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MANBY'S MORTAR AFLOAT.—*Remarks and Experiments on the Use of Manby's Mortars on board Ship with Cones of Wood as Projectiles and Auxiliaries to the Iron Shot, by Captain K. B. Martin, Harbour-Master, Royal Harbour, Ramsgate.*

The Register of Wrecks in your December number is indeed an appalling one, and may well enlist all our sympathies and stimulate us to every exertion which may tend to preserve life when property is thus sacrificed; for, alas! there is an increasing recklessness in the loading of every class of vessels now, which might well induce a mariner of the olden time to doubt if they were ever intended to reach their destination.

It is now nearly forty years since Captain Manby commenced his experiments (which many of us witnessed on the Norfolk coast) and since which many valuable lives have been saved by the employment of his mortars and apparatus, as used from the shore, to convey a line or lines to a stranded vessel; but we hear of few, or, indeed, no attempts to render this valuable auxiliary useful on shipboard, or from the ship to the shore. I have been induced by the examples which have recently come before me to institute a series of experiments with Manby's mortar, which may perhaps be the means of introducing them more generally into vessels of sufficient tonnage to carry them, as they occupy very little space upon deck.

And first with regard to steam towing vessels, many of which upon the Thames are very noble vessels of their class. Imagine an emi-

grant ship on shore upon one of the dangerous shoals, where the steamer could not approach her but could throw a line over her. The advantage of so doing every seaman may estimate without any further detail. Our steamer in several instances has taken an enormous risk at the Goodwin Sand, when, in conjunction with the lifeboat, they have gone off to distressed vessels, and by my request she is now equipped with a Manby's mortar and apparatus.

Now as to the result of my experiments. I was forcibly impressed with the fact that if a projectile could be thrown upon the tide which would float upon the surface in lieu of plunging into the deep, that in many instances it would stream down to the ship by being thrown close athwart her bows, when it was more difficult to cast a throw-line over her with an iron shot; and this would be especially the case where the whole body was submerged and only the spars and rigging of the wreck, with the crew clinging to them, above water. I therefore determined to try the effect of cones of wood of different densities, and the best of which I find to be the gnarled or knotty elm; which resists the concussion without splitting, and which my turner furnishes at 1s. 6d. each, of five and a half inches diameter and nine inches in length, these being the dimensions of the largest iron projectile fitted to the bore of the mortar. Through the centre of the wooden cone, laterally, an augur hole admits an inch rope, which may be passed through with dispatch, knotted at the inner end, and cut to any length as a strop, to which the throw-line is to be attached; and if a thimble is fitted to the end of the strop a small line may be rove and thrown double at short range if necessary. The small cost of wooden cones would be an inducement to have a set of them always ready, and differing as to the mode of appliance.

Now in this proposition it must be remembered that although I have thrown a wooden cone sixty yards against a fresh gale, with six ounces of powder, at the usual angle of 45°, yet the position of a ship on a lee shore would always give the projectile an impetus in lieu of a resisting medium; and I have thrown the same 4lb. cone of elm before the wind (which accelerated its flight) eighty fathoms or one hundred and sixty yards! Now if the iron shot from a ship fell short of the shore it is lost to sight and expended! Not so the wooden cone! every sea rolling in bears it upon its crest and, if the distance is not very great, will soon cast it upon the beach; for it must not be forgotten that the line attached to it formed an arc of a circle, the curve of which in a straitened surface upon the water will give a great increase of slack or stray line.

Such, I consider, is the value of cones of wood as auxiliaries to the iron shot, but not to supersede them! The most frequent cause of failure of the iron shot is the parting of the strop or thong of hide close to the mortar. Now the bore through the wooden cone can be made to receive a larger strop if necessary, but I have found an inch rope thus far sufficient to the strain which it is subject to when quitting the mortar.

