IRRIGATION AND DEVELOPMENT

It was in the Dry Zone that the early civilization of the Sinhalese flourished where the early settlers built their cities and religious monuments and an elaborate system of irrigation which increased the productivity of these areas. This elaborate but brilliant system of irrigation has been regarded as a tribute to the engineering skill of the ancient Sinhalese and the basis of all the glories of the ancient Sinhalese civilization.

The earliest Indo-Aryan settlers, around 500 B. C. are said to have purposely avoided the areas of heavy rainfall because of their dense forests and rocky mountains and settled in what was termed the 'dry zone' of the island. But in taking the line of least resistence they created a problem for themselves—they found that their chief settlements where often they found themselves on their arrival, had a limited rainfall. The North East monsoon, which on occasions was not dependable brought rain for only four months of the year. With the increasing population in the early 'day zone' settlements the need to obtain adequate supplies of water for cultivation of rice began to receive greater attention of the early Sinhalese.

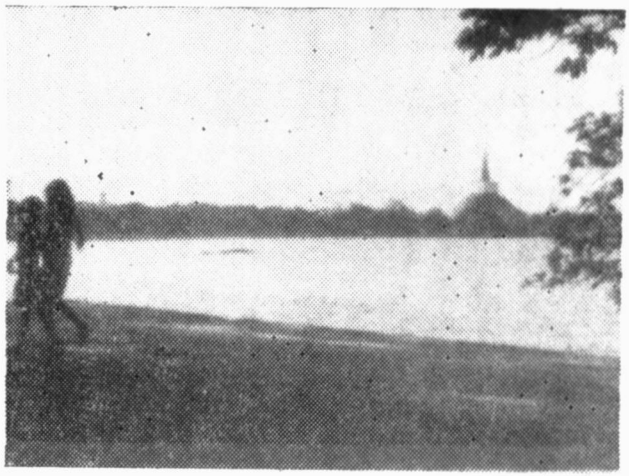
Two different systems were generally adopted in early times for conserving the monsoonal rain water dispersed over the plains of the Dry Zone. According to one the natural and effective plan of making use of the upper reaches of a valley and embanking its outlets was resorted to.

The natural plan

The other system was based on a much more scientific and ambitious method and aimed at securing a greater volume of water than any local catchment area could have supplied. This was effected by constructing massive causeways and anicuts across the larger rivers and turning the water into excavated channels which conveyed it sometimes many miles, over apparently flat country and impounded the water eventually in large reservoirs or a chain of reservoirs.

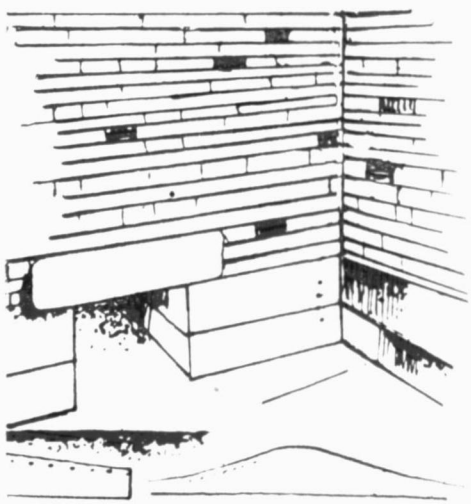
The special point of interest in the Kirindi Oya dam for instance is the astonishing fact that instead of being taken across the river by the shortest possible line as one would expect it was built in an oblique angle, which from the traces of the bund was judged by Parker to be nearly 45 degrees from the direct line. There is a possibility that this does not necessarily prove that the principle of oblique dam and of its great discharging power is more than one built square dam across the river. This knowledge which was acquired only in comparatively recent years in Europe is said to have been understood in Sri Lanka in very early times.

The pictures on this page and back inside cover illustrate some of these features.(Photographs: Lakdas Samarawickrema —Department of Irrigation)

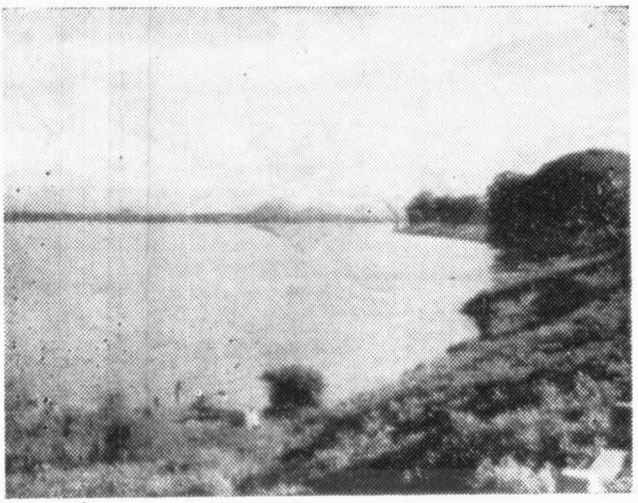


The Tank and the Stupa symbolize the ancient civilization. The Basawakulama pictured here with the Ruwanweliseya Dagoba in the background was one of the earliest of the Anuradhapura City tanks and has been identified as having been built in the 3rd century B.C.

The first irrigation tanks were mere ponds. Subsequently, larger tanks were built across non-perennial rivers during the dry season; later still some of these were enlarged and augmented. Stone anicuts built across even perennial rivers diverted water by means of canals to these tanks. The tank bunds were well protected by carefully placed stone pitching called "rala-pana".

