R. K. Gresswell and the Irish Sea Coast

In his 1953 book Sandy Shores in South West Lancashire, Ronald Kay Gresswell summed-up his investigations into the deposits of the South Lancashire Plain between Liverpool and the River Ribble. He described a wave-cut notch in the flat coastal plain, which he termed the Hillhouse Coast after a prominent landmark. Westward of this ancient shoreline he described the ancient forest of oak and silver birch that lay beneath the onshore deposits and which also occur as submerged forest deposits beneath the modern beach line from Liverpool to the Ribble. He went on to link this ancient shoreline to deposits in the Fylde and Cumbria. In the pre-radiocarbon era he could only estimate that the wood was of Neolithic age, correlated with the so-called 25-foot beach found in other parts of Britain.

Gresswell estimated the shoreline of the eastern Irish Sea after melting of the Pleistocene ice-sheet (p15) and (in his own summing-up): "*…the eustatic depression of the sea-level, which remained uncompensated by any other factor, must have caused the coastline to lie a considerable distance westward of its present position*". He drew this early Holocene coastline in Fig.6 as reproduced here. This would locate the early post-glacial coast at the 22-fathom depth line (approx -40m depth) which showed the Isle of Man linked to Cumbria.

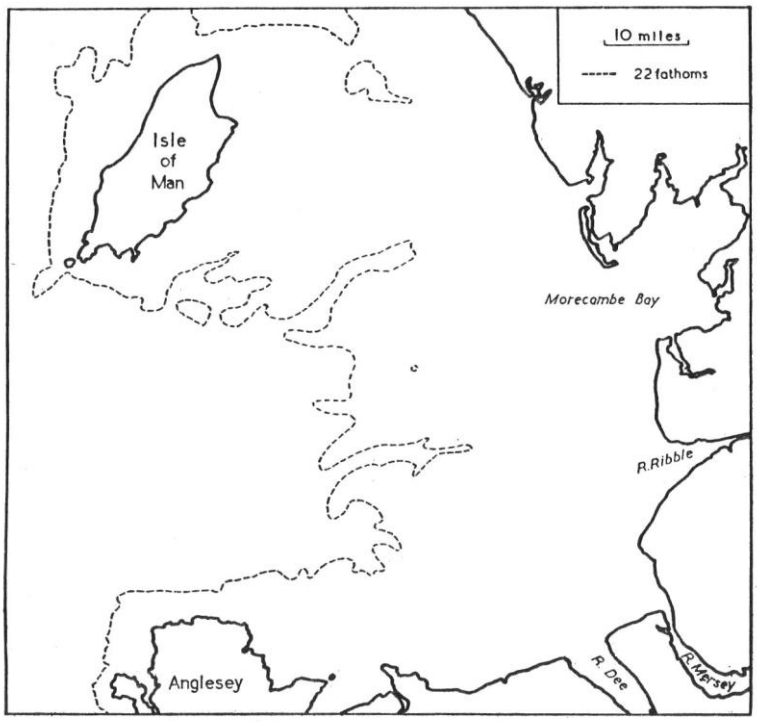

Fig. 6
Early post-glacial coastline

Figure 6 from Sandy Shores in South West Lancashire (1953)

Across this emergent rectangular plain (as may be seen on his map) he discerned from navigation charts where the ancient continuation of the rivers Ribble and Mersey-Dee had once flowed into a much-reduced Irish Sea. He argued that east of the 10-fathom depth-line the drowned river valleys had been smoothed by the sediment from the modern rivers; and he argued from his onshore borings that the in-filling of the Ribble estuary could similarly be observed in the Lancashire deposits.

In chapter IV he devised the sequence of advances and retreats of the post-glacial Lancashire coastline during the Holocene. On page 47 he illustrated this in the diagram reproduced here.