I cannot find that either rope or hide can be depended on with more

than six ounces of fine powder (which they have sent me from Woolwich with the mortars), and which threw the iron shot 107 fathoms or 214 yards. Now, independent of every other consideration, the progress of a cone of wood towards the shore would be easier seen and avoided than a 24lb iron shot, and attended with less injury to anything which it might strike. As a matter of course, there should be a generally understood signal from any vessel in possession of such projectiles or about to use them, and every well-appointed ship should certainly have them. I should also believe that a clever pyrotechnist might furnish a blue or crimson fire which could be attached to a wooden cone to show its progress and where it fell, during a dark night. The rocket is certainly superior to the mortar in this respect; but how very few seamen would handle rockets judiciously, and if not they are sharp-edged tools to the uninitiated, and not to be played with! It is probable that a small cell in the cone of wood might be filled with composition similar to the port fire which water would not extinguish, or with phospor, which water would ignite. This, however is a secondary consideration.

Let us now take a more extended view of their utility on board ship, in addition to their acknowledged value to stranded vessels. A fine well-found ship or steamer falls in with a poor fellow at sea in a deplorable condition. We know, as seamen, that a ship disabled for only a few hours in a heavy sea may roll her masts away, when if any steerage way could be kept on her they might be saved and her canvas rebent to the yards and again successfully spread to the gale. Here, then, her preserver might range up to windward of her in perfect safety, and deliver from the mortar a wooden cone and line with comparatively little risk, and with such assistance take her in tow. Again, you are at anchor in a roadstead and tideway. You have sent your boat on shore for provisions and water. She is coming off deep loaded. The breeze and sea has increased and is increasing; and, in spite of all their efforts, the wind and tide has swept them past and to leeward of the ship, and there they are, nearly within hail, tug! tug! tug! at their oars, when two ounces of powder in Manby's mortar and a floatsome wooden cone, would convey to them a line, by which you may haul them up and alongside. A boat's crew in this situation can often, with great labour at their oars, just hold their own and no more. Minutes then may become hours, and hours bring distress or casualty, which instant help might at once prevent. Such was the situation of the Admiral's barge in the Downs anchorage in 1854, and our steamer took hold of her and towed her up alongside that noble ship the *Austerlitz*, and received the thanks of the French Admiral.

I am convinced that many valuable lives would have been saved if Manby's mortars had been more generally in use on shipboard, as line after line might be thrown from a ship on to a coast where the mortar had no existence, or could not be brought to bear in time,—and would have to send its projectile, if so brought, against a furious gale. On the contrary, the ship, stored with lines and other resources, and aided

by the wind, could not miss throwing a line on shore, and bears with her to the scene of peril, whenever or wherever it may be, the means of self-preservation. And thus may it be said of the anxious veteran officer who has so recently gone to his rest that "he being dead yet speaketh!"

Cautions and Instructions in the Use of Manby's Mortars.

1.—Be sure and sponge dry the chamber of your mortar.

2.—Remember it must never be primed from a powder horn, as there is always considerable space in the chamber and the mortar would be over-charged. Quill tubes are always to be used with this ordnance, and a supply of them may be kept in a small tin box without hazard.

3.—Copper measures for the powder are furnished with the mortar marked ounces, in the proportion of two, four, eight, to determine the range and distance, but I have not yet succeeded in using the eight ounces without breaking either thong or line. I have therefore adopted the proportion two, four, six.

4.—The double frame and basket on which the line is coiled ready for service is an excellent arrangement for the shore. In the upper frame the teeth are fixed, and by lifting it off the line is ready. Now, this being rather a lumbering thing on deck, I have adopted a single frame, in which the teeth ship and unship like the thowels of a boat and put into a canvas bag until wanted again,—thus getting rid of the encumbrance when more or less confusion generally exists on deck. I have also introduced thowels to ship and unship in the vessel's gunwale, and by such means more lines than one can be kept ready faked for service in time of need. A little ingenuity may improve on any of these plans.

