It may also be noted that the drainage factor for two days and three days is not much different from that of one day.

CONCLUSIONS

1. The study shows that modified Snyder's coefficients predict runoff reasonably accurately for surface drainage system design. The recommended C_t and C_p values are 0.30 and 0.55 respectively.
2. The design capacity of Marh-Chiniot drain was underestimated. The drain was over-spilled as a result of 24 hour rainfall storm of recurrence interval less than two years. For a 24 hour storm of three years frequency the recommended drainage factor is 6 cusecs/square mile.
3. Drainage factor for 48 and 72-hour storms is not much different from that of 24-hour storm. Hence 24-hour storm gives reasonable value of peak discharge for surface drainage system design.
4. There is a need to improve data collection for reliable drain design. Reasonable length of accurate record of rainfall and runoff would ensure better design of surface drainage system.

ACKNOWLEDGEMENT

This study is a part of the research which the junior author is conducting in partial fulfillment of the requirement for M.Phil degree in Water Resources Management at the Centre of Excellence in Water Resources Engineering. The study is being further improved on the advice of the senior author. Comprehensive description of this study will be given in the thesis.

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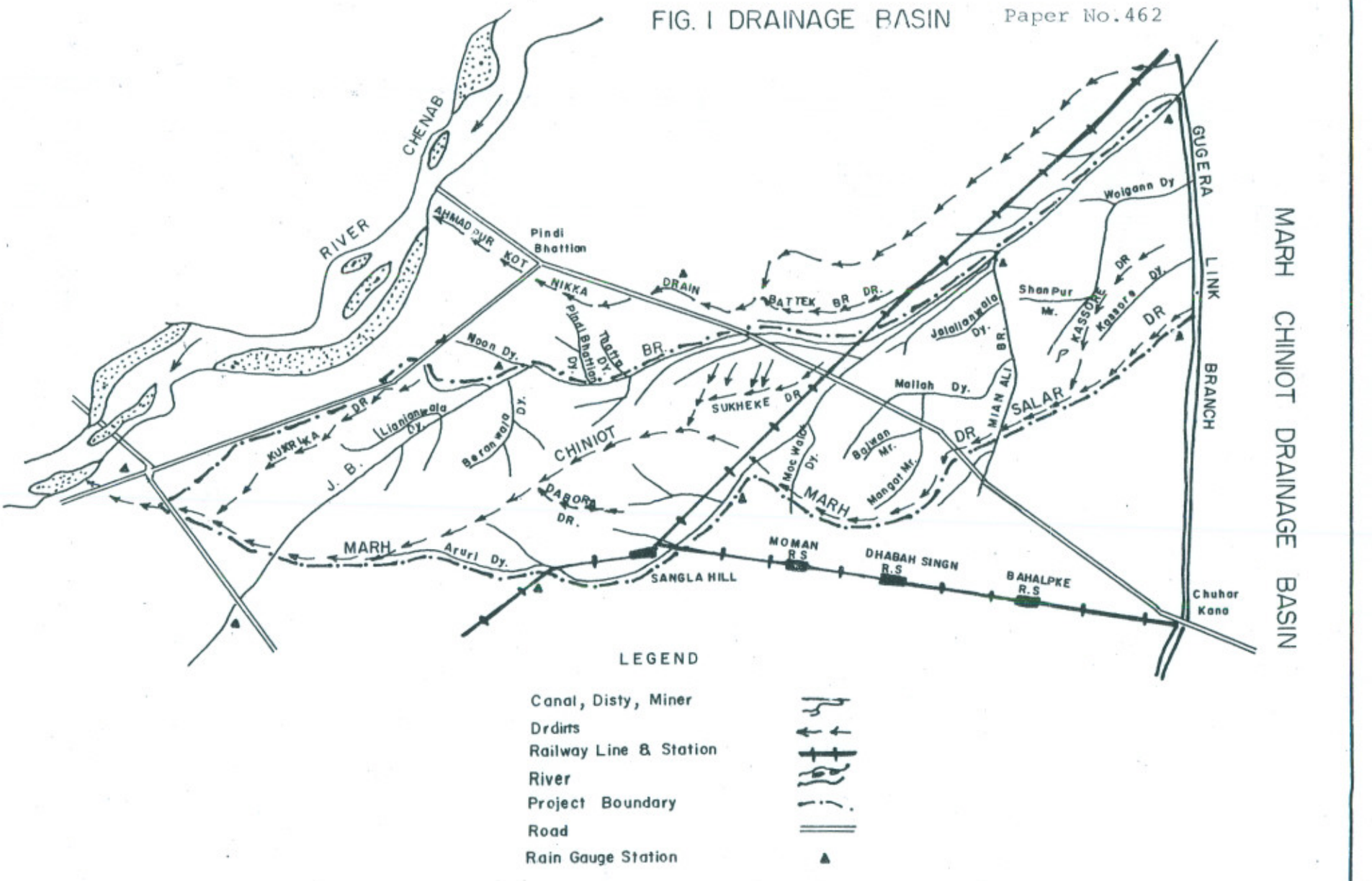
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FIG. I DRAINAGE BASIN

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LEGEND

- Canal, Disty, Miner
- Drdirts
- Railway Line & Station
- River
- Project Boundary
- Road
- Rain Gauge Station ▲

