north-eastern corner on a sandstone hill ending with a precipice about 80 ft. in height towards the river on the north. The ground covered by the citadel measures nearly 350 by 150 yds., and the town occupies a space of a square mile.

At the point of the divergence of the Gerger from the Karun, 600 yds. above the town, an artificial dike constructed of large blocks of hewn stone is thrown across the opening of the former. It was known as the Band i Kaisar (the Caesar’s Dike), but after having been repaired by Mahommed Ali Mirza, a son of Fath Ali Shah, in the early part of the 19th century, it was called Band i Shahzadeh, or Prince’s Dike. A little distance below this dike begins the artificial cutting in the sandstone rock and at half a mile from it is a second band, 60 yds. long, 65 ft. high, which completely blocks the progress of the stream. It has a roadway on the top, and, as it connected the town with the village Bulaiti (now deserted) on the other side, was called Pul i Bulaiti, *i.e*. Bridge of Bulaiti. At a short distance above it some tunnels have been pierced in the rock below the canal level on either side of the Gerger. From the point where the principal river parts with the Gerger down to a point 500 yds. below the citadel the river bed was paved with great flags of stone, the pavement being called Shadurvan. At the end of the pavement stand the band and bridge ascribed to the Roman emperor Valerian. The band is called Band i Mizan, the bridge Pul i Kaisar. The bridge has been built and rebuilt several times and its forty-one arches differ in material, style and size. Its length is 560 yds., and its roadway is 7 yds. wide. Seventy yards of band and bridge were swept away in 1885. Between the bridge and the Gerger opening and cut into the rock on which the western part of the citadel stands is a tunnel leading to a canal formerly called Darian, now Minab, *i.e.* Mian-do-ab, “ between two rivers,” because it waters the district south of the town lying between Gerger and Shutait. With the break of the band in 1885 the level of the main river has fallen and the Minab canal is not properly filled, causing much damage to cultivation in the district.

Persian tradition has it that Ardashir (either Artaxerxes of the old Persian kings or Ardashir of the Sassanians) built the first dike across the river in order to raise the water of the river to the level of the Parian canal. The dike became destroyed and was renewed under the Sassanian Shapur I. by Roman workmen sent for by Valerian who had been captured by the Persian king in 260. That Valerian had a part in constructing these remark­able works does not rest upon any historical basis; we may, however, believe that the Sassanian Ardashir, or his son Shapurï, finding that the river, having its bed in friable soil, was daily getting lower and finally threatened to leave the town and the Mian-do-ab district dry by not filling the Darian canal, engaged Roman workmen. The Gerger canal was cut and the river diverted from west to east of the town. The old river then became emptied and its bed was raised and, to prevent further erosion and washing away of the soil and a consequent fall of the river, was paved with huge flags. Then the Band i Mizan and the great bridge were erected across the river and finally a dam was constructed across the Gerger canal, where is now the Pul i Bulaiti, so as to turn back the Kanin into its original channel, but later, by means of sluices and tunnels, the flow of water was regulated in such a manner that two-sixths of the water flowed east and four-sixths west of the town. This gave rise to the later appellations Do-Dank and Chahar Dank, *i.e*.

two-sixths and four-sixths for the Gerger and Shutait re- spectively. (A. H.-S.)

**SHUTER, EDWARD** (c. 1728-1776), English actor, was born in London of poor parents. He made his first appearance on the London stage in 1745 in Cibber’s *Schoolboy.* He made a great reputation in old men’s parts. He was the original Hardcastle in *She Stoops to Conquer* (1773), and Sir Anthony Absolute in *The Rivals* (1775).

**SHUTTLE** (O. Eng. *shitel,* &c.; from the same word as “ shoot ”), a boat-shaped implement used in weaving to pass a thread of weft to and fro between two lines of warp. The origin of this implement is lost in the mists of a remote antiquity, and yet it was long preceded by the loom. Several wall paintings at Thebes depict looms that are apparently provided with a hooked rod for drawing weft through the warp, but with such a device either two weft threads would be simultaneously placed in one division of the warp, or the selvages would be imperfect. Since neither of these conditions obtain in the ancient Egyptian fabrics that have been recovered, it may be concluded that some other plan was also adopted. Netting needles have been found in Egyptian tombs, and as these would be more suitable for weaving than a hooked rod, it is conceivable they were so employed. Or a spinning spindle charged with weft might be conveyed through the warp, as was customary, at a much later period, with Greek, Roman and other weavers. So long as a shuttle was thrown from hand to hand, the breadth of cloth which one weaver could produce was limited to his ability to reach from selvage to selvage of the piece. But from 1733, when John Kay invented the “ fly shuttle,” these implements have been made straight, and propelled mechanically, also, to secure light running, they have been mounted upon rollers which project slightly on the under side. Shuttles are now made in various forms and sizes from box, and other hard-grained, smooth woods, as well as from vulcanized fibre and metals. For silk weaving by hand, they are approximately 12 in. long by 1 in. square in section, and weigh about 3 oz.; those for calico weaving by power, are about 12½ in. long, 1½ in. wide, 1¼ in. deep, and weigh about 9½ oz. ; they are also provided with conical steel tips which abut upon short coiled springs let into the shuttle. The construction, fixing and control of shuttle tongues that hold the weft, together with numerous devices for putting the thread under an elastic tension, have formed the subjects for many patents. The tongues intended to hold cops are split to form a spring whose strength suffices to fix the cop in position while the thread is drawn from the outer end through a porcelain eye in the shuttle front, the tension being regulated by deflection.

The small shuttles employed to weave ribbons, and other narrow goods, arc bowed in front, recessed to hold a spool of weft, and have an eye fixed at the centre of the bow for the thread to pass through as it unrolls. These shuttles are formed into sets, which correspond with the number of fabrics to be manufactured simultaneously and may be placed on one level, or in tiers; in either event, all in one horizontal plane arc moved to and fro together across different webs, by means of racks and pinions; for a rack is inserted lengthwise in each shuttle, and by engaging the racks with intermittently driven pinions, the shuttles receive their requisite movements.

For further information regarding weaving and looms, see Weav­ing and Weaving Machinery. (T. W. F.)