(1) பக்கங்களின் எண்ணிக்கை 40.

(2) புதுக்கித் திருப்பிய நாள் ~~4.7.88~~ 6/88

(3) ஆதாரங்குறிப்பவர் சுருக்கொப்பம்

தமிழ்நாடு ஆவணக் காப்பகம்.

தமிழ்நாடு அரசு

பொதுப்பணி துறை

அரசாணை எண்.
மு. கோப்புத் தாள் எண். 804-W. அச்சகம் / பலவகை

நாள் : 12. 3 - 1888. ~~198~~.

மடிக்கவோ கண்டபடி கையாளவோ கூடாது

ஆவண, கா-1—18,006—15-6-87.

12th March 1888, No. 804 W., Public Works.

1

911-12 W
4.4.81

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Buildings and Roads.
Civil Works.

Read—the following letter from J. W. MARTIN, Esq., Officiating Superintending Engineer, IV Circle, to the Chief Engineer, Public Works Department, dated Coimbatore, 23rd February 1888, No. 64 E.W. :—

Adverting to paragraph 3 of G.O., No. 188 W., dated 17th January 1888, on His Excellency the Governor's tour in the Western and Southern Districts, I have the honor to forward letter, dated 21st instant, received from Mr. George Brunton, M.I.C.E., Cochin, giving the outlines of his scheme for increasing the depth of water on the bar at the entrance to Cochin harbour.

2. I regret I do not feel competent to offer any opinion on the merits of Mr. Brunton's scheme, particularly as I have not got any of the books and reports to which he refers, and as I am not acquainted with the work at Liverpool that he says was carried out successfully by a method similar to what he proposes should be adopted at Cochin. However, if Government desire that the subject should be further inquired into, I would recommend that Mr. Brunton should be invited to work out in detail his scheme furnishing an estimate of the cost of the necessary tools and plant and the working expenses. I think it is also advisable that some reliable information should be obtained of the work carried out at Liverpool, particularly as regards the depth of water maintained and the state of the water at the time the work was carried out as regards being rough or smooth.

Enclosure.

From G. BRUNTON, Esq., M.I.C.E., to the Officiating Superintending Engineer, IV Circle, dated Cochin, 21st February 1888.

I have the honor to acknowledge receipt of your letter, dated 31st January 1888, and, in reply, would beg to draw your attention to the enclosed extract from the address of the Cochin Chamber of Commerce to His Excellency the Governor when he visited this town on his late tour.

2. My views with respect to the advantages to be derived from a sluicing apparatus to deepen this bar on the lines (with some modifications) laid down in the paper referred to have been greatly strengthened by perusal of other papers in the minutes of proceedings of the Institution of Civil Engineers, to be found in volume 83, page 386, and volume XC, page 308; this last paper gives a full account of the way in which the sand bank formed under the Liverpool landing stage was removed by sluicing.

3. The bar of this river has been formed and is maintained by the action of two forces opposing each other—one the constant endeavour of the sea to embank itself, the other the perpetual washing away of the sand by the velocity of the tides, the result being a pretty nearly unvarying depth of water on the bar of 14 feet.

4. The enormous area of backwater, which is filled and emptied every tide, accounts for the velocity of the currents in and out whereby the depth is maintained; the two forces neutralise each other at that depth, the sea cannot heap up more sand, the tides cannot cut more away; there is no doubt in my mind, however, that with a little extraneous help given to the outgoing currents the depth might be easily increased without much fear of the sand being rapidly replaced, because the velocity of the currents at bottom would not be decreased to any appreciable extent by the deepening, and the deeper the water the less would be the wave action tending to fill in.

Low water ordinary spring tides.

5. My scheme consists of building a boat, say, 120 feet long by 24 feet beam, in which I would place a compound engine of, say, 60 H.P. nominal and a boiler of sufficient power to drive the engine up to double its nominal power.

6. The engine should drive a centrifugal pump with a disc of 7 feet or 7 feet 6 inches diameter at 120 to 130 revolutions per minute; this disc would work in a large case bolted on to the bottom of the boat from which case a rectangular wrought iron pipe, say, 25 feet long with a cross section of 8 feet by 1 foot would be suspended by a flexible connection at any required angle. This pipe would be so counterbalanced as to leave only so much weight as would be required to keep its lower end in gentle contact with the sand, on which being provided with a shuttle-shaped cradle it should rest. Of course suitable apparatus would be necessary to raise and lower this pipe as required and to keep it in a line with the centre of the craft whichever way the latter would be moved.