Drainage area 371 sq.mile Period 1964–80

FIG. 2 RAINFALL FREQUENCY ANALYSIS

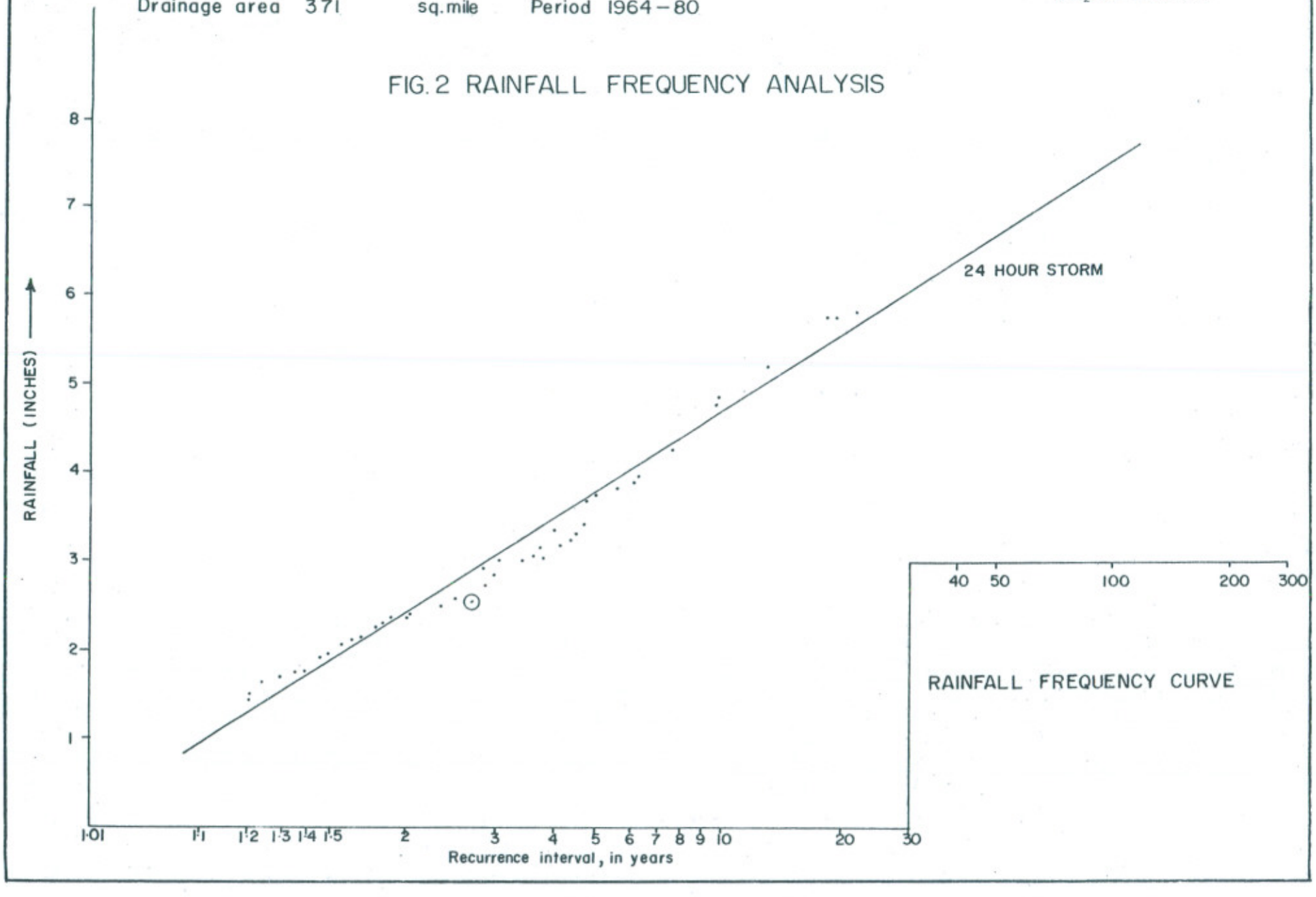
