



# *Sheetlines*

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“Grassholm Island and The Smalls: Cassini  
relics”

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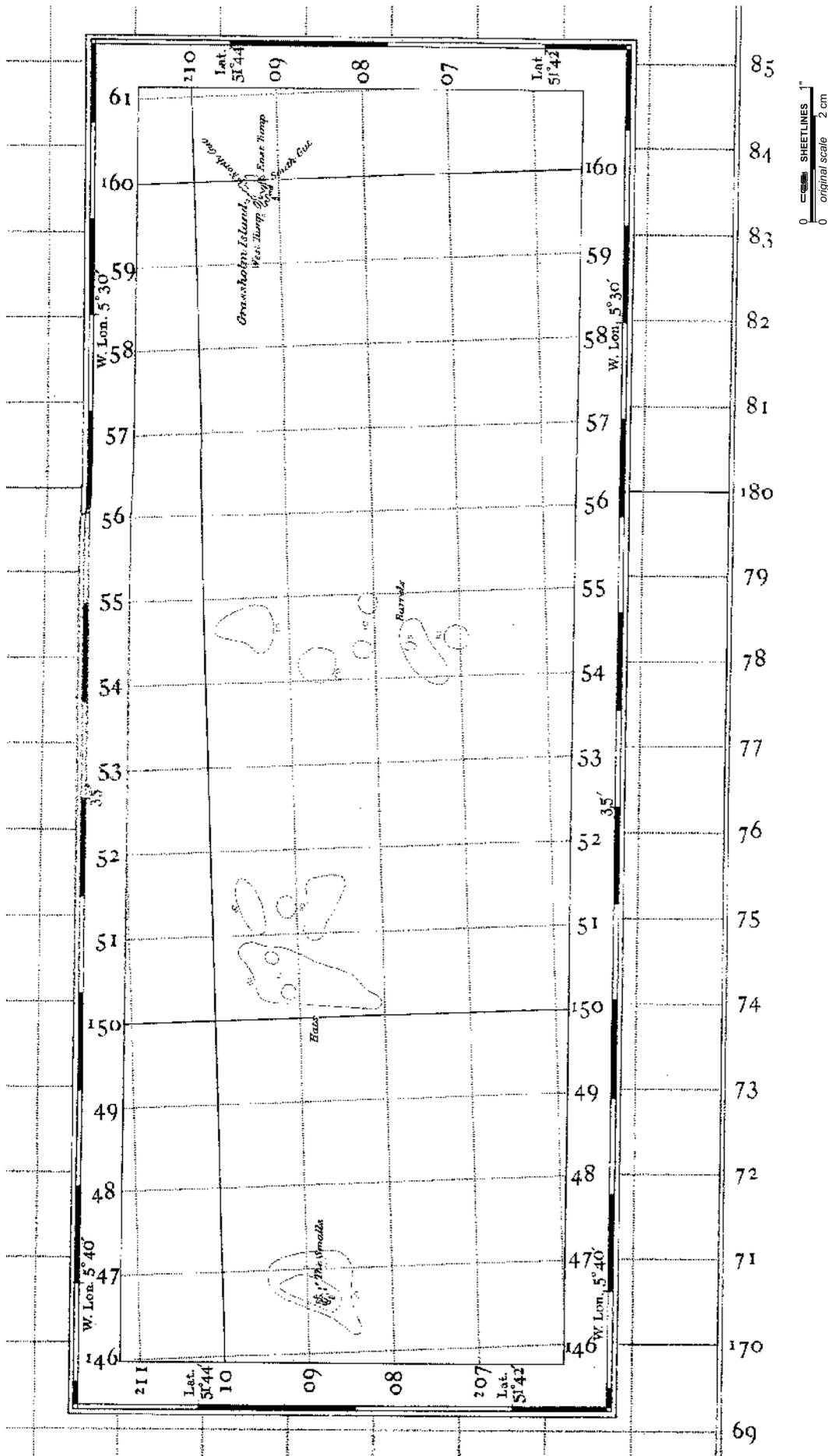
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Grassholm Island and The Smalls on New Popular sheet 151

## *Grassholm Island and The Smalls: Cassini relics*

*K S Andrews*

It is surprising that in *Sheetlines* there has been no report on the unusual treatment given to the mapping of Grassholm Island and The Smalls on one-inch and quarter-inch maps. CCS publications are also silent.<sup>1</sup> This article probes the evidence available on the maps and concludes that the Cassini projection of the islands in the one-inch Popular Edition became a rogue element in the New Popular Edition and Seventh Series. Treatment at the quarter-inch scale was also unorthodox.

### *One-inch maps*

These islands, the westernmost fragments of Wales, and the shallow waters between them named Hats and Barrels, when they appear on maps at all, were often included as an inset. This was in order to permit the sheet lines to enclose the optimum extent of Welsh mainland. Therefore, at the one-inch scale, this area was inset on the Popular Edition sheet 99, *Pembroke and Tenby*, using the Cassini projection then in vogue.

