

CAT scan in archeology

Scientists in Aix-en-Provence have used the principle of the CAT scan to trace ancient coastlines below the place where modern cities stand, says S.Ananthanarayanan.

The Phoenicians, a people who lived on the Syrian coast in the millennium from 1200 BC to 300 BC, were seafarers and dominated trade along the coast of the Mediterranean Sea. The modern Lebanese cities of Tyre and Sidon were important Phoenician ports, said to rival the present importance of Liverpool, Shanghai or New York.

Tyre and Sidon

These port cities were famous for their purple dye made from the shellfish found in their coastal waters. The dye extraction was arduous, a few drops at a time, but fabrics dyed with their help commanded a huge price with the nobles of Rome, among many others. As great seamen, and the Mediterranean at their doorstep, the Phoenicians traded in dyes, fabric, ceramics, glass, wine, crops and oil, from port to port and they and their cities became renowned.

But in the last 3000 years, the ravages of time have pushed the coastline many kilometers into the sea. Sidon was an island, but is now connected to the mainland, due to silting, apart from the old port itself being nowhere to be seen.

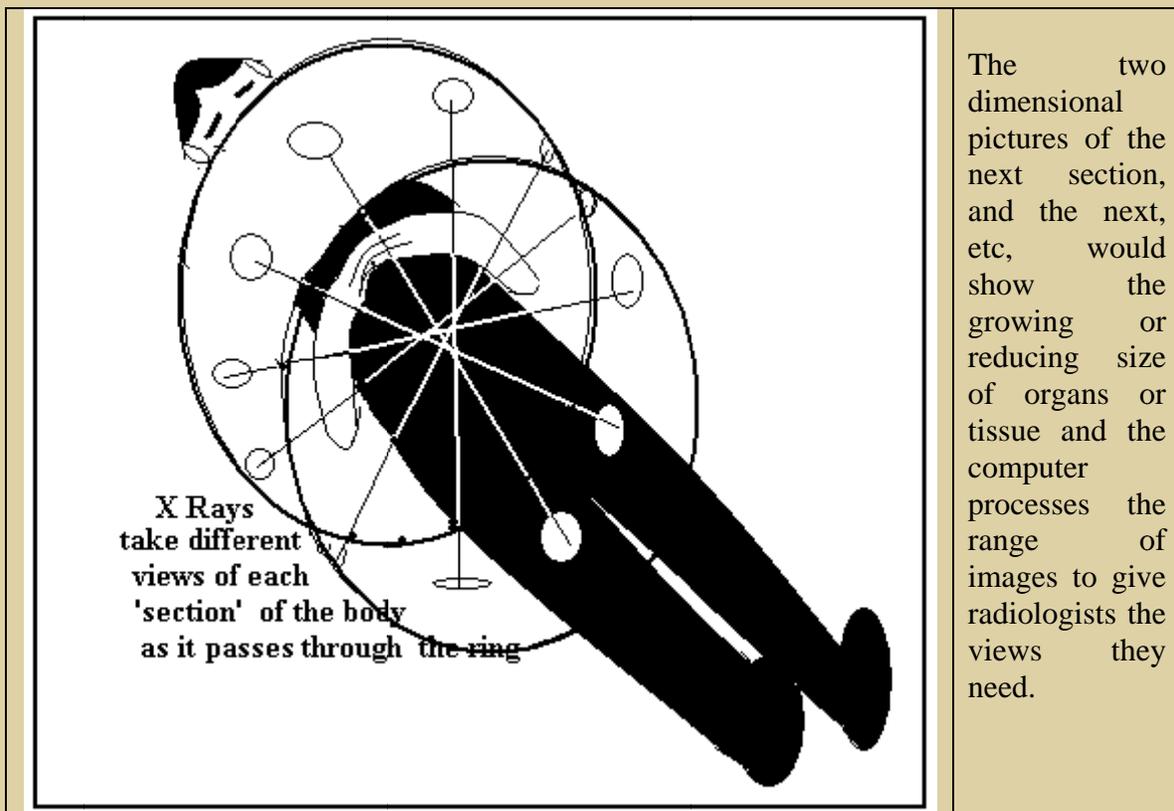
The fact that the ports were there is amply recorded and is well known, but the shape of the actual coastline and the position of the old harbours are not known at all.



CAT Scan

Computed Axial Tomography, or CAT scanning is to take X Ray pictures of the body, from all direction, one 'cross-section' at a time and then to put the pictures together with a computer. The X Ray emitters and the cameras are placed in a ring, to shoot from different angles and the patient moves slowly through the ring, so that different 'sections' get scanned.

At each section, each of the cameras in the ring gives the X Ray shadow from one angle. Putting these shadows together creates a two dimensional picture of that section.



The procedure yields detailed images of minutes features and either eliminates or help surgery to be better planned.

Finding the old coastline

Archeologists and historians trying to piece together the story of ancient Tyre and Sidon have a similar task – to image details buried below hundreds of meters of silt and clay. Nick Mariner and colleagues of the European Centre for Research in Geosciences of the Environment drilled all of forty boreholes all over the two cities. The team carried out

analyses, including carbon dating of seeds, wood, charcoal, marine shells found in soil samples at different depths and plotted a map, both according to depth as well as according to the age.

The result was a series of pictures, down the ages, which showed how the activity in the area changed from century to century. It is seen that both the sites were occupied since at least the bronze age (3000 BC), till Tyre was conquered by Alexander the Great (332 BC). The outline of the old harbours, just where the modern cities now stand have been clearly mapped. Both sites were later occupied by the Romans, the Arabs and then the Turks. It is seen that silting shot up during the Roman occupation and that heavy dredging must have been necessary to keep the ports workable.
