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The summerly discontinuity layer in the Central North Sea and its reaction based on the results of recent investigations made with survey and research vessel "Gauss".

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Abstract. The summerly discontinuity layer and its relations to physical chemical and biological phenomena has been investigated in August 1952 on a profile which was laid through the North Sea running from Fladen Ground via Dogger Bank towards Terschelling. Similar investigations preceded in August 1950. They were supplemented and extended in August 1953 during a third cruise. This report, in its essential features, is based upon the results of the August cruise 1952, contributed by J. Joseph, K. Kalle and the author.

In $56\ 1/2^{\circ}$ N and $2\ 1/2^{\circ}$ E measurements from the anchored ship over a depth of 72 m were carried out on the hydrographic profile for a period of 3 days. Besides repeated measurements of the vertical distribution of the physical and chemical factors, of the plankton and seston, continuous current measurements were made in 6 different horizons. It can be shown that the winddriven current is superimposed by inertia oscillations. Prevailing over the water movement was, however, the semi-diurnal tidal stream, the distribution of which is given from the surface nearly down to the bottom. A dependency of the phase on the strongly developed discontinuity layer has been intimated.

It is shown that the turbulence of the tidal streams influences the development of the summerly discontinuity layer, dependent on the strength of the tidal streams and the depth of the water. From this, three main forms of the summerly density stratification are resulting, namely: homogeneous regions, regions with thick discontinuity layer, showing either a leafy structure or a gradual transition in the vertical direction, and regions with a very thin, pronounced discontinuity layer. These different forms become clearly visible in the various "Gauss" observations; they become obvious by the vertical distribution of temperature, the turbidity and chemical data. Close relations exist also between the sound scattering layer and the various forms of the discontinuity layer. Thereby, the discontinuity layer does not seem to be directly effective but indirectly in consequence of the accumulation of sound reflecting particles, on the nature of which, however, nothing definite can be said as yet.

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