dinger, one peripheral, one a statement that Born's perturbation theory is equivalent to his (what hindsight!), and one to him as a precursor of von Neumann! I hope that Van der Waerden uses "quantum mechanics" as a synonym for "matrix mechanics" merely to stress that historically the term is Born's, not in order to prepare the ground for a new attempt to bypass Schroedinger. But we must wait for the second volume to see how wave mechanics is treated. Let us hope that it will include other neglected works, notably of Landé and of Milne, not to mention Heisenberg's 1927 paper on indeterminacy.

In this volume, Van der Waerden draws attention only to that part of Bohr's program which relates to the rise of matrix mechanics. And therefore, even though he tries hard to credit Bohr, he does not do justice to all of Bohr's remarkably detailed and suggestive ideas. He can still do so in his second volume.

Viewed as a program, Bohr's correspondence principle suffers from too much success. Viewed as a proposal for a solution to a problem, it must be seen as embedded in a wider problem, how to overcome the wave-particle duality. The duality problem was not solved but rather deepened by following the correspondence principle. Otherwise there would be no need for the uncertainty principle (nor would it be possible). Did that principle solve the problem satisfactorily? The answer to this question was given by Bohr in his discussions of complementarity: it was as satisfactory as possible. The complementarity principle thus came to replace the correspondence principle. Hence the lack of clarity about correspondence, and the injustice done to it, in subsequent literature, including Pasqual Jordan's *Physics of the Twentieth Century*.

Van der Waerden has rendered a valuable service by putting the correspondence principle back on the map, even though he appears thus far as an apologist of one party in the dispute—the majority—rather than as a dispassionate observer; however, he can still correct this impression. It would be easier for him to do so, I suggest, if he stressed more the role that problems play in the advancement of science.

JOSEPH AGASSI
Department of Philosophy,
Boston University,
Boston, Massachusetts

Continental Drift Revisited

The Origin of Continents and Oceans. ALFRED WEGENER. Translated from the fourth revised edition (Braunschweig, 1929) by John Biram. Dover, New York, 1967. 256 pp., illus. Paper, $2.

Debate about the Earth. Approach to Geophysics through Analysis of Continental Drift. H. TAKEUCHI, S. UYEDA, and H. KANAMORI. Translated from the Japanese by Keiko Kanamori. Freeman, Cooper, San Francisco, 1967. 253 pp., illus. $4.50.

The debate about continental drift has raged fiercely ever since Alfred Wegener advanced his concepts in 1912. Struck by the congruity of the South American east coast and the African west coast, Wegener had gathered relevant geological data which convinced him that indeed South America and Africa had once been together as a single continent. He further concluded that all the present land masses had once been united. Historically, Wegener's views received their widest distribution through translation into many languages of his third revised edition (1922) of *The Origin of Continents and Oceans* (English translation by J. G. A. Skerl, London, 1924). That edition has formed the basis for most English-language discussions. The fourth revised edition (1929), however, from which the present translation was made, presents Wegener's matured views and represents a revision over the third edition to the extent that 40 percent of the references and illustrations are new. This last edition is flawed by Wegener's justified but unfortunate acceptance of erroneous geodetic measurements which seemed proof of relative movements of Greenland and Europe. The revision is surprisingly modern and cogent in some sections but is archaic in others. The volume (despite the tedious prose) should be read by every serious student of continental drift.

H. Takeuchi, S. Uyeda, and H. Kanamori use the debate about continental drift to present a generalized discussion of the earth's structure and history. The geophysical principles are presented nonmathematically, but only magnetism and heat are treated in detail. The authors take the reader from A. Wegener's presentation (third edition) through the controversy and the critical American Association of Petroleum Geologists symposium on continental drift of 1928, critical because the embittered rejection of the theory of continental drift by the main body of American geologists of that time can in part be tied to that symposium. The authors carry the discussion through the development of paleomagnetism into the modern oceanographic work and set the stage for the latest advance of the continental-drift theory, the hypothesis of sea-floor spreading, which has come on the scene since the book was written. A well-balanced account of the debate, which has itself been anything but well balanced, is presented. The authors provide many pieces of personal information which could not be gotten from the scientific literature and which help to bring the debate into its true historical perspective. A very strong emphasis is justifiably placed on the post-World-War-II development of paleomagnetism in the modern rebirth of the concept of continental drift. In this, however, the authors reflect the Japanese and European history rather than the U.S. history of rebirth. The rebirth in the U.S. came about through geological and geophysical studies in western North America and, especially, studies of the deep-sea floor. The large-scale yet simple geologic structures and geophysical properties of western North America and of ocean basins could only be explained in terms of a mobile earth, rather than the static one so long favored by most American geologists. The authors' treatment can be easily understood by the intelligent layman. It brings the reader up to the current scientific frontier while providing him with a good background. The book can profitably be read by any scientist concerned with the problem, if he is not put off by the simple treatment.

DALE C. KRAUSE
Graduate School of Oceanography,
University of Rhode Island, Kingston

Physics without Words

Basic Data of Plasma Physics, 1966. SANBORN C. BROWN. M.I.T. Press, Cambridge, Mass., ed. 2, 1967. 330 pp., illus. $8.50.

This is a book essentially written by computer. It is a compilation of curves useful to those making calculations involving elastic and inelastic collision cross sections, charge exchange cross sections, mobility, diffusion, recombination, and secondary emission coefficients, as well as other atomic processes that occur in gaseous discharges. These data were searched out of the