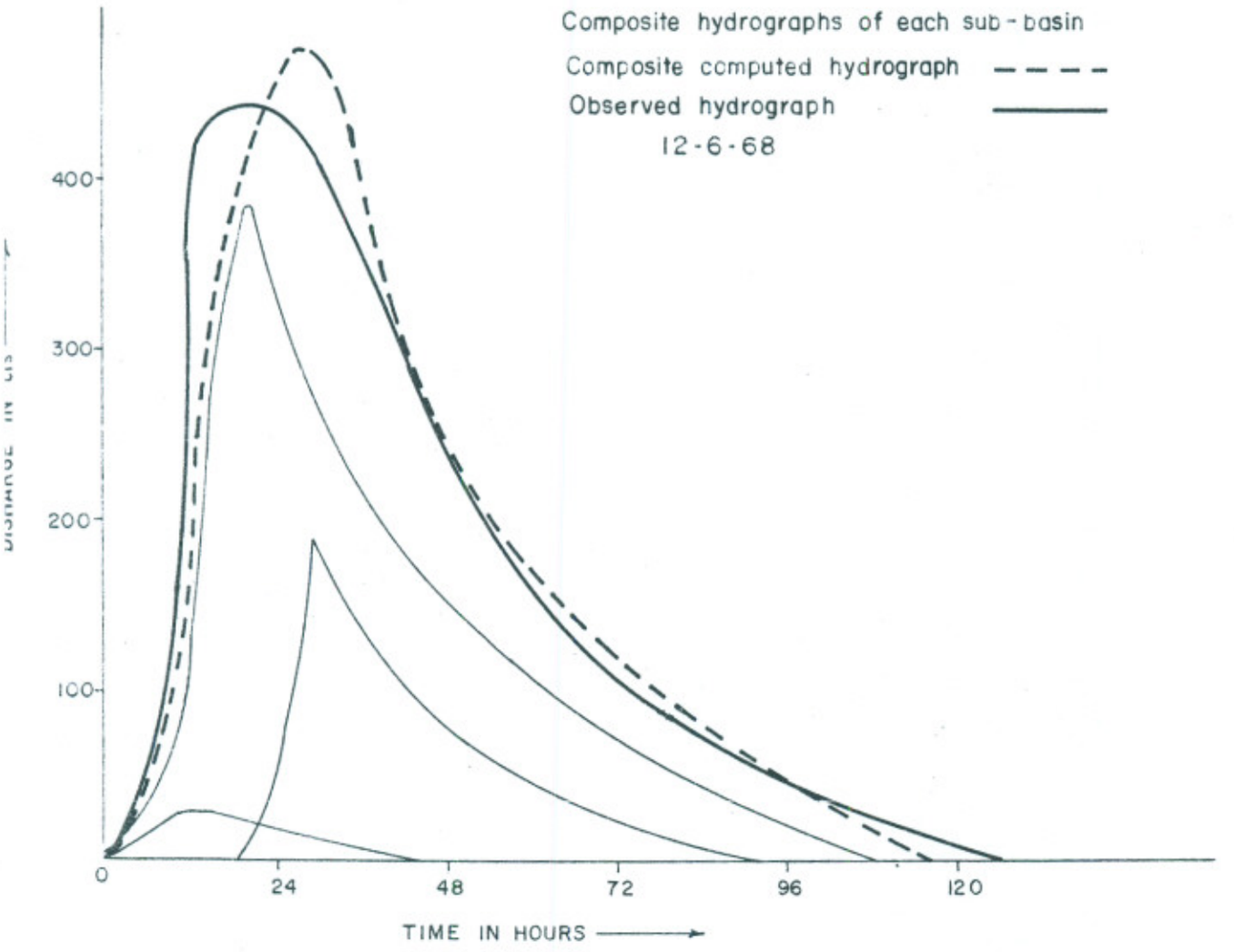
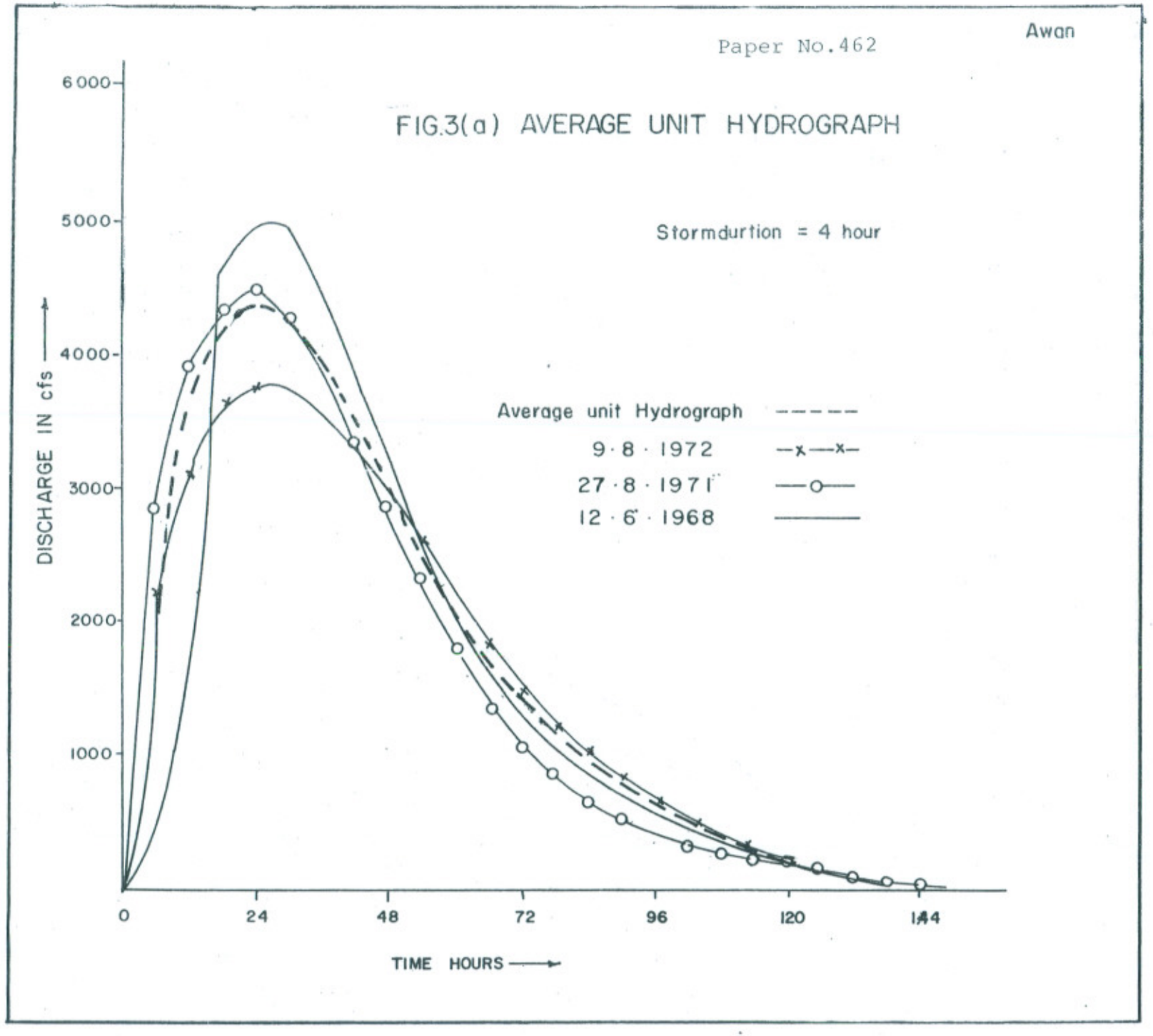


