ditions leading to naturally occurring pathologies in aging rats. His systematic approach reveals that (i) 100 percent of the rats that were more than 12 to 15 months old developed tumors of the mammary glands, (ii) 97 percent of the rats had gross changes in the aortas representing calcifying atherosclerosis, (iii) 46 percent had pitting in the kidneys caused in part by the dilation of the tubules at the surface, (iv) ulcers of the cardiac portion of the stomach were observed in 25 percent, and (v) 90 percent had adrenal glands that were spotted and granular. Ingle's discussion of "Adaptation diseases, adaptation energy and recommendations for further research" graphically illustrates both his scientific storehouse of information and his ability to single out important facets that lend themselves to crystallization.

The zenith of intellectual endeavor reaches a spire of meaning in "Sex steroid replacement in the aging individual" through the efforts of W. H. Masters. The discussion of a third sex will be received as both stimulating and provocative, depending, of course, on the age of the reader.

This book is recommended without any reservations. Here is a book that will make everyone appreciate more thoroughly the physiological process of aging that lies ahead in each of our careers.

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Gmelins Handbuch der Anorganischen Chemie. System No. 60. *Copper.* pt. A, sec. 1. Edited by Gmelin Institute under the direction of E. H. E. Pietsch. Verlag Chemie, Weinheim/Bergstrasse, ed. 8, 1955. 710 pp. Illus. $92.85.

Gmelins Handbuch der Anorganischen Chemie. System No. 60. *Copper.* pt. A, sec. 2. Edited by Gmelin Institute. Verlag Chemie, Weinheim/Bergstrasse, ed. 8, 1955. 755 pp. Illus. $101.04.

This volume, as do the others in this excellent reference series, impresses the reader with its thoroughness and with the breadth of its coverage of the topic. It is stated that the literature through 1949 has been completely examined and in certain instances through 1954. The table of contents is highly detailed. At the beginning of the sections on many of the major topics, lists of general references are given. These general references are not confined to German treatises but include works from a number of different nations.

The style in which the German text is written is clear and easily readable. There are numerous tables and diagrams which help to clarify the text, and the quality of printing and reproduction is excellent. This work is a must for any chemistry library and would be particularly valuable to inorganic chemists, metallurgists, and geologists with an interest in copper or copper ores and minerals.

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Proceedings of the Conference on Pathophysiologic and Therapeutic Problems of Terminal Conditions Associated with the Clinic and Practice of First Aid. State Publishing House of Medical Literature, Moscow, U.S.S.R., 1954. 240 pp. Illus. (In Russian).

The deliberations of this conference were centered primarily around the methods of revival of organisms developed by V. A. Negovskii, director of the Laboratory of Experimental Physiology of the U.S.S.R. Academy of Medical Sciences in Moscow. The discussions were related to problems of restoration of physiologic functions in animals and patients in agonal states and in early stages of clinical death resulting from severe hemorrhage, burns, drowning, electrocution, and so on. Under consideration also were methods of combating late stages of traumatic and burn shock.

Most of the resuscitation techniques reported at the conference involved (in addition to artificial respiration) the utilization of "antidromic" intra-arterial infusions (that is, directed toward the heart) of blood (usually oxygenated) and, at times, of various physiologic salt solutions. The quantities of blood thus infused (under a pressure of 160 to 220 mm-Hg) were comparatively small: 150 to 500 ml, usually the lower figures. Following the restoration of cardiovascular functions, intravenous infusions were resorted to when more blood or a blood substitute was needed.

The history of intra-arterial infusions goes back to at least 1871–74, when two Russian physicians, S. I. Kostaev and S. P. Kolomnin reported intra-arterial administration of defibrinated blood into patients with severe traumatic episodes. F. A. Andreev, in 1913, initiated experimental investigations of this method, continuing his experiments until shortly before his death in 1952. Extensive experimental and clinical observations were made by V. A. Negovskii *et al.* and many others. According to Negovskii's figures, arterial infusions were made in 1714 patients, 797 of whom (46.5 percent) survived. Of the 1714 patients thus treated, 1190 were in severe shock, not responding to other forms of therapy, and 57 percent of these survived; 227 were in agonal states and 45 percent of these survived; 116 were in a state of clinical death and 18 percent of these survived.

Briefly, the principle of the method is based on restoration of coronary blood flow and the alleged stimulation of cardiovascular interoceptors, thus leading to reflex stimulation of the cardiovascular system. A fair amount of basic experimental data is presented but not enough to satisfy the curiosity of a physiologist, at least not mine. The bulk of the emphasis was on clinical observations.

Interesting experiments are reported by E. A. Asratyan (Moscow). He produced controlled cerebral anoxia by raising the cerebrospinal fluid pressure to 300–400 mm-Hg in dogs kept alive by artificial respiration. Although the results obtained may be due also to mechanical pressure, the data are still of interest to clinicians and physiologists. Many of the animals remained alive for months even after 16 to 20 minutes of cerebral anoxia. The author reports four phases of restoration: (i) restoration of bulbar and spinal centers; (ii) phase of overexcitation and hyperthermia, at times resembling the state of decerebrate rigidity (the use of central nervous system depressants during this phase appeared to improve the chances of survival; this phase may last for hours or even days and may alternate with periods of calmness); (iii) phase of depression which may last several hours to many weeks; (iv) slow restoration of central nervous system functions.

The speed and degree of restoration of function depended on the length of the period of anoxia, age, and "constitution" of the dog. Thus, after a period of anoxia lasting 16 to 20 minutes, the dogs were able to sit up after 3 to 4 months and to stand after 6 months or even after a longer period. After an anoxic period of 8 to 10 minutes, sitting was possible after 4 to 6 days and standing after 10 to 15 days. Sensation was affected earlier and for a longer period than motor functions.

Conditioned reflexes (motor defense responses) disappear even after 5 to 6 minutes of anoxia but can soon be fully restored. After an anoxic episode of 6 to 8 minutes the conditioned reflexes disappear for longer periods and are not fully restored; ability to differentiate decreases. The conditioned responses are inconstant but, peculiarly enough, are difficult to extinguish. Following a period of anoxia lasting 8 to 12 minutes, conditioned reflexes disappear even for a longer period, differentiation is never restored, the conditioned reflexes are in-