

Tower of Babel. They employ a bewildering variety of economic languages, codes, and classifications, and (as the authors of *Ekonomicheskaiia semiotika* are quick to point out) the meaning of a term or a message may differ widely depending on which agency uses it. The resulting semantic noise causes economic waste, but its source is a problem in semiotics, the theory of systems of signs which has been known since John Locke. It was left to Soviet mathematical economists, during the last five years, to outline the new and exciting discipline, or rather interdisciplinary approach, of *economic semiotics*: the study of signs through which participants in the economic process, both humans and computers, communicate. This new approach to an old problem combines the tools and concepts of such diverse fields as economics, cybernetics, mathematical linguistics, and, of course, information theory.

Economic semiotics is concerned not merely with the amount of information carried by a message in a planned economy but, mainly, with its meaningfulness and usefulness to the recipient. The actual usefulness of a message to the decision-maker depends, among other things, on the amount of related knowledge he has already accumulated in his specialized vocabulary ("a thesaurus"), and on its timeliness (information is a highly perishable commodity!), its importance (how necessary it is for decisions to be taken by the recipient), its reliability, and, last but not least, its cost. V. M. Zherebin would then appraise the value of information contained in an economic indicator (e.g., a factory's rate of profits) as a weighted sum of these various characteristics (p. 62). M. V. Kharkhardin would measure it according to how much it contributes to the attainment of the economic system's objective function (p. 133). Most authors have a Gestalt view of information—it makes sense only within the context of a given economic system: "the concept of information is inseparable from that of a system" (p. 14). System analysis leads semiotics into its most vital tasks—the construction of the most efficient economic languages and the optimal systems of classifying, encoding, and decoding economic indicators. Shastova, for example, has an interesting discussion of the relative advantages of constructing a uniform system of industrial classification versus a number of subsystems, each industry branch being equipped with a language of its own and communicating with other branches via translators (pp. 166 ff.).

"The ability of a system to 'understand' and generate information, to appraise its importance and usefulness for the purpose of achieving certain objectives . . . is analogous to the functioning of simple and conditioned reflexes in a living organism" (p. 133). The development of economic semiotics itself is a healthy reflex to the current difficulties of central planning. While moving on a high level of generality and abstraction, Soviet scholars may eventually make possible a real breakthrough in the practice of economic planning and management, by revolutionizing the system of information flows and acquiring a deeper understanding of the costs and benefits involved.

LEON SMOLINSKI

*Boston College and Russian Research Center, Harvard University*

BASIC INDUSTRIAL RESOURCES OF THE USSR. By *Theodore Shabad*.  
New York and London: Columbia University Press, 1969. xiv, 393 pp. \$20.00.

The Soviet Union has steadfastly concentrated its efforts on the expansion of industrial capacity, especially for producers' goods. Underlying this effort has been

by far the world's largest program for the exploration and development of minerals and other raw materials. In consequence of this program, and its competent direction, the gross output of minerals in the USSR rose from a quarter of the United States level in 1937, and a fifth in 1950, to 67 percent in 1963. (See V. Tabelev, in *Vestnik statistiki*, 1966, no. 4, pp. 31–44, for an excellent discussion.) This expansion has permitted not only basic self-sufficiency for the USSR but also the export of minerals to both Eastern and Western Europe in quantities covering other foreign trade deficits.

Mr. Shabad's useful book sketches the trends of production in four groups of raw materials—fuels, electric power, metals, and chemicals—from 1940 to 1965. This review (pp. 3–90), although concise and nontechnical, is reliable and judicious. In general, it combines discussions of resources, usually in qualitative terms, with those of location, technology, and markets. The regional statistics and the clear maps are systematically cross-indexed.

The bulk of the work (pp. 93–346) consists of a regional industrial gazetteer, which is, overall, far less successful than the national summary. The regional groupings—political, economical, and geological—are rather artificial. They include the European parts of the Russian SFSR, the Transcaucasus, the Ukraine and Moldavia, Belorussia, the Baltic, the Urals, Siberia, the Kazakh SSR, and Central Asia. In consequence, very different areas, such as the North Caucasus and the Komi ASSR, are lumped together, while intimately interrelated economic entities, such as Leningrad and the Baltic, the Ukraine and Central Russia, and Kazakhstan, the Urals, and Western Siberia, are fragmented.

The basic data are uneven; incomplete editing has preserved much poor wording and irrelevancy. Illustrative are the following: "The iron ore center of Abaza gained in stature as a transportation hub with the completion in 1969 of a highway across the Western Sayan Mountains from the Tuva ASSR" (p. 251); "These limited developments were overshadowed by the discovery of major gas deposits . . . raising explored reserves to the level of the principal gas-producing regions of the USSR" (p. 311). The amount of local detail provided by the author is extensive; its reliability is difficult to judge in the absence of annotation. Numerous maps depict the spatial relationships of urban centers, transportation, and mineral resources. The lack of coordinates is a serious deficiency, given the varied scales and orientation of the maps—their layout is often overwhelmed by excessively large symbols undifferentiated in importance. As a result, the maps are both too busy and misleading. The one for Western Siberia (p. 242) is particularly bad.

The volume concludes with a summary bibliography and an excellent index. Its excessive price and a few weaknesses apart, *Basic Industrial Resources of the USSR* can be recommended as a sound, nontechnical survey of a major component of Soviet military-industrial power, and a major determinant of its urbanization. It can profitably be used in conjunction with Chauncy Harris's *Cities of the Soviet Union* (Chicago, 1970).

This volume is not and does not pretend to be a technical treatise. The need for thorough geological, technological, and economic assessments of Soviet mineral and other raw-materials resources that will keep abreast of the dynamic development of the Soviet Union must be stressed.

DEMITRI B. SHIMKIN  
*University of Illinois*