A few years ago George Ter-Stepanian, discussing the role of Man as a new and powerful geological agent emerging with the start of agriculture and animal husbandry during the Neolithic, proposed to separate the Technogene from the Quaternary as the beginning of the Quinary and to combine the Holocene with the Technogene (Ter-Stepanian 1983, "Did the Quinary start?", Abstracts, XI Congress, International Union for Quaternary Research, Moscow, 1982, p. 260; 1988, "Geological phenomena and processes in the Technogene," Problems of Geomechanics, Academy of Sciences of the Armenian SSR, Vol. 10, pp. 45–57).

In an interesting manuscript, currently in press, James A. Harrell and V. Max Brown provide rather convincing evidence for the identification of the author or authors of the so-called "Turin Papyrus" (James A. Harrell and V. Max Brown, 1991, "The Oldest Surviving Map from Ancient Egypt: The 1150 BC Turin Papyrus," Department of Geology, the University of Toledo, Toledo, OH 43606-3390, USA). It is presently known that this ancient Egyptian papyrus dates from the reign of Pharao Ramesses IV (1151–1145 BC). Discovered 170 years ago it contains, as known for more than 100 years, a map of the Wadi Hammamet area in Upper Egypt situated to the east of the Nile River. Many publications were devoted to the papyrus, several containing facsimile prints of the colored map. Those at the end of the 1800s and in the years 1909–1914, 1937, 1942, 1949, and a number of recent ones since 1988, focus on the question of whether we are dealing with the oldest known geological map. The map provides much geographical information and indicates the availability and location of minerals (gold) and of a beautiful grayish sculptural stone of economic value, in ancient times much in demand for statues of kings and other carvings. However, in order to qualify as a "geological" map it should also be the product of "geological reasoning" based on specific "geological concepts," an aspect that appears improbable.

There is no apparent connection between the statements by Ter-Stepanian on the beginning of an entirely new era in the geological history under the influence of Man and the discussions on the Turin Papyrus being possibly the oldest geological map. Nevertheless, there are solid reasons to comment upon these issues in a single editorial. They both reflect the role applied environmental geology and water sciences are playing at the service of the state and of the public.

The development of human civilization and human societies is impossible without a systematic prospecting and exploitation of renewable and nonrenewable natural resources, including hydrological and mineral resources. Since the dawn of history Man must have developed, for this purpose, a sound reasoning based on the careful and objective observation of natural features and natural phenomena and on logical criteria. Stone-age men knew that only certain stony materials were suitable for making their primitive tools. During the Neolithic period he went as far as exploiting underground flint mines at a number of sites in Western Europe, digging shafts and galleries. He transformed the flint thus obtained in an almost industrial manner into tools in regular workshops and traded them over long distances. Later, the discovery of metals and the development of metallurgy led to similar processes in various parts of the world. The same was the case with asphalt, mined in Mesopotamia since predynastic times.

It was also during the Neolithic period, about 6000 BC, that Man discovered, in the semiarid regions of the Near and Middle East, that agriculture and animal husbandry would ameliorate his way of life and that artificial irrigation would greatly increase production. Watering fields became a common practice in other parts of the world as well, as is testified by the extensive irrigation works constructed by ancient Indian civilizations in South America, on the Arabian peninsula, on the Indian subcontinent, in Sri Lanka and elsewhere. These hydraulic works included canals and lined ditches, dams, sluices and water distribution systems, storage basins, as well as wells for the exploi-
tation of groundwater. Available evidence indicates that as early as about 1500 BC, mechanical devices of the “Persian wheel” type, for lifting water from brick-lined wells, were in use in Mohenjo Daro in the Indus Valley.

Oral traditions were responsible for the passing on of knowledge and expertise from generation to generation, sometimes hidden under a veil of magical ceremonies performed by the initiated few. In many societies, for instance, blacksmiths were long believed to have magical powers. However, these achievements, impressive as they are, do not prove anything about Man’s scientific background in those early days. We all know how illiterate herdsmen and farmers and workmen in many countries and civilizations developed wonderful skills in many fields without any theoretical training, continuing to work up to the present using traditional methods and tools. Until very recently prospecting for natural raw materials, in particular metallic ores, precious metals, and semiprecious and precious stones, used to be the domain of adventurers and prospectors with little schooling.

