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ESTIMATING MEAN RUNOFF IN UNGAGED SEMIARID AREAS

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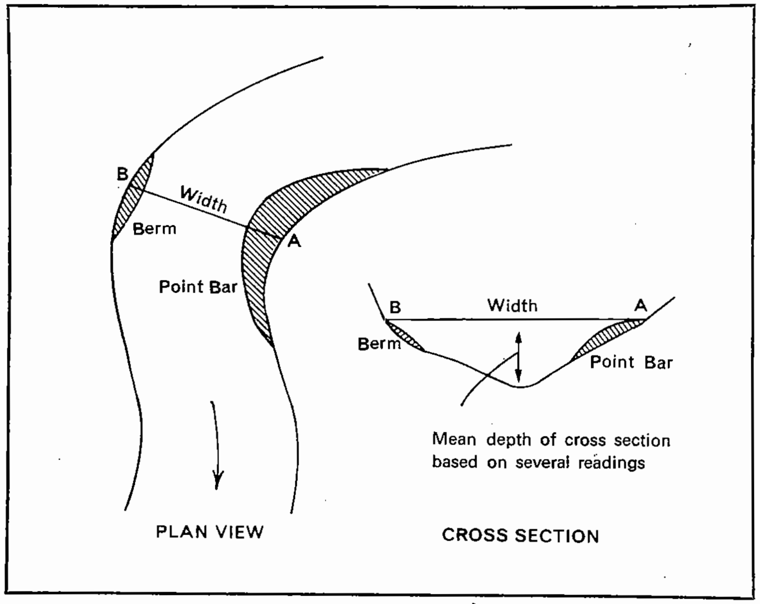

Fig. 3 — Sketch of stream channel showing parameters (mean depth and width) measured for determining mean discharge in figure 6 and 7.

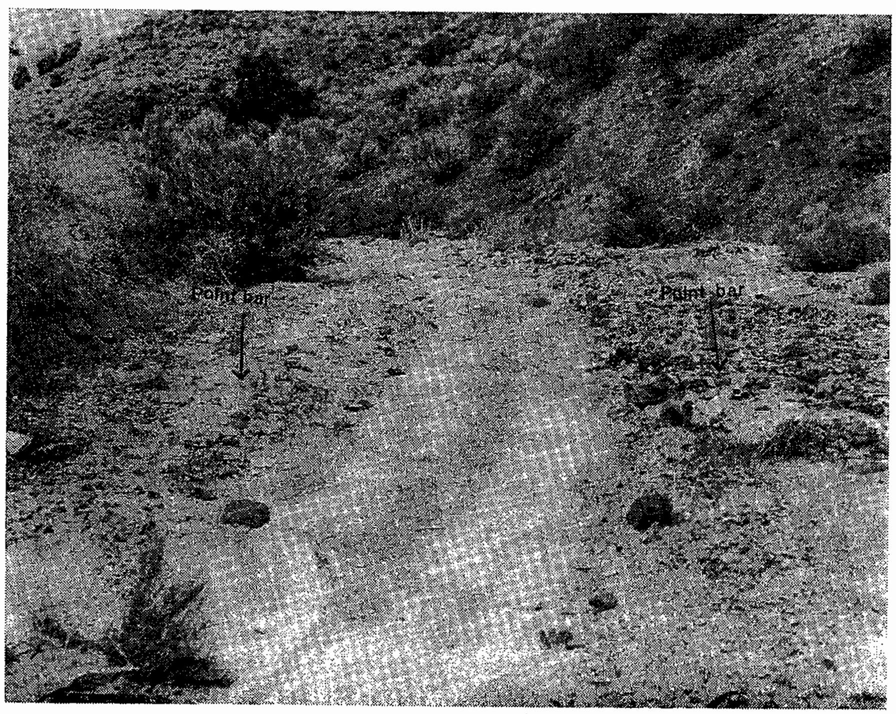

Fig. 4 — Point bars on an ephemeral stream, Brunswick Canyon near Carson City, Nevada.

gaged stream. The mean flow is determined at the miscellaneous measurement site using the equation:

$$Qm = QM \frac{Qa}{Qb}$$

where Qm is the unknown long-term annual mean flow at the ungaged stream, QM is the long-term annual mean flow at the gaged stream, Qa is the measured streamflow at the ungaged station, and Qb is the daily streamflow at the gaged stream on the same day as Qa.

The above equation implies that the ratio of long-term mean annual discharges at the two gaging stations is equal to the ratio of their concurrent discharges at any given time. Obviously, this is not so. The surface-runoff characteristics of two basins in close proximity to each other will usually differ. It is therefore necessary that the concurrent discharges used in the equation occur during a period of base flow, that is, a period of relatively steady flow after direct runoff has ceased. Furthermore, the recession characteristics of two nearby basins will generally differ to the extent that the ratio of concurrent discharges of the two streams will vary with time.

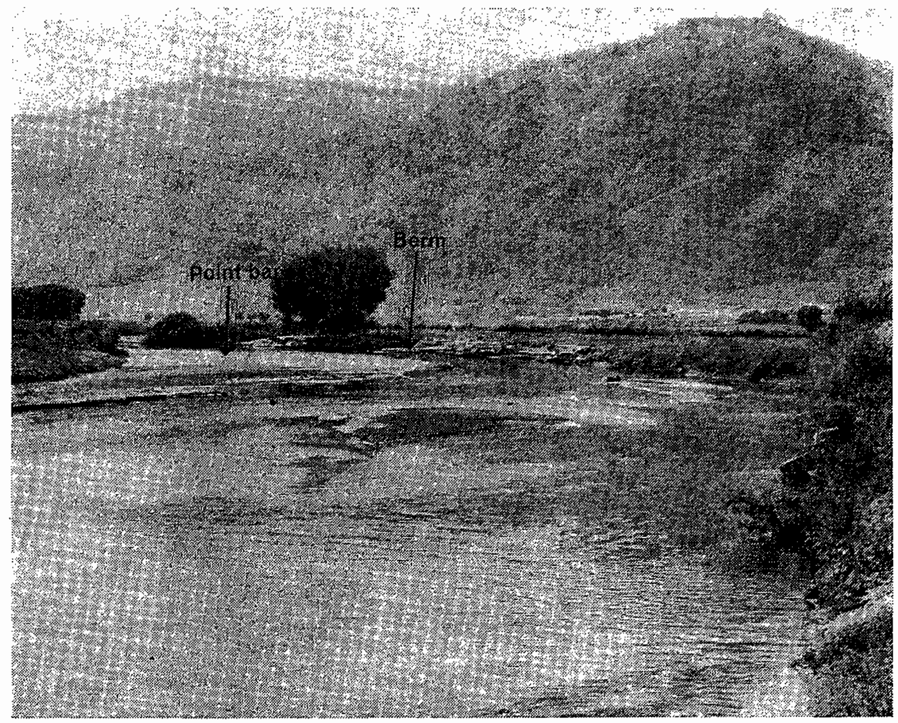

Fig. 5 — Point bars and berms on a perennial stream, Carson River near Carson City, Nevada.

Usually, the closer the base-flow discharge is to the long-term mean annual discharge, the closer the ratio of the concurrent discharges will be to the ratio of the long-term mean discharges. Often, too, it will be found that the ratio of concurrent discharges during some particular month will tend to be constant in all years and approximately equal to the ratio of long-term mean