



Scramble for the seabed

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The latest land-grab is under water and under way

Roll on, thou deep and dark blue Ocean - roll!

Ten thousand fleets sweep over thee in vain;

Man marks the Earth with ruin - his control

Stops with the shore

Byron

FOR nearly 30 years, legal control of the sea has actually stopped 200 miles from the shore, but even that is about to change. The 1982 UN Convention on the Law of the Sea allows states to extend their limits beyond 200 miles if they can show that the continental shelf beyond their coastline extends that far. So long as they can produce the necessary scientific data, and so long as the extra margin is at least 100 miles from the point at which the sea reaches a depth of 2.5km, they will be granted rights over the natural resources on and under the seabed up to 350 miles from land. For countries that ratified the convention before May 13th 1999, only four months now remain for the submission of their claims: the deadline is May 13th. A scramble for territory is nearing its climax.

In all, about 15m square kilometres are at stake. That is about half the area involved in the 19th-century scramble for Africa, and some big claims have already been lodged: Canada is seeking 1.7m sq km and Australia 2.5m. Many of the countries that stand to gain most relative to their size, though, are poor and small: Barbados, Mauritius and the Seychelles, for instance. Eight Pacific island nations, among them Fiji, Palau and Tonga, are claiming a total of 1.5m sq km.

The 80 or so countries with realistic hopes of being able to substantiate a claim are not expecting new fishing rights. Their designs are chiefly on minerals. Many people have for years believed that the seabed was paved with gold, and with some reason. It has long been known that roughly a quarter of the ocean floor is strewn with "manganese nodules", usually about the size of an apple, which contain not just manganese but also cobalt, copper and nickel. When the law of the sea was being debated in the 1970s, these nodules aroused enormous excitement. It subsided, though, when it became clear that the UN's proposed arrangements for licensing mining in the deep sea would involve the sharing of technical information with a new International Seabed Authority. America, whose companies were leaders in the field, did not relish parting with its technical secrets and turned against the UN's planned convention, which it has yet to ratify. Investment in deep-sea mineral extraction came to a halt.

Most Americans dropped their opposition to the convention after its provisions on deep-sea mining were changed in 1994. Even George Bush junior eventually came round to it and American ratification now seems only a matter of time. The United States, however, was not the only obstacle to digging and dredging in the deep. Gathering the nodules was, and is, technically difficult, chiefly because most of them lie in 4km of water, and it was not popular with environmentalists, either, since the necessary dredging stirs up quantities

Bluegreen



He may turn out to be a friend

of sediment that kills everything nearby.

The economics of mining has changed, though. Industrial commodity prices, despite recent falls, are much higher than in the 1970s, and technology has advanced. That means it may now become profitable to exploit the manganese crusts and other minerals recently discovered. Several countries certainly hope so. In the past five years China, France, Germany, India, Japan, Russia, South Korea and a consortium of east European countries have all been awarded licences by the International Seabed Authority to explore mining possibilities on the deep-ocean seabed, and a Canadian company, Nautilus Minerals, hopes next year to be the first deep-water mining company to start production. Its plan is to bring up ore containing copper and gold from the bottom of the Bismarck Sea north of Papua New Guinea, using technology developed by the offshore-oil industry.

That industry, with its own purposes in mind, is also keening to move into deeper waters, especially in the Arctic. Rising temperatures and melting ice make Arctic extraction easier, and American government scientists now believe that 90 billion barrels of oil and vast amounts of natural gas still lie beneath the Arctic. Nearly 85% of these deposits, they think, are offshore.

The thought of Arctic oil has quickened more than pulses. Canada is establishing a year-round Arctic presence on land and sea as well as in the air. Denmark is trying to prove that a detached part of the underwater Lomonosov ridge is an extension of Greenland, which is Danish territory. And Russia has staked a claim by sending a submersible to plant a corrosion-resistant titanium flag some 4km below the North Pole.

Inestimable stones, unvalu'd jewels

The covetousness goes beyond metals and oil. Two newish discoveries in particular tickle commercial fancies. One is gas hydrates—white, sorbet-like compounds that usually consist of methane molecules trapped in a cage of water. They were first found in permafrost in the 1960s and then, in the 1970s, on the slopes of continental shelves deep beneath the ocean floor.

Many scientists believe these hydrates together contain more energy than all the known deposits of fossil fuels, a possibility that makes them highly attractive to countries such as Japan and India, with little or no oil or gas. The oil companies, though, are cautious. Hydrates occur naturally in pipelines, and are unpopular because they clog the flow of oil. Extracting them would be intensely difficult. And methane, though it burns more cleanly than coal, absorbs a wider range of wavelengths of the Earth's outgoing radiation than CO₂. It therefore traps more heat, making it an even more pernicious greenhouse gas.

The second discovery is the strange variety of deep-sea life that is increasingly coming to light—quite literally. Some of it is to be found near “black smokers”, vents that occur along ridges in the middle of the oceans where two plates are spreading apart. In such places dissolved hydrogen sulphide comes out of the rock and suddenly cools, causing minerals to condense and create plumes of “smoke”. The first of these vents was discovered in 1977 on the Galapagos ridge by scientists in the Woods Hole Oceanographic Institution's submersible, *Alvin*. A more recent discovery, on the South-West Indian Ocean ridge last year, was made by China's research vessel, *Dayang 1*. Life at the dark depths where these vents occur gets its food and energy from the Earth, not from the sun—and much of it is strange. Here can be found sulphur-eating bacteria, scale worms that thrive in hot water at the tips of the smokers, and shrimps—blind, though they have eyes on the back of their heads—that can mend their DNA even after it has been highly irradiated. And below the crust in these volcanic parts micro-organisms have been discovered that may offer clues to the origins of life.

Much of the interest, though, comes from medical researchers who hope the strange properties of some of these creatures may lead to new anti-carcinogens or tumour-reducing drugs. Some more familiar forms of life, found in much shallower waters, also hold out the promise of new medicines. Sea cucumbers, for instance, are already being harvested and minced up by French and American pharmaceutical companies. Chemicals isolated from soft coral off Western Australia may help fight breast and ovarian cancers.

Old hands cast doubt on theories that huge quantities of minerals lie below the seabed. Big seams are needed if money is to be made. But most of the compounds found so far, say the doubters, come from volcanic deposits. Dissolved minerals—copper, gold, silver and so on—typically rise up with volcanic activity and then become sea-floor deposits; the surface copper in Cyprus, a volcanic island that was once below the waves, is an example. William Ryan, of Columbia University's Lamont-Doherty Earth Observatory outside New York,

says there are fewer nodules than people generally believe and most of them are in very deep water. He adds that everything done at sea is becoming more expensive, so the economics of mining may not have improved much. He is equally sceptical about methane hydrates, arguing that the energy they contain is less than the energy needed to release and secure it.

Such cautions may be wise, but they will not stop the scramble. Too many mysteries of the deep remain unexplained and, anyway, no country turns down a chance to enlarge its sovereignty.