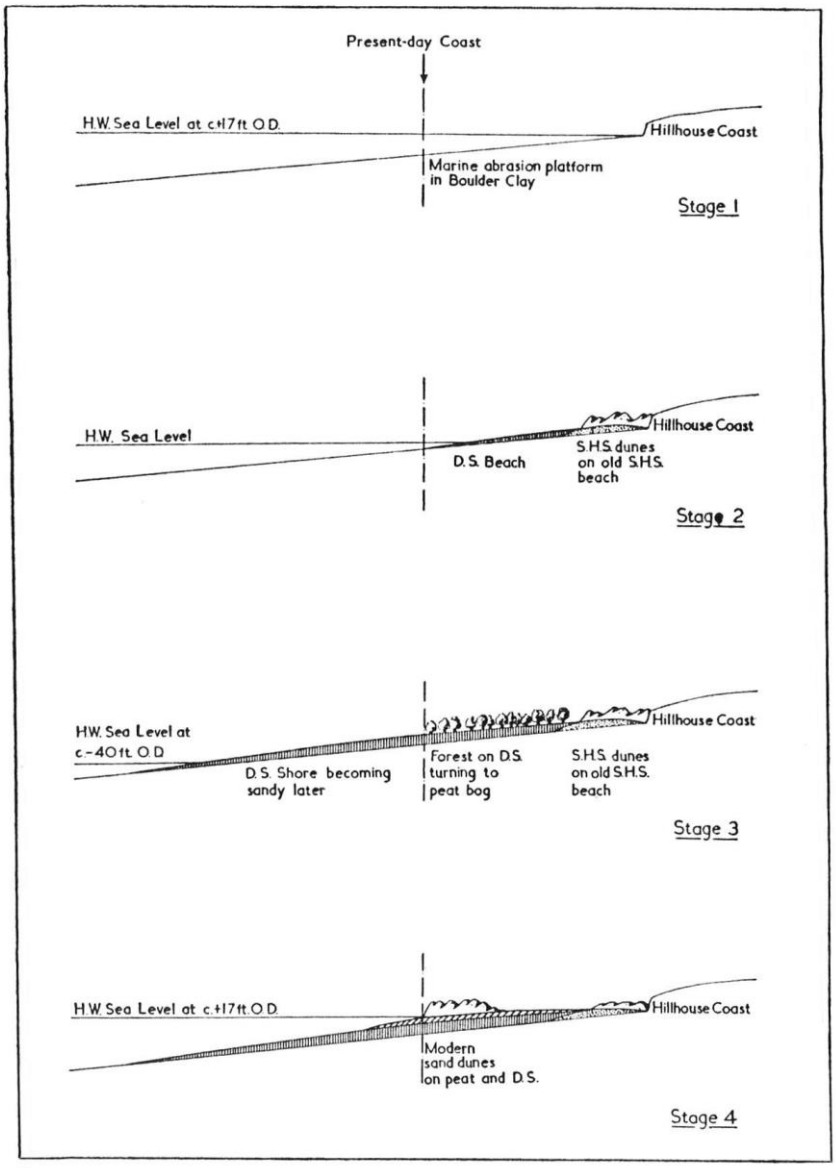

FIG. 13

Post-glacial episodes in South Lancashire

Diagrammatic and not to scale. S.H.S. = Shirdley Hill Sand, D.S. = Downholland Silt

Figure 13 from Sandy Shores in South West Lancashire (1953)

In stage 1 (early Holocene/ post-glacial) the sea rose to 7ft OD forming the Hillhouse coast. It then retreated in stage 2 towards the modern shore, allowing the growth of the oak and birch forests in stage 3 (mid-Holocene) as the sea retreated further out to -40ft OD. In stage 4 the sea returned close to modern shores, drowning the forests.

As a lifelong resident of Southport, Ronald Kay Gresswell M.A., PH.D., F.R.S.A., F.G.S. (1905-1969) was a prominent member of the British Institute of Geographers, known best for his fieldwork on the geomorphology of Lancashire during the 1940s and 50s. His work predated the radiocarbon and tree-ring dating methods that came to the fore only in the 1960s and 70s; and also the Milankovich theory of ice-ages that gained acceptance around the same time. His research is therefore 'pure' and

unbiased by these later theories; he discusses the 'eustatic' variations of the post-glacial sea-level due to ice-melt and the recovery from the ice-burden, solely in terms of their apparent local effects.

As in all such studies of ancient sea-levels, local 'isostatic' vertical movements of the land can be conveniently conjured to make almost any theory fit the evidence – so long as one does not try too hard to correlate them with the parallels from other parts of the world. This is not a criticism of Gresswell for it is found in almost all such studies. Later researchers from the 1960s onwards, taking on board the then-prevailing theories of glacio-isostatic modelling, would revise Gresswell's theories on the grounds that they did not correspond with the wider picture derived from the worldwide sea-level curves and the melting of the Laurentide ice-sheet. A summary of this later research may be found in the Coastal Geomorphology Survey of Great Britain, chapter 7 (see the reference below, pp 4-5).

In the 1950s Gresswell could only date the period of lowered sea-level by the vegetation sequences. The consensus at that era, based on the earlier work of Godwin and Steers, was that the deciduous forests were of Boreal-Atlantic age. This view of a high sea level, followed by a regression below modern sea level and finally a rise to modern shores, was often described as "the submerged forest period". Radiocarbon dates can now help to date these forests more reliably; see the feature here: Submerged Forests around Britain and Ireland.

