

the internal energy, but not heat nor work, is a state function. The second law is presented by postulating the existence of a state function, entropy, which is equal to the integral of dq -(reversible) $/T$. Heavy stress is placed on the necessity of having a hypothetical reversible path to calculate the entropy. The Carnot Heat Engine is not mentioned until the last section where it is treated as an application of the second law. The book ends with short sections on electrochemical cells, phase equilibria ideal solution theory, and the Carnot engine. I can strongly recommend this book for use in a general chemistry course.

Intuition and Science. By Mario Bunge. 142 pp. Prentice-Hall, Englewood Cliffs, N.J., 1962. Paper \$1.95.

Reviewed by Norman Feather, University of Edinburgh.

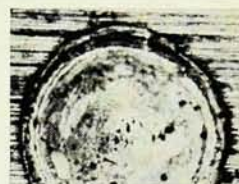
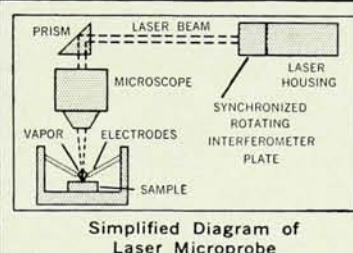
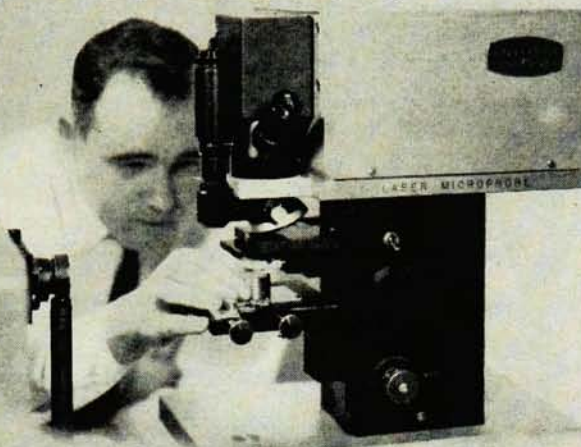
An innocent "Note to the Reader", inserted before the table of contents of this paperback, reads, "Most technical terms are explained in the glossary at the end of the book." The glossary occupies 10 pages of print; the main text only 120 pages. Even so, one reader who had fondly imagined that he could tackle anything of this length between paper covers in one session (if its subject was physical science in some general aspect) was quickly disillusioned. Dr. Bunge's monograph is compact of reference and argument; even with the glossary (which is not exhaustive) it is difficult reading.

This appraisal is not to discredit the author's intentions, nor his performance. His aim was to explore, for the first time comprehensively, as his publishers claim, the various varieties of human intuition which contribute to the advancement of formal mathematics and the interpretative hypotheses of factual science—and to examine the credentials of intuitionism as a valid stance for the philosopher.

Dr. Bunge writes vigorously on all these topics. He has read widely, he has formed his own opinions on matters of dispute, and he does not shrink from stating them pungently. He castigates philosophical intuitionism without mercy: "If we wish to have an adequate theory of intuition we should not resort to philosophers who abuse

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reason" (p. 112); "A product of mental laziness, ignorance, and superstition, . . . philosophical intuitionism is a form of dogmatism far more dangerous for culture than aprioristic rationalism. . . . It leads directly to authoritarianism, irrationalism, and charlatanism, the main enemies of cultural growth" (p. 120).

Perhaps the less excitable mathematician or scientist (as contrasted with the philosopher) will find more solidly rewarding Dr. Bunge's analysis of the role of intuition in relation to his own field of activity. Here, in the text and through the extensive bibliography, he will uncover much to engage his attention, if he should fall into an analytic mood.

The book originated in a course of lectures given to students of mathematics, philosophy, and physics in the University of Pennsylvania at the beginning of session 1960-61; philosophers will probably accept it as adequate by way of a sketch for a more leisurely and detailed study of a difficult topic; mathematicians and physicists may be content, having read it, to leave the issue where it stands, whilst they get ahead with the work in hand. But even they will not be ungrateful, one imagines, for so much insight into their modes of apprehension and thought.

Viscosity and Flow Measurement. A Laboratory Handbook of Rheology. By J. R. Van Wazer, J. W. Lyons, K. Y. Kim, R. E. Colwell. 406 pp. Interscience, New York, 1963. \$14.00.

Reviewed by **Herbert Leaderman**, National Bureau of Standards.

A body may be said to manifest flow behavior if it possesses no definite rest configuration, its rest configuration thus being a function of the surface traction history; and if its deformation behavior from a rest configuration for any given surface traction history is repeatable. Ignoring the question of thixotropic behavior, the most general constitutive equation for a body manifesting inelastic inertialess flow behavior reduces for the case of steady simple shear to a single-valued monotonically increasing shear stress as a function of rate of shear. This relationship is often called the "flow curve"; for materials whose flow behavior can be thus represented the