KARTENMASSSTAB UND HYDROGRAPHISCHE NAMENGEBUNG

(Chart scale and Hydrographic designations)

by

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When, several years ago G. Wüst (1), made a renewed attempt, in an article on the problem of the Gulf Stream, to revive the designation "Irish Current" (Irischer Strom), previously proposed by O. Krümmel for the principal prolongation of the Gulf Stream as it recurves towards the N.E., to replace the rather colorless designation "Atlantic Current" (Atlantischen Strom) which was almost universally employed, the proposal was enthusiastically (2) acclaimed.

But, the idea, presented a short while later by the same author (3) to call by the name of "North Atlantic Current" (Nordatlantischen Strom) that displacement of water so essential to Europe, deserved to have been even even better received. G. Wüst based the second designation on the fact that the North Atlantic Current, according to recent research maintains its principal branch to the west of Rockall Bank, and consequently does not touch the coast of Ireland; that is, the Irish insular shelf. This factual reason is necessarily preponderant; but in my opinion a more "sentimental" geographical reason also applies, which is, that the name "Irish Current" has never been actually adopted. The immense distances and the expanse of the North Atlantic are clearly apparent to European eyes, so that one rather hesitates to attribute the name of the relatively small "Emerald Isle", whose coast is probably grazed by the waters of the Gulf Stream for a distance of from 250 to 300 miles, to a section of current having a length of at least 1300 to 1400 miles (from the N.W. of the Azores to the Faröe-Shetland Islands Channel).

Similar purely geographical considerations made it seem advisable to introduce into German technical literature the name "Portugal Current" (Portugal Strom) — which, although first proposed by Hans H.F. Meyer (4) has long been in customary use in British technical literature. It seemed unfortunate that the region to which the appelation "Canary Current" applies should be considered as having its origin only off the Iberian Peninsula, as this occurs in part only during the summer months. In addition, we find that according to the new monthly charts of the surface currents in the Atlantic (5), the ocean region off the west coast of Spain and Portugal exhibits well defined divergence phenomena during the greater part of the year, which thus contrast this portion of the domain of the Canary Current with that bordering on the south, where they are less permanent.

In the more remote seas we are inclined to "think in terms of general charts"; but we should not, for instance, even in a rather summary description of the currents in the

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(1) *Tiefseebuch* (Das Meer, vol. 3), Berlin 1934, page 130.

(2) *Ann. der Hydr.* 63, 1935, page 58.

(3) *Neuere Auffassungen über das Wesen des Golfstromsystems etc.* Der Seewart 6, 1937, page 366.

(4) *Die Oberflächenströmungen des Atlantischen Ozeans im Februar* — Publication of the Institut für Meereskunde. N.F. Reihe A. Cahier 11. Berlin 1923, page 26.

(5) *Annalen der Hydr.* 68, 1940, Tables 5 and 6.

Indian Ocean, suppress the designation "Mozambique Current". KRÜMMEL (6) considers that the designation "Agulhas Current" is applicable up to the latitude of Durban (30° S); while H. PEACH displaces the boundary between the Mozambique Current and the Agulhas Current to 25° S. (7) G. DIETRICH (8) in his hydrodynamic investigation of the Agulhas Current, which deals with the waters in the region around South Africa to the southward of 27° and 28° S., does not specifically define the extent of the appellation; but since the work is dedicated to the "Southern Agulhas Current Region", it would appear that there is here an implication of an extension of the designation to the region bordering on it to the northeastward. According to the charts of G. MICHAELIS (9) and M. WILLIMIZK (10), the junction of the current flowing from the Mozambique Channel and the branch of the South Equatorial Current setting around the east and southeast coast of Madagascar should be completed in the latitude of Durban (30° S.). If we consider these two transports of water as the "roots" of the Agulhas Current, then here also — in agreement with KRÜMMEL — the northern boundary of the Agulhas Current in the Indian Ocean should be placed at not more than 650 nautical miles or about 1200 kilometers to the northeast of the Cape.

