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highly radioactive Waste

Nothing could demonstrate more clearly the nature of independent thought by a scholar, when applied to a great interdisciplinary problem and leading to an acceptable solution, than this article contributed by Dr Maureen E. Kaplan of Lexington, Massachusetts. It was published in September 1986. Her doctoral research involved neutron activation analysis of ancient pottery from the Mediterranean, and her thoughts were directed to the archaeological study of long term survival of human artefacts, such as Stonehenge. I met her at an AAAS Meeting, liked her and invited her contribution.

There is one problem where her researches needed an urgent application, namely the marking of the deep burial sites of highly radioactive wastes. Even at the time of my writing this, (2001 AD) no country has yet decided on the deep burial of these dangerous wastes, and therefore Kaplan's studies and her solution still remain only a theoretical proposal. I thought it was an excellent one, and her Manuscript was received in my office on 5 June 1985.

Dr Kaplan's basic problem was to design a marker on the surface which would indicate to humans in, say 10000 years' time, where there must be an absolute prohibition to explore below ground. She started by pointing to human edifices which had survived millennia and assessed their suitability as markers. The Pyramids in Egypt, 4500 years old, were too massive to be effective repository markers. The Acropolis in Athens had suffered more from human environmental attacks, than from the ravages of nature, and hence possible markers must also be protected against pollution. The Great Wall of China, more than 2000 years old, had required continual maintenance, a labour to be avoided, as it cannot be preplanned. Wall carvings in Ancient Egypt had been destroyed by salt crystallisation and therefore excellent drainage would have to be provided for the suggested markers.

Kaplan concluded that only the monoliths of Stonehenge provide an archaeological example to be followed. Hard stones, like basalt or granite, must be used, as metals rusts or if precious, would be recycled. The markers should be twice the height of the human figure, their surface be highly polished to prevent water attack, and they should carry written messages in English, French, Arabic, Spanish, Russian and Chinese. The markers should also endeavour to convey the prohibition in symbols and in pictures, showing for example one man, out of three, who had disobeyed, had suffered and falling down, died, while the two on his sides, remained standing.

Thirteen years after this publication in ISR, G. Benford published his book *Deep Time—How Humanity communicates over Millennia* (Avon 1999), the results of a highly-endowed Commission of Enquiry for the US Congress. I was delighted that ISR was first again, and that Kaplan had succeeded.