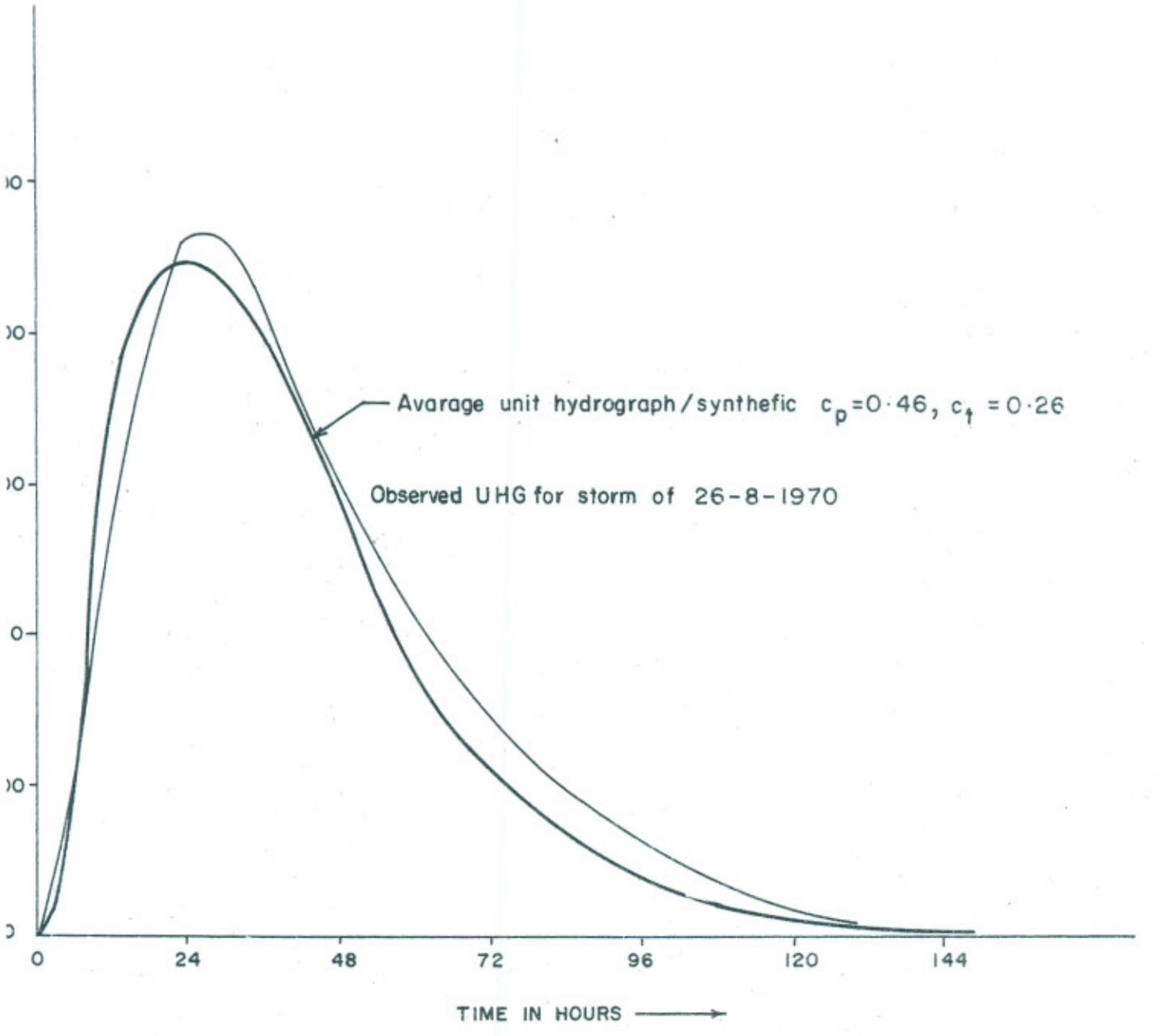
FIG.3 COMPARISON OF OBSERVED AND COMPUTED HYDROGRAPHS



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FIG.3(a) AVERAGE UNIT HYDROGRAPH
Stormdurtion = 4 hour
Average unit Hydrograph
9·8·1972
27·8·1971
12·6·1968
DISCHARGE IN cfs
TIME HOURS
6000
5000
4000
3000
2000
1000
0
24
48
72
96
120
144

IG. 3(b) COMPERASION OF SYNTHETIC AND OBSERVED UNIT HYDROGRAPHS



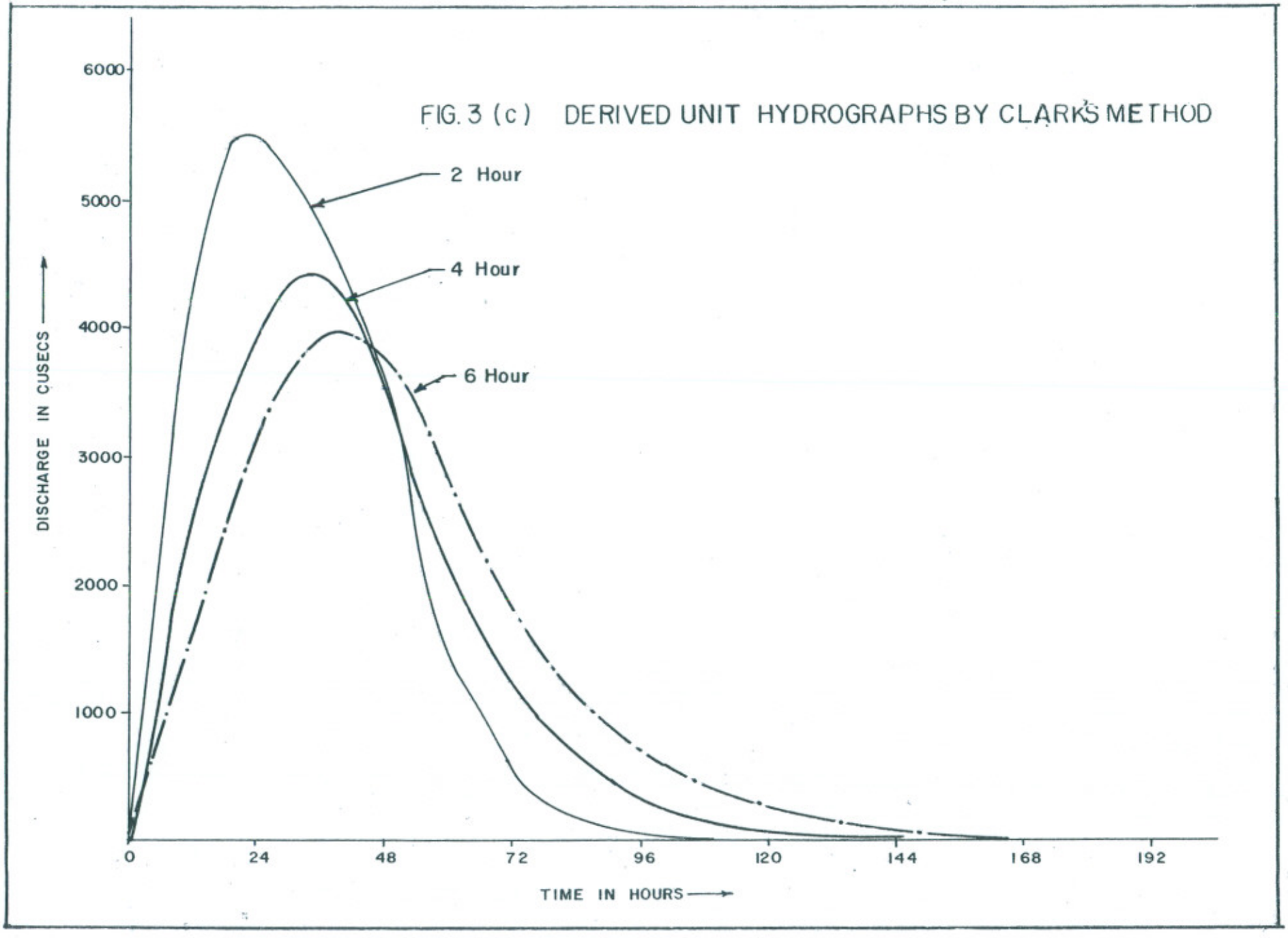

FIG. 3 (c) DERIVED UNIT HYDROGRAPHS BY CLARK'S METHOD
2 Hour
4 Hour
6 Hour
DISCHARGE IN CUSECS
6000
5000
4000
3000
2000
1000
0
24
48
72
96
120
144
168
192
TIME IN HOURS

