

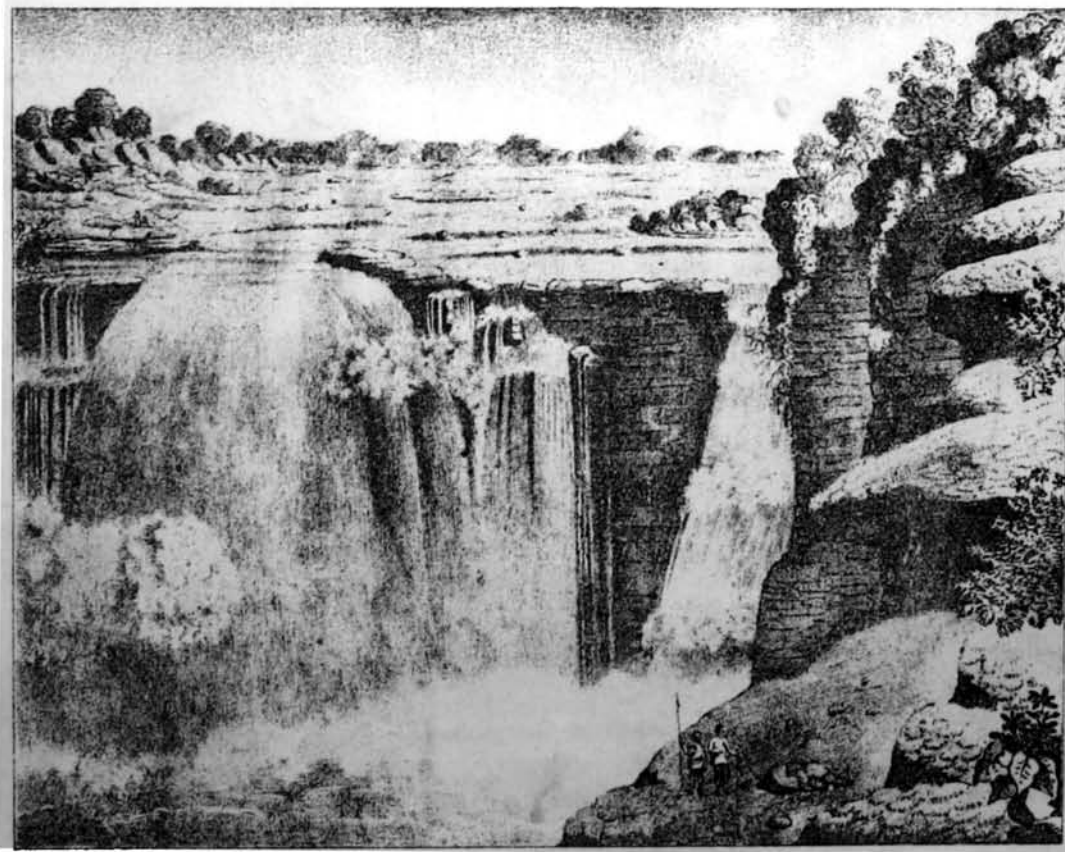
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A FALL OF THE RIVER TONSE IN REMWAN.
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HYDRO-ELECTRIC SURVEY OF INDIA.

VOLUME II.

Second Report on the Water Power Resources of India.

Ascertained during the Season
1919-1920

By F. E. BULL,

Chief Engineer, Hydro-Electric Survey of India,

AND

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Electrical Adviser, Government of India.



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"ADDENDUM TO ELEMENTARY NOTE," FROM THE PRELIMINARY REPORT.

Useful Hydraulic Data (in round numbers generally).

Flow.

1 cusec flow = 1 cubic foot per second = 62.4 lbs. per second,
 = 60 cubic feet per minute = 3,744 lbs. per minute.
 = 374 gallons per minute,
 = 3,600 cubic feet per hour,
 = 86,400 cubic feet per day,
 = 2.6 million cubic feet per month,
 = 31½ million cubic feet per year.

Gallons per minute = cusecs × 374

Cusecs = $\frac{\text{Gallons per minute}}{374}$

Regulating Storage.

100,000 cubic feet stored will give 1.16 cusecs for 24 hours

"	"	"	"	"	2¼	"	"	12	"
"	"	"	"	"	4½	"	"	6	"
"	"	"	"	"	9¼	"	"	3	"
"	"	"	"	"	27¾	"	"	1	hour

Main storage.

31½ million cubic feet stored is equivalent to 1 cusec for a year; but owing to evaporation and percolation more storage would actually be required. In round figures:—

1,000 million cubic feet

stored will give 30 cusecs continuously for a year..

"	"	"	40	"	"	"	9	months.
"	"	"	60	"	"	"	6	"
"	"	"	90	"	"	"	4	"
"	"	"	120	"	"	"	3	"

Reservoirs.

1 acre = 43,560 square feet.

1 acre of water 1 foot deep = 43,560 cubic feet.

= 1 acre foot.

1 square mile = 640 acres = 27.88 million square feet.

1 square mile of water 1 foot deep = 1 square mile foot,
 = 27.88 million cubic feet, which will (in practice) give a flow
 of about $\frac{3}{4}$ cusec for 12 months, $2\frac{1}{4}$ cusecs per 4 months or
 3 cusecs for 3 months.

Catchments.

1 inch of rain = 100 tons per acre or = 3,600 cubic feet per acre.
 = 1 cusec per acre per hour.
 = 64,000 tons or 2.33 million cubic feet per square
 mile.

In practice, however, only a percentage, and often a small percentage, will reach the reservoir ;

Power from flow.

On the practical basis assumed throughout this report

$$\frac{\text{Cubic feet flow} \times \text{head in feet}}{11} = \text{electrical horse power.}$$

If 15 is the divisor, the result is in kilowatts.

On small projects 12 and 16 may be used.

Power from storage.

(i) Regulating.
$$\frac{\text{Thousands cubic feet stored} \times \text{head in feet}}{42} = \text{e.h.p. hours.}$$

If the divisor is 56, the result is in kw. hours or B.O.T. units.

(ii) Main.
$$\frac{\text{Millions cubic feet stored} \times \text{head in feet}}{370} = \text{e.h.p. years.}$$

If the divisor is 500, the result is in kw. years.

Millions cubic feet \times head in feet \times 17 = B.O.T. units.

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