and incoming coastal researchers would get more succour from the Kelletat bibliography.

In short, they are both worth having, the German volume winning on points!

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The Thames Barrier, by S. Gilbert and R. Horner, 1984, Thomas Telford Ltd., London, 182p. £12.75, ISBN 0-727-70182-7.

Gilbert and Horner have produced a book concerned with what must be the most expensive engineering structure specifically designed for coastal defence to be built in the UK, namely the Thames Barrier at Woolwich. At the cost of £446 x 10^6 (1972 prices) the barrier was completed in 1982 and is designed to save Central and Inner London from the flood-related consequences of a severe North Sea storm-generated surge moving up the Thames estuary. The authors have produced an informative and readable account of the need for, design, and construction of the barrier. Their style is documentary but authoritative as both authors had the advantage of being on the various official working parties reltated to the barrier development during its over-long gestation period. I use the word 'over-long' as it was nearly thirty years after a near-disaster in 1953 before the barrier was completed. It took the North Sea Surge of January 1953 to force the UK Government to recognise the disaster that could overtake Central London and more directly, the infrastructure of central Government, if a surge level as high as recorded in 1953 flood was to reoccur in conjunction with a high spring tide. By 1966 the cost of such a repeat storm and surge level was estimated at £2000 x 10^6. Clearly given such an obvious positive value to the cost-benefit analysis, the crucial question to ask is why the barrier took so long to be started, let alone completed?

By virtue of their positions as representing the Greater London Council (GLC) and the Department of the Environment (DOE) the authors have partially opened the lid on the long history of planning and counter-planning caused by the vacillation of what may be termed the major villain of the affair! The Port of London Authority (PLA) exercised an overwhelming influence on the type of structure to be built: barrier or barrage, as well as to its position on the Thames. The book provides an interesting perspective on how a 'tail wagged the dog.' The PLA through the 1950s and 1960s constantly reviewed the design requirements of the barrier as a function of controlling ship access to their principal docks in eastern London. The dimensions of ship locks or barrier openings were constantly being redefined downwards (170 m down to 66 m widths) as the PLA found more and more of its port facilities being either closed due to a decline in shipping or being transfered downstream to new developments well beyond any potential barrier sites. The switch to facilities downstream with bigger ship berths meant that the maximum size of vessles requiring access through the barrier steadily fell during this planning stage. The only benefit from this protracted planning exchange was that the original dimensions of barrier access demanded either moveable barrier or swing bridges that were probably beyond the technical ability of design engineers in the UK at that time. Gilbert believes that this vacillation probably added 15% to the final bill as well as extending barrier completion by several years. The authors are only thankful that an emergency of the type that neccessitated the barrier's construction was not recorded during the delay!

The book can be split into two themes. The first seven chapters will probably be of greater interest to coastal scientists as they concentrate on explaining the nature of the surge problem as well as outlining the debate over which course of remedial action was the best to implement. Chapter 1 outlines in concise, yet comprehensive terms, the origins of the Thames flood problem, looking back to historical times to show how London river-side development had accentuated the possibility of flooding. The important element in flood prevention, that of the height of extreme tides in London, is introduced. The increasing rapidity of higher and higher flood levels being reached is shown to be the principal spur for the barrier to be built. For example in 1978 two tides reproduced very closely the record level reached in the 1928 flood, *i.e.* after only 50 years a record tide had been repeated twice in one year. Chapter 2 considers the reasons underlying this growing flood hazard; sea-level rise, subsidence of S.E. England, increasing settlement of the London area due to groundwater abstraction, amplification of estuary tidal range plus the overriding problem of North Sea surges (which could at the mouth of the Thames create upwards of a 3.5 m rise in water level above the predicted tide height). Chapter 3 considers how the 1953 storm-generated surge triggered the realization that London, Central Government

and (most importantly for Britain attempting to rebuild a post-war economy) business could be dislocated if not shattered, by the re-occurrence of such an event. Another surge of the dimension of 1953, but superimposed onto a spring tide, would for example have put the London Underground Transport system out of action for as long as a year. Hence the massive damages bill estimated in 1966. Chapter 4 reports on the debate surrounding the various options for flood control/defence. The choice of a barrier was not clearcut, nor the definition of the critical flood design height. Chapter 5 examines in some detail one of the earlier suggested barrier sites, at Crayfordness, downstream of the final Woolwich barrier site. This earlier site with its attendant design problems was the alternative choosen by the PLA after the Longreach site (chosen in 1956 by the PLA) was rejected by the same authority in the early 1960s as they had in the intervening period built new ship jetties there! Chapter 6 shows how Herman Bondi's report of 1966 cut across most of this never-ending debate by (1) asserting that the barrier must be built at all speed, and (2) indicating that yet another site, at Woolwich, was the optimum location. It is amusing to read how Bondi, an astronomer, cut the Gordian Knot of PLA, GLC and DOE entanglements in order to push the barrier forward! Chapter 7 ends this first theme by examining the river side flood precautions brought in to contend with the movement of the barrier site upstream to Woolwich.

The bulk of the rest of the book (Chapters 8 to 13) is a chronological account of how the final site and final barrier design were developed. The description of how the barrier was built (started in 1975) including the delays and problems generated by cost and labour during the inflationary spiral of the 1970s, and finally finished by October 1982, will probably be of most interest to engineers. However, I found it a useful exercise to follow this readable account of the construction problems posed by this construction project. Read this section and you can find out why England was scoured for left-handed plumbers during barrier construction!

Chapter 14 relates how the barrier is operated as part of the flood forecast/control scheme for eastern UK and what happens when a decision to close the barrier is taken (only twice since completion). The last two chapters are individually authored by Horner (Chapter 15) and Gilbert (Chapter 16) who both reflect on lessons learnt from this venture. An important suggestion is that a single authority should be considered to be empowered for any future massive construction projects in order to speed up the development process. More ominously, it is suggested that the power of the statutory UK public inquiry system into the position and design of such structures needs to be drastically curtailed, not a comment to enthuse the anti-nuclear power lobby!

Given such a slim volume it is a pity that the publishers did not consider a reduced option of a paperback version. The available hardback is well-documented and produced, has no obvious errors, and is usefully illustrated with line and plate figures. All in all, this brief and readable book is an asset to its authors, and should be read by coastal zone investigators as an example of how 'big' coastal projects are envisaged and nurtured in the UK.

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An Introduction to Coastal Geomorphology, by John Pethick, 1984, Edward Arnold Ltd., London, 260p. Paper, $16.00, ISBN 0-7131-6391-7.

John Pethick's *An Introduction to Coastal Geomorphology* is one of the more useful general texts on coastal dynamics since *Beach Processes and Sedimentation* by Paul Komar (1976). Pethick has written for the undergraduate studying coastal processes or landforms in general. His text evolved from a course he teaches in the Geography Department at the University of Hull (UK).

Pethick's objective is to bring coastal geomorphology into the framework of process studies while drawing from the numerous disciplines associated with the coast. His systems approach results in three main sections: the first examining energy imputs into the coastal system, the second dealing with this energy transformation into sediment and water movement, and the third concentrating on landform response in the form of beaches, dunes, mudflats, marshes, estuaries, and cliffs with chronological emphasis on the Quaternary.

While chapter 1 (Introduction) sets the coastal geomorphological stage, chapters 2, 3, and 4 deal with waves, wave-induced currents and tides respectively. Wave theory is covered succinctly, whereas wave-induced currents (chapter 3) although adequate, exhibits an equation definition error (p 41) and an incorrect reference to figure 15 (p. 39). I was somewhat concerned about the discussion on edge waves in that the actual mechanisms involved with