FIG. 3(d) COMPUTED AND OBSERVED HYDROGRAPHS

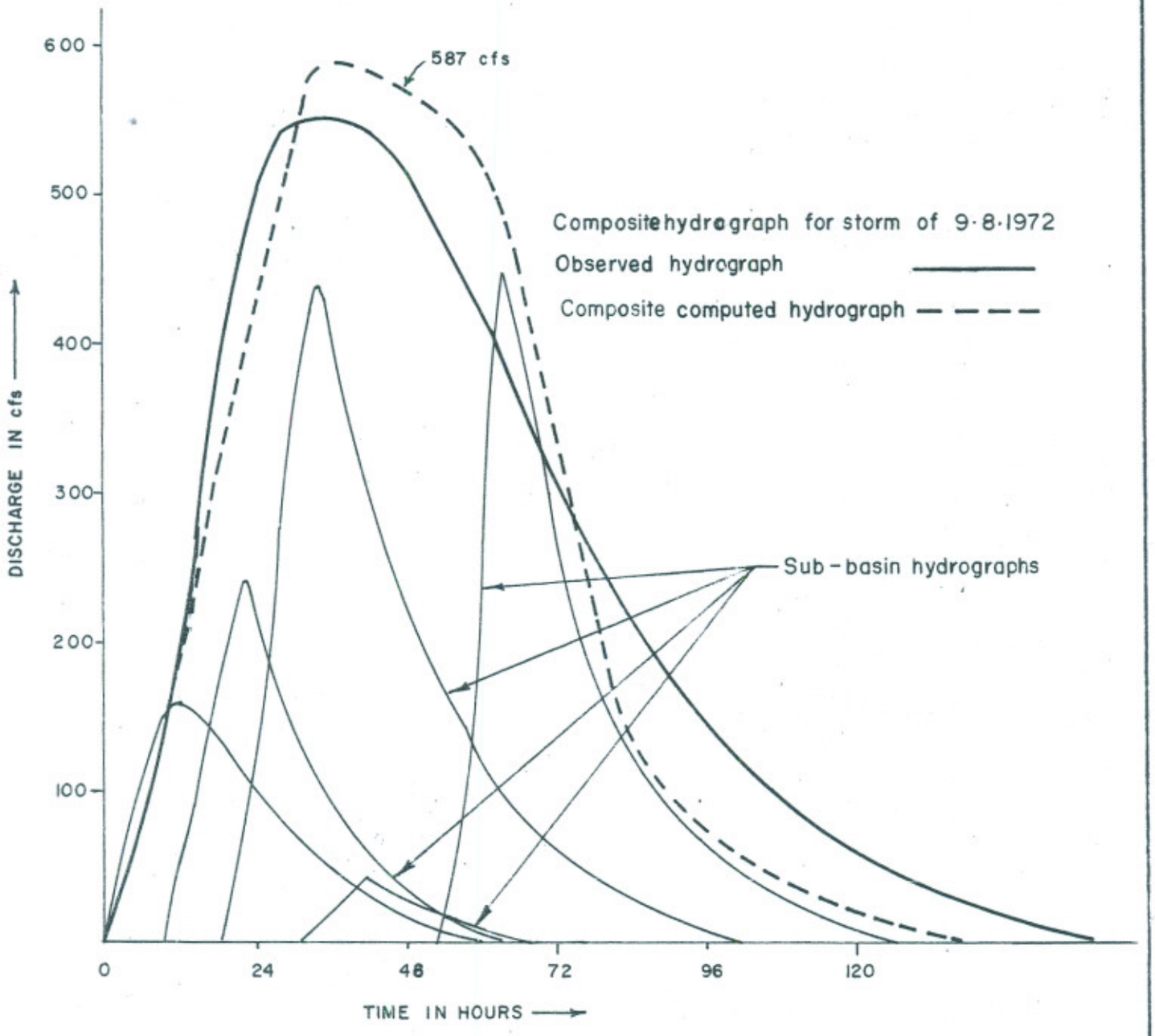


FIG. 4 COMPOSITE HYDROGRAPH FOR RETURN PERIOD OF 3 YEARS

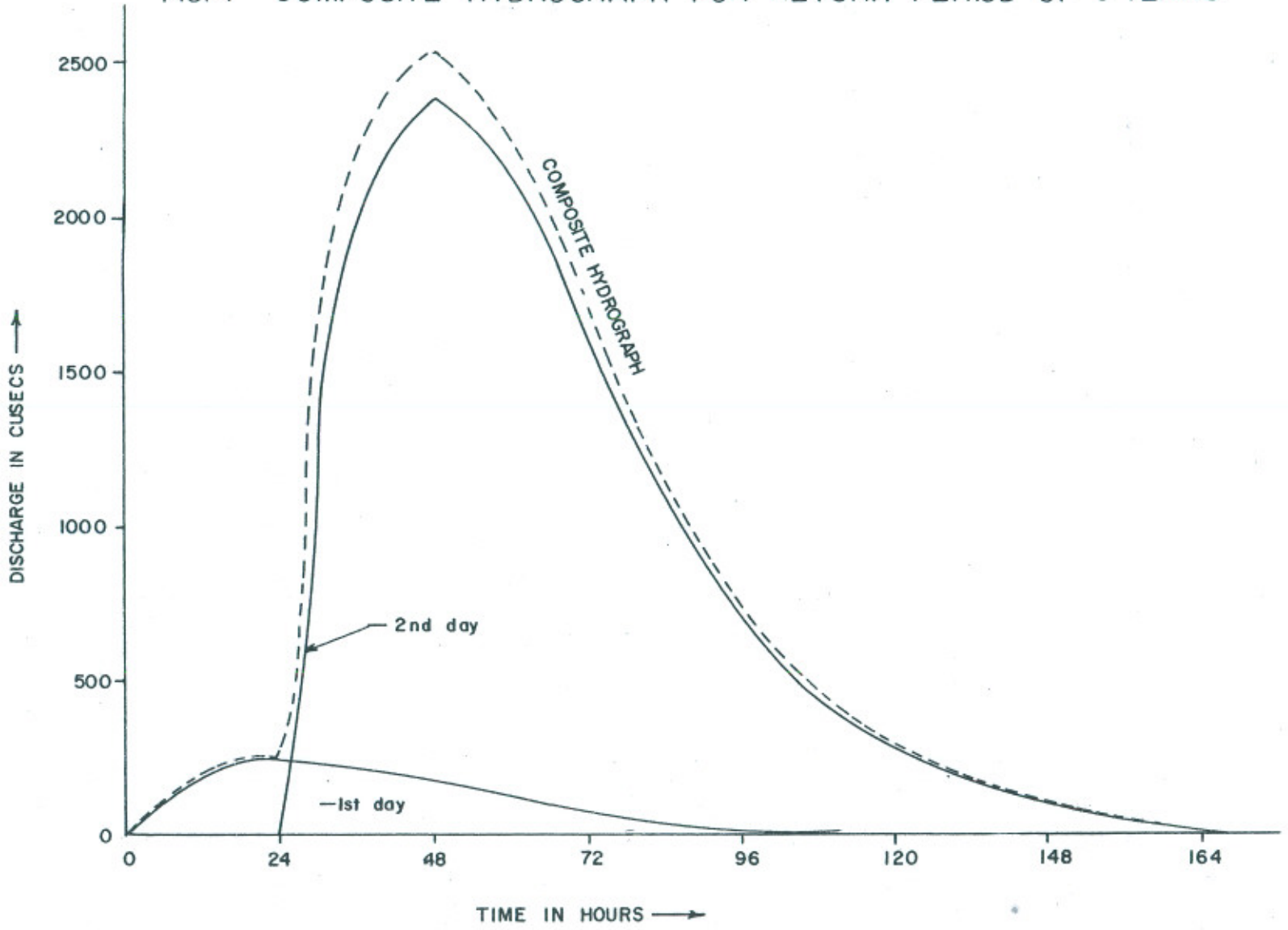


