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Cyclone in the Mozambique Channel

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Between the coast and the island of St. Thomas the soundings were carried in a direct line S. 34° W., with occasional soundings to the right and left of the line, in order to show the slope of the bottom. For nearly one-half of the way the line runs parallel to the coast, forming the western margin of the delta of the Niger, and at a distance of about 100 miles from it. For the remainder of the route it crosses the mouth of the Bight of Biafra. The bottom is very uniform, both as regards elevation and mineral character. Although there seem to be no steep ridges or valleys, there are some well-marked depressions and elevations which deserve to be noted. A first maximum depth of 1783 was met with in lat. 5° 15'4" N., long. 3° 10' E., which no doubt indicates the position of the deepest water of the Bight of Benin, terminating in the Avon's Deep, a gully much resembling the "Bottomless Pit" further west, and cutting deeply into the coast flat off Lagos. Proceeding southwards, the water shoals gradually, to a minimum observed of 1391 fathoms, in lat. 3° 55'3" N., long. 4° 7'3" E. It then deepens rather rapidly in the next 25 miles to 1916 fathoms, in lat. 3° 36'6" N., long. 4° 28'1" E. This second maximum depth occurs immediately off the principal mouth of the river Niger. The depth now remains remarkably constant between 1800 and 1900 fathoms, a third maximum of about 1970 fathoms occurring 100 miles from St. Thomas. From the soundings obtained the course of the 1500-fathom contour line can be traced very clearly until it bends away into the Bight of Biafra, where it is uncertain whether it embraces or avoids Prince's Island. The soundings between St. Thomas and Prince's Island show that they are separated by water over 1500 fathoms in depth. The 1500-fathom line follows the line of the coast into the Bight of Benin; it then runs out into a point to the north-west of the mouth of the Niger, and to another point to the south-west of it, with a depression between them running up towards the mouth of the river, the so-called Nun entrance.

Profiles T, V, and W, between the Niger and the Congo, show the alteration in the continental slope caused by the *débris* of the great rivers entering the ocean in this neighbourhood.

Profiles X, Y, Z, Φ , and Ψ , are examples of profiles of volcanic islands, and resemble those of the Canary Islands.

CYCLONE IN THE MOZAMBIQUE CHANNEL.

(*With Diagrams.*)

FAMILIAR though the words "cyclone," "tornado," and "typhoon" are with the general public, every meteorologist knows that authorities differ much upon many points concerning them, and that their courses, dimensions, and even forms, are still a matter of dispute.

The thousands of observations collected by navigators in every sea, and carefully tabulated in such Observatories as those of Washington and London, have not yet sufficed to settle some very conflicting theories upon atmospheric currents. The work of observing goes on actively, and every record carefully made of storms on sea and land is a valuable contribution both to men of science and to practical seamen. From numberless independent and apparently discordant observations, general laws have been observed and rules laid down that now enable seamen "to manœuvre

with the storm," and to escape its vortex or most violent and dangerous point.

It is happily not often, therefore, that a vessel passes through that dangerous though interesting circlet, and I think it may interest some of your readers to have laid before them extracts from the log of a vessel that passed through the vortex of a cyclone which moved down the African coast in the end of January last.

The vessel—in which I was a passenger—was, fortunately, a British mail steamer—the *Courland*, of the Castle Packets Company—a model sea boat, originally constructed for service in the north seas, and commanded by as cool and experienced a seaman as ever stepped on board a British ship.

We were on our way northwards, from Delagoa Bay to Mozambique. Strong winds from the south were first encountered in the latitude of Delagoa Bay, and these steadily increased in force, remaining at the same time remarkably steady in direction, on our way up the coast. The vessel touched at Inhambane and Chiloane, and it was after leaving the latter port that we began to see we had to face a thoroughly bad cyclone. I have myself served eighteen years at sea, but never remember experiencing more terrific winds, though perhaps I may have seen a heavier sea.

It was generally felt throughout the vessel that the Captain's wise precaution in laying her head off-shore as early as the evening of the 29th, and thus securing abundant sea-room, freed the vessel from a very great danger, if not indeed from risk of destruction. Had she been, during the worst of the storm, in the shallow waters that stretch off the Zambesi's mouth, the seas encountered would have been more confused and broken, and far more harmful, than those which actually broke upon us: the ship would have suffered more damage, and, had the engines failed for however short a time, she would, if "in-shore," probably have become a complete wreck.

