

(1) Number of pages _____

(2) Date of repair _____

(3) Initials of the Referencer _____

MADRAS RECORD OFFICE.

Government of Madras.

Public Works DEPARTMENT.

G.O. No.	1212 - 13	Press
		Mis
22-25		
Dated	1 . 5	1871 .

Not to be folded or roughly handled

of the Rooshkocina, Yerralwa, and Tamrapoorney, or in cases like that of the Perryaur, where, owing to the unhealthiness of the locality during the months of March and June inclusive, the ordinary daily gaugings cannot be taken.

2. Six instruments could be usefully applied at once, one of them with tube and driving wheel adapted for a depth of 40 feet.

3. After having practically tested the value of the instrument it may be brought into general use for the several purposes noted by Colonel Sankey in his memorandum; for many of those purposes a far less costly instrument would do, and it could be made up in this country.

4. The English cost of a 30-feet instrument is £40; in the Madras Public Works Workshops the cost would be 600 Rupees.

Fort St George, (Signed) J. C. RYVES, Captain, R E,
17th April 1871. Acting Chief Engineer for Irrigation.

No. 24. ORDER THEREON, 1st May 1871, No. 1,212.

IRRIGATION, No. 3.

ORDERED that the following letter be sent —

(Here enter No. 1,213, dated 1st May 1871.)

(True Extract.)

(Signed) J. CARPENDALE, Colonel, R E,
Secretary to Government.

PUBLIC WORKS DEPARTMENT,
FORT ST. GEORGE, 1st May 1871.

No. 25.

No. 1,213

To

THE SECRETARY TO THE GOVERNMENT OF INDIA,
PUBLIC WORKS DEPARTMENT.

IRRIGATION, No. 4.

SIR,—With reference to the Proceedings of the Government of India under date the 21st February 1871, No.

—71I, forwarding a memorandum, accompanied by an illustrative design, by Colonel Sankey on a self-registering hydrometer devised by him for rivers and de-ways, and requesting to be informed whether the instrument is likely to prove useful, and if so, how many will be required, I am directed herewith to forward a Note by the Acting Chief Engineer for Irrigation, in which that officer reports that hydrometers of the kind referred to can be advantageously employed in this Presidency, and that six can be immediately brought into use. Captain Ryves is, however, of opinion that a far less costly instrument, which could be made up in this country, should answer for many of the purposes indicated by Colonel Sankey.

I have the honour to be,

Sir,

Your most obedient servant,

Colonel, R.E.,

Secretary to Government.

Case
containing
Supplies 5-4-73

MEMORANDUM

REQUESTED for reference the under-mentioned papers

Lo. 1212 - 1 May 71
Letter to Govt of India: 1213. 1 May 71.
with 4 plans enclosed.

Cdr. Lankey, Self activity,
river gauge.

OFFICE OF THE CHIEF
ENGR. FOR IRRIGATION,
P. W. Department,

5-6 1873.)

To
The Registrar of the

J. M. Hawkins

Head Clerk.

W. C. C. C. C. C.

10 3
for Inspector

No 95

Note by the Acting Chief Engineer for Irrigation

Colonel Sankeys Self-Registering Hydrometer would be useful in many situations in the Presidency—for instance in obtaining complete data regarding water supply available for storage in new reservoirs such as those proposed in the valleys of the Panchkora, Genatalwa and Tambapurney, or in cases like that of the Perypau where owing to the unhealthiness of the locality during the months March and June inclusive the ordinary daily gaugings cannot be taken.

2. Six instruments could be usefully applied at once, one of them with tube and driving wheel adapted for a depth of 40 feet.
3. After having practically tested the value

value of the Instrument it may be brought
into general use for the several purposes noted
by Colonel Sankey in his Memorandum.
For many of those purposes a far less costly
instrument would do and it could be made
up in this country

4. The English cost of a 30 feet instru-
ment is £40; in the Madras Public
Works Workshops the cost would be 60 Rupees

Fort St George, A. R. S. Captain C. B.
17 April 71. Chief Engineer for Irrigation

The Secretary, Govt.
P. M. S.

