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Cyprian A. G. Bridge Captain R.N.

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HYDROGRAPHICAL NOTES MADE BY LIEUTENANT G. GIORELLO, OF THE ITALIAN NAVY, ON A VOYAGE FROM HONG-KONG TO YOKOHAMA, IN THE MONTH OF JUNE, 1877.—(*Rivista Marittima*, October, 1877.)

Translated by CYPRIAN A. G. BRIDGE, Captain R.N.

At 8 o'clock on the morning of June 23rd we left the port of Victoria in Hong-Kong, and proceeded by the Tathoung Channel (eastern passage).

The appearance of the weather was favourable, and the barometer had for thirty hours stood steadily at 758 (29·84 inches), after having been during the preceding 19th and 20th between 753 and 755 (29·64 inches and 29·72 inches). Just outside the passage we encountered light winds from the southward, and a long swell from the north-east.¹ We proceeded at the rate of nine knots. As we stood away from the land we headed for the Formosa Channel, shaping a course that would carry us to the westward of the shoals in the southern part of the channel, and bring us so as to sight the Island of Formosa in its north-western part. In the night between the 23rd and 24th the wind shifted from the south towards the east, and then remained variable between north-east and north-west, winds which we experienced during the whole of the 24th. The swell at the same time had changed to one from north-east and north-west, as we proceeded farther to the northward. On the morning of the 25th the south-west monsoon set in. We were in sight of Paksa Point in Formosa at day-break. At this moment we began to experience a current direct from north-west to south-east, which set us towards the coast, and obliged us to snape course more towards the north-west. We found that, in proportion as we neared the north of the island, the stream ran always with greater strength towards the south-east. The English chart, No. 2,412, notes at the exit from the channel the counter, or cold, current from the north-east to the south-west, with the direction, "the surface current sets according to the monsoon." Being then in the season of the south-west monsoon, we had every reason to expect that we should not encounter a current, or at least have it in our favour, that is to say, that the surface water should run from the south-west towards the north-east. This is the first discrepancy that we observed on the present voyage between our own observations and those given in the charts and sailing directions (*portolani*). We must note that, until we were close to Formosa, that is, until about 6 o'clock

¹ In translating, the compass equivalents as given in *Spanish* in Captain Bedford's "Pocket-book" have been used. The *Italian* equivalents given by him are apparently not those of the Government navy, but of the merchant service.

on the morning of the 25th, no current exerted any influence on position, so that we arrived in sight of Paksa Point at the time at the distance estimated. We have said that the current always with greater strength towards the south-east. We found the spot at which we most felt its influence was in the latitude of court Island, at which point the current ran with a velocity of 3.5 knots an hour. From that time it rapidly decreased in strength until the evening, and at 26° of latitude completely disappeared. argued from this, that the water which flows from the Yellow Sea into the China Sea, after having run as though coasting the main coast, instead of always inclosing itself in the Formosa Strait, turns sometimes to the northward of that island, and flows against the Sima group, whilst only a small quantity of water reaches the Formosa Strait; but still this does not follow the line of the China coast, but approaches the west coast of Formosa instead.

From noon on the 25th until the same time on the 26th, between the two positions, 25° 30' N., 121° 45' E. (of Greenwich) and 27° 25' N., 124° 50' E., with the wind south-south-east, we had to give no "set," although, to believe the indications on the chart, we were already in the region of the Kuro-Siwo, or Japanese current. At 5 o'clock in the evening of the 26th we sounded, and taking advantage of the circumstance, we tried the temperature of the water at 11 fathoms (20 m.) and 27 fathoms (50 m.) depth. At 11 fathoms we found a temperature of 80° F. (26° 5' C.); and at 27 fathoms we found 74° 30' F. (23° 6' C.); which gave the remarkable difference of 5°. The evident conclusion from this was, that we were within the current in which the water coming from the south runs towards Japan, and at a depth of 27 fathoms (50 m.) we reached either the stationary water or a counter-current coming from the north. From that time at noon on the following day, the 27th, we learnt that in 24 hours we had been carried by a current of little less than one knot and a half direct towards the east-north-east.