7. The water would be taken into the pump above and be impelled through the pipe and impinge on the sand, which would be driven by the force of the water seaward, and upward, remaining in suspension a considerable time, sufficient with an ebb tide running at from 3 to 4 miles an hour to carry it well out into deep water (see Mr. Bergeron, volume LVIII, page 133).

8. The boat would be anchored and manœuvred in the manner shown in volume LXXXIII, page 387.

9. I have chosen the method above described instead of the double propeller of Mr. J. J. Van-Rutchoten, volume LVIII, page 145, because this sluicer will have to work in a seaway with sometimes a considerable swell and the vanes of propellers would be knocked off if allowed to come in contact with the sand, whereas the pipe hinged as above would allow of considerable rise and fall in the boat without damage, and a stream of water, such as would be maintained by a pump as above described, would be more effectual than that from propellers, as a large portion of their force would be lost in driving water which would not act directly on the sand. Another great advantage would be that all the working machinery would be inboard and easily get-at-able.

10. A vessel such as described above would be able not only to move itself by hydraulic propulsion (see volume 77, page 1), but to act as a tug in case of sailing vessels.

11. There is, I believe, no reason to doubt the efficiency of sluicing as given in the papers abovementioned. I have had very great experience of the action of streams of water on sand and mud whilst working the pumps I have used for years in the Travancore and Cochin paddy-fields, and I feel very confident that such a sluicer dredger as I contemplate would give an additional depth of 6 to 7 feet on this bar at a very reasonable cost, the tide itself being made to do all the carriage.

12. I append a skeleton sketch of the proposed sluicer and a section of the bar derived from the latest chart.

EXTRACT, Cochin Chamber of Commerce address to His Excellency the Governor.

Mr. George Brunton, M.I.C.E., our Chairman, has brought to the notice of the Chamber a method whereby "bars," such as the one we have to contend with, are removed and made navigable in an apparently easy manner.

2. The method suggested by Mr. Brunton was designed some years ago by a Mr. J. J. Van-Rutchoten of Rotterdam, and called by the inventor a propeller dredger.

3. The following description of this dredger is taken from the minutes of proceedings of the Institution of Civil Engineers, volume LVIII, page 145:—

"It (propeller dredger) consisted of an ordinary strong craft, a 12 H.P. portable engine and a pair of trussed beams, one on each side of the craft, carrying steel shafts and suitable bearing for them. These beams were hung from the sides of the craft, so that they could be lifted by tackles and lowered to any depth required. The lower ends of the shafts were fitted with ordinary propellers, about 3 feet 6 inches in diameter, and the upper ends with bevil wheels, to which power was transmitted from the engine fixed in the craft to a cross shaft driven by a belt from the fly-wheel. This machinery was tested several times in the river Maas, and in April 1876, when he was present, the craft was steamed into position by its own propellers against the current. The depth of water being then about 13 feet over the shoal with deep water all round, the propellers were lowered until they nearly reached the top of the shoal and work was commenced. The engine made ninety-six revolutions and the propellers about one hundred and fifty-six revolutions per minute. The craft being anchored in such a manner that it could be kept straight to its work and warped as required to keep on the higher part of the shoal. It soon became apparent that a large quantity of material was set in motion by the revolutions of the propellers, and after about forty minutes work the engine was stopped and soundings taken. It was then ascertained that the shoal had been lowered about 1 yard in depth for a length of 150 yards and a width of 8 yards.

"The craft was next turned round and worked with the stream, the results obtained being practically the same as when working against the stream. The shoal consisted of a coarse compact sand in water.

"The machinery was subsequently used under the supervision of the Engineers of the water start in various kinds of strata, such as fine sand, clay, peat, clay and peat mixed, &c., and the average results were that, including the time necessary for getting the craft in position, about 130 cubic yards of sand were moved per hour, 116 yards of sand mixed with clay and proportionally lower quantities in peat and clay. This appeared to indicate that a great deal might be done in the way of levelling the bottoms of rivers by simple and inexpensive mechanical appliances which could be worked almost continuously irrespective of variations in the depth of water," which the Chamber gives *in extenso*, as it will then be more simple to compare it with the requirements of this port.

