ACCRETION RATE IN TWO OF THE SALT MARSHES AT BLAKENEY POINT, NORFOLK

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One of the clearest examples of plant succession is that found in salt marshes. The main factor determining the rate of succession appears to be the rate at which the marsh level changes in relation to mean sea level. Such changes may be the result of regional changes in land and sea level, or to local accretion of "mud". Long period measurements of regional change may be made in favourable cases, for example, Lambert, Jennings, Smith, Green & Hutchinson (1960), but accretion rates must always be measured locally. Such measurements have been made for example by Richards (1934) and by Steers (1948), using patches of distinctively coloured sands. A similar technique was used by Oliver (1916) at Blakeney Point but only a few of the results were published (Oliver 1916, Carey & Oliver 1918) and the position of the sand patches is not known. It seems worth while, therefore, to report the occurrence of natural sand layers of known age in some of the Blakeney Point marshes, and of the accretion rates shown by them.

Borings in four of the Marrams marshes show a layer of sand, now about 5 cm. below the surface. The layer is wedge-shaped (table 1), with its thicker end at the base of the main shingle bank, which intermittently overrolls the marsh and is gradually obliterating it (Clymo, 1967). The layer is traceable to about 50m. into the marshes from the shingle bank, but occurs only sporadically on the landward side of creeks which are more than about a metre wide. It seems reasonable to suppose that this sand was washed out from, or over, the main shingle bank by the storm surge of 1953.

Apart from the area immediately behind the main bank, the accretion rate in these marshes seems to be about 5mm. per year. This may be compared with the figures in Carey & Oliver (1918) for "high salting bearing *Obione*" of 0.4 inches in 29 months—a rate of 4.2 mm. per year. This was probably one of the Marrams marshes and may have been the 4th one of this note where *Halimione* (=*Obione*) is abundant (table 2).

Comparison may also be made with Steers' (1948) measurements at Scolt Head Island. The maximum rate found was 9 mm. per year in Missel Marsh (Asteretum). The minimum was 2 mm. per year in Upper Hut Marsh (Suaedeto-Halimionetum), [where the vegetation appears to be most similar to that in the Marrams 4th marsh].

Whilst in any one locality height may be related to vegetation, and to accretion rates, there is no reason to expect that in another locality with different tidal conditions, exposure and mud supply, the vegetation limits will be at the same height, nor that accretion rates will be the same, although the general pattern may be similar. With this in mind there do not seem to be unexpected discrepancies in these different measurements.

TABLE 1. *Depth (cm.) of mud and sand layers in Marrams marshes to the east of Watchhouse.*

1st marsh east of Watchhouse

Metres from shingle bank	4	10	14	20	25	38	53
Sand layer thickness (cm.)	13	5	2.5	1	0.5	trace	trace
Depth of top of sand layer in July 1960	2.0	3.2	3.8	4.0	*4.0–5.1	5.1	
Depth in Sept. 1964	4.3	4.4	6.2	6.5	*5.2–6.1	6.2	5.4
Rate, mm./yr., 1953-60	2.7	4.3	5.1	5.4	5.4–6.9	6.9	
Rate, mm./yr., 1953-64	3.7	3.9	5.3	5.6	4.5–5.3	5.3	4.7

4th marsh east of Watchhouse

Depth of sand layer in Sept. 1964	3.8	*4.8–5.5

*range of 5 measurements

TABLE 2. *Per cent. frequency data for marshes where accretion measurements were made.* 20 square quadrats 25 cm. side.

	1st marsh	*4th marsh*
Aster tripolium	45	90
Armeria maritima	60	–
Halimione portulacoides	5	80
Limonium vulgare	95	25
Plantago maritima	–	5
Salicornia fragilis	25	16
S.ramossisima	100	20
Spergularia marina	90	5
Suaeda maritima	–	60
Triglochin maritimum	70	20

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