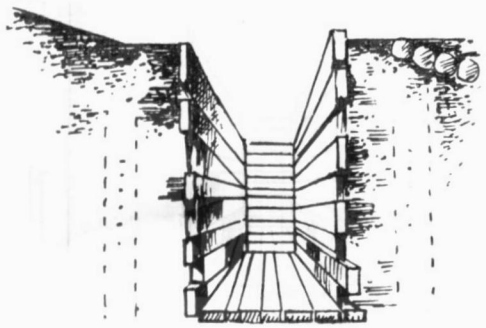


The Bisokotuwa was an important feature in the construction of the large ancient reservoirs. The stored water was released through carefully constructed sluices to the irrigation channel system. The sluices were made of dressed stone slabs on the innermost (water) side backed by several layers of brick masonry on all 4 sides which in turn was backed by a layer of carefully selected puddle clay. Thus it was ensured that leakage of water through the sluice into the earth embankment was kept down to an absolute minimum. Access to the horizontal sluice barrel was through a vertical shaft known as the Bisokotuwa also made of stone and backed with brick and clay. The Biskotuwa is now called a 'valve-pit' in modern sluices.

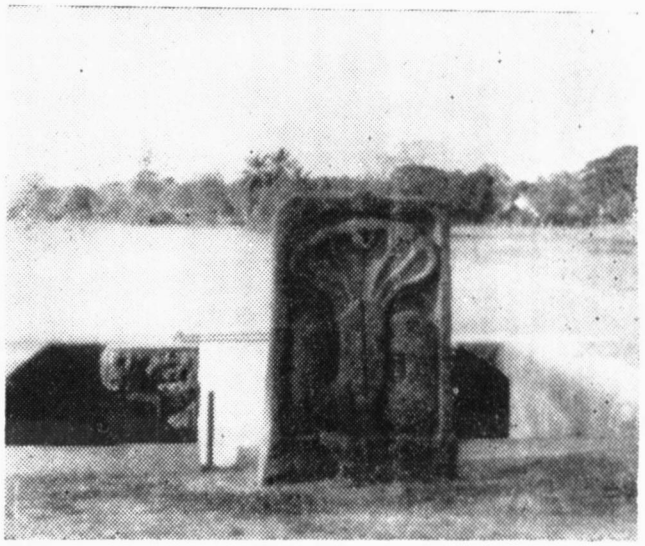


The historic Kala Wewa built by King Dhatusena in the 5th century A.D. was one of the earliest reservoirs built across a perennial river using the twin-reservoir technique. Water from the Kala Wewa-Balalu Wewa was led along the famous Jaya Ganga to augment the city tanks at Anuradhapura.

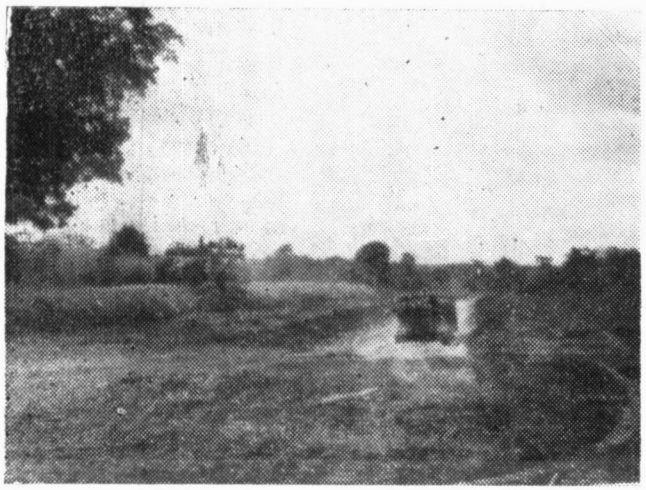
A typical 'wewa' as shown in Parker's famous book. The low-lying sections of the undulating land in the Dry Zone where rain water collected was finally 'bunded' on one side to retain this water for irrigating a second crop.



A cross-section of the Bisokotuwa or "valve pit" in the sluice, as illustrated in Parker's "Ancient Ceylon".



The Nagarupa is the traditional symbol of the guardian deity of the ancient irrigation works. It was located at or near the irrigation sluice.



Restoration of the large-and medium-scale irrigation systems in the dry zone was started using heavy construction equipment in the years immediately before World War II and gathered much momentum after the War. These restored systems will now be incorporated in the new large Multi-Purpose Development Projects like the Mahaweli Diversion Scheme.

THE SLUICE

(*FRONT COVER PICTURE*)

The ancient sluice at Kantalai when discovered in British times. This sluice demonstrated the ingenuity and knowledge of the ancients. It had a Bisokotuwa and 2 sluice barrels. The cross-section of each sluice barrel increased from the beginning on the reservoir side, to the end on the down-stream side. The increase in area was about 7 times and this ensured that the high velocity of the water was reduced in the course of its passage through the barrels, so that when the water emerged from the sluice into the channel it did not cause any damage.

Correction

On page 3, in the second line of para 2, the 3rd century B.C. refers to the date when the Bisawakulame was built. On page 10, at the beginning of para 2, the date in the sentence "The catastrophic floods of December 1975..." should read "...December 1957"