Two further examples from the Atlantic Ocean: H.F. MEYER (in the work cited above p. 25-26) referring to the currents in Canadian waters writes ;— "The Cabot current, coming from the Gulf of St. Lawrence tends towards the western side of the channel in accordance with the representation of J.W. SANDSTÖM. To the southward of Nova Scotia it widens out...". This description is based; among other things on a very scanty illustration of the name "Cabot Current", which is found on the small current chartlets appearing on the back of the new monthly charts of the Atlantic Ocean issued by the Deutsche Seewarte. Since, however, in the Cabot Strait, which has a width of from 55 to 60 nautical miles, two currents may be clearly distinguished, i.e. in addition to the rather strong current flowing outward on the west side, the somewhat weaker but rather constant current flowing in on the east side, — the somewhat arbitrary appellation of Cabot Current does not appear to be employed in competent Canadian literature; at least not in the works of W. BELL DAWSON which may be properly regarded as authoritative. The current which is flowing outward is here called the "Gaspé Current", in the Gulf itself, (after the peninsula to the southward of the upper Gulf of St. Lawrence) and in the Cabot Strait, at the position of its strongest development, it is designated as the "Cape Breton Current". The water displacement setting in on the Newfoundland side, a branch of the Labrador Current, is called the "Cape Ray Current" (after the southwest hook of Newfoundland). Also, J.W. SANDSTRÖM (12) does not made use of the appellation "Cabot Current", as far as I know. If — as a European observer — one has the Atlantic current system as a whole in mind and consequently more the impulse to the North Atlantic coastal currents issuing from the Cabot Straits rather than the ramifications in the Gulf of St. Lawrence, then the appellation Cabot Current is comprehensible, especially since the Cabots themselves at least observed and described the westsouthwesterly set off the coast of Nova Scotia (see J.G. KÖHL, Geschichte des Golfstroms, Bremen, 1868, page 31 and chart on pages 78/79). However, the very complicated system of currents in Gulf of St. Lawrence should not for this reason be overlooked.

Let us examine finally the "Antilles Current" (Antillen strom). KRÜMMEL proposed this name in his work "Die equatorialen Meeresströmungen des Atlantischen Ozeans" (Leipzig, 1877, page 9). In this he describes the Antilles Current as the smallest part of

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(6) *Handbuch der Ozeanographie,* 2 Vol. 2° Edition, Stuttgart 1911, page 672.

(7) *Die Oberflächenströmungen um Madagascar* — Publication of the Institut für Meereskunde N.F. Reihe A. Cahier 16. Berlin 1926, page 17.

(8) *Aufbau und Dynamik des südlischen Agulhasstromgebietes.* — idem — Pamphlet 27, (1935).

(9) *Die Wasserbewegung an der Oberfläche des Indischen Ozeans* — idem — Pamphlet 14 (1929).

(10) *Die Strömungen im subtropischen Konvergenzgebiet des Indischen Ozeans* — idem — Pamphlet 14 (1929).

(12) *The hydrodynamics of Canadian Atlantic Waters. — Expedition of the Canadian Fisheries* 1914-15. — Ottawa 1918.

