

EXTRACT FROM TOPSOIL AND CIVILIZATION

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(pages 200-203)

Ceylon is not of great importance to twentieth-century world civilization, but the history of land use there is interesting. The ancient Singhalese of Ceylon created one of the most advanced civilizations of their time in an area that is now an almost depopulated desert and jungle. They built their civilization on one of the most remarkable irrigation systems of ancient or modern times.

A group of hills and mountains rise in central and south-western Ceylon, while the northern and eastern parts of the island are flat or rolling plains. The annual rainfall in the hill section ranges from 100 to 250 inches, most of it coming during the monsoons from May to November; but the rainfall on the plains, where extended droughts are common, drops to as low as 25 inches annually and is quite irregular.

Agriculture without irrigation was too uncertain on the north-eastern plains to support a permanent civilization, but the hill and mountain regions had an unhealthy tropical climate, so the ancient Singhalese chose the drier region and irrigated it.

Although the irrigation works, which used the system of gravity flow almost entirely, were started about 500 B.C., they were planned and surveyed as accurately as could be done with modern survey instruments. The Singhalese constructed stone anicuts in the streams to divert part of the flow to canals, which led the water along ridges to large reservoirs that were located at the highest possible elevations and completely surrounded with earth embankments. Dozens of these large reservoirs were constructed, several of which covered four to six thousand acres and had earthen dams from forty to ninety feet high surrounding them. During the rainy seasons enough water was stored in these reservoirs to irrigate crops during the dry seasons. Canals led from the large reservoirs to smaller ones at slightly lower elevations, and from these to the grain fields on the lower plains.

This remarkable irrigation system was expanded for more than a thousand years, and by A.D. 500 practically all the irrigable land of the island was under irrigation. The irrigation system and the civilization was maintained until the twelfth century. As the population increased, the Singhalese were apparently not satisfied with farming the relatively flat irrigable lands; also, they doubtless wanted timber from the forested hills. They cut the trees from the upland forests, causing runoff and erosion to be greatly accelerated. Because of neglect or barbarian invasion, floods and silt washed out or filled up the diversion canals, and with the reservoirs dry, famine depopulated the island. Civilization disappeared about A.D. 1200. Today only the ruins of the cities and temples and the breached and silted remains of the huge canals and reservoirs remain to tell the story of this once great civilization.

During the period of barbarism that followed the fall of the ancient Singhalese, the land largely recovered. When the Portuguese, Dutch, and British came to the island in the sixteenth

century, the hills of Ceylon were again covered with forests, and the barbarian natives were practicing a shifting agriculture in the wet, tropical hill-region.

Now we shall see what this new occupation by civilized men has done to the land. In 1878, Thwaites, Director of the Botanical Gardens, in a letter to the Governor General of Ceylon, stated 'It must have made itself painfully evident to many of the older residents of the island that great changes have been brought about by the deforesting of large areas—from this deforesting has resulted much washing away of valuable surface soil, which cannot be replaced and which has found its way into the rivers, or has been deposited on lower lands, thus covering large areas with silt and interfering with native cultivation.*

By 1931, the situation had become so serious that the British government appointed a special committee to study soil erosion and recommend appropriate governmental action. This committee found severe erosion over practically all the cultivated land of the island and recommended drastic legislation to regulate the use of privately owned lands as well as government lands. Ceylon is making some progress, but erosion is still so severe that it threatens to destroy many of the valuable tea and rubber plantations. The silt load in most streams is so great that it is impractical for engineers to construct irrigation works that would supply water to the semi-arid plains on which the ancient Singhalese civilization was built.

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