But the plain, matter-of-fact language of the vessel's log speaks most eloquently for itself:—

"Left Chiloane at 7 A.M. upon the 29th Jan. *Noon*.—Strong gale and gusty, with high following sea; ship rolling and lurching heavily. *P.M.*—Furled all awnings and secured everything for bad weather. 4 P.M.—Strong gale from S.S.W., with very high sea; ship rolling heavily and shipping much water amidships. . . .

"8.15 P.M.—Put ship's head to the southward, and engines at half-speed.

"*Midt*—Blowing with hurricane violence during the squalls, and terrific sea; heavy and continual rain; ship rolling and pitching heavily, and taking much water on board fore and aft. . . .

"30th Jan., *Noon*.—Wind and sea increasing, and sky very gloomy and threatening. . . .

"8 P.M.—Blowing a hurricane, with high confused sea. Ship pitching and rolling heavily; using engines as required, to keep her head to sea.

" 9.30 P.M.—Fell calm, and sea dropped.

" 10.30 P.M.—Put her head N.N.E. ; breeze sprang up. *Midt*—Blowing with terrific violence from north.

" 31st Jan., 1 A.M.—Blowing a hurricane from the northward, with very confused sea. 4 A.M.—Wind shifting from all points of the compass, continual rain, high confused sea, with furious squalls. Ship rolling and pitching heavily. . . .

" *Noon*.—Strong head winds, fine clear weather, considerable head sea.

" (Head N.N.W.) 4 P.M.—Fine clear weather and smooth sea.

" 7.50 P.M.—Stopped, and let go in 7 fathoms, outside Quillimane bar.

" 8 P.M.—Light airs from south and smooth water."

There can be no doubt that the storm so simply described in the above extracts, was a true cyclone of unusual severity.

This will be sufficiently proved by the steady but rapidly increasing barometric depression, as the centre or vortex of the storm approached the vessel; the almost dead calm which fell upon her whilst within that vortex, and the sudden shift of wind to the directly opposite quarter of the compass immediately the vortex had passed over; together with the steady rise of the barometer after the centre had passed by.

A reference to the diagrams accompanying this paper will show the cyclone's apparent course upon the coast, and the position of the *Courland* both before and after the centre had passed over her. Until reports have been received from vessels at other points in the Mozambique Channel and far away north and east of the position in which the *Courland* was, upon January the 29th, 30th, and 31st, it will be impossible to tell whether this cyclone covered a large area or not. It is well known that cyclonologists themselves differ upon the question of the diameter of the usual rotatory storm—some, like Birt, Peddington, and Reid, holding that the diameter, in well-proved cases, has far exceeded 500 miles; whilst others, like Maury, incline to the belief that the diameter of the actually gyrating winds never exceeds a tenth of that length—that, in fact, a cyclone is a "whirlwind within a storm."

The winds experienced by us would serve to prove either theory. The remarkable steadiness in their direction for five previous days—almost due south—would be said, no doubt, by the first theorists to be due to the fact that the vessel's course lay upon what is called the "axis of the storm," *i.e.* the direction in which the whole body of the cyclone was moving. Upon this supposition, the edge of the cyclone may be said to have been entered in lat. 26° S. when the strong southerly winds were first experienced, and its *semi-diameter* would then certainly have been over 500 miles.

If, on the other hand, we assume the circle of rotatory winds to have been entered only on the evening of the 29th, when the abnormal depression of the barometer first began to show itself, then the cyclone's diameter would not have greatly exceeded the limit laid down by Maury, for, by

the evening of the 31st, the barometer was normal, and every vestige of bad weather had disappeared.

I, myself, am inclined to believe the diameter of the actually rotating winds was small. It had, I think, rather the appearance of a whirlwind travelling upon the northern edge of a storm. Certainly, the vortex cannot, in a geometrical sense, be called the centre of a cyclone, of which the strong winds met with in 26° S. lat., and upwards, formed a part; for the area of atmospheric disturbance was incomparably larger to the southward of that "centre," or vortex, than to the northward.

