early resolution will lead to great good.

There is absolutely no evidence that low-temperature storage and recovery procedures will be possible in the near future with live human beings, let alone dead ones. Arguments based on appeal to authority are irrelevant and misleading. Does Ettinger think that force equals mass times acceleration simply because so eminent a man as Newton has said so? And Ettinger taught physics for more than 10 years!

The discussion of the legal, religious, economic, and philosophical problems that arise along the road to immortality might be entertaining in another context. How much will the processing cost? What about the birthrate? Would refusal to be preserved be tantamount to suicide? If the parts of a man are progressively replaced with artificial substitutes, is it still the same man?

Perhaps the author has been pulling our legs. Maybe it's science fiction after all. The publisher must have fooled us with the dust cover.

D. E. GOLDMAN
Bethesda, Maryland

Geobotanical Mapping

Short Guide to Geo-Botanical Surveying. S. V. Viktorov, Ye. A. Vostokova, and D. D. Vyshivkin. Translated from the Russian edition (Moscow, 1959) by J. M. Maclennan, Pergamon, London; Macmillan, New York, 1964. xii + 158 pp. Illus. $9.

Guide for Surveying Phreatophyte Vegetation. USDA Handbook No. 266. J. S. Horton, T. W. Robinson, and H. R. McDonald. U.S. Department of Agriculture, Washington, D.C., 1964 (order from GPO, Washington, D.C.). 37 pp. Illus. 20¢.

At an early stage in any study of natural resources, an appraisal of the distribution and characteristics of the resource is necessary. Appraisal and survey of the topography, geology, water, and soils of the United States were started during the last century and are continuing today. Why a comparable appraisal of vegetation is simultaneously disregarded is a puzzle. Russia, in contrast, is well along in mapping vegetation and relating the plant cover to the environment. In this book, *Short Guide to Geo-Botanical Surveying*, different methods of mapping and of collecting and compiling data are described in detail.

The methods are familiar to all geologists and foresters. Reconnaissance, to familiarize the investigators with plants and their environmental relations, is followed by detailed observations along transects, usually supplemented by studies of aerial photographs and observation from airplanes. Transect surveys are made along lines drawn on base maps or photographs across the trend of the topography to insure sampling of most habitats. Grid surveys are used to compile large-scale maps where detail is required. All habitats are observed in continuous outline surveys that provide the greatest detail and accuracy. Vegetation types are defined by the dominant species.

Special surveys emphasize problems peculiar to different vegetation types and to man's use of the resources at his command. Forest surveying is discussed, but no references to the American or Western European literature on the identification of trees and the estimation of their volume from aerial photographs are mentioned. Different methods of surveying bogs and wetland provide data for the peat industry, agriculture, road location, and hydrologic studies and show the value of these resources and the interest taken in them. Surveys to understand range problems consider grazing and hay requirements in semidesert, desert, and tundra regions. The authors recommend that desert vegetation be mapped by mapping different types of topography and inferring different vegetation types. Correlations between vegetation and topography, so inferred, are invalid, and error could be introduced into their mapping program.

Surveys of vegetation types associated with variations in hydrology, geology, and soils are made to stress the indicative value of vegetation.

To evaluate water loss by evapotranspiration, a measure of vegetation is essential, and the USDA Handbook No. 266, *Guide for Surveying Phreatophyte Vegetation*, goes a long way to aid in describing and measuring riparian vegetation in semiarid regions. The authors state that several methods of sampling and measuring vegetation are available, but they suggest a standard method so that separate surveys can be compared. Only after many data are collected can the validity of the method be judged, but it seems to be technically and statistically sound.

The two reports, appearing at the same time, are interesting in contrast. The USDA report is a straightforward, objective discussion of methods of describing, sampling, and measuring vegetation and of analyzing the results. The Russian report is vague, some of the methods are subjective, and it leaves the impression that a method is valid because it was suggested earlier. The translation is invaluable, however, because it provides us with information about what the Russians are doing in vegetation mapping.

The two reports may indeed be the stimuli needed to start an appraisal of a little known resource—wild plants.

ROBERT S. SIGAFOOS
U.S. Geological Survey, Washington, D.C.

Science for the Layman

A Star Called the Sun. George Gamow. Viking, New York, 1964. xiv + 208 pp. Illus. $5.75.

This book is dedicated, in the words of its author, "to the memory of my book, *The Birth and Death of the Sun,* published . . . in 1940." He goes on: "Twenty-four years is much too long . . . for any book on a rapidly developing subject to stand its ground, and today *The Birth and Death of the Sun* is hopelessly obsolete." In fact, Gamow overstates the case here. In view of the fact that the earlier book was written when the great expansion of our understanding of the atomic nucleus had just gotten under way, and that the sun is essentially a gigantic nuclear reactor, Gamow's new book extends and fills out the ideas presented in the earlier volume, rather than superseding them. Our conceptions of the nature and life history of bodies like the sun changed far less from 1940 to 1964 than they changed from 1916 to 1940, and although *A Star Called the Sun* is more than a revision of its predecessor, the earlier book is recognizably its parent.

The book has seven chapters. The first tells how astronomers have determined the distance, size, mass, and surface temperature of the sun. The second introduces the most powerful and successful of all methods of solar investigation—spectroscopic analysis of light. Gamow presents the interpretation of the sun's spectrum in terms of modern atomic theory. The third chapter describes the solar surface as