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## Charles Clover's weekly column takes an inside look at the environment

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### Altering evolution

#### Leuven, Belgium

Even in February, the streets of the medieval city, 15 minutes north of Brussels by train, lift the spirits. The intricate 15th century town hall, the cobbled market square, the great Gothic and Baroque churches and the Flemish vernacular buildings are a delight - as is the fragrant Belgian beer.

advertisement We were at the great Catholic University to discuss the future of the world's fisheries and to mark the giving of an honorary degree to Daniel Pauly, the scientist, based at the University of British Columbia, who has done most to describe the crisis in the world's oceans.

There were ironies here. The last time I had anything to do with the Belgian fishing industry was when we ran the story of how Belgian trawlers were ploughing the Irish Sea and discarding 90 per cent of the immature plaice they were catching in order to land a few valuable sole.

New rules intended to cut down on that kind of insanity and are being worked up by the European Commission and the fishing industry - a welcome new direction for the EU, the success of which will be judged later this year. What was fascinating this week was the succession of nuggets from a range of speakers about the history of the sea, the state it is in and the first tentative steps about trying to manage it better.

Did you know, for instance, that most of Europe gave up eating fish from the end of the Stone Age and until around 1000 AD - though Scandinavia continued? As James Barrett, a Cambridge archaeologist who digs up discarded fish bones, told us, the Anglo-Saxons had no word for cod.

Most startling was to discover the extent that modern industrial fishing has altered evolution. Many were aware that the persecuted North Sea cod has changed the age at which it spawns from seven years old to three, because natural selection now favours cod that breed young. But this is no isolated phenomenon.

The best evidence of "fisheries induced evolution" is from the Barents Sea, in the Norwegian arctic. Dr Ulf Dieckmann, from the International Institute for Applied Systems Analysis in Austria, explained that commercial cod fishing on a modern scale did not really get going there until the 1920s.

So it was possible to show from excellent records compiled from the 1930s that the cod there have today lowered their spawning age by half, from their original spawning age of ten. Smaller cod produce only half the number of eggs, making the population more vulnerable to over-fishing.

Dr Dieckmann said the Northern cod, of the Grand Banks off Newfoundland, exhibited this trend too, from 1985, another sign of potential collapse that scientists failed to spot. Fishery induced evolution has now been detected not only in cod but in plaice, sole, American plaice and small yellow croaker (which lives in the seas off China). Previously people thought that man might alter evolution over millennia, now we know that if we try hard enough we can do it in a matter of decades.

Most startling was Dr Dieckmann's estimate of how long it would take to repair this "Darwinian debt," which he says we owe to future generations. The answer was 250 years. That is the time it is estimated that it would take if the Barents Sea was closed to fishing for cod to go back to spawning at ten years old.

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## No change there

Marine reserves are one of the ways of repairing the damage before matters get even worse. But as Daniel Pauly observed, at the present snail-like pace, the world stands no chance of meeting the target it set itself in 2002 of setting up a network of marine reserves by 2012.

The Netherlands, like Britain, are proposing a series of reserves to comply with EU law. But as Han Lindeboom, from the Institute of Marine Resources in Texel explained, these omit 20,000 square kilometers of North Sea known as the Central Oyster Grounds, where oysters were harvested in the 19th century - and where none are found today.

Omitted also is the richest area of seabed for quahogs, shellfish known to live to over 400 years old and at risk from bottom trawling. But what makes the whole exercise pointless is the Dutch government's assurance that in these reserves "existing uses will not change."

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## Why not invest in the sea?

How to get over the short term pain of reducing fishing pressure when the long-term economic benefit from healthier fish stocks could be so much greater? Over dinner, a few of us came up with an idea.

Why don't conservation organisations - or hedge funds, come to that - buy up fishing quota, and sell some back to fishermen when stocks improve? I checked with Defra and it is actually possible. Who knows, investors might actually make some money.

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