

Palaeontology

New bones for old

AFTER 12 years of planning and legal battles, one of the world's top ten palaeontological sites — at Messel, near Darmstadt in West Germany — has been designated a rubbish dump. The decision, which will not be immediately disastrous, is a compromise between the obligation of the local bureau of mines to deal with dangerous old mine workings and the scientific community represented principally by the Senckenberg Museum in Frankfurt.

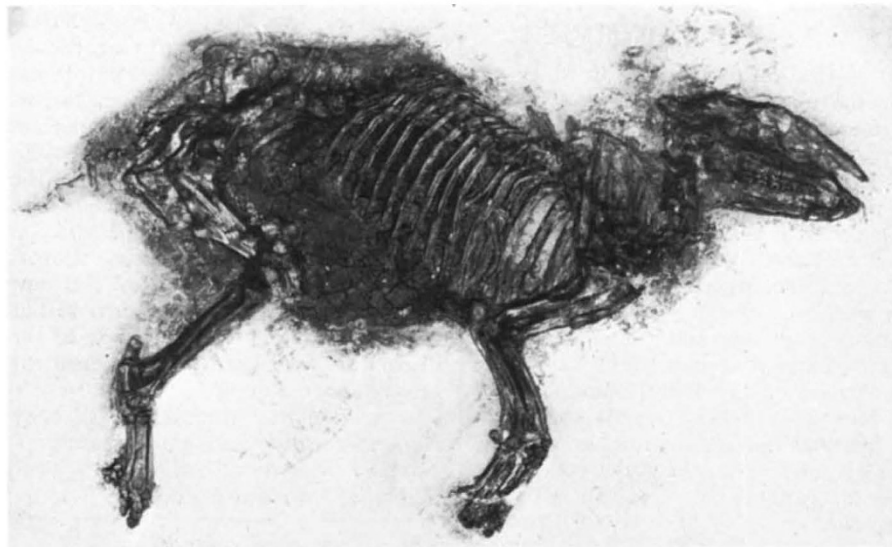
The main site covers about 10 per cent of a 90-year-old opencast mine working in soft oil shale that forms a pit 1 km long and 60m deep. An entire Eocene ecosystem is preserved with a huge variety of fossils of outstanding quality.

The first fossil, a crocodile, was found at Messel in 1875. Between 1886 and 1971, some 20 million tonnes of oil shale were mined. As the mining decreased in the 1960s, the pit became the focus of a rush of amateur fossil hunters. It was eventually closed to the public because of its dangerous state but, with a five-year grant from the Volkswagen Foundation, scientific excavation began in 1976.

To preserve the complete site permanently for palaeontologists would cost DM30 million (£7.5 million) on one estimate, a sum that could not be found by the mining authority of the *Land* of Hesse which has legal responsibility for the site. It has therefore decided that the pit will be filled with waste, although about 40 per cent of the area will be preserved for 20 years for scientific work, and an extra 9 hectares will be made accessible for a period of a year or two while drainage is carried out.

The site is the product of two rivers which bore detritus into a warm (20-30°C) still lake over a period of 1-2 million years. The oil shales preserve not only the contents of the lake but also the flora and fauna of the teeming palm forests that lined its margin. The fossils contain 40 per cent water and were difficult to preserve until the advent of replacement techniques using water-miscible plastics. These reveal skeletons and unique soft-part detail, fine enough to show replacement of many structural parts by bacteria and including feathers and hair. Stomach contents show, for instance, that the bat *Palaeochiropteryx tupaiodon* lived primarily on Lepidoptera and that the horse-like *Propalaeotherium* ate foliage including bay leaves and vines.

Every major group of the animal kingdom is represented at Messel and published papers already fill more than 130 monographs issued by the Senckenberg Museum. Finds have included many rarely preserved amphibians, skeletons of bats with hair and skin, a unique rodent genus



Propalaeotherium messelense, a European relative of the ancestor of the horse.

and, last year, an anteater never before unearthed in Europe and indicative of later land links with America than has hitherto been supposed.

Given the legal position whereby responsibility is a matter solely for *Länder* government, even though most of the research on the site is supported by federal agencies, those involved have reluctantly

accepted what appears to be the best compromise. The argument that Messel is so important that it should be designated by the United Nations Educational, Scientific and Cultural Organization as a site of special historical interest neglects the legal fact that an initiative in that direction would have to come from the *Land* of Hesse. □

Israeli Arabs

Finding technical jobs

Rehovot

FEW Israeli scientists can claim to have declined the offer of a job overseas in favour of one at one-quarter of the salary at home; even fewer are Arabs. One who fits both bills is Dr Nicola Yanaki, a nuclear physicist whose decision to work for one of Israel's most successful high-technology companies was made, in part, to help fellow Israeli Arabs.

Yanaki, who lives in the predominantly Jewish town of Upper Nazareth, is product manager for mammography at the Elscint plant in that town and is largely responsible for the company's advanced systems for the detection of breast cancer. Called Man 2 and Man 3, they provide extremely fine resolution and optimal contrast for accurate differential diagnosis.

Yanaki grew up in the town of Ramle, near Tel Aviv, and received his first scientific training at the Arab Orthodox College (a high school) in Haifa. He then went to Tel Aviv University, where, in August 1981, he became the first Israeli Arab to win a doctorate in nuclear physics. During his stay at Tel Aviv University, Yanaki developed and patented a special gamma-radiation detector. This device, while not yet produced commercially, aroused interest among oil companies because it has proved useful in oil exploration projects.

Indeed, it was because of this detector that a US oil company offered Yanaki a well-paid job, which he turned down when

asked to join the staff of Elscint, which now sells \$110 million worth of medical imaging equipment a year. Yanaki clearly feels that he should repay the nation for having provided him with a good education, as well as being motivated by a desire to help other Israeli Arabs. Those with advanced training in science and engineering have limited employment opportunities because many science and engineering jobs are in defence industries and hence, Yanaki says, "are naturally closed to Arabs in present circumstances".

Until these circumstances change, Israeli Arabs with Yanaki's background must look to civilian science-based industry. By taking a job with Elscint, Yanaki feels that he has "opened the way for others". At Elscint itself, this is clearly the case. There are two Arab engineers in Yanaki's own staff, and another Arab, Anvan Nujam, is carrying out research in Elscint's ultrasound division.

At a time when many others are pessimistic about the chance of peace in the Middle East, Yanaki is optimistic, pointing out that the people of the region have everything to gain by working together. He looks forward to the day when he and his colleagues at Elscint will be able to work on joint projects with researchers in neighbouring Arab countries. And, he adds, "I'm sure that day will come more quickly than anyone now believes possible".

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