In the New Popular Edition sheet 151, *Pembroke*, there is a very similar inset for Grassholm Island and The Smalls. The New Popular being a Transverse Mercator projection with National Grid, the main body of the map was reworked from Cassini material in order to change the projection and be square with the sheet lines. This was also done with the other sheets of the series where Fifth Edition material was not available. However, for some reason the inset on this sheet was not squared up, so the grid lines were skewed, giving a strange effect unique on the sheets of the New Popular Edition (see illustration). The submarine contours were included in updated form with the exception of the ten fathom line around Grassholm Island, which, oddly, was omitted and never again shown at the one-inch scale.

When the Seventh Series was launched, these anachronisms were not corrected on sheet 151, *Pembroke*, the skewed grid inset being retained. The Scottish Popular Edition latterly also had a skewed grid but that edition was phased out when the Seventh Series Scottish coverage was completed in 1961. Thus the skewed grid of Grassholm Island and The Smalls became a nostalgic relic of a bygone age. When sheets 138 and 151 were combined in 1965, the inset was reduced in scope and squared up to give just Grassholme Island (with a new spelling to mark the occasion.) The ten fathom contour was still omitted.

The National Grid is skewed in the insets of the New Popular and Seventh Series because, following the arrangement of the Popular inset, the longitude marks show that the orientation, though varying, is close to north-south. Readers will know that the National Grid is N-S only at 2°W. Because the National Grid is skewed, it is tempting to jump to the conclusion that the inset has retained Cassini projection. It is obviously important to differentiate between map projection and orientation on the paper; tilting the map does not, of course, change the projection. By the test of comparing the lengths of the northing lines and the easting lines, the New Popular inset grid cells are not squares; the northings are marginally shorter than the eastings, making them rectangles. This test is passed by the Seventh Series editions 4009 and A, making the cells of the grids squares. Therefore the New Popular inset is not quite Transverse Mercator and could be Cassini projection.

<sup>1</sup> R Hellyer, *Ordnance Survey Small-Scale Maps, Indexes: 1801-1998*, Kerry: David Archer, 1999, records insets but not their idiosyncrasies.

Further examination of the insets has given rise to more questions. For example, ‘Have The Smalls and Grassholm Island really drifted apart by 850 feet in thirty years?’ The results of measurements of the maps made to investigate this question are given in the accompanying table and can be summarised as follows.

- Shrinkage of the cloth/paper is slight, showing the validity of the measurements.
- The longitudes of The Smalls and Grassholm Island are constant.
- The nominal one-inch scale of the inset and the apparent distance between the islands are increasing as we progress from Popular to New Popular to Seventh Series.

Could scale expansion be due to the change of projection? The Cassini-Soldner projection has the characteristic of true scale perpendicular to the meridian, whereas the Transverse Mercator projection does not.<sup>2</sup> However, the Transverse Mercator projection is deliberately manipulated in order to reduce the scale error at the extreme east and west limits of Britain. At Grassholm Island, easting 160 km., the scale factor is 1.00031, a difference too small to be noticed at the one-inch scale.<sup>3</sup> Therefore the different projections are not the reason for the differences that are observed. The conclusion remaining is that the scale of the inset is inaccurate by mistake and not by intent on the Popular and New Popular, as shown in the table by the increasing distances between the longitude marks and between the grid lines. Thirteen kilometres of grid averages 8.10 inches on the main map but is only 7.95 inches on the New Popular inset. The scale of the Popular inset is even smaller.

<i>Measurement in inches</i>	<i>Popular 2750/30</i>	<i>New Popular 20,046</i>	<i>Seventh Series 4009</i>	<i>Seventh Series <u>A</u></i>
<b><i>Inset map measurements</i></b>				
The Smalls to Grassholm Island	7.94	8.00	8.10	8.10
W long 5° 40' to 5° 30', N edge	7.00	7.04	7.15	7.16
W long 5° 40' to 5° 30', S edge	7.01	7.05	7.16	7.18
147 to 160 grid line on 210 northing	—	7.95	8.08	8.08
<b><i>Main map measurements</i></b>				
5 mile scale bar	4.98	5.00	5.00	5.01
Dale + to Milford Haven +	6.32	6.36	6.40	6.40
Milford Haven stn to Lamphey stn	7.97	8.02	7.97	7.99
W long 5° 10' to 5° 00' on S edge	7.14	7.20	7.20	7.21
187 to 200 grid line on 190 northing	—	8.09	8.10	8.10