4. Now the bar at the entrance to the Cochin harbour is about 960 yards 2,880 feet broad, the water varies in depth of at least 22 feet, and with such an apparatus as the propeller dredger the Chamber does not see that there would be any difficulty in attaining this, and what is more at a greatly reduced cost when compared with other schemes.

5. The Chamber is unable to state what the actual outlay would be, but if your Excellency will give the scheme your support, estimates will be made. It may be worth mentioning the whole work of construction and maintenance could be undertaken by Mr. Brunton, M.I.C.E.

ORDER—dated 12th March 1888, No. 804 W., Public Works.

The Governor in Council desires that the Chief Engineer and Master Attendant will submit a joint report, after careful inquiry on the spot, upon Mr. Brunton's proposals.

2. It is remarked that Mr. Robertson in his reports on Indian Harbours, dated 1871, came to the conclusions (1) that the Cochin Harbour would be much improved by the erection of groynes, one on each side of the harbour, 3,000 and 2,300 feet in length, and (2) that with the assistance of dredging and raking, a depth of 20 to 21 feet at low springs could be maintained.

3. The late Captain Taylor, in paragraph 5 of his report, No. 11132, dated 16th December 1880, stated that, in his opinion, a depth of 30 feet was necessary to justify a large ship in making a narrow harbour mouth like Cochin; and it appears from paragraph 15 of the report on Cochin Harbour by Colonel Sankey and Captain Taylor, printed with G.O., No. 911, of 4th April 1881, that this minimum depth of 30 feet was admitted by the Chamber of Commerce to be necessary to make Cochin a first-class harbour available for large ships.

4. Mr. Parkes, in his report, dated 11th March 1881, printed with the same Government order, considered that a depth of 27 feet was the least that could be allowed.

5. Mr. Brunton's proposals, if carried out and if perfectly successful, would give only 22 feet depth of water. The Chief Engineer and Master Attendant should state whether they consider it likely that a depth of 22 feet of water could be obtained and maintained at a reasonable cost with Mr. Brunton's proposed system of sluicing, and, if so, whether this depth would be sufficient for the classes of steamers and ships frequenting Cochin, or would prove of such advantage as to justify the estimated expenditure.

(True Extract.)

Captain, R.E.,
Under Secy. to Govt., P.W.D.

To the Chief Engineer, Public Works Department.
„ Superintending Engineer, IV Circle.
„ Marine Department.

Exd. J. Moses.

Spare Copies

BUILDINGS AND ROADS.
CIVIL WORKS.

Govt. of (1888) Madras.

PUBLIC WORKS.

Dated March, 12th.

Recd.

Encl.

G.O., 12th March 1888, No. 804 W.

MARCH.