(13) *The charts of* H.H.F. MEYER *and* FELBER *show the two currents.*

the equatorial current, which, "deviated by the chain of islands curving to the westward (Lesser Antilles) flows along them to the northward". In his "Handbuch der Ozeanographie" 2nd Vol. 2nd edition, page 559, he states;— "Outside of the West Indian Islands, a large branch, if not the principal mass of the northern equatorial current, bends to the northwest; the Antilles Current shown on our charts". On page 560 it is stated:— "The current is quite strong along the islands (meaning the eastern side of the Bahama Islands) reaching 1.5 nautical miles per hour...". On the other hand Hans H.F. MEYER (in the work cited above on page 24) when first speaking of the Lesser Antilles denies them any appreciable influence on the north equatorial current. "It is however forked by the Greater Antilles. One part, the Antilles Current of Otto KRÜMMEL, sets to the northwestward on the northern side of Haiti and Cuba...". The same description is given by O.H. FELBER (14). G. SCHOTT, writing in his Geography of the Atlantic Ocean, 2nd edition 1926, page 180) "In WNW, NW, and NNW directions these currents (the equatorial waters of the Atlantic Ocean) flow towards the island wreath of the Lesser Antilles, and that which does not reach the Caribbean, joins with the equally westerly setting Antilles current flowing along its outer edge as well as to the northward of Porto Rico, Haiti and to the eastward of the Bahamas". With this conception of KRÜMMEL of 1877 and that of H.H.F. MEYER it would appear, even though it is not definitely so stated, that the name "Antilles Current" is thus based on the fact that this island group is of essential importance for the westerly branching of this current. In accordance with the above-mentioned new monthly charts of the surface currents in the North Atlantic Ocean, the stream lines however which later graze the outer edge of the Bahama Islands, thus forming the main body of the "Antilles Current", do not by any means préviously touch the northern edge of the Lesser Antilles during all months. It is true for the charts from May to September and for the chart of December, but in the other months the current lines, which later form the eastern border of the Gulf Stream to the northward of the Florida Straits, flow in an east-west direction from the open sea towards the Bahama Islands (15). The fact that the principal mass of the water transport near the northward of the Bahamas joins up with the Gulf Stream as a second root, after grazing the outer edge of the island group for a distance of 700 to 750 nautical miles, should be at least of equal importance for its appelation, as its contact with the Lesser Antilles in the early stages, especially as the latter contact is probably not constant. Further, the greatest displacements are probably attained off the northerly Bahama Islands (compare KRÜMMEL and WÜST (17) and also the new monthly charts of the Deutsche Seewarte for the North Atlantic Ocean). Finally, in addition to the above the following distances are cited :— The distance swept by the current along the Lesser Antilles exclusively, from the small Caribbean Island of Barbuda up to Navidad Bank, is at most 450 nautical miles; to this there is added the stretch of about 600 nautical miles between the Navidad Bank and the fork of the Nicolas and Santara Channel north of Cuba, where the westerly and rather weak branch of the Antilles Current grazes simultaneously the north coast of Haiti and Cuba and the southern edge of the Bahama Islands. It is difficult to reject the presumption that KRÜMMEL, making

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(14) *Oberflächenströmungen des Nordatlantischen Ozeans, between* 15° *and* 50° *N.* (Archives of the Deutsche Seewarte; 53 Vol., N° 1; 1934, page 9).

(15) *On the charts of* FELBER *and also in evidence on those of* SCHOTT *the principal direction is in the N.W. quadrant. On these the mean direction is given, in the mechanical sense, while in the charts of the author, recently prepared, the dominant direction is given. The data on which the charts are based should not be less than that employed by* FELBER *in Holland. From the charts of* SCHOTT, *based on the drift of bottles in the North Atlantic Ocean* (Archives of the Deutsche Seewarte 20, 1897, N° 2, Tables 1-3) *it should be possible to adopt a representation of currents in which the lines of the equatorial currents definitely curving around the outer edge of the Antilles, might be estimated at* 33%. *As these charts give no choice for the drift it is possible that more consideration has been given to the exceptional currents in a S.E. and N.W. direction than the ordinary drift in a east-westerly direction.*

(16) *In conformity with the Navidad Bank, the most easterly projection of the insular shelf of the Bahamas, from the North-east end of Haiti to the northern terminal of the small bank of the Bahamas.*

(17) *Florida and Caribbean Currents.* — Publication of the Institut für Meereskunde. N.F. Reihe A. Pamphlet 12, Berlin 1924, page 39.

use of the large scale relief chart, would have decided on the name "Bahama Current", which is currently employed in the Anglo-Saxon literature and in particular, in American literature, where it is apparently as much in common usage as the appelation "Antilles Current" (19).

(18) *In addition to the ocean charts, the reader might also draw his conclusions from the bathymetric charts of the "Meteor-Werke"*, Vol. III. Part 1, fascicle I (Stocks-Wüst) and IV (Stocks).

(19) *For instance, Pilot Chart of the Central American Waters,* Washington. — *Currents on the principal commercial routes of the North Atlantic.* London 1930. Introduction; Table I, fig. 1.