FIG. 4 (a) Paper No. 462

COMOPOSITE HYDROGRAPH FOR RETURN PERIOD OF 4 YEARS

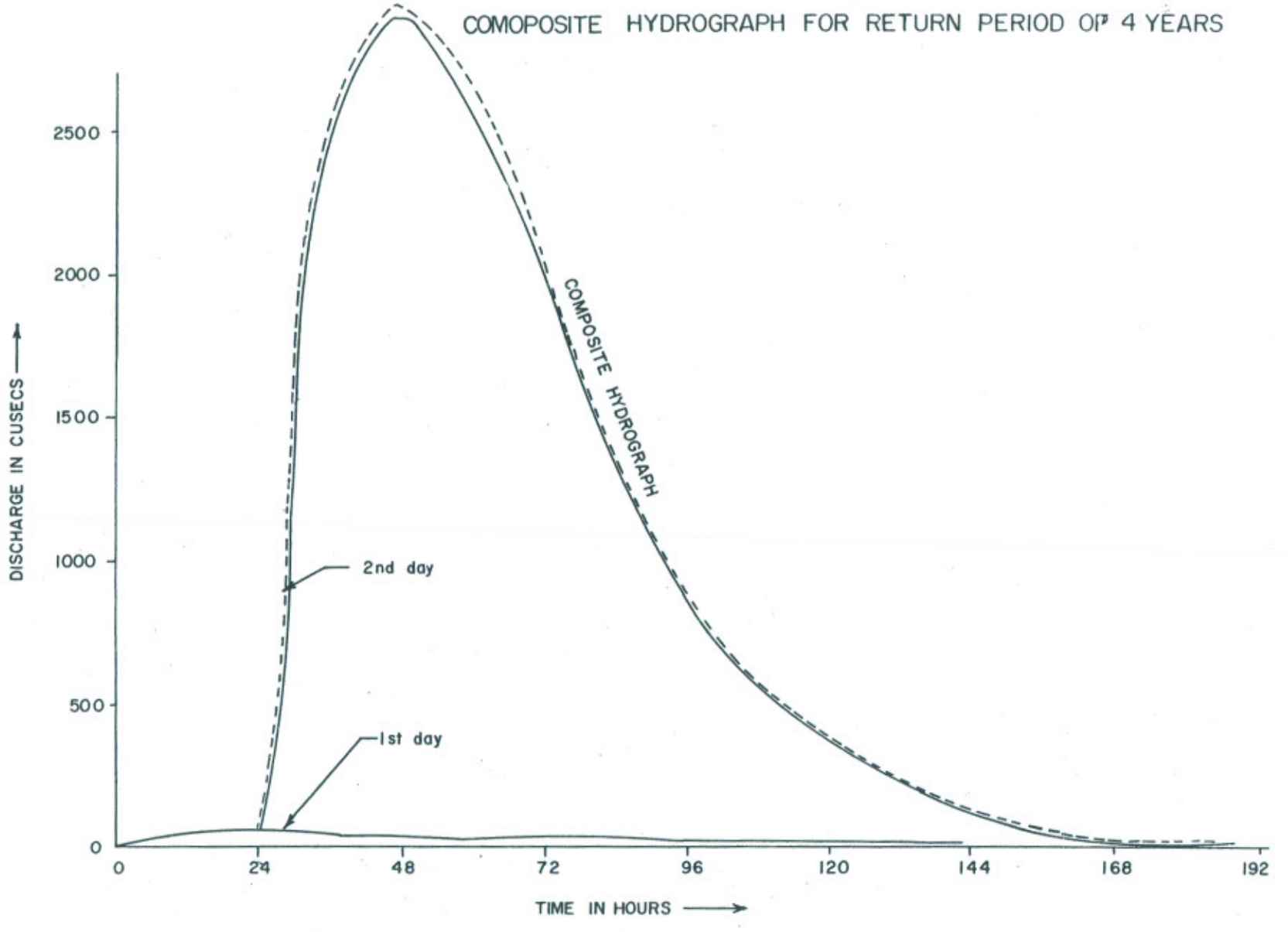


FIG. 4(b) COMPOSITE HYDROGRAPH FOR