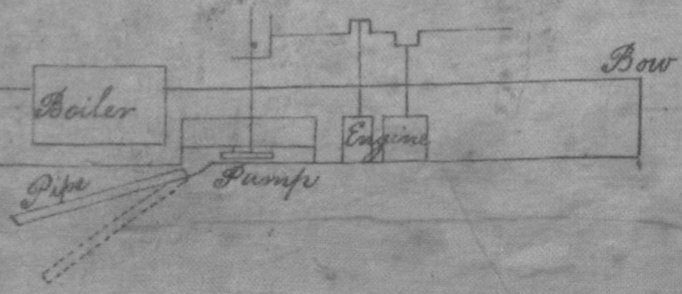
Cochin Harbour

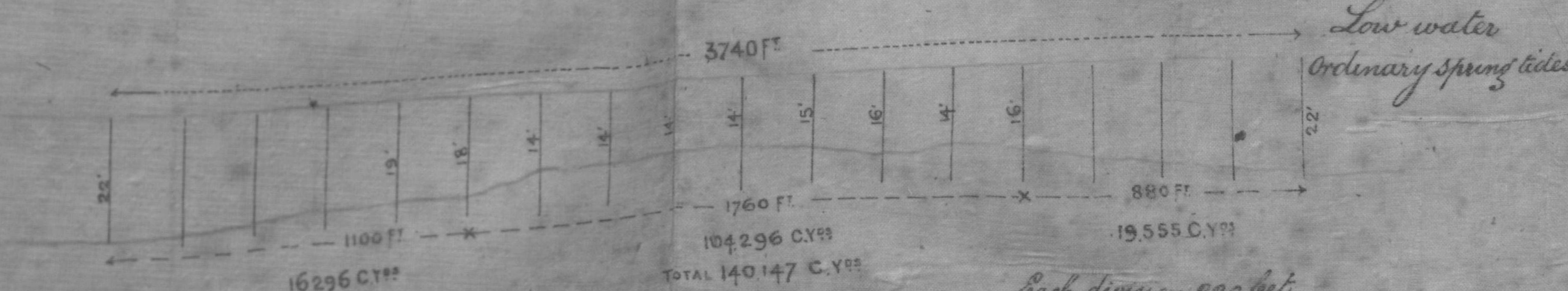
Directing the Chief Engineer and Master Attendant to submit a joint report, after careful inquiry on the spot, in regard to certain proposals of Mr. Brunton for increasing the depth of water on the bar at the entrance of the —.

G.O., No. 804 W. dated 12th MARCH 1888.

Skeleton Sketch of proposed Sluicer for the Cochin Harbour Bar

Scale 1 m/m to 1 foot





Each division 220 feet

Breadth of Channel 200 ft.

$$\frac{140,147}{2000 \text{ yds per hour}} = \frac{70 \text{ hours}}{8 \text{ hours per day}} = 8\tfrac{3}{4} \text{ days}$$

(SIGNED). GEO. BRUNTON.
M.I.C.E.

Scale for heights 1 m/m to 1 foot

Cochin 21st February 1888.

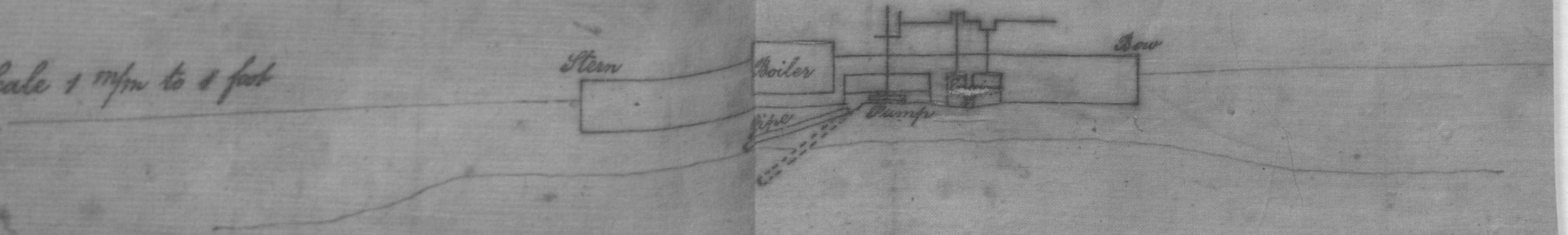
Pro: No: 804 W d/ 12th March/58

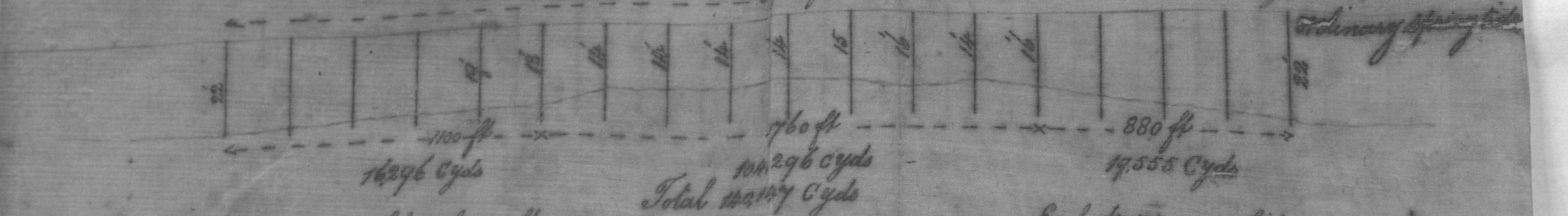
ENGINEER'S OFFICE
P.W.D.