I should not omit to say that inquiries made at Quillimane showed that on the 29th and 30th January violent winds were experienced from the south-west, which shifted up to the west and north-west before declining: from which it may be safely inferred that that place was within the range of the circular winds. Also, that the Eastern Telegraph Co.'s ship *Great Northern*, in her passage from Delagoa Bay direct to Mozambique, whose approximate position was to the south-east and east of us upon those days, met with "a hard blow from the south-east," "with a heavy easterly sea,"—evidence which also places her within the cyclonic area.

One word as to the meteorological symptoms that preceded and accompanied this storm, although they were, I may at once say, singularly negative and few. There were none of the appearances that usually betoken a West African tornado or a typhoon in the China seas—no heavy, solid banking-up of clouds, and very little thunder and lightning. The only noticeable feature in an almost uniformly overcast brown sky—over which the "drift" scudded furiously—was a peculiar leaden blue in the zenith during the day, and a clearing of the sky overhead, so that many stars became visible as the vortex passed over the vessel. An extraordinary clearness of the atmosphere succeeded the storm. Although "weather signs" were absent, the barometer proved throughout a true and faithful guide.

The following were the readings of the barometer and thermometer:—

	BAR.	THERM.
JANUARY 29th, <i>Noon</i> ,	29'61	83
" " 4 P.M.,	29'57	82
" " 8 P.M.,	29'53	78
<i>Midnight</i> ,	29'47	77
JANUARY 30th, 4 A.M.,	29'37	81
" " 8 A.M.,	29'35	79
" " <i>Noon</i> ,	29'30	84
" " 4 P.M.,	29'12	78
" " 8 P.M.,	28'98	78 }
(This was the lowest reading in vortex of cyclone.)		
<i>Midnight</i> ,	29'08	81
JANUARY 31st, 4 A.M.,	29'32	78
" " 8 A.M.,	29'45	75
" " <i>Noon</i> ,	29'49	82
" " 4 P.M.,	29'48	84
" " 8 P.M.,	29'52	83

No further incident worthy of remark occurred during the voyage to Mozambique, which was performed on the 2d and 3d of February in almost a calm.

I see it is stated in an official publication, *The East African Pilot*, that no reports have been received of cyclones occurring in the Mozambique Channel. The above remarks may therefore be of some value as proving—contrary to the opinion there expressed—that this channel is not free from these destructive storms.

HENRY E. O'NEILL,
Hon. Cor. Mem., Scot. Geog. Soc.

H. M. CONSULATE, MOZAMBIQUE,
Feb. 5th, 1887.

THE PLACE-NAMES OF IONA.

III.

BY ALEXANDER CARMICHAEL.

PORT AONA'AIN.—Port Aona'ain is evidently a modification of the not very pronounceable name of Port Adhamhnain, port of Adamnan. The place is also called Port a Chrosain, port of the little cross.

My intelligent informant—kindly old John Macinnes, now dead—said that his father remembered a beautiful sculptured cross standing immediately above the beach there. It is more than probable that the cross was commemorative of Adamnan, ninth presbyter-abbot of Iona. Hence the two names of the place—Port Aona'ain (Port Adhamhnain), the Port of Adamnan, and Port a Chrosain, the Port of the Little Cross.

There is a Port Aona'ain in Mull, and a Port Aona'ain in Lismore; and there are at least eight ancient dedications to Adamnan in various parts of Scotland, ten in Ireland, and probably some in England and Wales.

At Clachan-Ard, North Uist, there is a glacial block of some interest to the student of place-names, and to the student of saint-life. The block is of Laurentian gneiss, this being the formation of the whole Outer Hebrides, except a small area of Cambrian Red Sandstone in the neighbourhood of Stornoway.

The stone is situated on the lower spur of a low glacier-rounded hill, facing the Atlantic, and stands on edge on a bare exposed rock. It is of an oblong form, and measures $12\frac{1}{2}$ feet in length, $8\frac{1}{2}$ feet in breadth, and from 2 to 3 feet in thickness. A Latin cross, $13\frac{1}{2}$ inches in length, and $11\frac{1}{2}$ inches in width, is incised on the face of the stone looking towards