the chamber's floor, and by contracting the muscles of its extremities it easily pushed itself off the floor. The recordings suggest that these movements were brief and rather smooth.

"As the animal's thorax was no longer pressed under the influence of its increased weight, the frequency of its breathing declined. After a very brief period of quickened heart-beat, the systole frequency continued to diminish, consistently approached its initial level. It took, however, about three times as long for the number of heart beats to reach the initial level as it did in laboratory experiments in which the animal was subjected to the same acceleration as when the sputnik was put into orbit.

"This is most probably connected with the fact that in the ground experiments the animal, after the acceleration ended, was in normal conditions, while in the sputnik the acceleration was replaced by a state of complete weightlessness.

"In this state the animal's nerves whereby it feels the position of its body in space were not sufficiently affected by the external irritants. This conditioned the change in the functional state of the nervous system regulating blood circulation and respiration and determined a certain extension of the time for the normalization of these functions after the acceleration effect ended.

"It is also possible that this phenomenon was somewhat intensified by the action of concomitant factors during the ascent—vibration and noise, which were greater than in the laboratory experiments.

"It should be noted that the change in the physiological functions, registered in the animal at the beginning of the sputnik's movement along its orbit, coincides basically with the results of previous investigations with high-altitude rockets.

"An analysis of an electrocardiogram recorded during the state of weightlessness revealed certain changes in the configuration of its elements and the duration of separate intervals. The observed changes were not of a pathological nature and were connected with the heightened functional activity during the period preceding the state of weightlessness. The electrocardiogram showed transient reflected nervous changes in the regulation of the heart's action. In the subsequent period the picture of the electrocardiogram grew increasingly closer to that characteristic of the animal's initial condition. In spite of the unusual state of weightlessness the animal's motions were moderate.

"The normalization of blood circulation and respiration during the period of weightlessness, *i.e.*, during the period of the sputnik's movement along its orbit, evidently indicates that this factor in itself did not cause any essential and stable changes in the state of the animal's physiological functions. Thus it may be said that the animal well endured not only the sputnik's ascent to the orbit but also the conditions of travel along the orbit.

"In ensuring the conditions necessary for the animal's vital activity in a prolonged flight in a sputnik, it is most important to provide a proper gas environment, the composition and pressure of which should not cause violations of the animal's physiological functions. This task could be accomplished only by the use of an hermetically sealed chamber in which normal atmospheric pressure with an oxygen content of 20 to 40 per cent and a carbon dioxide gas content of no more than one per cent was maintained by air regeneration.

"Special highly active chemical compounds which, absorbing water vapors and carbon dioxide, emitted oxygen were used as regenerating substances. These chemical compounds absorbed also such noxious gases formed in the process of the animal's vital activity as ammonia, for example. An analysis of the data obtained showed that oxygen was emitted in sufficient quantities. The fact that the pressure in the chamber did not drop shows that it was effectively sealed. . . ."

Center for Communication Sciences

A Center for Communication Sciences has been set up at Massachusetts Institute of Technology to conduct studies of the communication functions of the nervous system, of computers, and of organisms and machines in conjunction with each other.

The center will use the facilities of the Research Laboratory of Electronics, where there has been a concentration of interest in this field. The steering committee for the center is composed of Jerome B. Wiesner, director of the Research Laboratory of Electronics; Claude E. Shannon, one of the originators of the mathematical theory of communication; Gordon S. Brown, head of the department of electrical engineering; Robert M. Fano, a communications engineer specializing in information theory; Roman Jakobson, a linguist; and Walter A. Rosenblith, a biophysicist with a special interest in sensory communications.

The activities of the new center can be traced back to the Massachusetts Institute of Technology Radiation Laboratory, which, during World War II, was responsible for the development of radar. After the war, the Research Laboratory of Electronics was established to continue research work in related fields on a peacetime basis. Staff members of the laboratory have worked on a large number of problems, but increasing interest in the communication sciences has resulted in the participation of research-workers from fields not commonly associated with electrical engineering, such as psychology, physiology, and linguistics.

Among the questions to which the center would like to find the answers are the following: Can we describe in mathematical form the grammar of a natural language? Can we give a rational account of the way in which the brain processes information coming to it through the senses? What role does information play in human learning and decision-making? Are there laws which resemble the laws of physics in their generality and predictive power?

Scientific Secretaries for Atomic Energy Conference

An international team of 21 scientific secretaries from 13 countries has been appointed for the second United Nations International Conference on the Peaceful Uses of Atomic Energy, to be held in Geneva 1–13 September. All have arrived at U.N. Headquarters in New York. They will work there, and later in Geneva, on the subjects that will receive major attention at the conference: nuclear fission; fission reactor engineering; physics; biology and isotopes; and raw materials, mining, and chemistry.

The secretaries, whose appointments were announced last month by Sigvard Eklund, conference secretary-general, are: Renee Bovy (Belgium), Frank Bruce (United States), Terence E. F. Carr (United Kingdom), Thomas C. Church (Canada), Thomas Coor (United States), D. Harold Copp (Canada), Israel Dostrovsky (Israel), Aleksandr Nikitich Efimov (U.S.S.R.), Hiroshi Fukunaga (Japan), Claudio Garavaglia (Italy), Fred Hudswell (United Kingdom), David Okrent (United States), Ivan Dmitrievich Rozhansky (U.S.S.R.), Afaf A. Sabri (United Arab Republic), Carlos Sanchez del Rio (Spain), Cesar Sastre (Argentina), Gavriil Sergeevich Strelin (U.S.S.R.), Pierre Yves Tanguy (France), Ivan Ulehla (Czechoslovakia), William Brian Woollen (United Kingdom), and Valery Ziegler (France).

News Briefs

Revue de Géographie Physique et de Géologie Dynamique is again being published after suspension because of World War II. For information, communicate with Masson et Cie., éditeurs, Paris.

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Norman Hilberry, director of Argonne National Laboratory, is heading an atoms-for-peace survey mission to Latin America. This is the first major project