cavity from the ventral surface of the fish. The electrical potential difference across the gill epithelium was recorded by placing calomel electrodes (with KCl bridges) in the fluid bathing the outside of the gills and in the perfusion fluid entering the heart. Na fluxes in both directions across the gill epithelium were measured by placing Na^{24} in fluid entering the heart and therefore perfusing the inside of the gills and Na^{22} in the bathing fluid out side the gills. In separate experiments, Cl fluxes were measured by placing Cl^{36} either on the inside or outside of the membrane. When Ringer's solution was used on both sides of the gill epithelium, the fluid in the blood vessels was -10 to +15 mV to the fluid outside the gills, while the ratios of outflux (blood to mouth) to influx for both Na and Cl were about 100. Thus, both Na^+ and Cl^- are actively transported by the gill epithelium under these conditions. Similar conclusions could be drawn from experiments in which fresh water or sea water bathed the outside of the gills.
This work was supported by Grant G12765 from the National Science Foundation.

Salt Transport By Eel Gill Epithelium
I. Apparent Active Transport Of Both Na And Cl By The Eel Heart-Gill Preparation

D. C. Tosteson, D. Nelson, S. Spivack, and A. Schmidt-Nielsen
Washington University School of Medicine

These experiments were designed to decide whether Na^+ or Cl^- or both ions are actively transported by the eel gill epithelium. The observations were made on a modification of the Keys eel heart-gill preparation in which the head of the eel was placed in a chamber and the gills exposed to the bathing fluid in the chamber by two incisions which entered the mouth cavity from the ventral surface of the fish. The electrical potential difference across the gill epithelium was recorded by placing calomel electrodes (with KCl bridges) in the fluid bathing the outside of the gills and in the perfusion fluid entering the heart. Na fluxes in both directions across the gill epithelium were measured by placing Na^{24} in fluid entering the heart and therefore perfusing the inside of the gills and Na^{22} in the bathing fluid outside the gills. In separate experiments, Cl fluxes were measured by placing Cl^{36} either on the inside or outside of the membrane. When Ringer's solution was on both sides of the gill epithelium, the fluid in the blood vessels was -10 to +15 mV to the fluid outside the gills, while the ratios of outflux (blood to mouth) to influx for both Na and Cl were about 50.

These data are consistent with the conclusion that both Na^+ and Cl^- are actively transported by the gill epithelium under these conditions. However, since substantial net outward fluid movement occurred during these experiments, it is possible that one cause of the high flux ratios is outward filtration across the gill epithelium.

This work was supported by Grant 012765 from the National Science Foundation.