On the same day, the 27th, beginning at daylight in the morning we carried out, at a distance of ten miles apart, a series of soundings, which, with the spots at which they were carried out, will be noted in the *Meteorological Log* (*sic*) of the ship. We were not able to sound over a greater distance than 60 miles, since at the 70th fathom it was not possible, with the means at our disposal, to feel sure that the sounding-line reached the bottom or not. From an inspection of a layer of tallow put on as "arming," we could suppose that the line had touched, but we could not tell the moment at which it happened, on account of the immense curve in the line that sagged towards the stern, although the ship was perfectly stationary. A weight of 2 cwt. (50 kilcs.) was used, attached to a common line paid out by hand. There was reason to suppose that a lower counter-current was added to the causes that rendered the working so difficult. In various attempts that succeeded badly, the work was suspended, and it was hoped that we might have completed, so as to mark on the chart in these latitudes, and in a direct line towards Van Dien, a series of soundings.

As the wind continued to blow fresher from the south-east, the sea became heavier, and the barometer exhibited a tendency to fall. At 3 p.m. we sighted the islet of Dundas, belonging to the Linschoten Islands. On account of the mistiness that came on, it was perceived that we should arrive in Van Diemen's Straits at night, when the light could not be seen, nor the islands which bar this passage towards the west be recognized, and it was decided to pass between Naka Sima and Suwo Sima.

We hardly had begun to get amongst the islands, when a very strong current, of at least three miles an hour, set as from the west towards the east. Beyond the islands we headed towards the north-east. At daybreak on the 28th we saw that in 24 hours we had been set to the east-north-east 43 miles. Course was altered to sight and pass within ten miles of Siwo Nis-aki; but taking into account the current marked on the English chart, No. 2,347, we kept a half a point more to port, and with all that did not arrive in sight of the land; whilst from daybreak till noon on the 29th, it was seen that we were set free 40 miles from W. by S. $\frac{1}{2}$ S. to E. by N. $\frac{1}{2}$ N., instead of S.W. by W. to N.E. by E., which convinced us that the current in this place does not always exactly follow the coast, as would appear from the chart. Taking into account this current which we had experienced, we shaped course to sight during the night the light on Rock Island, and also to get in a short time within the range of the light from the other lighthouse on Cape Iroo-Saki.

From 2 to 4 p.m. the ship was tried under sail with the wind from the south-west, force 4, and sea rather heavy. From 5 to 6 we fired at a target, under steam, making at the same time observations on the rolling of the ship at different speeds. At 5 in the evening, before beginning to fire, the position of the ship was ascertained by observation, and at the beginning of the night we got an exact latitude.

We were thus under most favourable conditions for making the land. About 2 in the morning of the 30th, we ought to have seen the light, from which we should then shape course for Vries Id. and the Uruga Channel. Not having, at 3 o'clock, seen the light, and being overtaken by a thick fog, it was thought we might have come too much to the southward, and then, to avoid the dangers presented by Redfield Rocks, we steered north-north-west for about an hour and a half (until it was light) at half speed. It was just light when we headed towards the north-north-east, and then north-east, so that on that course we might leave Rock Island on our left, and make Vries, or one of the islands that run from Vries to Fatsizio almost from north to south. This manœuvre was caused by our seeking to lose as little time as possible in making the land. The fog continued very thick, and there were all the appearances of our being near the land from the thickness seen ahead. We proceeded slowly, and when it cleared for a moment nearly ahead, but a little on the port bow, were seen breakers and a rock. We could not make it out clearly, but manœuvring, on the supposition either of our being near Cape Iroo Saki or Rock Island, we first steered south-east, and afterwards east and north-east. Thus we sighted Rock Island, which we made out well

from the lighthouse situated in the centre of it. It was then evident that we had made the land near Cape Iroo Saki, and the current then set us towards the north-east instead of towards the east by no means as we had experienced early in the day, and with three-quarters of a mile velocity, instead of two and a-half to three miles, as given in charts.

