

FIFTY YEARS AGO ...

Vol. XX, August 1943, of the *International Hydrographic Review* included a short and interesting article by André MEYNIER. An extract of which is given below:

"SUBMARINE CANYONS AND OCEANIC REGRESSION

by André MEYNIER

(Extract from the "*Annales de Géographie*", Paris - April-June 1942.)

Submarine cartography developments have drawn the attention of American Geographers on the existence of deep submerged valleys which cut into the continental shelf near its outer edge. Extending their investigations to other littorals of the world, they have enumerated 102 canyons of this kind, 46 of which are situated around North America. Their depth reaches nearly always 1000 feet and, in more than 50 cases, exceeds 5000 feet. In general, they are a prolongation of more or less large continental rivers. Sometimes, however, they look as if disconnected from the present estuaries of these rivers such is the case of two canyons on the southern coasts of Portugal. Sometimes also, they prolong the old water course and not the present one of the river; such as the Cape Breton trench, possibly a former bed of the Adour. They appear more frequently off flat and straight coasts such as the American Coast from Cape Cod to the Hudson River, the Gulf of Bengal and the Gulf of Guinea. There is therefore no question of a prolongation of rias such as may be found in Brittany or in Galicia. Neither have they any connection with fjords. Their cross profile is shaped after a fairly sharp V, suggesting a form of juvenile valley. Their longitudinal section presents steps and platforms such as that of continental rivers, generally speaking, their slope decreases down stream. Whenever they prolong rivers with a big flow, their slope is less steep than when prolonging rivers of minor importance. This slope is however always abnormally steep: 1 per cent after the largest rivers, 2 to 3 per cent in other cases. A survey of their distribution disposes of any idea of a connection with latitude, the width of the continental plateau and the stability or instability of the coast.

On the basis of various hypothesis as to their origin, Mr. SHEPHARD, builds up an ingenious theory. These canyons are supposed to have been dug by rivers at the time of a sea regression, and once submerged, to have been entirely filled up by sediments which have also buried all traces of continental relief on the platform. Still, thus accumulated in deep hollows, such sediments would be instable and unconsolidated, with a tendency to slide downstream; periodically, heavy landslides resulting from earthquakes would partially clear the valley. In fact, the George Bank Canyons (near Cape Cod) have only been discovered subsequently to the 1929 earthquake although situated on one of the most frequented sea routes in the world. Since 1896, deepening of from 20 to 200 feet have been recorded in a canyon of the Equator. The absence of submarine canyons on certain littorals would be accounted for by a more rapid cementation of sediments."