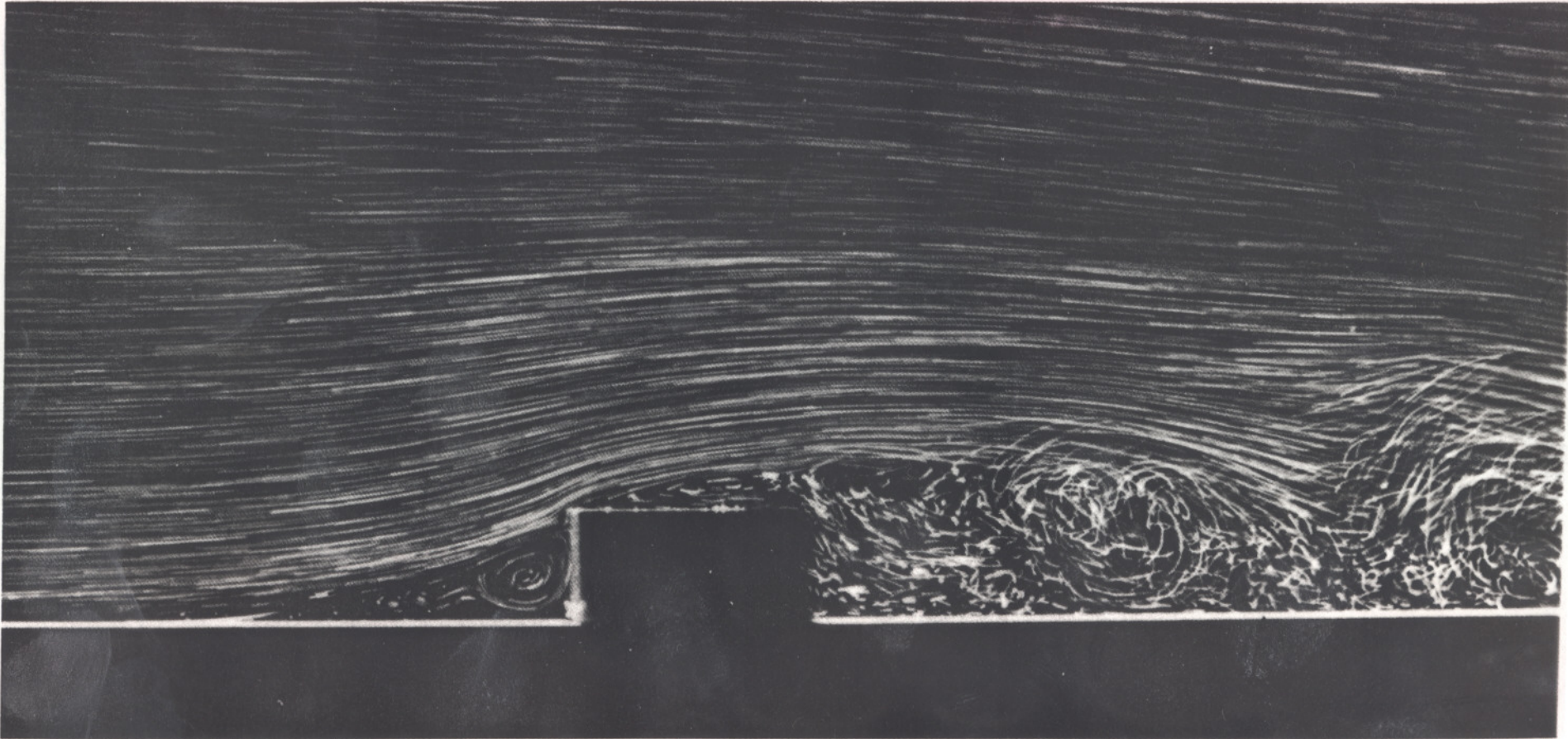


38. Laminar separation from a curved wall. Air bubbles in water show the separation of a laminar boundary layer whose Reynolds number is 20,000 based on distance from the leading edge (not shown). Because it is free of bubbles, the boundary layer appears as a thin dark line at

the left. It separates tangentially near the start of the convex surface, remaining laminar for the distance to which the dark line persists, and then becomes unstable and turbulent. ONERA photograph, Werlé 1974

TURBULENT FLOW



39. Turbulent separation over a rectangular block on a plate. The step height is large compared with the thickness of the oncoming laminar boundary layer. The flow is effectively plane, so that the recirculating region

ahead of the step is closed, whereas in the corresponding three-dimensional flow of figure 92 it is open and drains around the sides. ONERA photograph, Werlé 1974