RETURN PERIOD OF 5 YEARS

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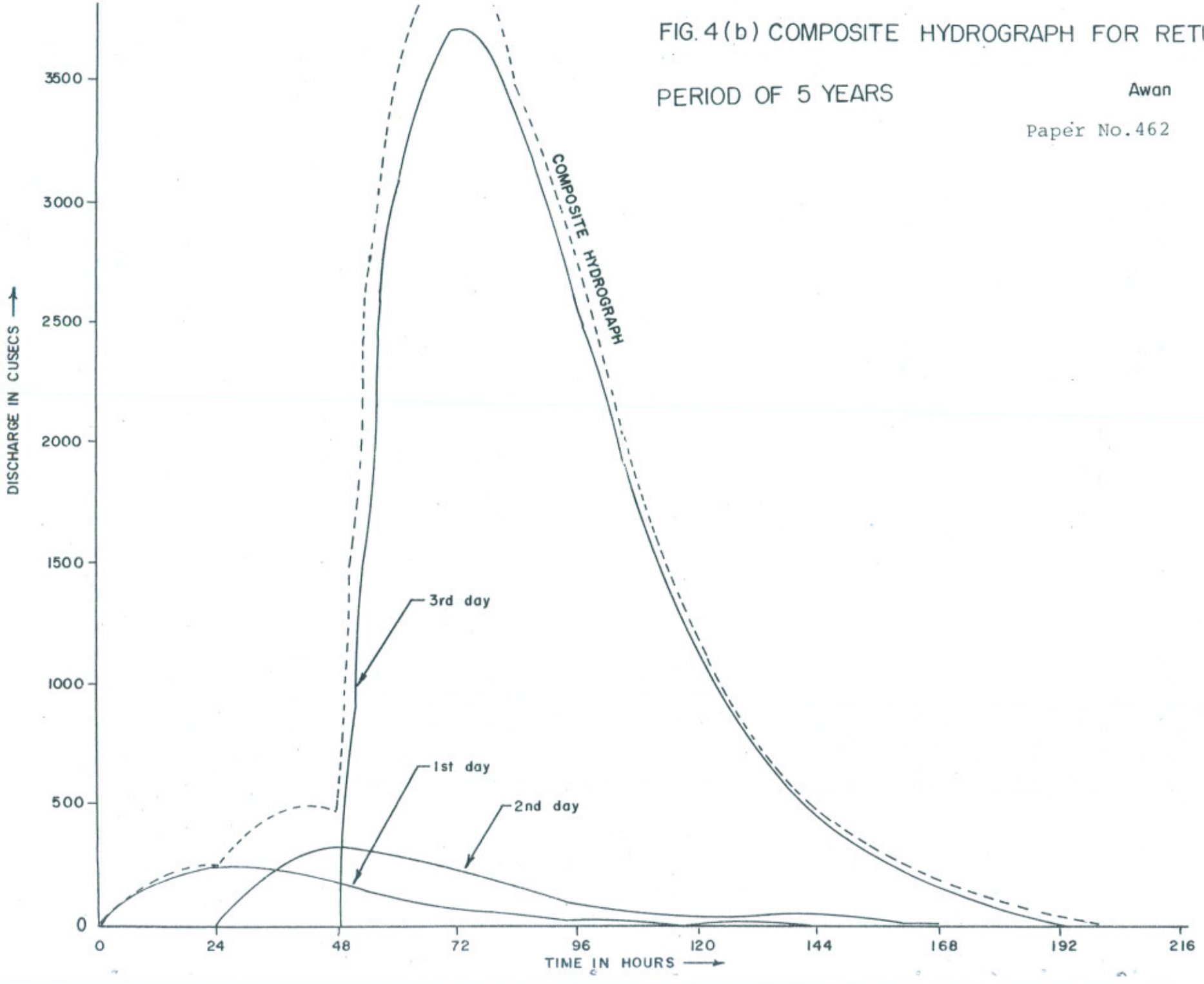
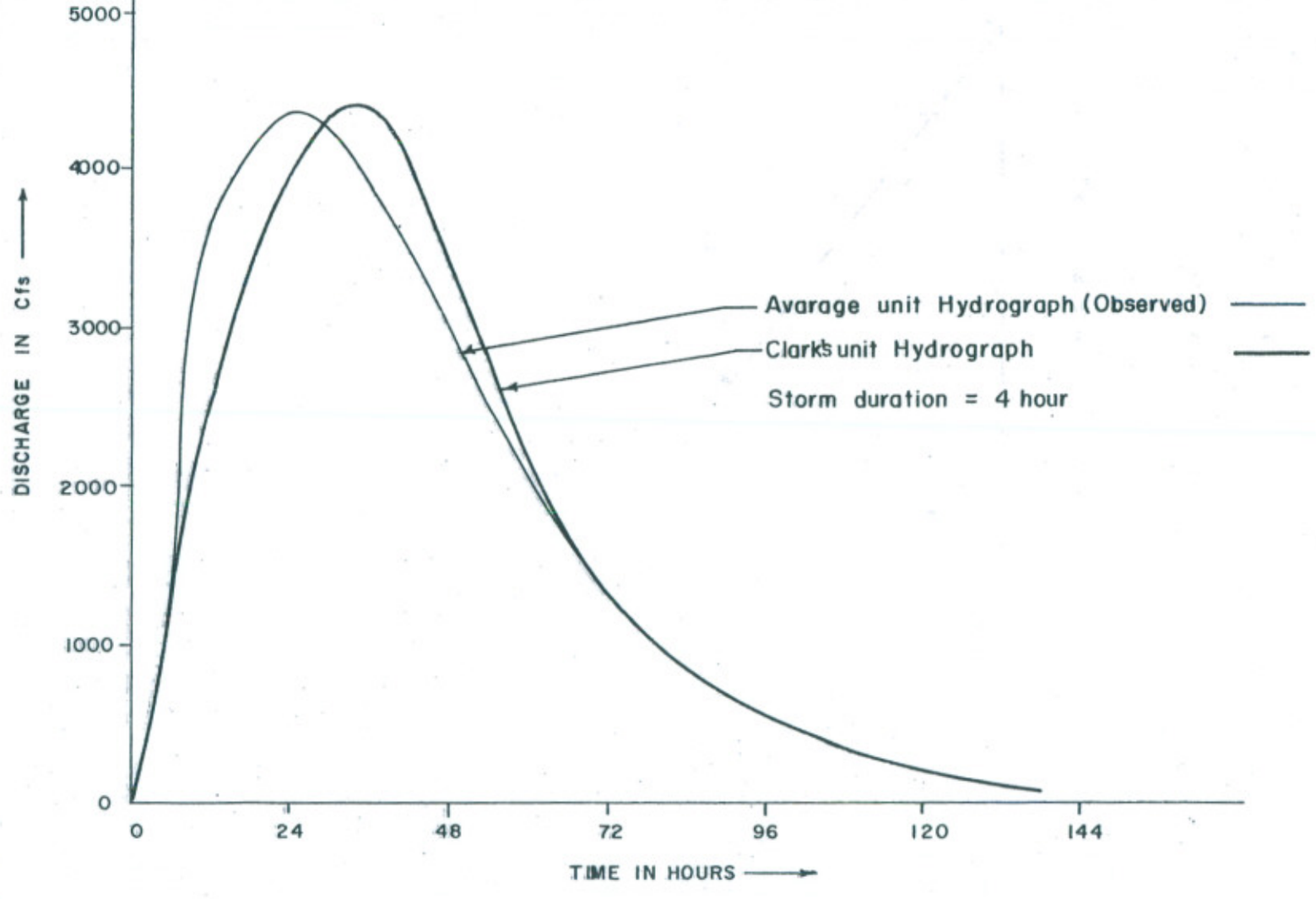
