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AN ANCIENT "CORRELATION" BETWEEN STREAMFLOW AND DISTANT RAINFALL IN THE NEAR EAST

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IN a recent paper in this journal, J. Neumann and S. Parpola published evidence indicating that the period 1200–900 B.C.E. was a mostly dry and warm era in the climatic history of the Near East, particularly in Mesopotamia.¹ Earlier, J. A. Brinkman suggested that the known decline of Assyria and Babylonia in the eleventh–tenth centuries B.C.E. was due primarily to famine conditions.² Famine conditions must have been even more grave in the desert and desert-like areas adjacent to Mesopotamia "inhabited" by nomadic and semi-nomadic tribes whose incursions into the more cultivated areas of Mesopotamia must have increased and intensified in periods of dearth. These must have further weakened the two states.

Brinkman did not supply climatic evidence for his thesis. Climatic and other items of evidence are set forth in the Neumann-Parpola paper. One of the especially important non-textual items of evidence was the archaeological evidence from the site of Ugarit (near the modern city of Latakia, Syria, destroyed about 1200 B.C.E.). According to C. F. A. Schaeffer, the excavations indicate that the soil layer into which are embedded the remains of buildings of Ugarit corresponds to a period of "extreme heat and dryness" (translation of Schaeffer's words).³ Neumann and Parpola point out that there is a positive correlation in the modern meteorological data between the rainfall of the Eastern Mediterranean littoral and Iraqi stations, and in support of their thesis they present a diagram (their fig. 2) of rainfall at Latakia and Mosul for the period 1952–53 to 1974–75, the period for which rainfall data were published *both* for Latakia and Mosul. Naturally, higher rainfall in Mesopotamia and in the catchment area of the Euphrates and that of the Tigris entail greater streamflow in these rivers, a fact which is implicitly involved in the authors' figures 4 and 5. The authors proceed to say that, if the assumption is made that the correlation between Ugarit and Mesopotamian rainfall in the closing centuries of the second millennium B.C.E. was not very different from that of the modern era, then Mesopotamia too must have suffered frequent droughts, low rainfall in general, and a reduced streamflow when the Eastern Mediterranean littoral experienced a mostly low rainfall.

With reference to the statement concerning a positive correlation between the rainfall of the coastal areas of the Eastern Mediterranean and streamflow in rivers of Mesopotamia, we wish to draw attention to a passage in the Babylonian Talmud which indicates that about 200 C.E., if not earlier, it was already known that there was

¹ J. Neumann and S. Parpola, "Climatic Change and the Eleventh–Tenth Century Eclipse of Assyria and Babylonia," *JNES* 46 (1987): 161–82.

² J. A. Brinkman, *A Political History of Post-Kassite Babylonia* (Rome, 1968).

³ C. F. A. Schaeffer in J. Nougayrol et al., *Ugaritica*, vol. 5 (Paris, 1968), pp. 761 f.

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what we may call a positive correlation between rainfall in Palestine (the “West,” as the Jews in the Babylonian Exile would refer to Palestine) and streamflow in the Euphrates, some 500–600 km to the ENE. In Tractate *Shabbath*⁴ of the Babylonian Talmud, a relevant statement is quoted in the name of Rav (or Rab), one of the greatest scholars of the first generation (about 200 C.E.) of *amoraim* (interpreters of rabbinic laws). The name of the scholar was in fact Abba bar Aivu, but so great was the esteem in which he was held that he was usually referred to as “Rav,” the intended meaning of that name being “Rabbi of all the Jews in Exile,” as explained by the commentator Rashi (eleventh century C.E.).

Rav was born in the second half of the second century C.E. At an unspecified date he went to Palestine to learn from the most prominent Talmudic scholars there. It is known that he returned to Babylon in 219 and a few years later founded a Talmudic Academy at the city of Sura (about 35° 50'N, 38°45'E) by the Euphrates, on the mid-reaches of the river. The Academy soon won fame. Having spent several years in Palestine and then in Babylonia and, being, in all probability, a highly perceptive person, he was able to note the fact of what we call “positive correlation” between the discharge of the Euphrates and the rainfall in Palestine. Undoubtedly, this recognition must have been stimulated by the known frequent exchanges between the Jewish communities and, especially, scholars in Palestine and Babylonia. It is plausible that these exchanges included information on rainfall which was vitally important for both. It is certain that Sura enjoyed the waters of the river, but the river itself, its discharge, closely depended on rainfall.

The positive correlation of rainfall in Israel today with that of what once was Babylonia and its river flow at this time is well understood. Of the twenty-eight depressions that reach the Eastern Mediterranean in the rainfall season from the West, on the average, twenty-two cross the Eastern Mediterranean coast,⁵ including Israel, in an easterly to northeasterly direction affecting areas of what was once Babylonia.

According to folio 65b of the Tractate *Shabbath* of the Babylonian Talmud,⁶ Rav made the following statement: “Rain in the west [Palestine] is strongly testified by the Euphrates.” This translation of the Aramaic text is taken from the English translation by H. Freedman in the Hebrew-English edition of the Babylonian Talmud. We thus note that already at the dawn of the Christian Era, if not earlier, the positive correlation of rainfall of the Eastern Mediterranean littoral and Babylonia (more precisely, the Euphrates streamflow) was a known fact.

⁴ H. Freedman, trans., *Shabbath: A Tractate of the Babylonian Talmud* (London, Jerusalem, and New York, 1972).

⁵ See the figure on p. 372 in *Weather in the*

Mediterranean, 2d ed., vol. 1, Meteorological Office publication, no. 391 (London, 1972).

⁶ See again Freedman, trans., *Shabbath: A Tractate of the Babylonian Talmud*.