Nos 63—71 I.
GOVERNMENT OF INDIA
PUBLIC WORKS DEPARTMENT.
IRRIGATION

FORT WILLIAM, FEBRUARY 21, 1871.

Lieut.-Col. Sankey's self-registering hydrometer for rivers and tide-ways.

Read the following Despatch —

No 110, dated 25th December, 1870

From—The Secretary of State for India,
To—The Government of India

Transmitted herewith is a Memorandum, accompanied by illustrative
design, by Lieutenant-Colonel Sankey, R. E., on a self-registering hydro-
meter devised by him for rivers and tide-ways.

2. It has been ascertained that specimen instruments in accordance
with the design can be manufactured at a cost of £40 each, and I shall
be glad to be informed if you think it desirable that one or more should
be procured and sent either to your Government or to Colonel Sankey
at Bangalore.

Dated 9th November, 1869

Memo by LIEUT.-COL. R. H. SANKEY, R. E., on a self-registering hydrometer for rivers and
tide-ways

In order to have a perfectly reliable record from which to deduce the discharge over a
lengthened period of any stream, the following conditions must be insured —

1st—The agency employed for such record must be perfectly trustworthy and
intelligent

2nd.—The register post or hydrometer must be placed in that portion of a stream
which is freest from all abnormal action of currents, either during high or low
water.

3rd.—The registration must be carried on as continuously as possible both by day and
night.

In India particularly, it is almost hopeless to fulfil the first of these conditions as the
slightest relaxation of the supervising authority is safe to lead to the return being "cooked"
or to blundering equally injurious. This has also a direct bearing on the second of the above
conditions, as it seldom happens that the straightest or best reach of a river is to be found in
the immediate neighbourhood of a town or village, and the person charged with keeping the
register has thus to be placed in a more or less isolated position away from constant super-
vision

The necessity of insisting on the third condition being fulfilled is superfluous, yet by the
systems hitherto believed to have been followed, such would have been impracticable. Setting
aside other difficulties it would be impracticable to expect a man to note accurately the
readings of a register post, even every two or three hours during stormy nights, and during
dark ones it would be simply impossible.

So far as I have myself been able to investigate the matter, the data on which the
regime of the most important rivers have been determined will be found on careful examination
to rest on very defective registration. Even in the well-known work of Elia Lombardini
"Sullo stato idrografico naturale e artificiale della Lombardia" the annual discharges of the
Po and its feeders are in great measure hypothetical. In fact, I know of no river or canal for
which a perfectly continuous or reliable record has been kept

The attention of all interested in the well-being of India being now so much directed
to the extension of irrigation, it is almost unnecessary to urge the extreme desirability of
ascertaining as soon as may be the regime of all streams either already put under contribution,
or likely to be so in future. In fact, without a correct knowledge of this nature, Engineers
must more or less work in the dark. Hence the necessity for a self-registering hydrometer

The uses of such an instrument need not, however, be confined solely to the gauging of rivers. For all large irrigation canals and their branches, it would be most desirable to keep up a continuous register of the actual quantities of water delivered at all times for irrigation. In times of drought, such a register must especially be useful, and still more so during floods which so frequently, and particularly in Southern India, prove disastrous to canals.

Among other uses, a self-acting register placed near the head of a canal would act as a "tell-tale" on the persons engaged in their management of the regulating sluice shutters, and thus ensure responsibility being brought home in case of injury to the canal arising from their neglect.

Again, in regard to large irrigation reservoirs, a continuous register of the depths of water at all times would prove of the utmost utility, both as regards the immediate objects of the work, as also with a view to the collection of data on matters which though affecting materially the economy of irrigation, little of an accurate nature is at present known. Nothing for instance, is as yet determined with sufficient precision as to the losses due to evaporation, leakage, &c, in such works, and an analysis of these matters can only be undertaken after a careful registration of the afflux and efflux of water and the corresponding condition of the reservoir. In the present state of knowledge it is almost impossible to determine satisfactorily the height to be given to a reservoir embankment, taking fully into account on one side the accessions of water from all causes, and on the other, the draughts for irrigation and losses from evaporation, leakage, &c.