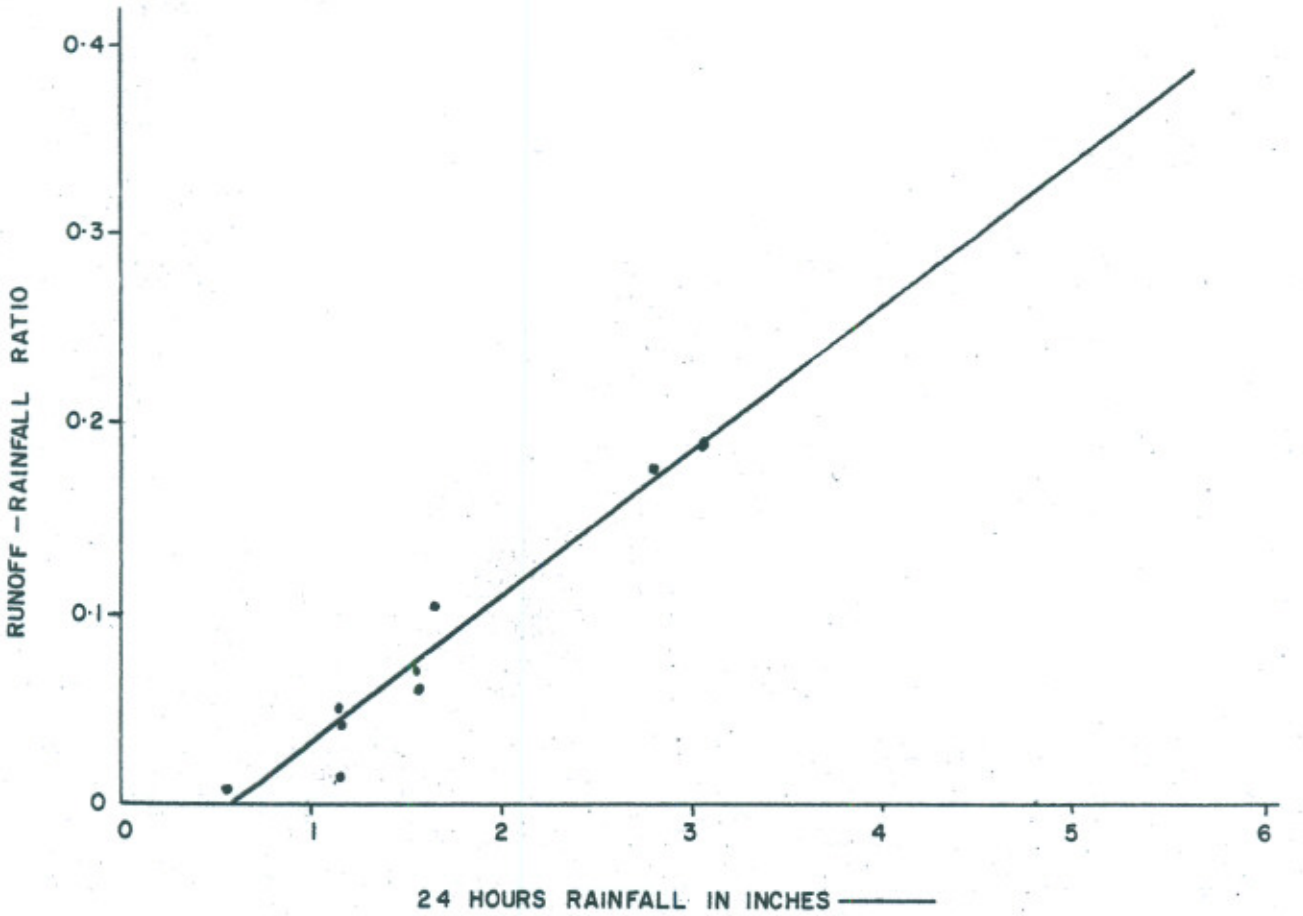


FIG.4(c) COMPARASION OF OBSERVED AND CLARK'S UNIT HYDROGRAPHS





FIG, 4 (d)

STORM RAINFALL-RUNOFF RELATION CURVE FOR MARH CHINIOT DRAIN