Scientific reasoning as such is also very old, but it used to be incorporated mostly in philosophic thinking, often shunning the very idea of practical applications of the theories evolved. One could mention as typical examples the works of Herodotus, Thales of Miletus (624?-548? BC) and somewhat later Anaxagoras of Clazomenae, or Abu Ali al-Husayn ibn Sina, known in the West as Avicenna (980–1037 AD). There are, of course, the famous exceptions, scholars who were interested in such down-to-earth practical things as machines, war-engines, clocks, and contraptions and devices for lifting water and equipment for mining. Here one can mention from pre-Christian times Archimedes, Heron of Alexandria, Ctesibius; from the early Arab period (AD 860 onward) Mohammad, Ahmad and Hasan, the sons of Musa ibn Shakir and others; and in 15th and 16th century Europe Leonardo da Vinci and Georg Bauer, better known under his latin name of Agricola.

George Ter-Stepanian is correct: the advent of Man the Maker at the dawn of history did change the course of the evolution of the Earth fundamentally. For the first time a biological species was capable of surveying his environment consciously, monitoring 2nd altering it, and manipulating natural processes. Unfortunately, Man’s mastery of the environment is still mostly limited to his destructive forces, but this is another matter.

Man the Thinker and Writer emerged only much later, but, nevertheless, more than 3000 years ago. His religious concepts, recorded in vast numbers of written documents in many languages on stone, metal plates, clay tablets, papyrus, and other materials, may sometimes appear unfamiliar to us. Other features of these ancient records are astonishingly modern.

The so-called“Turin Papyrus” is one example. A painstaking study, including a very detailed analysis of the handwriting of the various texts in the ancient Egyptian hieratic script found on the back side of the papyrus, revealed that most of it was the work of the Scribe of the Tomb Amennakhte, son of Ipuy. Other contributors were Hori, son of Khons, another Scribe of the Tomb, Nekhemmut the Younger, Foreman of the Tomb, and Anherkhe the Younger, another Foreman of the Tomb. All lived in present-day Deir el-Medina near the Valley of the Kings and all were important officials. Graffiti also identify the Scribe Amenhotep, probably the son of Amennakhte.

Amennakhte probably never visited the Wadi Hammamat region himself, his work being that of compiling and recording various observations made by colleagues and sons. He did, however, legate to posteriority another papyrus which shows the plan for the tomb of Ramesses IV with a plan and cross sections indicating the main rock types observed. He certainly was a talented recorder as well as an interested observer of nature, but we would probably never have known about this but for the fact that the Turin Papyrus, which may have initially resided in an administrative document pool in Deir el-Medina, eventually ended up with many other documents in Amennakhte’s family archives, put together over several generations by his descendants (who also served as Scribes of the Tomb) and finally stored in the family tomb. The archives were discovered between 1814 and 1821 by Bernardino Drovetti and sold in its majority in 1824 to King Charles Felix of Sardenia and Piedmont.

What could be more modern than a family of government (or religious) officials, sufficiently aware of the value of knowledge and of economic, social, and political benefits of recording information pertaining to geography and natural resources, and preserving these during several generations in a family archive? It constitutes a perfect example of the combination of private enterprise with public function.

Two hundred years earlier, during the reign of Pharaoh Tutanchamon (1357–1351 BC) another official, Renny, was commissioned to find new deposits of gold in the region east of Edfu in Upper Egypt. His rank permitted him to record his mission in some inscriptions, a sure sign that this mineral prospector was an influential bureaucrat, not an illiterate adventurer (H. Quiring, 1948, “Geschichte des Goldes,” pp. 37–56; F. W. Green, 1909, “Notes on some inscriptions in the Etbai District,” Professional Society of Biblical Archeology, London, pp. 247–254.)

The administration in ancient Egypt, whether controlled by kings or priests, was not the only one to recognize the important role of professionals in society. Already 1000 years earlier one can note the work of archivists, scribes, and bookkeepers in Mesopotamia, maintaining all kinds of records on clay tablets. A Sumerian clay tablet is the oldest known geographical map, but perhaps even more interesting are the Sumerian and Babylonian mathematical and economic tablets indicating the basics of land surface measurements and land resources surveys.

As professionals in applied environmental geology and water sciences we can be proud of a written history dating back more than 3000 years and of oral traditions that are several millenia older. There has been no lack of recognition by states or societies. Nevertheless modesty is required because our capacities were always geared towards the