5.—Be sure you extend the strop or lanyard attached to the shot as far as circumstances will permit in front of, and in a line with the intended direction of the projectile, as it relieves the snatch on the gear at the instant of discharge.

6.—The powder is not used in cartridge but loose in the chamber of the mortar. A very convenient method is to have the charges in small paper bags marked two, four, six. Tear the paper and place the fracture under the vent, and the effect of the quill tube is certain.

7.—Have your port fire tied on to a four foot staff, that you may stand well clear of the throw-line. In my steamer we use salamanders, the bulb of which, in those vessels, can always be kept red-hot in the furnace grate.

[The first station in our volume for the year has been assigned to the foregoing important design of our much esteemed friend Captain Martin, known to many of the readers of our Journal, and known but to be respected and his friendship desired. In common with them, we deplore the inroads of those "ills which life is heir to" incident to age, but which deprive him not of that consolation afforded by the calm retrospect of a life abounding with deeds of good for his fellow men, among which is that described in the foregoing paper.—Ed.]

NEW CALEDONIA.—*By Captain Tardy de Montraver, Commanding H.I.M.S. "Constantine." Translated from the Annales Maritimes et Coloniales.*

Limits of New Caledonia. General Aspect.

New Caledonia, or, strictly speaking, the island to which Cook gave this name, lies in the direction of S.E.b.E. and N.W.b.W., between the parallels of 22° 30′ and 20° 10′ S., and the meridians of 164° 32′ to that of 151° 46′ E. of the meridian of Paris. Its outline on the map represents with tolerable accuracy the regular form of a caterpillar. It is sixty-six leagues in length, with an average breadth of ten. The surface therefore covers about 650 square leagues, and independent of its annexations of adjacent isles, of which I shall hereafter speak, contains a more extensive territory than that of our inland territories united.

The S.W. point, named the Prince of Wales Promontory, is separated from the mainland by a broad and deep strait, which M. Ensign de Vaisseau Senez, assisted by M. l'Aspirant Laregnère, carefully explored, and to which we have given the name of *Constantine*, leaving to the island which it separates from the mainland the name of *Ouin*, by which it is known to the natives.

A chain of islands, scattered as it were by chance, and united by sand or coral banks, extends for upwards of thirty miles south of Ouin, when they reach an island of middling height, about ten miles in diameter, visited by Cook, named by him Pine Island, and called Konieh by the natives. Its centre is marked by a conical ring, with a wide base, visible forty miles distant, and is situated in lat. 22° 40′ S., and long. 165° 1′ E.

On this island, the advanced guard of the lands to the south of New Caledonia, rests an immense reef, which, after having projected one of its more dangerous points for twenty miles into the S.W., embraces with its two arms, one to the East, the other to the West, the whole of New Caledonia, and terminates only in the N.W. at forty miles distance from the northern extremity of the island. Penetrable at a few points only, it contains in its almost unbroken girdle the isles which connect Pine Island to Ouin, the mainland, the numerous isles which border the latter, or lastly to the group of islands which stretch out N.W. of New Caledonia to the parallel of 18° 15′.

This reef, the largest perhaps known, approaches or recedes from the land according to the caprices of its madrepore formation. It is intersected at various distances by deep and narrow channels, the divergences of which, within the outer chain, form a labyrinth of winding passages, through which, guided by the eye and experience, ships gain the harbours of the coast, and small vessels can make the entire circuit of the island within the outward reef.

To this collection, which primarily constituted New Caledonia, geographers have added the group of the Loyalty Isles, composed of a

chain of islands lying parallel to New Caledonia, and separated from it by a channel ten leagues broad. The three principal of these islands are all that are inhabited of them, aud present no interest now, beyond that which arises from their annexation to New Caledonia and their relations with it.

