length the various methods used to obtain hydration numbers and the reasons the various methods do not give concordant results. They appear to accept the thesis of "primary" and "secondary" solvation and the concept that values of "secondary solvation" are dependent on the method used in their determination.

Parsons gives an outline of recent attempts to evaluate the electric potential of interfaces, devoting a large portion to the concepts of Lange. Parsons clearly points out wherein various theories fail to represent experimental observations and where necessary evidence for a hypothesis is lacking.

Bockris, in a systematic manner, outlines recent concepts regarding the kinetics of electrode reactions. His chapter is highly mathematical. He presents, in an interesting way, modern aspects on polyelectrodes, sonic electrode kinetics, and photo-electrode kinetics.

Floyd presents a most enjoyable discussion of the electrochemistry of nerves and muscles. His chapter can be followed readily by those not engaged in electrophysiology. It is well illustrated and gives emphasis to chemical aspects.

An extensive bibliography is included with each chapter. Most readers will find this book well worth while. It should be read by those who are engaged in or who contemplate work in electrochemistry.

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La Cybernétique. Du cerveau humain aux cerveaux artificiels. Paul Cossa. Collection, Evolution des Sciences. Masson, Paris, 1955. 98 pp. Illus. Paper, F. 525.

This little book, by a neurologist, is written in a sprightly and popular style and betrays no indications that the author is the least bit overawed by the claims of enthusiastic cyberneticists. Its nine chapters touch on the origin of cybernetics (following the introduction of Wiener's *Cybernetics* and, so, underestimating the contribution of early work in communication engineering, process control industries, and the like), models of vital behavior, feedback, the mechanical "animals" of Grey Walter, Albert Ducrocq, and the homeostat of Ashby (referred to generally as "les petits monstres") electronic calculators (numerical and logical) and translators (dubbed "les grandes monstres"), the information concept and entropy, aspects of the new industrial revolution implied by automation, and finally whether machines can think, learn, or create, and similar metaphysical considerations.

Cossa has done an excellent job of popularization without becoming sloppy in his treatment of concepts that are not always elementary. The only bone I would pick with him concerns the opinions expressed on what machines cannot do. It is no real limitation on machine behavior to say that a machine can do only what its creator designs it to do, for it is not inconsistent with science to view man himself, exhibited by the author as not so limited, as a creature that can do only what his Creator designed him to do! To say that a machine cannot create, perform a critical function, or learn is mere rhetoric without an operational specification of what these words mean. I find it more plausible to believe that (i) what can be specified operationally can be realized in principle in a machine, and (ii) insofar as the mechanistic viewpoint is valid in biology, admitting creativity, and so forth, in man, it implies the same for the machine. Of course, no machine can do these things now, but denial of the possibility of it ever doing so seems unjustifiable.

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The Chemistry of Petroleum Hydrocarbons. vol. I. Benjamin T. Brooks, Cecil E. Boord, Stewart S. Kurtz, Jr., and Louis Schmerling, Eds. Reinhold, New York, 1954. viii + 646 pp. Illus. $18.

This volume of *The Chemistry of Petroleum Hydrocarbons* has been written by 60 outstanding chemists who have spent the major portion of their lives in this field. They have concentrated in 646 pages the chemistry of a field of hydrocarbons that bears an intimate relationship to the 8-million-barrels daily production of petroleum which plays such a highly important role in our economic life, our welfare, and the defense of our nation. Many of these experts are in the petroleum industry.

The scope of this volume covers mainly scientific fundamentals. There are 21 chapters: "Hydrocarbons in Natural Gases," by D. T. McRoberts (United Gas Co.) and T. W. Legatski (Phillips Petroleum Co.); "Hydrocarbons in Gasolines, Kerosenes, Gas Oils and Lubricating Oils," by A. N. Sachanen (Socony-Vacuum Oil Co.); "Composition of Petroleum Waxes," by B. T. Brooks (consultant, New York); "Types of Crude Petroleum," by W. A. Cruse (Mellon Institute of Industrial Research); "The Composition of Shale Oils," by H. N. Thorne and J. S. Ball (U.S. Bureau of Mines); "Origin of Petroleums," by B. T. Brooks (consultant, New York); "Extractive and Azeotropic Distillations," by C. S. Carlson (Standard Oil Development Co.); "Separation of Aromatics by Selective Absorption," by A. E. Hirschler (Sun Oil Co.); "Principles of Solvent Extraction," by A. W. Francis and W. H. King (Socony-Vacuum Oil Co.); "Separation of Paraffins by Urea and Thiourea," by R. L. McLaughlin (Mellon Institute of Industrial Research); "Physical Properties and Hydrocarbon Structure," by S. S. Kurtz, Jr. (Sun Oil Co.); "Ultraviolet Spectra of Hydrocarbons," by W. Priestley and B. F. Dudenbostle (Standard Oil Development Co.); "Molecular Structure and Spectroscopic Data," by E. J. Rosenbaum (Sun Oil Co.); "Analytical Applications of Infrared and Raman Spectroscopy," by H. M. Tenney (Esso Standard Oil Co. of Louisiana); "Mass Spectroscopy of Hydrocarbons," by W. S. Young (Atlantic Refining Co.); "Analysis and Composition of the Heavier Petroleum Fractions," by K. Van Nes (Royal Dutch Shell Co., Amsterdam); "Preparation of Pure Paraffins and Olefins," by B. T. Brooks (consultant, New York); "Syntheses of Low Molecular Weight Alicyclic Hydrocarbons," by J. M. Derfer (Ohio State University); "Syntheses of Low Molecular Weight Aromatic Hydrocarbons," by J. M. Derfer (Ohio State University); "Syntheses of High Molecular Weight Hydrocarbons," by R. W. Schiessler and R. L. McLaughlin (Pennsylvania State University); "The Fischer-Tropsch Process," by H. H. Storch (U.S. Bureau of Mines).

After studying this book I have come to the conclusion that no one in the oil industry who has to do with hydrocarbons in oil can afford to be without it. It is a handbook of knowledge on a subject that has been long overdue.

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International Review of Cytology. vol. III. G. H. Bourne and J. F. Danielli, Eds. Academic Press, New York, 1954. 530 pp. Illus. $9.50.

Subjects reviewed in this volume include nutrition of animal cells; karyometric studies on cells in tissue culture; properties of urethane and its action on mitosis; composition, and structure of giant chromosomes; chromosomes in mammalian somatic cells; enzymes in isolated nuclei; differential centrifugation of homogenates; enzymatic aspects of embryonic differentiation; azo dye methods in enzymatic histochemistry; transparent chamber methods; the mast cell; elastic tissues; and composition of the nerve cell. All are by outstanding authors—Weymouth, Bucher, Cornman, Alfert, Beatty, Dounce, De Duve and Berthet, Gustafson, Pearse, Williams, As-