### *Quarter-inch maps*

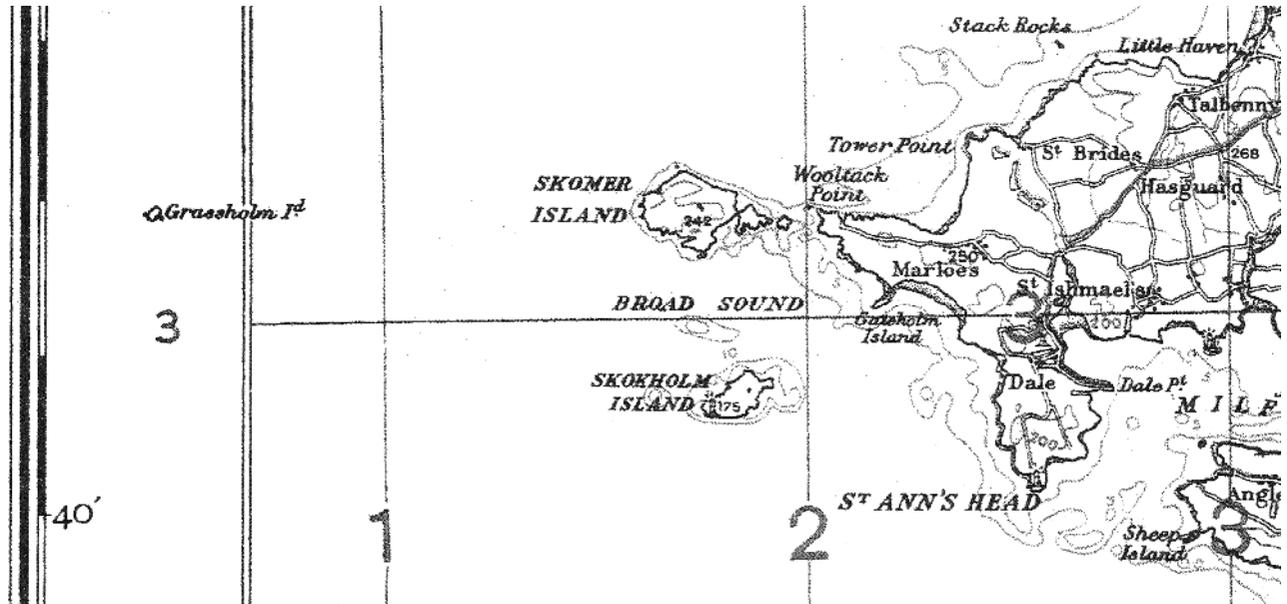
Editions of the quarter-inch map of England and Wales initially covered large areas of St George’s Channel but the Second Edition (Large Sheet Series) sheet 5 was cut short and even Grassholm Island was not shown.<sup>4</sup> The Third Edition covered the islands on sheet 7 handsomely. For the New Series sheet 7A, the sheet line was moved east with Grassholm Island being drawn just outside it, not in a proper extrusion but in the margin with no

<sup>2</sup> J P Snyder, *Flattening the Earth*, Chicago: University of Chicago Press, 1993, 97.

<sup>3</sup> J B Harley, *Ordnance Survey Maps: a descriptive manual*, Ordnance Survey, 1975, 20.

<sup>4</sup> Many of the maps mentioned have been accessed through the kind assistance of Anne Taylor at Cambridge University Library Map Room.

surrounding sea tint and with a blue submarine contour, ten fathoms. In the coloured edition with layers, the island's submarine contour was repeated in brown, displaced slightly south of the blue one, but the outline edition eschewed this singularity.



*Grassholm Island marginalized on Fourth Edition quarter-inch War Revision 1940*

The Fourth Edition at quarter-inch scale with National Yard Grid, sheet 7, has the sheet line slightly further east, so Grassholm Island is even more marginalised but at least its submarine contour is only in blue (printing 2534; the printings in 1937 and 1939 omit its contour.) The Military Edition, War Revision 1940, GSGS 3957, also omits the contour (see illustration) and the later National Grid version of this map is the same.

The Fifth Edition, 1:250,000 sheet 12, *South Wales*, and the special sheet *Wales and The Marches* has an inset for all the islands, squared up and fully contoured in blue. This demolishes the theory that freak currents had selectively scoured the seabed around Grassholm Island, a *prima facie* interpretation of the absence of the ten fathom contour on the New Popular and Seventh Series one-inch maps.

### *A few holm truths about spelling*

On one-inch maps prior to the publication of the Seventh Series combined sheet 138/151, the spelling used is 'Grassholm Island', as it is on all the quarter-inch maps noted above. The new spelling 'Grassholme Island' adopted on the Seventh Series from 1965 is ignored on the Fifth Edition 1:250,000 revision C of 1973. The 1:50,000 First Series was issued with 'Grassholme Island' on the map but 'Grassholm Island' on the cover (later corrected). The Landranger has reverted to 'Grassholm Island'.

Since holm / holme means islet, the name 'Grassholm Island' would appear to be tautologous, a grammatical affliction that, mercifully, has not infected Flat Holm and Steep Holme in the Bristol Channel. Steep Holme, however, having survived intact until 1973, underwent typographical amputation on later revisions of the Fifth Edition 1:250,000 to 'Steep Holm'. The 1:50,000 First Series and Landranger also have 'Steep Holm'. The spelling of 'Flat Holm', as befits a geographical feature under the vigilant gaze of the *Sheetlines* editor, has remained thoroughly consistent.