A confusion exists in reference to their name, which ought to be cleared away by adopting the appellation known to the natives. Thus, the most northerly island, which has been called Halgan by d'Urville, and Britannia by the English, should take the name of Uvéa, which was given it by the original inhabitants in remembrance of the island of that name now called Wallis, which is peopled by the aborigines.. The middle island, called Chabrol by d'Urville, and known to the natives by the name of Lefu, already adopted by the English, should bear the same name on our maps; and the southern island, named Britannia by d'Urville, should be called Méré, as in the language of the original inhabitants. We might leave the name of Beaupré to the group of three small islands situated to the north of Uvea, and for which the natives have no name. The group of Loyalty thus defined extends from S.E.b.E. to N.W.b.W., between the parallels of 21° 37′ and 20° 27′ S., and between the meridians of 165° 52′ and 163° 58′. It presents nothing striking; the islands are little elevated, level, and without any indentations sufficiently deep to afford a harbour at any point throughout their extent.

New Caledonia presents this remarkable feature, that along its entire length it has two parallel chains of mountains, separated from each other by a central valley, cut at long distances only from each other by secondary platforms, abutments of the principal chains. We must conclude that the waters of the interior find their outlet towards the sea at the North and South of the island by considerable rivers. We already know this to be the case in regard to the northern part, where we have discovered the River Diahot, formed no doubt by the union of the waters which come down from the two chains in the central valley to the North of Kanala. It is probable that we shall find in the South of the island an analogous issue for the waters of the interior, to the East, I think, of the Strait of Constantine.

The eastern chain, less elevated than the western, is more uniform, and presents few culminating points of the height of 700 metres (ϛϛϛ feet), which may be considered as the medium height of its loftiest ridges. The height, however, appears much greater, for being shut in between the sea and the central valley, its slopes towards the sea are eztremely rapid, and give the appearance of greater altitude.

Such is the aspect of the island seen from the open sea, that it presents a pretty regular outline. and one is far from expecting the irregular details that are observable on approaching it. Few countries, in short, present in a more decided manner all the characteristics of successive and different formations. Thus, whilst the mountains of the interior present all those of the primitive earths, the low lands, the islands, and peninsulas, which border the coast, offer at every step irrefragable proofs of a recent formation by upheaval. These observ-

ations are especially applicable to the western coast, which seems to have been almost alone subjected to these convulsions of nature, and all the advanced portions of which have evidently been submerged at no distant epoch.

I regret that I was unable to make these remarks otherwise than in a general manner, or to devote myself to this interesting question, for I have no doubt that an experienced geologist would find in New Caledonia a vast field to explore, and valuable observations to record.

Arrival of the "Constantine" at Pine Island.

I have stated elsewhere the reasons which induced me to begin in the South my operations on New Caledonia, and to found there our first establishment, even had the local difficulties been greater. It was these motives that led me to make sail for Pine Island. after having doubled the group of the Loyalty. On the mornsng of the 5th of January, the land was visible at a great distance in the West, an even ground, little elevated, crowned towards its centre with a peak, which soon led us to recognise the Isle of Pines. Unprovided with charts and nautical information concerning it, I thought it prudent to trust to the memory and eye of a man on board, who had already been to Pine Island; and it was well that I did so, for he conducted us to the anchorage of which we were in search with the confidence and success of a pilot who had served his time to his occupation.

Near us, to the South, was a small low island, covered with mangroves, and reaching the chain of reefs which we lay alongside of, after having rounded them to the South. About two miles distant in the West, a chain of islands, equally low, which sheltered us, and displayed a rich crown of lofty pines, of the species peculiar to New Caledonia, and which differs from those of Europe as much as from those of Norfolk. In the North we had the conical summit of Pine Island, and from N.N.W. to W.N.W. the lands on which it rests losing themselves, without any sensible declivity in the horizon, and presenting to the eye a thick curtain of those same pines, the pointed heads of which trace on the sky the monotonous profile of the island.