A stern critic of Gresswell's work has been M. J. Tooley who would argue (1978) that the Hillhouse 'cliff' was actually the shore of a trapped inland lake; and that the true former coast lay somewhat further west. From modern radiocarbon dates he and other researchers would now prefer a sequence of more conservative advances and retreats around the modern shoreline. Up to five possible transgressions of the present-day coast are envisaged between 9200 BP and 5000 BP; with subsequent build-up of the deep sandy beaches that we see today. The idea of a submerged forest period was quietly dropped. There remains general agreement however, that the sea only reached its modern level around 5000 BP (c3000 BC).

It should be noted that none of this later work challenges Gresswell's insight that the former river channels could be discerned in the shallow bed of the eastern Irish Sea and therefore they must be post-glacial; and it follows that at whatever era these rivers flowed, the Isle of Man must have been linked to Cumbria. The divergence is that the later researchers, being constrained by the glacio-isostatic models that they must cite, could not contemplate such huge advances and retreats of the shoreline by as much as 30-40 km across the eastern Irish Sea; they would prefer to talk only of small-scale oscillations just offshore of the modern coasts. This is where Gresswell's naïve and 'pure' insight is so valuable.

In my own cross-disciplinary studies, I came at this problem from a world-wide pattern of correspondence of sea level change in alternate quarter-spheres. This is the pattern expected to be produced by a pole-shift that would have occurred during the mid-Holocene: the late fourth millennium BC (see the feature here: Raised Beaches and Submerged Forests). This theory was first published in *The Atlantis Researches* (1995) and *Atlantis of the West* (2002). We find *emergence* around 5,000 years ago, by similar distances, along shallow East Asian and South American coasts; and so we should not be surprised by *submergence* of the scale proposed by Gresswell.

The present author would continue to have serious issues with current models of sea-level change since the ice age. The various vertical movements of land and sea-bed (or the collapsing 'fore-bulges' of more modern parlance) which are proposed to explain the sea-level anomalies around the world would themselves constitute a change to the Earth's figure; and must therefore trigger a wobble of the rotation axis and a pole-shift. This would in turn feed-back as variations of sea-level and climate

very similar to those that the 'isostatic' movements are advanced to explain. Sea level researchers seldom mention geodesy and fail to consider the rotational dynamics of the planet.

The question of whether the floor of the eastern Irish Sea was exposed during the warm mid-Holocene period has wider consequences for archaeology. It is also related to the question of whether there was a land-bridge between Britain and Ireland, and to the Isle of Man; and how the various flora and fauna reached these islands after the ice age. It offers the possibility of Mesolithic and Neolithic archaeology submerged offshore, compliant with Welsh, Irish and Mediterranean myths. Celtic myths and legends recall sunken cities and lost lands around the coast of Britain; and if we are to properly investigate these as memories of real events then the 'submerged forest period' prior to 5,000 years ago is the only era when we find both submergence and a warm climate.

In the BGS Report (2015) we may see that Gresswell's 10-fathom line would roughly correspond to the *Eastern Irish Sea Mud Belt* and the older region as the *Central Irish Sea Gravel Belt*. In both these regions however, the report describes the Holocene deposits as varying between 5m and up to 40m depth. Therefore anything of archaeological interest that was formerly at sea level would now be deeply buried.

In closing this review of Gresswell's pioneering work, I can only express appreciation for the painstaking work that he and other fieldworkers undertake; those who excavate in difficult locations to give us the dated primary evidence of past regimes; and without whose work the secondary and cross-disciplinary researchers could not progress. But specialists can sometimes be too close to a problem; what we need is not more onshore work and theoretical models, but more data from offshore.

The diagrams reproduced here from 'Sandy Shores in South West Lancashire' are believed to be out of copyright. Should anyone object to their inclusion here then please contact the website author.

References: the following will lead to all the relevant detailed coastal studies and papers.

http://archive.jncc.gov.uk/pdf/GCRDB/GCRsiteaccount1961.pdf
this is part of:
Geological Conservation Review
Volume 28: Coastal Geomorphology of Great Britain
Chapter 7: Sandy beaches and dunes – GCR site reports
Site: AINSDALE (GCR ID: 1961)

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Tags: sea level change, submerged forest, catastrophism, sea-levels, ancient climate, ice ages, Irish Sea, Lancashire, Wales, Gresswell, Hillhouse Coast, pole shift

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https://www.third-millennium.co.uk/the-irish-sea-coast