This [illegible] has been lithographed

Skeleton Sketch of proposed Sluicer for the Cochin Harbour Bar

Scale 1 m/m to 1 foot





16,296 C yds

104,296 C yds

17,555 C yds

Total 140,147 C yds

Breadth of Channel 200 ft

Each division 220 feet

140,147 / 2000 yds per hour = 70 hours / 8 hours per day = 8¾ days

Scale for heights 1 m/m to 1 foot

Cochin 21st February 1858

Geo: Brunton M. Inst C.E.

No. 64
E.W.

Supg. Engineer's Office II Circle,
Coimbatore, 23rd February 1888.

From

J. W. Martin, Esqr.,
Offg. Superintending Engineer,
II Circle.

To

The Chief Engineer,
P. W. Department.

Sir,

Enclosures
Mr. Bruntons
letter with a sketch
and an Extract
from the address
of the Cochin Cham-
ber of Commerce.

Adverting to para 3 of G.O. No. 188 W. dated 17th January 1888, on His Excellency the Governor's Tour in the Western and Southern Districts, I have the honor to forward letter dated 21st instant received from Mr. George Brunton M. Inst. C.E. Cochin, giving the outlines of his Scheme for increasing the depth of water on the bar at the entrance to Cochin harbour.

2. I regret I do not feel competent to offer any opinion on the merits of Mr. Brun Scheme, particularly as I have not got any of the books & reports to which he refers, and as I am not acquainted with

the work at Liverpool that he says was carried out successfully by a method similar to what he proposes should be adopted at Cochin. However if Government desire that the subject should be further enquired into, I would recommend that Mr. Brunton should be invited to work out in detail his scheme furnishing an estimate of the cost of the necessary Tools & Plant, and the working expenses. I think it is also advisable that some reliable information should be obtained of the work carried out at Liverpool, particularly as regards the depth of water maintained, and the state of the water at the time the work was carried out as regards being rough or smooth.

I have the honor to be,
Sir,
Your most obedt. Servt.,

J. W. Martin
Offg. Supg. Engineer
IV Circle

P.W.C. No. 1854

From
The Offg Supg Engr
Fourth Circle

No. 1313 W d/ 5.5.83
" 2192 W d/ 9.8.83
" 1301 W d/ 12.5.87
" 188 W d/ 17.1.88
" 604 E d/ 1.9.88
" 2943 W d/ 27.12.80
" 912 W d/ 4.6.81

Trach 174/89

Dated 23rd February 1888.
Rd 27.2.88

No. 64
E.W.

Encl. 3.
(+1 plan)

Cochin Harbour:-

Forwarding a report from Mr. G. Brunton giving the outlines of his scheme for increasing the depth of water on the bar at the entrance of —.

For orders.

BW

SP 3

Uwh 24/2/88

9

From
George Brunton Esquire
M. Inst C. E.

To
J. W. Martin Esquire
Offg Supg Engineer
IV Circle

Sir,

I have the honor to acknowledge receipt of your letter dated 31st January 1888, and in reply would beg to draw your attention to the enclosed extract from the address of the Cochin Chamber of Commerce to his Excellency the Governor when he visited this town on his late tour.

My views with respect to the advantages to be derived from a sluicing apparatus to deepen this bar on the lines (with some modifications) laid down in the paper referred to have been greatly strengthened by perusal of other papers in the Minutes of Proceedings of the Institution of Civil Engineers to be found in Vol 83 page 386 and Vol XC page 308, this last paper gives a full account of the way in which the sand bank formed under the Liverpool Landing Stage

I with R
28.2.88

was removed by sluicing

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Low water ordin
spring tide

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My scheme consists of building a boat say 120 feet long × 24 feet beam in which I would place a Compound Engine of say 60 HP nominal and a Boiler of sufficient power to drive the Engine up to double its nominal power.

The Engine should drive a Centrifugal Pump with a Disc of 7 feet or 7' 6" diam at 120 to 130 revols per minute, this disc would work in a large case bolted on to the bottom of the boat from which case a rectangular wrot iron pipe say 25 feet long with a cross section of 8 feet × 1 ft would be suspended by a flexible connection at any required angle. This pipe would be so counterbalanced as to leave only so much weight as would be required to keep its lower end in gentle contact with the sand on which X being provided with a shuttle shaped cradle it should rest. Of course suitable apparatus would be necessary to raise and lower this pipe as required and to keep it in a line with the centre of the craft whichever way the latter would be moved.