This anchorage possessed nothing attractive; it was four miles distant from the land, and the communications must be difficult and even dangerous for canoes; I had therefore no intention for a single instant of remaining there beyond the time strictly necessary for my procuring from the missionaries some information of Port St. Vincent, where I had resolved to form our southern establishment, and also of the state of things in New Caledonia. M. Coudein, Ensigne de Vaisseau, who had been shipwrecked in the *Seine*, had known the missionaries, and was besides acquainted with some words of the native tongue, was immediately sent ashore, and returned in the evening, with the most unexpected and surprising intelligence. He had at the same time learnt that missions were established at Poeupo and at Balade; that Mgr. d'Amata was no more; that Admiral Despointes had recently paid a hasty visit to Pine Island; that the taking possession was already concluded, and a post established at Balade, where that

general officer was still to be met with. This news being confirmed the next day by M. Goujon, one of the missionaries who remained on the island, and the particulars which he kindly gave me of the state of things, determined me not to remain in this anchorage but for the time necessary to solve a question left undecided, and induced me to give up the project of repairing to Port St. Vincent, that I might reach Balade as soon as possible, where I still hoped to meet Admiral Despointes.

Detained on board from the consequences of a recent accident, I most sincerely regretted my being unable to visit the mission on the Isle of Pines; a model establishment, where the Fathers have contrived to bring together everything calculated to render life, if not agreeable, at least easy; and at the same time they have practised, as in a model farm, all the improvements of useful and ornamental husbandry: thus preparing, beyond all question, the means for the approaching colonization.

It would be impossible to imagine a more healthy and suitable spot than that which the Fathers have chosen for the elevation of their modest dwelling. A delightful valley, shaded by every kind of tree which the island supplies; a small comfortable house, neat and simple; a garden, enriched with all local and exotic productions which have been naturalized there by the care of the missionaries—such as the vine, the mulberry, the olive, and others which are yet only in a state of experiment; and, in the midst of all this, a winding brook bearing freshness and fertility wherever it flows, after lending the force of its current to a mechanical saw mill, due to the intelligent activity of P. Chapuis, a man equally industrious and well-informed, and devoted to the labour of the mission; cows, oxen, and sheep wandering here and there; numerous hives of bees concealed beneath the shade of trees; flowers planted in every place to remind each one of his absent country;—all things, in short, breathe quietude and happiness in this little retreat, unknown to the antipodes.

At a short distance from the mission two sandal-wood Captains from Sydney, wearied with their adventurous life, or allured by the advantages of the situation, have founded an establishment no less interesting than that of our missionaries.

If I deeply regretted being unable to rest there for some days after so rough a passage as we had just accomplished, I lamented still more deeply that I could not turn to advantage my stay at Pine Island by studying for myself a spot which I believe is called to play an important part in the future of New Caledonia. However, I now console myself with the thought that the observations which I might have made in person would have added very little to that knowledge which has been communicated to me by the Fathers of the mission and by the officers whom I have on several occasions sent thither. It is from their narrative that I am about to say a few words on this interesting point, and respecting which Cook's account is still truthful and complete.

In the present day, as in times past, Pine Island is remarkable for

the great number of its trees of that species. They are seen in abundance on the principal island, and cover a portion of the low islands which enclose the anchorage of Alewène, on the western coast. I do not think they would prove advantageous for ship-building, for they are extremely knotty, heavy, and brittle; but they are perfectly well suited for ordinary timber work, and by their property of hardening in the air they present all the appearances of a lengthened durability. We find also in the interior of the island, but in smaller numbers, some hard woods suitable for ship-building; but they are sufficiently scarce to render great reservation necessary in the felling of the timber. This precaution should be observed equally in regard of the pines, which ere long will be exhausted if there be no order to arrest the blind destruction which is already in operation, and will continue on a larger scale as soon as an important establishment is created. A clearance being made of the more wooded parts of the island, which present collectedly only the smaller portion of its surface, the elevated parts are covered with rich pasturage which our finest meadows could not be compared with. A thick grass, nearly a metre (three feet) in height and soft when it is young, has taken possession of the whole soil, and would be sufficient to feed, throughout the year, innumerable flocks.

