

## Three Big New Ocean Currents Located

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Present-day maps of the ocean currents off the west coast of South America will have to be revised as a result of a recent cruise of The University of California's Scripps Institution of Oceanography.

Working extensively in this little-studied area on four specific problems in physical oceanography, Scripps scientists have returned to San Diego with definitive answers to three of them. The fourth, and perhaps the most mysterious, remains unanswered.

Warren S. Wooster, Associate Research Oceanographer, who led the expedition aboard the vessel *Horizon*, said the ship left in September for Peru and northern Chile to determine whether an east-flowing surface current south of the Equator, actually existed, as predicted by theory and previous sparse data whether there was a current running beneath the north-flowing Peru Current and in the opposite direction; whether the north-flowing Peru Current arises in the Antarctic or farther north; and what happens to the water in the narrow, swift Cromwell Current, which flows east beneath the Equator, after it passes the Galapagos Islands.

**South Equatorial Countercurrent.** Several months ago Joseph L. Reid, Jr., Assistant Research Oceanographer at Scripps, published a paper predicting that between five and ten degrees south of the Equator there would be found an eastward-flowing current that is the mirror image of the well-known North Equatorial Countercurrent. The expedition charted this current. It is a flow about 300 miles wide, not as strong as that in the north, but powerful enough to drive the ship well to the east of her course. It has never been reported before.

**Undercurrent off Peru.** The cool, rich, northward-flowing waters of the Peru current were found to be underlain by another current at depth running south, Wooster said. The existence of this current had also been predicted.

**Source of Peru Current.** During most of the year, the west coast of South America is bathed by cool, north-flowing currents. It has been assumed that these form a single current several thousand miles long. Wooster says that this is not so. Rather there are two current systems, one off Chile, one off Peru. Between the two in northern Chile there is a patch of relatively warm water which is the site of rich tuna catches. The Chilean Current turns westward to sea, Wooster says, and the Peru Current comes into being well north of the turn.

**Cromwell Current.** One of the mysteries of the area is what happens to the waters of the Cromwell Current after it passes the Galapagos. Efforts to trace the current to the east of the islands failed, Wooster said.

The expedition was one of a series planned to investigate the oceanography of the rich South American waters, which provide much of the tuna processed in California. *Horizon* spent three months at sea on the trip. The expedition received support from the U. S. Fish and Wildlife Service, the Office of Naval Research, the National Science Foundation and the Inter-American Tropical Tuna Commission.