

THIS WEEK

EDITORIALS

OBJECTION! The perils of leaving forensic science to the open market **p.548**

WORLD VIEW Colin Macilwain on why nuclear experts fail to convince **p.549**



WATER BORNE Amazonian fish found to carry seeds for miles **p.551**

Lessons from the past

The Chernobyl disaster still has much to tell us about the long-term risks of low-level radiation exposure. But only if the necessary follow-up studies are supported.

As the battle to make safe the Fukushima nuclear reactors continues, the political fallout is spreading across Japan and around the world. Despite reassuring early reports, it is clear that significant amounts of radioisotopes have been released from the plant, and some workers there face severe radiation exposure as they try to cool the overheated nuclear fuel. In response, several governments are reviewing the safety and future of their own nuclear programmes. Fukushima has undoubtedly strengthened the hand of those who oppose nuclear power.

The global reach of the disaster brought an echo from history last week when iodine-131 from Fukushima was detected in Ukraine — home to the Chernobyl power plant, site of the world's worst civilian nuclear disaster. A quarter of a century ago, a flawed safety test at Chernobyl triggered a massive explosion and fire that spread tonnes of radioactive material across Europe, and shredded public confidence in atomic energy.

Like Fukushima, the consequences of Chernobyl were wide ranging. In the satellite countries, resentment of Soviet handling of the disaster contributed to the fall of the Soviet Union. Thousands of children developed thyroid cancer after drinking contaminated milk. Billions of crucial dollars from the economies of Ukraine and Belarus were redirected to remediation, health care and compensation. Every day, some 3,500 workers still labour at the plant to prevent further releases, while decommissioning of the site's four reactors has barely begun. Recovering from a nuclear disaster is the task of generations: it will be another 50 years before Chernobyl is just a memory.

As we report on page 562, the pace of recovery at Chernobyl has been slowed by the reluctance of other countries to pay for it. The shattered reactor 4 still lies beneath a haphazard concrete sarcophagus, erected in the frantic months after the accident. Maintenance work keeps it secure — for now — but the walls are streaked with rust and its roof is in a poor state of repair. Engineers want to build a safe confinement arch to allow them to dismantle the reactor, at an estimated cost of US\$1.4 billion.

The Chernobyl Shelter Fund, managed by the European Bank for Reconstruction and Development, has so far amassed more than \$800 million of that sum, from 30 donors. But funding shortfalls have delayed the project by years and the 2015 target for completion will be difficult to achieve without more money from the international community.

One immediate consequence of the Fukushima disaster should be to encourage this money to flow. Nuclear accidents have global repercussions, and public mistrust of nuclear power demands that its problems not be left to fester. It is in the world's interest to push forward with safe nuclear power — but also to deal properly with its damaging legacy when things go wrong, as they will.

Today, new nuclear power stations are being constructed in more

than a dozen countries. China alone is working on almost half of the 65 reactors currently being built, and there is growing interest in the technology from developing countries. Supporters of the spread of civil nuclear power must acknowledge that some of these countries would be unable to cope alone if faced with a nuclear accident on the scale of Chernobyl.

Nations, particularly those pushing new nuclear build, must invest in bodies such as the International Atomic Energy Agency, to ensure that new and old reactors around the world are sufficiently safe, and that they are fully prepared for the worst. And politicians and the nuclear industry must revisit their relationship with a sceptical public. Being open and transparent about the uncertain costs of new build in countries such as the United Kingdom would be a start. If a public subsidy is required to get them built, then say so. If the industry wants people to believe its assurances that nuclear power is safe, then now is not the time for obfuscation and weasel words, on any aspect of the technology (see page 549).

Governments must also work to present a clear narrative about the health implications of accidents such as Chernobyl and Fukushima. For heroic plant workers exposed to extreme radiation doses — and for those still suffering from Chernobyl's legacy of thyroid cancer — the risks are all too clear. But it is harder to pin down more subtle health effects. There are hints that low-level exposure can raise the risk of cardiovascular disease, breast cancer and other conditions, consistent with the idea that there is no safe threshold for radiation exposure. To clarify the situation, the world needs studies of large numbers of people exposed to very low doses of radiation — and Chernobyl can provide those. Funding such research is vital for those affected by Chernobyl's radiation, but it should also answer some of the questions over the future of nuclear power.

People legitimately ask whether the low levels of radioactivity now drifting across Japan are safe. The current best answer is 'probably'. A better response would be to find out, before another 25 years pass. ■

ANNOUNCEMENT

Nature mentoring awards

Every year, in a selected country or region, *Nature* awards prizes for outstanding scientific mentoring. The competition this year is to be held in France. Two prizes, each of €10,000, will be awarded: for a lifetime of mentoring achievement, and for an outstanding track record at mid-career. The competition is now open. Details of the procedures and nomination forms can be found at www.nature.com/nature/mentoringawards/france. The closing date for nominations is 27 June 2011.