It is evident at first sight that Pine Island is exclusively reserved for the felling of timber and the raising of cattle. Its extent is large enough to serve as a field of trial for the most important cultivations in agriculture, or for the enterprises of industry and for the trade of wools; both of which are destined to make the fortune of New Caledonia, in concurrence with Australia, in supplying the great markets of Europe with provisions. The extent and fertility of its pasturage will forcibly demand the attention of the first colonists, and will be to them a guarantee for complete and rapid success. Situated at the extremity of the New Caledonia group, it commands it on both sides, whilst it is at the same time the point nearest within reach of Australia, which will yet be, for a long time to come, the market for supplying provisions to our colony.

As for the climate, I doubt if there exists on the globe a spot more happily endowed than that of which we are speaking. A sentinel unknown in the midst of the ocean, this island receives in every season fresh breezes from the sea, sometimes from the S.E., sometimes from the S.W., according as the general winds prevail over the trade winds from the coast of New Holland, or as the latter predominate over the former. If this circumstance of situation renders its landings dangerous (by always maintaining there a strong swell of the sea) and its anchorages bad, on the other hand it keeps up continually, both on the coast and inland, a coolness which allows one to forget, even in the middle of the day, that one is under the tropic. The temperature seldom exceeds 85° Fahrenheit during the day, and is always cool during the night in summer and often cold in winter, when the S.W. winds generally blow. Here, more than in any other part of New Caledonia, the seasons differ sensibly, through the variations of tem-

perature more than through drought and rains, as in most tropical countries. We also observe here, as much as in Sydney, the influence of the seasons on vegetation and production, and one may obtain, in nearly the same degree, the productions of Europe and those of the tropics; at the same time this island being more favoured in that respect than any other corresponding point of New Holland.

It would be difficult to suppose that any epidemic or endemic disease could exist under a climate like this and in such physical conditions. Therefore none are observable, and I am convinced that Europeans, intent on labour could not go anywhere and find a more healthy climate. Diseases of the skin (hydroceles), which are often met with among the natives, being the consequence of their uncleanliness and of their manner of living, and not of the climate, would very seldom extend to Europeans accustomed by habit to a regular mode of living.

The entire island does not count more than eleven or twelve hundred inhabitants, scattered over different parts of the coast. Some are fixed at Gadji, the principal village, situated in the N.W. of the island, where the chief of the tribe resides. Others inhabit some small villages, such as that of Moupé, on the N.E. coast, hamlets of a day, composed of a few huts or *carhets*, forsaken as soon as built; and, finally, the greater number incessantly wandering from one village to another, from the missionary to the English establishment, from Gadji to the mainland, living from day to day on the little which the law of hospitality—a law sacred among savages—grants them.

It is but a few years back that this tribe knew no other existence than the savage life now led by the neighbouring tribes. Accustomed to complete nudity, notwithstanding the relative rigour of the climate, they felt not the need of protecting themselves from the cold and the rain by any other means than fire and the bark of the niabouli. Wild roots, fishing, and some little cultivation satisfied their wants. War was the only occupation of the men, and the most absolute indolence filled up the existence of the women. In short, the manners and habits of the tribe now under discussion were a few years back the same as those of the tribes I have since visited on the mainland, and of whom I shall presently speak more particularly.

But it is now no longer the case, since the frequent visits of Europeans have given them new wants and the desire of possessing, they have become more industrious. Some have embarked in European vessels to satisfy these wants, have lived with their crews and visited other archipelagoes, where they perceived their superiority to the original inhabitants who had not yet been improved by the intercourse of the Europeans. Many have followed this first example and visited Sydney. All have brought back from their voyages vices and desires which savage life can no longer satisfy. Some speculators have undertaken to satisfy these new vices, and must have coaxed the chief in order that they might work to their content the indigenous population. Then came out missionaries and vainly exercised their angelic patience and all the energy and will they possessed to repress the evil. Having to struggle against the vicious instincts of the natives, they were