

Monitoring of body rhythms: "Ticking loudly will not do"

Last week several hundred investigators from 15 countries converged on the Arkansas Medical Center for a symposium of the International Society for the Study of Biological Rhythms. The reports indicated that the keys to the biological clocks that appear to regulate various biological activities are as obscure as ever (SN: 9/11/71, p. 178). However observations and descriptions of periodic fluctuations in biochemistry, endocrinology, psychology, immunology, space medicine and other study areas are starting to find some clinical applications.

Heinz Wolff of the Medical Research Council in London demonstrated a six-channel tape recorder (it looks like a pocket transistor radio) that monitors up to six variable body functions every minute for up to 30 hours. Tiny sensors are attached to appropriate areas of the body. This way daily variations of blood pressure, pulse, temperature, respiration, posture and other body rhythms can be monitored.

The recorder is being used for some 20 research projects around the world. It is comparing, for example, rhythms in a Filipino rice worker and in a London bus driver in order to detect differences that might indicate susceptibility to certain diseases.

The British inventor has dubbed his recorder a "SAMI"—a socially acceptable monitoring instrument that can be worn by anyone in the normal course of a day. "Ticking loudly in the supermarket will not do," Wolff observes. Such instruments, he anticipates, will eventually become vital preventive medical tools by helping people profile their usual body rhythms and to detect fluctuations that might indicate disease.

A Psycho-physiological Diary is being kept by 50 persons participating in a study at the Institute of Living Hospital in Hartford, Conn. Although the study now concentrates on normal people, it is being expanded to include individuals with various psychiatric problems as well. The diary provides a way of recording one's daily moods (psychology), body changes (physiology) and life events in computer-scorable form. Once these patterns of daily living, which most people forget, are stored in the computer, they become available for detailed analysis. In essence the computer extends the human memory by using speed and mathematical capabilities to detect subtle rhythms, fluctuations and patterns of daily routine that precede changes in living style and health.

So far the diary print-outs have shown that manic depressives vary far more in mood and body rhythms than

other persons participating in the study. Moods tend to swing three or four days before an individual comes down sick with a common cold. Mood shifts, Stroebel speculates, might eventually serve as markers for impending ulcers, asthma, or other types of psychosomatic attacks.

Although clinicians are starting to recognize there are crucial periodic fluctuations throughout the day in those physiological variables that determine health or disease, they still tend to depend on a single measurement of such variables without regard for the time of day. For this reason blood pressure readings should be taken periodically over a 24-hour period and charted before hypertension is diagnosed, Frederic Bartter, chief endocrinologist at the National Heart and Lung Institute, advised. Howard Levine, a New Britain, Conn., physician agreed. He has been monitoring his own blood pressure for two or three years and has found that it peaks abnormally high around 2:50 p.m. Yet during the last 15 years all his

physical checkups had been conducted in the morning and thus had given no indication of high blood pressure.

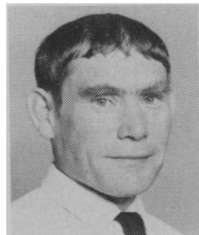
Then Andrew Ahlgren of the University of Minnesota's Chronobiology Laboratories described a project he recently headed up. Minneapolis high school students measured themselves daily over a specific period for fluctuations in blood pressure, moods, vigor, eye-hand skills and other mental and body functions. They noted considerable variations and daily fluctuations which Ahlgren feels should be brought to the attention of their physicians.

Whether rhythm monitoring will become a widespread tool in clinical medicine, however, will depend in large part on acceptance by physicians. Traditionally physicians have been hesitant about giving patients information about their health, and using rhythms in diagnosis involves self-monitoring by the patient. More research on how dysrhythmias might reflect disease is also needed before rhythm monitoring becomes a common clinical adjunct. □

The Lasker awards for medical research



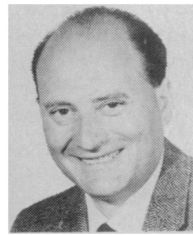
Freis



Brenner



Yanofsky



Lasker Foundation
Benzer

For 26 years the Albert and Mary Lasker Foundation has presented annual awards for distinguished work in basic and clinical medical research. Twenty-two of the winners have later received the Nobel Prize. (Earl W. Sutherland, Marshall W. Nirenberg and H. Gobind Khorana are recent examples.)

This year the Lasker award for clinical medical research goes to Edward D. Freis, senior medical researcher at the Veterans Administration Hospital in Washington. For 25 years he has studied the effects of hypertension—a form of heart disease that affects 23 million Americans and is a leading cause of stroke (the third leading cause of death in America).

Freis has shown that even moderate hypertension, if untreated, can lead to fatal complications. But "hypertension now is a controllable disease," he says. And he has dem-

onstrated the effectiveness of the use of drugs in its treatment.

The award for basic medical research, and the \$10,000 that goes with it, was shared by Sydney Brenner of the University of Cambridge in England, Charles Yanofsky of Stanford University and Seymour Benzer of the California Institute of Technology. They were cited for contributions to the field of molecular genetics. Each has worked with genes in viruses and bacteria and their work has helped found the field of fine-structure genetics.

Their research showed that there are hundreds of sites within the gene where mutation takes place, explained the nature of the genetic code and described the gene as a biological and physical entity. Their work has helped in the understanding of human genetic diseases and is the basis for clinical treatment of many of them.