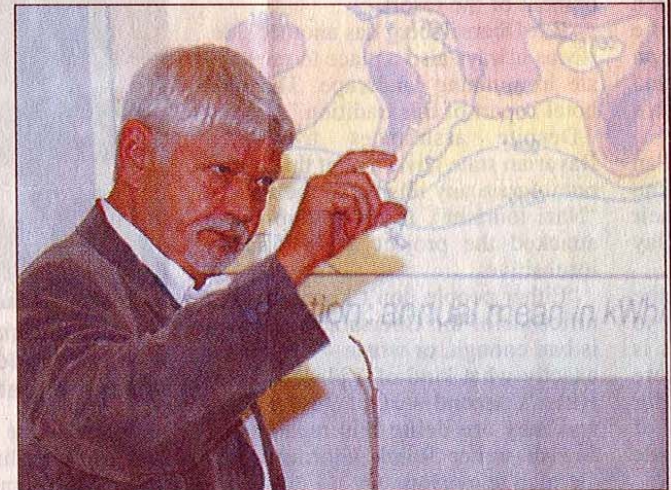


Travel > 2 Women > 3 TV & Radio listings > 4-5 At Your Service

Biorock offers hope for restoring reefs

52
A technique to encourage the growth of rock by causing the electrodeposition of minerals in sea water may hold the key to the survival of coral reefs, writes FRAN GILLESPIE



Above: Professor Wolf Hilbertz addressing members of the Qatar Natural History Group.

Left: A lotus-shaped unit being hand-wired as part of the Vabbinfaru project in Maldives.

vaged fragments of coral to the reef structures, and the enhanced growth rates of the corals were closely moni-

the hotel beach was suffering from rapid erosion so the resort managers first tried to halt this by creating a barrier of bags filled with sand.

The bags soon shredded, littering the beach with plastic debris, and the sand

CORAL reefs may well prove to be the first major casualty of global warming. Reefs worldwide are dying off at an alarming rate: it is estimated that as much as 40% of the world's coral reefs have been destroyed by damage to the environment resulting from human activity. It is possible that another 25% will be dead by 2020.

At a recent meeting of the Qatar Natural History Group, members learned about the restoration of coral reefs using a dynamic new method, the creation of 'Biorock'.

This is the brainchild of Professor Wolf Hilbertz, who was invited to Doha from Dubai, where he is working on a major project to surround The Palm islands with manmade reefs.

In 1974, Professor Hilbertz, who is an architect and marine scientist, and his colleague Dr Thomas Goreau developed a technique to encourage the growth of rock by causing the electrodeposition of minerals in sea water.

Years of experimental applications

followed before they patented their Biorock. Basically, the method involves placing frameworks of iron or steel on the sea bed.

Then a weak electric current is passed through the frame. This can be done using wires leading from the shore, or using solar-power, or it can even be powered from zinc blocks which give off a weak electrical current as they decompose. Solar panels can be floated far out at sea, on rafts anchored to the sea bed.

The current causes electrolysis in the sea water, resulting in calcium carbonate (limestone) being deposited on the framework. This accelerates the growth of coral, and within six months an ecosystem starts to form, as coral and plants grow and fish congregate.

Hilbertz and Goreau's company, the Global Coral Reef Alliance, has demonstrated the new technique of repairing damaged reefs at various locations around the world.

Teams of local divers help to graft sal-

tored.

The survival of corals on the Biorock reefs consistently exceeded the survival of corals on adjacent rock formations. The structures very quickly became integrated, living parts of their marine environment.

They have been termed 'Coral Arks' because they assist the re-population of corals on natural reefs that have suffered devastation from either natural or human-related causes.

Successful reef building projects have now been started in a dozen countries world-wide. Much of the work takes place in developing countries with little money to spare, so whenever possible, recycled materials are used.

Driftwood lying on a beach can be used to support a large solar panel. Surplus reinforcing bars from building sites can be welded into a variety of shapes. Once an electrical current is passed through the framework the rust is reabsorbed into the metal.

At an ocean resort in the Maldives,

washed away. A concrete sea wall contained toxic chemicals, and nothing would grow on it.

The owners then tried the new Biorock technology. The 140-foot-long project was named The Necklace, and was the first stage in a grand plan to encircle the entire island with manmade reefs. A line of rectangular box-shaped structures of ordinary construction reinforcing steel bars was laid on the sea bed.

At first the open structure provided little resistance to waves, but as the limestone began to form and the transplanted coral took anchor and grew, wave movement was slowed down and the seawater began to drop suspended sand on the shoreline.

In two years the beach grew 15m, and many species of fish congregated on the new reef, along with turtles and moray eels. Similar work has been carried out in the Seychelles. Professor Hilbertz said that the recent tsunami did no damage to the artificial reef structures there or in the Maldives.

Qatar's own coral reefs, which are mainly located at Khor al Udaid and around some of the offshore islands, suffered serious damage in the late 1990s when the water temperature rose to 38C, causing widespread bleaching and the death of thousands of fish and turtles.

It may be that the regeneration of coral using artificial reefs may be a step towards helping the recovery of the marine ecosystem in the Arabian Gulf.

Corals grown using the Biorock process seem to be more tolerant of warming oceans than those on natural reefs. In a recent catastrophic bleaching, 99% of corals on surrounding reefs died, but between 50 and 80% of those growing on The Necklace survived.

Clearly, Biorock is not the long-term solution to coral destruction; the remedy, if there is one, lies in the efforts of the world's nations to reduce the pollution which is warming the atmosphere with such devastating effects on the environment.

But, given time, it can start the regeneration process for damaged reefs and speed recovery which might otherwise never happen.

The Rayyan Water Bottling Company, owned by Khalid al Rabban, sponsored Professor Hilbertz' visit to Qatar.



An interior view of large breakwater with massive coral at left, of the Ihuru Necklace in Maldives.