The water would be taken into the pump above and be impelled through the pipe and impinge on the sand, which would be driven by the force of the water seaward and upward, remaining in suspension a considerable time, sufficient with an ebb tide running at from 3 to 4 miles an hour, to carry it well out into deep water see Mr Bergeron Vol LVIII page 133. The boat would be anchored and manoeuvred in the manner shewn in Vol LXXXIII page 387

+ with R / 28.2.88.

I have chosen the method above described instead of the double propeller of Mr J. J. Van Rutchoten Vol LVIII page 145 because this Sluicer will have to work in a seaway with sometimes a considerable swell and the vanes of propellers would be knocked off if allowed to come in contact with the sand whereas the pipe hinged as above would allow of considerable rise and fall in the boat without damage, and a stream of water such as would be maintained by a pump as above described would be more effectual than that from propellers as a large portion of their force would be lost in driving water which would not act directly on the sand. Another great advantage would be that all the working machinery would be inboard and easily get-at-able.

A vessel such as described above would be able not only to move itself by hydraulic propulsion (see Vol 77 page 1) but to act as a tug in case of sailing vessels.

There is I believe no reason to doubt the efficiency of sluicing as given in the papers above mentioned. I have had very great experience of the action of streams of water on sand and mud whilst working the pumps I have used for years in the Travancore and Cochin paddy fields, and I feel very confident that such a Sluicer Dredger as I contemplate would give an additional depth of 6 to 7 feet on this Bar at a very reasonable cost, the tide itself being made to do all the carriage.

I append a skeleton sketch of the proposed Sluicer and

a Section of the Bar derived from the latest Chart

I have the honor to be
Sir,
your most obedient Servant

Geo. Brunton M. Inst C.E.

Cochin
21st February 1888.

SUPDG ENGINEER'S OFFICE
No. 77 m
23 FEB. 88
P. W. D.
FOURTH CIRCLE

Extract. Cochin Chamber of Commerce address to H E the Govern

Mr George Brunton M. I. C. E. our Chairman has brought to the notice of the Chamber a method whereby 'bars' such as the one we have to contend with, are removed and made navigable, in an apparently easy manner

The method suggested by Mr Brunton was designed some years ago by a Mr J. J Van Anchoten of Rotterdam, and called by the inventor a propeller dredger

The following description of this dredger is taken from the Minutes of Proceedings of the Institution of Civil Engineers Vol LVIII page 145

"It (propeller dredger) consisted of an ordinary strong craft a 12 HP portable engine and a pair of trussed beams, one on each side of the craft, carrying steel shafts and suitable bearings for them: These beams were hung from the side of the craft, so that they could be lifted by tackles and lowered to any depth required. The lower ends of the shafts were fitted with ordinary propellers, about 3 feet 6 inches in diameter, and the upper ends with bevil wheels to which power was transmitted from the engine fixed in the craft to a cross shaft driven by a belt from the fly wheel. This Machinery was tested several times in the river Maas, and in April 1876 when he was present the craft was steamed into position by its own propellers against the current. The depth of water being then about 13 feet over the shoal, with deep water all round. The propellers were lowered until they nearly reached the top of the shoal and work was commenced. The engine made ninety six revolutions and the propellers about one hundred and fifty six revolutions per minute. The craft being anchored in such a manner that it could be kept straight to its work and warped as required to keep on the higher part of the shoal. It soon became apparent that a large quantity of material was set in motion by the revolutions of the propellers, and after about forty minutes work the engine was stopped and soundings taken. It was then ascertained that the shoal had been lowered about one yard in depth for a length of 150 yards and a width of 8 yards

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"appliances which could be worked almost continuously irrespe
"of variations in the depth of water."
which the Chamber give in extenso as it will then be more
simple to compare it with the requirements of this port.

