifested in increased metabolic heat production in body cells to compensate for the drop in body temperature. J. P. Hannon points out that the extra chemical heat is an important factor in acclimatization to cold.

The response of a living organism to temperature changes is well described in Benzinger, Kittzinger, and Pratt's paper on the human thermostat. The theory is that the posterior hypothalamus is the highly temperature-sensitive nerve center at the base of the brain whence signals emanate to make the thermostat function. This would add another critical function to this important nerve center. A current theory in neurophysiology holds that the hypothalamus might contain an electric oscillator, not unlike that in the pacemaker cells in the heart, whose frequency provides our sense of time. In a state of fever the oscillator frequency is raised causing external time to seem longer.

The many diverse effects of heat and cold on living systems are pretty well surveyed in this symposium. Section 1 describes temperature measurement and calorimetry. There follow sections on temperature effects in biological systems, tissue heating and thermal sensation, physiological responses to heat and to cold, hypothermia, and temperature regulation. The papers are consistently well written for the nonexpert as well as for the specialist. For example, the paper by Minard and Copman on elevation of body temperature in disease gives, among other things, a lucid and lengthy discussion of heat stroke. Examples include heat stroke in men in the boiler room of a battleship when the ventilation failed; in prisoners of war in a dungeon; and in laborers imbibing alcohol and work-in the sun. These are well-documented examples of the consequences of failure of the human thermostat, especially as regards temperature control of the brain.

The symposium amounts to a thorough-going compendium of up-to-date work in the subject of temperature in biology and medicine because of the excellent documentation. Each paper has generous references; there is an author index and a subject index, as well as a table of contents. This is a highly commendable reference book for workers in the life sciences.

Alexander von Humboldt. By L. Kellner. 247 pp. Oxford University Press, New York, 1963. $5.75.
Reviewed by ***Norman Feather,*** *University of Edinburgh.*

"Thus that scientific conspiracy of nations which is one of the noblest fruits of modern civilisation was by his exertions first successfully organised"—so Agnes Mary Clerk, indefatigable biographer of scientists, wrote of Alexander von Humboldt for the eleventh edition of the *Encyclopaedia Britannica* in 1910. Today, Dr. Lotte Kellner seeks warranty for her new biography in the larger "conspiracy" of recent times: "To recall in this period of a new International Geophysical Year the details of his life and his achievements is of timely importance. . . ."

Some warranty was perhaps needed, for the corpus of Humboldt literature is already considerable, but Dr. Kellner need not have sought justification in mere topicality. She has written a lively account which can stand on its own merits. It is not entirely satisfying in isolation—Humboldt's life was so long, and his achievements so varied—but the story is told attractively, with a wealth of detail based on sound scholarship. The reading of it may confuse at times, but it does not daunt; the reader is more likely to be sent scurrying to consult the more copious authorities, which are amply quoted, than dejected to find some less formidable subject of study.

Alexander von Humboldt: a self portrait. Frontispiece from the book *Alexander von Humboldt* **by L. Kellner.**

As scientist and explorer, Humboldt accepted the whole world as his laboratory; as archaeologist and humanitarian, the whole race of man for enquiry. He ranged over most of the continent of Europe as diplomat-extraordinary, representing, or in company of, his royal masters. A biography of such a man which has no maps of reference to offer—maps of the physical features of distant lands, or political maps of the Germanic states between the great revolutions—cannot be entirely satisfying in isolation, and Dr. Kellner's biography has none. But the text is full of background information; the scene is forever crowded with people. All the time there is a brisk