At daylight we sighted, a little to the northward of us, an American vessel, steering the same course as ourselves. She had the vessel astern, and might have been making from seven to eight knots per hour. Continuing on, we left her astern about a mile, when we met the breakers. On then altering course to starboard, we made a signal that she was running into danger, so that she could haul up on the starboard tack in time to get clear of the shore, as we then steered course east, and afterwards we saw that she followed our motions as was coming after us. In the latitude of Rock Island we lost sight of her, on account of the fog. When the above ship, the "Charter Oak" of Seaport, arrived in port, we learnt from the Captain that he, from the same causes which led us to believe we were steering a wrong course, had been confident about his proceeding, and had run directly for Vries: but our sudden manœuvre having been observed, at the signal, which he could not distinguish on account of the fog, but seen, he had thought there was some danger, and had followed our movements. The breakers he did not see until some minutes after.

Our course was shaped for Vries and then for Uraga Channel. Having passed Vries, the fog began to lift, and at noon had completely cleared and we were able to fix our successive positions by bearings. At 4 P.M. on the same day, the 30th, we reached the anchorage at Yokohama. From the observations which we have been explaining, relating the history of this passage, we may conclude that the Kuro-Siwo current is generally met a few miles to the northward of the Kuro-Siwo, sometimes it does not begin to make itself felt until much farther, and that its force is very variable, and is so within limits much more extensive than those assigned by the chart, since we experienced it up to 20 miles on one day and 43 miles on another. The waters of the Kuro-Siwo flow into the Pacific from the basin of the Sea of Japan or Eastern Sea, acquiring greater velocity when on the way between the Linschoten Islands and between those islands and that of Nipon, and thence they rather set from the coast of Japan than follow it. The current which had set us to the northward in the night between the 29th and 30th, may be rather taken to be a current falling into the Gulfs of Owari and Suruga.

From information obtained, we had, to corroborate this assertion, many opinions of captains of ships-of-war at present at Yokohama. All say that, from Van Diemen's Straits to that port, running along the coast, they have not observed the currents marked on the charts. The same assurance was received from the "Sunda," of the Peninsular and Oriental Company, which makes periodical voyages between Hong-Kong and Yokohama. The Captain of the "Tigre," which makes the same voyage in the service of the *Messageries Maritimes*, assured us of the same fact, saying, that in the nineteen times that

had made the voyage between the two places in this vessel (that is at almost all seasons of the year), he could state that he always encountered relative differences in the strength of the Kuro-Siwo, and that in nearly half of his passages from Siwo-Misaki to Iroo-Saki he had not experienced any current, or had found it insignificant. The same captain, moreover, added, and this agrees with our own statements, that the currents sometimes observed in this part of the sea may be attributed to the tide, since at times the set is also towards the south-east, a direction quite at variance (to the extent of about 90°) with that given and noted on the charts.

We have spoken of all this at length, in order to notify that in the passage between Hong-Kong and Yokohama it is necessary not to trust too much to the direction and force of the current as given on the charts. It often happens that thick fogs come on, and frequently, for several days together, it is not possible to count upon the assistance of astronomical observations. To count, therefore, in making a landfall upon a current equal to that found 200 miles farther to the south-west, would, in the majority of cases, lead to a grave error.

With reference to the navigation of this part of these seas, it results, from much information obtained, that, as a rule, all prefer the passage of Van Diemen's Straits; but the captain of the "Tibre" asserts that it has many times happened to him (and he ought by this time to be well acquainted with the locality) to have to heave-to during the night, and that perhaps, the fog continuing, he was not able to make out the islands at the mouth of the strait, and did not see the light. The captain of another *Messageries* mail steamer almost always preferred the passage between the two islands of the Linschoten group, or passed between the more southerly of these and Oho Sima. And this latter is the passage chosen also by the Peninsular and Oriental steamer "Sunda," when the weather is thick, or threatens to become so. The passage chosen by us between Naka Sima and Sawa Sima may often be an advantageous one; still it is little used, because imperfectly surveyed, though there is reason to believe that it is perfectly clear, as the sailing directions suppose, and as it appeared to us, for we did not see any obstacle, though a long sea from the south-east would certainly have shown us the breakers or other signs of shoal water, in case of the existence of shoals in mid-channel.

(Signed) G. GIORELLO, *Lieutenant*.

"Cristoforo Colombo," Yokohama,
15th July, 1877.