Now the bar at the entrance to the Cochin Harbour is abo
960 yards / 2880 feet broad, the water varies in depth of at least 22 feet
and with such an apparatus as the propeller dredger the Chamb
does not see that there would be any difficulty in attaining
this, and what is more at a greatly reduced cost when
compared with other schemes

The Chamber is unable to state what the actual outlay
would be. but if your Excellency will give the scheme you
support. Estimates will be made. It may be worth mentioning
the whole work of construction and maintenance could be
undertaken by Mr Brunton M. I C E.

E.1
PW 1854
83

ENGINEER'S OFFICE
2/77 M.
27 FEB 83

Enclosures 1–3 of a letter No. 64/W dated 23rd February 1888 from the Supdg. Engineer 4th circle.

Letter of Mr. Brunton with a sketch and and extract from the address of the Cochin Chamber of Commerce

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14

Mr. Brunton's scheme for improving Cochin Harbour, by deepening the Bar.

Before considering the scheme, it is advisable to refer to G.O. No 2943 M of 27th Decr. 1880 with which is printed a report on the Cochin Harbour by the late Capt Taylor, dated 16th Decr 1880 No 11,132 in which he states (para 4) "independently of the bar obstruction, more than a sea mile of about 18 feet of water has to be approached and passed over from the open sea with its heavy ground swell" and further (para 5) "Now the least depth that would justify a large ship in approaching the Coast and making a narrow harbour mouth is I consider 5 fathoms or 30 feet, and I know no instance where so small an allowance even as that obtains at present. The removal of the bar which is only from 2 to 4 feet less than the entire passage would not remedy this existing defect. The Cochin Chamber of Commerce put the present depth on the bar at 16 feet, but I have known it 14."

This view was confirmed by General (then Colonel) Sankey by when in company with Capt. Tryon he visited Cochin in 1881, and reported upon the proposals to improve the Harbour; for in the joint report by these officers which is printed with G.O. No 911 W of 4th April 1881 it is clearly shown that in order to provide a channel 30 feet deep from the Harbour with the same depth of water, it would be necessary to construct two long breakwaters, and although it was not admitted that these works would be successful in forming a first class harbour, the evidence is clear that the mere removal of the bar will not effect the objects desired.

Turning to Mr Brunton's scheme it will be seen that he proposes to deal only with the bar, which he puts at 460 yards broad with a minimum depth on it of 14 feet, through which he considers a channel 200 feet wide could be maintained by sluicing – the depth of this channel could of course not exceed that of the open sea outside the bar, which may be admitted to be 20 or 21 feet, as that is the depth which Mr Brunton proposes to maintain on the bar.

There is no doubt that the depth of water on the present bar could be increased if the sand is disturbed by raking or sluicing, so that the ebb tides can carry it seawards, but it is open to question whether another bar would not form further out; even however if the work proposed was successful in keeping open a channel 21 feet deep through the bar, the harbour would still be unapproachable for large vessels –

It is possible however that large sailing ships which now are unable to cross the bar with full cargoes, would make more use of the harbour, if the proposed scheme is a success, and in order to arrive at an opinion on this point, Mr Brunton should be asked for approximate estimates of the precise cost & annual expenditure involved in his proposals; and also for a

statement of the additional
tonnage that is now prevented
from making use of the
harbour, solely on account
of the shallow water on the
bar.

In this connection it may be
remarked that sailing
ships could not make an
entrance 200 feet wide
without the assistance of
a tug; and the proposal
to employ the same vessel
as a tug and dredger
seems altogether untenable.

As regards "hydraulic propulsion"
it is not in the least likely
that the views of Mr Brunton
will be accepted by the
Secy. of State, and if the
vessels are designed &
provided by [illegible] either in
England or India, it would
be far better that the tug,
at all events, should in
no way be an experiment.

3.3.88

C No 1854

G.O.

The Governor in Council
[illegible] direct that the
Ch. E. and Consulting Architect
submit after careful enquiry
on Mr George Brunton's
[illegible]

It is to be remarked that
Mr Robertson in his Report
on Western Harbours dated 1871
considered that Cochin harbour
could be much improved by
the erection of 2 groynes
& one on each side of the
harbour 3000 and 2300 ft
in length and believed that
with the assistance of dredging
and [illegible] a depth of
20 to 21 ft [illegible] at [illegible]
always could be maintained.

