by touch; and there should be a roughening or a longitudinal corrugation on F sharp, the middle note of the scale, for the same purpose.

A third advantage would result from these two changes. The lines on the staff, in the normalized notation, correspond to the black keys on the normalized keyboard; and the spaces of the staff to the white keys. If the page be turned so that the left side becomes the top the correspondence is perfect, each written note on the staff having its corresponding place on the keyboard. The physiological reflex between eyes and fingers to be established by the learner thus becomes as simple and direct as it is possible to make it. The time required to become moderately expert in sight reading and playing would then be reduced at least to half what it is now.

T. P. Hall

Vancouver, B. C.

PULSATION OF A CAT'S HEART AFTER DEATH

An interesting case of prolonged beating of a cat's heart after death came to the writer's attention a short time since. A cat was killed by the use of ether at 2:20 P.M. A short time afterwards the body was stretched on a window-sill out of doors where it stayed undisturbed, and to all appearances dead, until 3:30, when it was taken in to the laboratory and immediately skinned, and the thorax cut open exposing the pericardium and lungs. The student doing the dissecting, Mr. John M. Long, at once called the writer's attention to the fact that the right auricle (only) was beating in almost perfect rhythm, and with apparently considerable strength. This continued with only slight variation in rhythm until 3:56, when a small quantity of normal salt solution was poured over the pericardium. Beginning at this time, the pulsations began to lose their rhythm until at 4:03 the auricle was beating at the rate of three pulsations at normal speed followed by an interval of fourteen seconds, then again three beats, followed by the interval, and so on, both the heats and intervals being very regular. This continued for four minutes (until (4:07), when the number of pulsations was reduced to two instead of three, and the length of the interval began to vary from thirteen to eighteen seconds. More salt solutions was poured over the pericardium at this time, and at 4:18 the inferior vena cava was cut just above the diaphram. No change in the regularity of the pulsations was noticed from that recorded at 4:07 until the organ abruptly stopped beating at 4:44 P.M.

This gives a total length of time from the administration of the ether until the heart stopped beating of two hours and twenty-four minutes. Of course there must be subtracted a short period at the first when the cat was dying, but this still leaves something over two hours during which the auricle continued to beat after the death of the animal. During all this time no contraction was noticed in any part of the heart other than the right auricle. The pericardium was not opened until after the heart had ceased to beat. No electrical or mechanical means were used to stimulate the heart in any way, except the application of normal salt solution, as above mentioned. So far as the writer knows, this is the longest case on record of a cat's heart continuing to pulsate after death.

Horace Gunthorp

University of Washington,
Seattle, Wash.

STOCK CULTURES OF A PROTOZOON

During the course of investigation with Protozoa, a rather convenient and easy method of obtaining and keeping stock cultures of Colopoda was found.

Colopoda, as is well known, usually occur early in soil cultures from which they can be obtained, in the active state, in large numbers. Later in the life of the culture the animals encyst and it is upon this condition that the following method is based.

From a young soil culture active Colopoda are isolated, transferred to syracuse watch glasses and ordinary hay infusion added. After one or two days the culture fluid in the watch glass is allowed to evaporate slowly by leaving exposed to the air. During this slow

evaporation the animals encyst. The dried-up culture is left exposed for one or two days, when new hay infusion is added. The animals, having divided within the cysts, revive and are found in greatly increased numbers. This drying-up process can be repeated until a more or less concentrated culture of the organisms is obtained. The concentrated culture of organisms is then pipetted into a petri dish in which a piece of ordinary filtered paper, cut so as to exactly cover the bottom of the dish and moistened with hay infusion, is placed. The petri dish is then left uncovered to slowly evaporate. The filter paper, with the encysted organisms on it, when thoroughly dry can be cut into small pieces and kept indefinitely.

To start fresh cultures, pieces of the filter paper are put into watch glasses or other containers and hay infusion added. In a short time the animals revive and new cultures of the original are thus obtained.

This method of keeping stock cultures seems to be especially adapted for schools and colleges where only a limited amount of time is devoted to the Protozoa and where no time for the ordinary culture preparation work is available.

JOSEPH H. BODINE

ZOOLOGICAL LABORATORY,
UNIVERSITY OF PENNSYLVANIA

QUOTATIONS

THE BRITISH COMMITTEE FOR AIDING MEN OF LETTERS AND SCIENCE IN RUSSIA[1]

WE have recently been able to get some direct communication from men of science and men of letters in North Russia. Their condition is one of great privation and limitation. They share in the consequences of the almost complete economic exhaustion of Russia; like most people in that country, they are ill-clad, underfed, and short of such physical essentials as make life tolerable.

Nevertheless, a certain amount of scientific research and some literary work still go on. The Bolsheviks were at first regardless, and even in some cases hostile, to these intellectual workers, but the Bolshevik government has apparently come to realize something of the importance of scientific and literary work to the community, and the remnant—for deaths among them have been very numerous—of these people, the flower of the mental life of Rusia, has now been gathered together into special rationing organizations which ensure at least the bare necessaries of life for them.

These organizations have their headquarters in two buildings known as the House of Science and the House of Literature and Art. Under the former we note such great names as those of Pavlov the physiologist and Nobel prizeman, Karpinsky the geologist, Borodin the botanist, Belopolsky the astronomer, Tagantzev the criminologist, Oldenburg the Orientalist and permanent secretary of the Petersburg Academy of Science, Koni, Bechterev, Satishev, Morozov, and many others familiar to the scientific world.

Several of these scientific men have been interviewed and affairs discussed with them, particularly as to whether anything could be done to help them. There were many matters in which it would be possible to assist them, but upon one particular they laid stress. Their thought and work are greatly impeded by the fact that they have seen practically no European books or publications since the Revolution. This is an inconvenience amounting to real intellectual distress. In the hope that this condition may be relieved by an appeal to British scientific workers, Professor Oldenburg formed a small committee and made a comprehensive list of books and publications needed by the intellectual community in Russia if it is to keep alive and abreast of the rest of the world.

It is, of course, necessary to be assured that any aid of this kind provided for literary and scientific men in Russia would reach its destination. The Bolshevik government in Moscow, the Russian trade delegations in Reval and London, and our own authorities have therefore been consulted, and it would appear that there will be no obstacles to the transmission of this needed material to the House of Science and the House of Literature and Art. It can be got through by special facilities even

[1] From *Nature*.