The term imacro-engineering', first used by Frank Davidson and explained theoretically [Title 327], has always excited me as I have had the chance to see several examples, and it stimulated my historical curiosity. My visit to the Dutch Delta made me think historically, as The Netherlands had often suffered in past centuries from disastrous flooding of their country.

A number of human endeavours in prehistoric times deserve to be called 'Macro-Engineering' such as Stonehenge, although we still do not know the precise manner in which it was constructed. First accurately surveyed and described are the Egyptian Pyramids, followed by the great Roman civil engineering works like aquaducts and cross-continental roads. In the Middle Ages, the Gothic Cathedrals [see Title 271] and other great places of worship were masterpieces not only of construction, but also of the provision of building materials (millions of bricks) and their transportation to the site.

In the 19th century the Suez Canal, and in the 20th the Panama Canal deserve to be included, followed in more recent times by the separation of uranium isotopes for the manufacture of Atomic bombs and the spectacular Apollo flights to the Moon. The mastery of constructing nuclear submarines is also a great macro-engineering achievement, and these will now serve for oceanographic exploration, as Jules Verne foretold more than 100 years ago. *National Geographic* in March 2000 published the first non-secret report that a nuclear submarine; the USS *Hawkbill*, had carried out extensive oceanographic and meteorological research and data acquisition work in the Arctic Ocean, much of it below the ice. Although secret, naval under-ice surveying work was routine since the USS *Nautilus* reached the North Pole submerged in August 1958, 42 years earlier, it was only in March 2000, that this research was de-classified, and another scientific prediction was fulfilled.

In Europe, the Channel Tunnel [see Title 247] and the Dutch Delta Project [see Title 225], both now completed, were examples of great macro-engineering achievements, and I was fortunate enough to watch them in progress and record them in ISR. To me, the grand scale and the precision of these two, were eloquent proof that macro-engineering need not have the resources of a Superstate to be implemented. If there is careful planning, and sufficient time for their completion, and if the raw materials can be assembled over lengthy periods, if the special machinery for tunnelling can be procured without having to design and manufacture it, then macro-engineering projects can be undertaken and completed successfully by states, like England, France, The Netherlands and Japanese bridge and tunnel engineers, always provided that Professor R.T. Seaman's ideas expressed in \*Shared Characteristics of Large-Scale Endeavors\* [see Title 164] are followed in a free and democratic society.