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The renewal of the deep water layers in the Norwegian Sea.

By

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Three processes of renewal are considered: the influx of Atlantic water in the surface layers, the formation of bottom water by convection and the renewal of the intermediate deep water by advection. A physical "model" is formulated and the solutions of the equations are shown to be in concordance with the observed mean vertical distribution of temperature and salinity at Weather Ship Station M (66°N., 2°W.).

The theory also predicts simultaneous annual variations within the entire body of deep waters, with amplitudes of temperature depending on the vertical temperature gradients and with salinity amplitudes depending on the values of salinity. The results of a detailed analysis of the 10 years' series of measurements at station M is shown to be in accordance with these predictions. Also the slow variations of temperature and salinity are shown to agree with theory.