picturing the necessarily complex polycyclic structures encountered by all carbohydrate chemists. Current practices leave much to be desired, and this survey, prepared in the light of terpene and steroid experience, suggests a reasonable approach.

Chromatographic techniques will long retain a position of singular importance. Thus, it is appropriate that the paper chromatography discussion in volume 9 has been followed by one on column chromatography (W. W. Brinkley) in volume 10. Both discussions are excellent. It is indeed fortunate that these literature studies are being provided during this critical period of rapid extension of the principle.

Many of the nitrogen-containing derivatives of sugars and the reactions leading thereto have been surveyed under the headings "Glycosylamines" (G. P. Ellis and John Honeyman) and "The Amadori rearrangement" (John E. Hodge). Although they have long been recognized as being biologically significant, there is still much to be explained in the chemistry of these compounds. These current compilations will be used for a long time by all who work with these difficult and often baffling reactions.

Traditionally, glycosyl halides in the acetylated form are key compounds for the preparation of glycoside derivatives. Being essential for the preparation of many complex derivatives, a study (L. J. Haynes and F. H. Newth) of this group is welcome. Several pages of tabulations of physical constants of glycosyl halides and their derivatives will make the section additionally useful for laboratories with limited library facilities. The same is true for extensive tables of constants (George G. Maher) reported for the methyl ethers of aldopentoses, rhamnose, fucose, and D-galactose.

Polysaccharides associated with cellulose in most of its native forms are diverse in composition and structure. Results from work on these compounds are somewhat obscured in some cases because of the relatively severe treatments to which the original wood was exposed. However, the significant literature has now been reviewed (W. J. Polglase) and organized in a meaningful manner. The question of retention of native qualities has also plagued heparin research, but a survey (A. B. Foster and A. J. Huggard) of recent work indicates that very substantial progress has been made in the study of this biologically important polysaccharide material.

Volume 10 has every right to take its place alongside the earlier members of this series as a near essential for all carbohydrate chemists.

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Atom und Psyche. Ein Deutungsversuch. Egon Freiherr von Eickstedt. Ferdinand Enke, Stuttgart, 1954. 158 pp. Cloth, DM. 14.20; paper, DM. 12.

Die Selbstgestaltung des Lebendigen. Synoptische Theorie des Lebens als ein Beitrag zu den philosophischen Grundlagen der Naturwissenschaft. Karl Friederichs. Ernst Reinhardt, Muenchen–Basel, 1955. 222 pp. Cloth, Fr. 20.50; paper, Fr. 18.

These two volumes can appropriately be reviewed together, not only because they belong to the line of German *Naturphilosophie,* but also because their intention and viewpoints are similar. Both start with the theory of levels or the hierarchy of reality, as was advanced, in Germany, particularly by Nicolai Hartmann. Both try to fit together these eternal antagonists in the world drama, body and mind, conceiving of physical matter, organism, soul, and spirit as layers in the great cake of reality, and arriving at a psychicist interpretation similar to that advocated by Sinnott in this country. For the philosophically minded, they will make interesting reading.

Von Eickstedt, the distinguished anthropologist, travels from the subatomic territory via the hierarchy of biological systems to mental phenomena. The elementary units of physics being at the basis of reality, the question is raised whether the psyche also comes in, and concordances may be found between the atomic world of microphysics and the properties of living and animate nature. In fact, many such parallels show up. Behavior at the microphysical level compares to vital rather than to macrophysical phenomena. The elementary processes in physics are beyond space, time, and substance which are only categories of human experience; likewise, the familiar categories of space, time and substance dissolve in narcosis, under mescaline or after traumatic lesions. Microphysics is governed by statistical laws where the individual particle has a "choice" between different possibilities, just as the human individual follows his "free will" and, nevertheless, a statistical law allows us to predict quite exactly the number of suicides in years to come. Amplification of microevents to macrophenomena seems to play a role in biological happenings, as, according to the target theory, one quantum "hit" suffices to produce a mutation, and so forth.

Friederichs, noted for his contributions in the field of applied entomology, calls his theory "autotelism." While giving credit to the approaches made toward teleology by organismic biology, general system theory, cybernetics and cognate approaches, and acknowledging that, according to my own writings, many apparently vitalistic features of the organisms can be conceived as consequences of their being open systems and steady states, he finds these conceptions shortcoming in view of the *Sinnhaftigkeit* and *Innen* of the organism. The essential limitation of the concept of wholeness is to skip the unspatial component of the organism that has a decisive influence on vital happenings.

Since the success of some 2000 years of philosophy has been indifferent in putting together the physical and psychical halves of the great Humpty Dumpty, no blame can be laid on the erudite authors for not having provided the final solution. We do not judge whether, according to Friederichs, the psychophysical union can be compared to the spatio-temporal union of physics, whether speaking of physical, biological, psychological, and cultural "levels," does not involve a μετάβασις εις ἄλλο γένος, in how far Eickstedt's parallel between microphysical and psychological happenings is permissible, and so forth. Perhaps the wisest attitude is indicated by Friederichs who, laudatorily commenting on certain statements of the reviewer, says that the latter "appears in Faraday's position when he was asked what electricity is. His answer: 25 years ago I could have told you, but I cannot today."

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Realms of Water. P. H. Kuenen. Revised version translated by May Hollander. Wiley, New York; Cleaver-Hume, London, 1955. 327 pp. Illus. + plates. $6.50. (Originally published as *De Kringloop Van Het Water.*)

The demands for more and more water that society is making upon science and technology become more pressing with each new day. The increasing industrialization throughout the world, coupled with the unrelenting rise in populations, requires a continuing assessment of our water resources. In order to appraise significantly the world supplies of this precious commodity, we must be aware not only of its distribution over the crust of the earth but also of its travels. P. H. Kuenen has compiled in this new book much of the necessary background information for these problems.

The book treats the journeys of water from its principal reservoir, the oceans, through the atmosphere, glaciers, terrestrial waters, and ground waters, and finally through the rivers back to the oceans. The physical and chemical interactions between water and its various temporary environments are emphasized. Somewhat neglected, however, are the chemical isotopic compositions of natu-

ral waters which can retain a record of their previous history.

A clear picture of the consequential role of the hydrosphere in such phenomena as climate and erosion is put forth. The geologic behavior of water is related to its extraordinary properties: its existence in nature in the gaseous, liquid, and solid states; and its ability to dissolve most substances on the surface of the earth to at least a limited degree.

The author apparently seeks his principal audience in the lay reader. Although the volume abounds in diagrams and pictures, there is a paucity of tables and equations which would have allowed the author to present his arguments more succinctly. Again, some of the illustrations, taken directly from scientific publications, contain notations that are not explained in the text. There are also many inconsistencies in the use of units; for example, salinities are designated as both parts per thousand and parts per hundred in diagrams on the same page (p. 67). Nonetheless, the author is successful in presenting a vigorous and lively history of the travels of water.

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(Inquiries concerning these publications should be addressed, not to Science, *but to the publisher or agency sponsoring the publication.)*

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