

Time for plates of turtle

Sea Turtles and the Turtle Industry of the West Indies, Florida and the Gulf of Mexico. Revised edition by Thomas P. Rebel. Pp. 250. (University of Miami: Coral Gables, Florida, March 1974.) \$10.00.

It has often been pointed out that our exploitation of the food resources of the sea remains very largely at the hunting and gathering level. We consume not merely very little of the primary plant production of the sea but very little of the herbivore life too. Mostly, we consume predators further up—sometimes much further up—the food chains, with heavy losses of energy on the way. A book which discusses a group that includes important herbivores is, therefore, welcome.

The aim of this book is practical—the assemblage of the available information necessary “to the proper development and control of our turtle resources”. Dr Rebel starts with the description, identification and distribution of marine turtles, which is accompanied by good figures. Then he reviews what is known of the life history of the six species of turtles found in the western Atlantic and adjacent

seas; these are all the marine turtles known in the world save a seventh species in Australasian waters. This part of the book contains many scattered pieces of information with gaps in between; separate observations have been recorded in disparate fashions. For none of the species of turtle do we have a complete life history, even in outline, but that is no fault of the author's—it reflects the dearth of sustained and methodical observation.

Turtle fishing and the commercial uses of turtles are reviewed and the author describes the progress which has been made in the cultivation of turtles and makes an assessment of the future prospects. A valuable final feature of the book is a bibliography of nearly a hundred pages covering academic as well as practical matters, which is extensively annotated.

Considering the greed with which turtles have been consumed at all stages of their lives with never a thought for the morrow it is astonishing that there is yet time to conserve and exploit them sensibly. Dr Rebel's book gives us reason to believe that turtle populations can be rebuilt and managed, to give a sustainable yield of animal protein and by-products. Let us hope that Dr Rebel will have the reward of seeing this begin to happen in his lifetime.

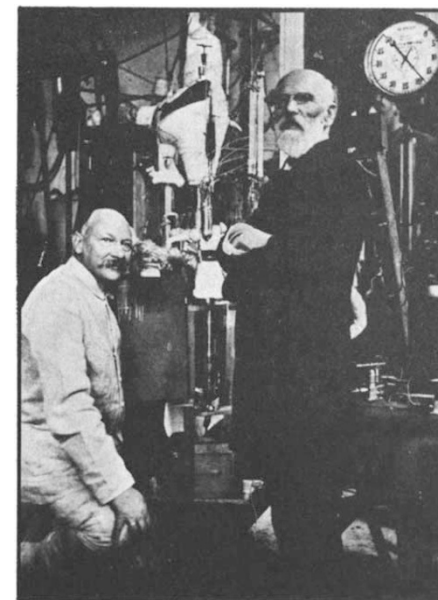
Garth Underwood

Television:

WITH a programme entitled “The greatest advance since the wheel” *Horizon* (BBC2, November 25, 9.25 p.m.) hit top form yet again. The great advance referred to is superconductivity, which, we were told, is now at the same stage of development as was aviation just before Lindbergh's epic flight. If some similar breakthrough could be achieved with a dramatic development involving superconductivity, then industry would have to recognise the enormous potential offered by developments in the laboratory over the past few years.

Having hit the viewer with this dramatic theme, the programme settled down in slightly more sober vein, and care was taken not to overdramatise achievements already made, nor to underestimate the difficulty of getting industry to provide funds to develop the full potential of superconductivity. As one researcher put it, “you can never convince economists that innovation is worthwhile unless there's a war or crisis”. But this innovation does seem genuinely worthwhile, though I doubt that it can achieve success in all the diverse areas covered in the programme.

Superconducting magnets are, of course, already in use in powerful accelerators and fusion research experiments. Their advantages are that they



J. D. van der Waals (right) and H. Kamerlingh Onnes—pioneers in the field of superconductivity

need scarcely any power to run, just a few kilowatts to keep the helium in the liquid state, and they don't heat up. We were shown prospects of two really big developments: d.c. motors and a.c. generators.

The former is still looked on with suspicion by industry, but seems to have been clasped to the bosom of the

Royal Navy, which is always interested in the prospect of more power from a motor which weighs less. This conjures up some bizarre visions—“it's no use, Sir, we've been hit in the liquid helium bath”—but no doubt such equipment would be no more vulnerable than the complex electronic computers which are already on many modern ships.

As for generating a.c. power with the aid of superconducting coils, industry, it seems, just doesn't want to know. Power generated in experimental setups is tiny by industrial standards: 1 MW, a fraction of 1% of the output of the standard generators used in power stations. The description of research in this area left me slightly puzzled. It seems that the development is so difficult because the superconducting permanent magnet must be made to rotate (cooling helium and all) inside the generator coils. Why, I wonder, do the experimenters not leave the magnet fixed and rotate the coils around it? There is probably a simple explanation, but the point should have been made clear.

There was also a slight puzzle in the otherwise straightforward explanation of superconductivity. According to Bardeen, Cooper and Schrieffer it seems that electrons travel in pairs through a superconductor, and that this prevents them being scattered by impurities in the metal. Perhaps that is what the mathematics tells us, but the physical description and animation offered by *Horizon* was too simplistic and perhaps too naive. Someone could have been on hand to offer more elucidation.

The programme ended as it began, with some more flamboyant stuff, this time about superconducting coils used in magnetic levitation trains. But hard core industrialists would probably have been more intrigued by two more straightforward uses of the new wonder, mentioned earlier in the programme. The powerful magnetic fields produced with the aid of superconductivity can be used to separate weakly magnetic ores from rock which would not otherwise be economically workable; and in a similar way suspended colloidal iron oxide can be removed from water, taking with it just about any impurities which may be present. That offers a better way to treat sewage, to scrub the dirty waters of polluted rivers clean, and so on. And there is no pie in the sky about these straightforward applications of superconductivity.

Perhaps not quite “the greatest advance since the wheel”—it would, incidentally, be interesting to ask a few people what their candidate for this title would be—but good televised science. And that's something to be grateful for.

John Gribbin