That [illegible] the late [illegible]
Taylor in para 5 of his
report No ~~[illegible]~~ ~~[illegible]~~ 1113
dated 16 Dec 80 stated
that in his opinion a
depth of 30 ft was necessary
to facilitate a large ship
to [illegible] reaching a moorings
[illegible] [illegible] [illegible] Cochin

Also that it appears
from para 15 of the
Report on Cochin harbour
by Col. Sankey & Capt.
Taylor printed in G.O.
No 911 that this depth
of 30 ft was considered
necessary to enable Cochin
to be 1st class harbour and
that this opinion was
also that of the Chamber
of Commerce at that
Port.

Mr Bristow's estimate
of ~~considerably~~ [illegible]
and cost of probably
unsuccessful would give
only 22 ft depth of
water. The Ch. E.
ask Bristow [illegible]
as to the extent which
~~give their opinion~~ which
whether they consider
it likely that a depth
of 22 ft of water could
be obtained and maintained
[illegible] and at a reasonable
cost with Mr Bristow's
proposed system of training
walls & as whether this
depth would be sufficient
for the steamers that
[illegible] that would be
likely to come here

Mr Parkes in his report
dated 11th March 81 printed
in the same G.O. considered
that a depth of 27 ft
was the least that could
be allowed

of the Cochin Residency

7/3/88

Public Works

PUBLIC WORKS DEPARTMENT.

No. 804 W. 18 7

PROCEEDINGS OF THE MADRAS GOVERNMENT.

Under date the 12th March/ ~~UNDER date the~~

READ the following

Letter from the Superintending Engineer IV Circle. } M. E. No. 64 - E. W. of 23rd February 1888.

C.

PPH
9 March

The Governor-in-Council desires ~~directs~~ that the Chief Engineer and Master Attendant will submit a joint report, after careful enquiry on the spot, upon Mr. George Brunton's proposals.

It is remarked that Mr. Robertson in his reports on Indian Harbours, dated 1871 came to the conclusions ~~considered~~ (1) that the Cochin Harbour would be much improved by the erection of groynes one on each side of the Harbour, 3,000 and 2300 feet in length, and ~~believed~~ (2) that with the assistance of dredging and raking a depth of 20 to 25 feet at low springs could be maintained.

That

~~That~~ The late Captain Taylor, in para 5 of his report No. 11132, dated 16th December 1880, stated that in his opinion, a depth of 30 feet was necessary to justify a large ship in making a narrow harbour mouth like Cochin ~~Also~~ ~~that~~ And it appears from para 15 of the report on Cochin Harbour by Colonel Sankey and Capt. Taylor printed with ~~in~~ G. O. No. 911 of 4 April 1881, that this minimum depth of 30 feet was ~~admitted~~ by the Chamber of Commerce to be ~~deemed~~ necessary to make Cochin a first class harbour available for large ships. ~~and that this opinion was that of the Chamber of Commerce at that Port.~~

Mr. Parkes in his report dated 11th March 1881, printed with ~~in~~ the same G. O., considered that a depth of 27 feet was the least that would be allowed.

Mr. Brunton's proposals, if carried out and if perfectly successful, would give only 22 feet depth of water. The Chief Engineer and Master Attendant ~~in this report~~ should

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should state whether they consider it likely that a depth of 22 feet of water could be obtained and maintained at a reasonable cost with Mr. Brunton's proposed system of sluicing, and if so, whether this depth would be sufficient for the classes of steamers and ships ~~frequenting~~ Cochin, ~~and~~ or would ~~that would be likely to make~~ prove of such advantage as to justify ~~use of the Cochin Harbour.~~ the estimated expenditure

WCW
8.3.88

8/3/88

To.

The Chief Engineer P. W. D.
" Suptg: Engineer IV Circle.
" Marine Department.

20

Cw. 8.iii.88

Govt. of (1888) Madras

PUBLIC WORKS.

13/3

Dated

Recd. Encl.

G.O. 12 Mch 1888 No. 804 W.

Cochin Harbour

=

Directing the Chief Engineer and Master Attendant to submit a ~~joint~~ joint report ~~on~~ after careful enquiry on the spot, in regard to certain proposals of Mr Brunton for increasing the depth of water on the bar at the entrance of the

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70/5

12/3