As the accompanying sketches serve to illustrate the nature of the hydrometer I propose, a few words will suffice in conclusion. The instrument consists of a sufficiently long iron tube secured perpendicularly to the river bottom by a screw pile or otherwise, and with a float rising or falling inside it according to the level of the water, thus giving motion to the mechanism for recording continuously the movements. The mechanism only requires to be "set" once a month. The sketches give an example of an hydrometer to answer for a river whose maximum flood-rise is as much as 30 feet. Other sizes might be adopted for special cases, but by simply shortening the tube and float line, the one given would answer nearly all purposes. Where facilities exist for setting the mechanism once each week, an eight-day clock might, of course, be substituted, and the horizontal scale of the register paper increased four-fold. It is almost needless to observe that this instrument can be made to meet all the conditions laid down as indispensable at the commencement of this memorandum.

ORDER.—Ordered, that a copy of this Despatch and of its enclosure, together with a copy of the illustrative design referred to, be forwarded to the Local Governments and Administrations marginally noted, with a request that it may be reported to the Government of India whether the machine is likely to prove useful, and how many will be required.

R. E. S. S. S.

Colonel, R. E.,
Offg. Depy. Secy. to the Govt. of India.

No 632

To.
The Secretary to the Government of Madras
Public Works Department.

The Day Chief

Business for Immigration
To the Secretary of
Port & Pilots.

Enders

Photo in Vol. 4 Col. 1.
Sandberg's self-reporting
hydrometer for zinc and
lute-very.

Ad 1212-1213 - T. Hurst

Die 23

6220486/11Q.24.

The sub. Supd. of N. Rivers & Canals
No. 79 - 28 March/71

1871
No. 960

GOVERNMENT OF INDIA
PUBLIC WORKS DEPARTMENT.
IRRIGATION.

To
[Signature]

Nos. 63-71 I.

Dated February 21, 1871

Received 2 March/71.

Enclosed 4 Drawings [unclear]

3.

PM 1794/71

[Faint handwritten notes and signatures]

Forwards papers regarding a self-regis-
tering hydrometer by Lieutenant-Colonel
Sankey for rivers and tide-ways, with a
request that the Government of India
may be informed whether the machine is
likely to prove useful, and the number that
will be required

P W D Press-23 2 71-10

No. 1212-1213-10 May/71

Ob 22

c. 22nd April 1871 (Q. 24)

Public Works Department
No. 1212
Proceedings of the Madras Government
Under date 1st April 1871

Read the following
The Government of India - J. E. N. 63-71 I. of 21 Feb/71
The As. Eng. for Irrigation - 95-71 of 17 April 1871

Ordered that the
following letter be sent.
[unclear]
The Secy. to the Govt.
of India P. W. D.
[unclear]
With reference to the
Proceedings of the Govt.
of India under date
the 21st February 1871 -
No. 63-71 I. - forwarding
a memo. accompanied
by an illustrative design
by Col. Sankey on a self-
registering hydrometer
designed by him for rivers
and

and tide gauge, and re-
quoting to be informed
whether the instrument
is likely to prove useful
and if so, how many will
be required, I am directed
herewith to forward a
note by the Acting Chief
Engineer for Irrigation in
which that officer reports
that hydrometers of the
kind referred to can be
advantageously employed
in this Presidency and
that six can be imme-
diately brought into use.
Captain St. John is
however of opinion that
a far less costly instru-
ment which could be
made up in this country
would answer for many
of

of the purposes indicated
by Colonel Saakey.

10

Wb

Despatch 3/5/71 with a copy
of the note by the Chief Eng^r

21

Handwritten text in the top left corner, possibly a date or reference number.

Handwritten text in the bottom left corner, possibly a signature or name.

Cost of 1871 Madras.

PUBLIC WORKS.

The Secretary to the Govt. of
India

Further Procs 15th of 11

Dept

For

1-5
Four Plans
of May 1871 A-1212-1213.

No. 22 @ 24125

[Faint, mostly illegible handwritten text, possibly a list or description of items.]