storm in the North Sea area on February 16, 1962? We might add that Robert Currie has identified the 18.6 yr. lunar nodical cycle in long-term tree-ring records and several geophysical parameters, so that we are evidently not dealing with a simple oceanographic effect, but with one that modulates geomagnetic signals and atmospheric dynamics.

Fergus Wood's major contribution to this increasingly important field comes at a most appropriate time when the eyes of scientists around the world are being directed to the rising dangers and threats of large-scale coastal disasters.

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Coastal and Estaurine Sediment Dynamics, by Keith R. Dyer, 1986, John Wiley & Sons, Chichester, 342 p, £36.50stg, ISBN 0-471-90876-2.

The author, Professor Dyer, was Head of the Sedimentation Group at the Institute of Oceanographic Sciences until savage financial cuts broke up the team which he had assembled and led to the forefront of rigorous research. The field of marine sediment dynamics will sadly miss the collective works of Heathershaw, Langhorne, Carr, Davies, Soulsby and of Dyer himself and will echo the hope, which is expressed in the preface, that the group will reform with the same zeal elsewhere, possibly in Plymouth where the author has now taken up again as Dean of the new Institute of Marine Studies. The work of Dyer's group reflected the decades of change in Marine Geoscience from the geologists broad description of the seafloor, through the demands of engineering and pilotage for an improved understanding of bathymetric evolution and into our ongoing technical and mathematical assault on the fine scale physics of wave and tidal boundary layers and the resulting seabed sand transport. *Coastal and Estuarine Sediment Dynamics* is not a history book, but it is the story of those developments written by, and one suspects for, informed reflection on the state of the subject with a view of planning the next steps forward.

The book, with eleven Chapters and some 340 pages, is well illustrated throughout, with some two hundred line drawings and two half tones. The short, introductory Chapter 1 outlines the descriptive, empirical and deterministic approaches and argues for the last based upon the first but resorting reluctantly to the second when inadequate theory is available. The book remains true to these objectives. The Chapter also sets a temporal context through sea-level change and concludes with a patchy discussion of fluvial sediment inputs to the world ocean.

Chapter Two is a well written, concise but comprehensive description of the mineralogical and physical properties of sediments, the bulk of which deals with the acquisition and analysis of grain size distributions and with their potential for palaeoenvironmental interpretation. Dyer presents all of the old arguments but makes no choices. The sixty pages of Chapter 3, on Fluid Flow, begin at the beginning with mass continuity, drag and open channel flow. Dyer then finds his pace with a very detailed description of boundary layers exemplified by flow over bedforms. The reader is brought right up to date with Dyer's Group's last work on some of the subject's theoretical shortcomings through detailed discussions of the reference height for roughness lengths and turbulent bursting phenomena. Tides are covered descriptively in six pages and Airy wave theory receives similarly short shrift, and then Dyer again changes pace for a brief but comprehensible section on wave-induced boundary layers.

There are two possible solutions to the problem of summarising and explaining the vast body of theory and literature which lies behind Chapters 4 to 8, the Sediment Dynamics of the book's title. This is because the initiation and subsequent transport of sediment must be dealt with in both steady and reversing flows. Dyer chooses the route which presents the initiation of bedload transport in first steady and then reversing flow (Chapter 4: Sediment Movement and Chapter 5: Sediment Movement Under Waves) before combining both initiation and flux of suspended sediment under both steady and reversing currents in Chapter 6 (Sediment Suspension). Dyer then returns to bedload rates in Chapter 7 (Sediment Transport Rate) and finally deals with Cohensive Sediments in

Chapter 9. All of the relevant material in these Chapters is competently handled and the author continues to prefer physical arguments to empirical correlations. Thus Shields is presented in Chapter 4, but only after a detailed analysis of grain threshold forces. Again Chapter 7 explains the transport equations of Meyer-Peter and Muller, Yalin and Ackers and White alongside Einstein and Bagnold. In each of these Chapters the theory is followed by comprehensive references to coastal and estuarine field measurements.

The remaining Chapters of the book attempt to apply the preceeding, process-orientated approach to models of coastal environments and Dyer has chosen threefold division: Estaurine Sedimentation (Chapter 9), Beach Processes (Chapter 11) and the rest which is entitled Coastal Sedimentation (Chapter 10). Chapter 9 is similar to Dyer's earlier book and deals with currents and sedimentation patterns within a traditional classification system. Chapter 10 covers modern marine bedforms with sections on furrows, sand waves, mega-ripples and sand banks, and it is pleasing to see that the analysis of the latter is included in terms of Coriolis and the Rossby Number. The last Chapter, on beaches, contains descriptive discussions of shallow water wave theory, a more detailed section on edge waves and associated beach features, a summary of the work on longshore currents and sand transport, and three short sections on shore normal processes and features. Here, as in the two preceeding Chapters, it is a shame that the book does not place its earlier detail on processes into the appropriate environmental context. For example page 191 in the Sediment Transport Rate Chapter covers the latest work on shore normal transport functions and yet page 310 in the beaches Chapter resorts to the rather dated Null Point Hypothesis in a section headed Onshore-Offshore Transport.

In conclusion, and upon rereading *Coastal and Estuarine Sediment Dynamics* for this review, the impression is of a well-written review of the existing literature which is aimed at the final year or postgraduate level. The mathematical content is well explained and one is never left with that feeling of equations plucked from the air. The comfortable confidence of the book is only disturbed when occasionally, and quite abruptly, the reader is tempted along a new and as yet unresolved research avenue, which awaits another Sedimentation Group and another time, and that, I think, was Dyer's intention.

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GENESIS, by HANS HANSON, 1987, Doctoral thesis, Technical University of Lund, Sweden, 1987 200 p.

GENESIS is a one-line model system for simulation of shoreline changes including a number of physical features like the effects of breakwaters, shore-parallel as well as perpendicular, groins, sea walls and artificial nourishment. GENESIS was developed to serve as an engineering tool to provide insights in the development and control of shoreline changes including the effects of coastal structures.

At its present stage of development GENESIS requires calibration and verification by data for the development of at least two sections of shorelines covering the area in question in order to provide a reliable prediction of future evolutions.

The author covers a wide area of practical interest to coastal engineering planning. Even if the results may be qualitative rather than quantitative their importance definitely is that they provide a basis for comparisons, thereby for guidance of planning considering a number of alternative suggestions.

Results, however, depend upon the validity of their assumptions and as pointed out by the author more than once the applied littoral drift formulae are sensitive to breaker angles and a number of other wave data. This includes wave angle-and time series-sequences. Sensitivity analysies *per se* are dealt with in Chapter 6 which also includes subsections on groin permeability, the influence of grain sizes, the beach berm height and the "depth of closure" of the sea/land interaction.

The author openly admits shortcomings like the lack of consideration to sea walls' hydraulic influence on beach stability including local scour which may happen in front of them. No distinction is made between the various degrees of reflection caused by sea walls or revetments.