have taken pains to provide background information, and the papers are as much short reviews as specialized technical reports. The contributions are well balanced between thermotropic and lyotropic systems, and the close relationship which has come to be recognized between the two is made clear. The trend of much of the work is away from the complex bulk optical properties of liquid crystals and toward their molecular properties, and this trend will help considerably in winning a wider audience.

This volume is belated, and it is regrettable that the editors chose not to compensate by going outside the conference proceedings to shore up some weak spots. Most of the biology included is weak or peripheral, and contributions from a membrane biophysicist and biochemist would have filled a gap made conspicuous by the thrust of the physical studies.

The book is outrageously overpriced at $30. The publishers have foredoomed a volume which otherwise merits attention.

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Soviet Geomorphology

Processes of Coastal Development. V. P. ZENKOVICH. J. A. Steers and Cuchlaine A. M. King, Eds. Translated from the Russian edition (Moscow, 1962) by D. G. Fry. Interscience (Wiley), New York, 1967. xvi + 738 pp., illus. $37.50.

There is no doubt that this book is an outstanding work, probably one of the most significant contributions since D. W. Johnson's classic *Shore Processes and Shoreline Development*. Zenkovich's book covers a wider range of topics and employs a larger amount of hydrodynamic interpretation. Major emphasis is placed on two subjects of traditional interest: equilibrium beach profiles (chapters 2 through 5) and variation of beach forms alongshore (chapters 6 through 9). The last six chapters deal with such topics as coastal development as affected by vertical movement, proximity to rivers, aeolian processes, and tides and storm surges. A concise account of shallow-water hydraulics appears in the first chapter.

The author states that "the main ideas developed by Soviet scientists are described in some detail in this book." Thus, of the 1105 references, as many as two-thirds are Soviet contributions. Although this feature is a bonus to Western scientists, the reader will be annoyed by the author's fond comparison between Soviet and non-Soviet contributions, in which the former are usually favored. Not only is such comparison unnecessary, but it is also meaningless, since the proportion of quoted references hardly represents the true proportion of contributions. For instance, Zenkovich implies that most non-Soviet authors reject the null-point concept altogether and that very few are in some measure of agreement with Cornaglia. As a matter of fact, an exhaustive study regarding this concept was conducted by non-Soviet workers, among them Ippen, Eagleson, and their colleagues at M.I.T., during the 1950's. This study, though widely known and quoted in the Western world, is not mentioned in the book. Apparently, the author is a victim of a circumstance which he himself deplores: inadequate exchange of information between Soviet and non-Soviet scientists.

The book is essentially concerned with coastal morphology, and, understandably, the treatment is qualitative. It would have captured a wider circle of readers had it been more generous with topics relating to dynamics. The book describes a theory by Shulyak which is said to make it "possible to predict the size of ripple marks at a given depth and for a given material from the parameters of the surface waves." According to this theory, "currents over a ripple-marked sea bed may move as much as three times faster than over an even bed," thus increasing the sand transport greatly "even when the undisturbed speed is below the threshold velocity for sand of the size involved." Information as important as this should have been accompanied by quantitative evidence. This shortcoming is found in the treatment of several other topics, including that of littoral currents. A theory by Shadrin, the first of its kind to consider the effects of surface gradient and bottom irregularities on the velocity distribution in the surf zone, should have been discussed in more detail.

The book reveals some interesting aspects of the Soviet school of coastal morphology. One such aspect is the concept of equilibrium beach profile, in which the role of initial bottom slope is emphasized. It is suggested that at a certain critical angle of slope a zone of deposition will occur away from shore and "will finally appear above the surface of the water as a narrow strip known as a barrier island beach." The possibility that a bar can emerge above water surface on a gentle slope was demonstrated years ago by a wave-tank experiment at the University of Tokyo's Coastal Engineering Laboratory. Another interesting aspect is the wide recognition among Soviet scientists of rhythmically curved shorelines and bars as well as sand waves on the shallow sea bed. These features are migratory in the direction of sediment movement and probably represent a certain mechanism linking processes of sediment movement with those of beach topography. They have received little attention in this country, although they do develop along many parts of our coasts.

The book is recommended for a graduate-level reading course in physical geography as well as for libraries of geography, geology, and coastal engineering.

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Disease in Plants

Physiological Plant Pathology. R. K. S. WOOD. Blackwell Scientific Publications, Oxford, 1967 (distributed in the U.S. by Davis, Philadelphia). xiv + 570 pp., illus. $11.50. Botanical Monographs, No. 11.

Despite their intrinsic importance as biological phenomena, the physiological and biochemical mechanisms underlying the induction and development of plant diseases have not received detailed attention. For nearly a century, the discipline of plant pathology has been concerned chiefly with the ecology (in a broad sense) and genetics of pathogens and their hosts and with the scientific principles of disease control through chemicals, plant breeding, and cultural practices. There is a growing awareness, however, that many of the current disease-control practices may be limited by complexities in the biological balance existing between potential pathogens and their hosts and, in addition, that the needs and demands of agriculture and society are changing. As a prelude to different and less empirical control procedures, there has been a decided shift in research emphasis towards the basic physiology and biochemistry of host-parasite interactions.