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Some features of the water masses at the
Entrance to the Skagerrak observed during
the Joint Skagerrak Expedition 1966.

by

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Introduction.

One of the aims of the Joint Skagerrak Expedition in June-July was to study more closely the connection between the different water bodies in the Skagerrak and the adjacent section of the Norwegian Channel by simultaneous observations in both areas.

The Norwegian program was carried out in the north-western flank of the investigated area, mainly in four sections running from the coast across the Norwegian Channel into the shallow waters of the North Sea. All stations were occupied three times with intervals of approximately one week. At each station temperature readings were made and salinity samples taken, at several stations also oxygen and phosphate samples.

At the end of the cruise current measurements were made at an anchorage station at the edge of the North-Sea plateau.

Distribution and movement of water masses.

The main features of the general distribution of different water masses, previously known, was again demonstrated, but during the expedition minor changes were observed. Between the first and the second run the average temperature of the upper 15 m layer increased by 1.5°C and the salinity decreased by 1.2 ‰ corresponding to an increase in amount of Baltic Water. This sudden change in the upper layer is probably due to a large outflow of Baltic Water, which had previously been accumulated in the Skagerrak.

Just above the edge of the North-Sea plateau subsurface warm Atlantic Water of high salinity was found, bordered on both sides by colder and less saline water. The salinity in the core increased from south to north. This situation must be maintained by advection. In the North-Sea Water, on the coastal side of the core, an intermediate winter minimum occurred in temperature.

This incomplex distribution of the subsurface water masses was maintained during the whole period of observation, except in the northernmost part of the area where warm highly saline Atlantic Water intruded the near-shore waters after the first run. By the end of the runs this water mass had partly replaced the North-Sea Water of minimum temperature mentioned above.

In correspondence with the main movement of the water-masses in the area a clear divergence-line occurred on the west side of the coastal current. The divergence-zone is best demonstrated by the distribution of temperature, vertically in the upper 50 m, and horizontally in the 5 m depth.

At the anchor-station calculation of the residual current, derived from overlapping 25 hourly means during a period of 2 $\frac{1}{2}$ days, shows that the core of Atlantic Water mainly moved in a SE direction.

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