Chapter 2

Egypt

“Egypt is ... the gift of the river” (Herodotes, Histories, 2.5). The Nile, the longest river on the planet, is different from all the others in two features, spatial and temporal. First, its valley that can be used for agriculture is a narrow strip for 800 kilometers that is followed by the delta, with a spot on the side, the Fayum. The two parts are of about equal area. All the cultivable land is at a short distance from the mighty Nile and its ramification that innervate the delta. The satellite photo presents a picture that has changed little for 5000 years: In antiquity, the delta was a little smaller, the cultivated area was smaller than the current green band along the river and there was no Aswan dam. The desert presents two formidable barriers, sandy dunes on the left and rocks on the right, that prevents the extension of agriculture but also protect the valley from hostile incursions from the outside.

The second feature that is unique to the Nile valley is the regular annual cycles of floods (before the construction of the Answan dam). From the relatively low level (the average discharge of the Rhine in Strasbourg) during the first half of the year, the water begins to rise gradually before the summer solstice. No sudden devastating flood. The volume increases quietly, mightily, to reach its peak during the torrid summer months when the sun would burn the fresh plants.
At that time, as described by Herodotus (Histories, 2, 97),

“when the Nile overflows, the country is converted into a sea, and nothing appears but the cities, which look like the islands in the Egean. At this season boats no longer keep the course of the river, but sail right across the plain.”

The average profile of the volume of water is presented in Figure 2.1. But the inflow of water is just part of the story. When its recedes in September, the Nile covers the land with the highly fertile brown silt that has been carried from the mountains in Abyssinia and around Lake Victoria\(^1\). Finally, and that is not less important than all the other elements, the flood washes the land from salts that could accumulate and transform the region into a barren land\(^2\). in October, the land is ready to be seeded for the germination and the growth of the crops under the benevolent winter sun. The harvest takes place in the spring before the next flood. The cycles have, in general, an exquisite timing. They have shaped the life of Egypt through millennia.

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Figure 2.1:

Herodotus was curious to find out where all this water could come from, but he found

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\(^1\) (Today, the silt is stopped by the Aswan dam and has to be replaced by chemical fertilizers).

\(^2\) Note on that
no answer. The water comes from the rains in the high mountains of East Africa and
lake Victoria. Because of the variability of these rains and of the water level in the
lake, the annual cycle could itself be subject to other cycles of various durations. Both
insufficient and excessive water meant hardship and could lead to famine. We all know
from the seven good and the seven bad years in the Bible. The variability of the water
level is illustrated in Figure by the maxima and minima in the modern record in the
next. As the water level predetermines most of the life in Egypt, some records of water
level have been kept up to before 3000 BC\textsuperscript{3}.

\begin{figure}
\centering
\includegraphics[width=\textwidth]{figure1.png}
\caption{Maximum et minimum du débit annuel du Nil à Assouan (1871-1965)}
\end{figure}

Source: Manning (2002).

Figure 2.2:

The variability of the Nile may have had some positive impact on the growth of the
state and the Egyptian civilization by keeping the population in check and maintaining
the surplus for the ruling state.

All the life in Egypt depended on the sun and the Nile. Both were gods. In good years,
the land was spectacularly productive with grain yields higher than 10 up to 15 in the
best areas. (There were between 5 and 6 in Europe before the Industrial Revolution).
The surplus captured by a dominant class, the Pharaoh and the state, the priests, later
the Persians, the Ptolemies, the Romans and still later the Ottomans. That is the

\textsuperscript{3}Bell (1970).
Irrigation

The irrigation methods in the two parts of Egypt, in the valley along the river and in the delta, respectively, are different because of their geography. In the delta, Herodotus (2, 14) writes:

“At present, it must be confessed, they obtain the fruits of the field with less trouble than any other people in the world, the rest of the Egyptians included, since they have no need to break up the ground with the plough, nor to use the hoe, nor to do any of the work which the rest of mankind find necessary if they are to get a crop; but the husbandman waits till the river has of its own accord spread itself over the fields and withdrawn again to its bed, and then sows his plot of ground, and after sowing turns his swine into it—-the swine tread in the corn—after which he has only to await the harvest. The swine serve him also to thrash the grain, which is then carried to the garner.”

In the valley of the Nile, the “gift of the Nile” had to be acquired as Herodotus writes in the introductory quote and adds (Histories, 2.10):

“The greater portion of the country above described seemed to me to be, as the priests declared, a tract gained by the inhabitants.”

As seen on the satellite photo, the Nile valley is not wide. During the flood, the mass of water was formidable. No barrage could be built. (The Nile was dammed only 50 years ago, at great pain.). Indeed, no barrage would be necessary, nor desirable: the Aswan dam stops the silt which now has to be replaced by chemical fertilizers. The geography imposes that all irrigation is set locally (Manning, 2002). Through a local network of dikes and canals, the water is fed in, or retained when receding, and also appropriately drained out. An illustration is provided by Figure 2.3.

A local network generated local externalities but there were no externalities between different regions. Any of these networks could capture water as a free good. It is not surprising that the land was administratively divided according to regions, Nome, that followed each other along the river. The geographic constraints on the irrigation process have some implications for the structure of the state that will be discussed later.

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4The expression is also attributed to Hecaetaeus of Miletus by Arrian (Anabasis, 5 2).
2.1 Time

The regular annual and daily cycles with the protection of the desert on two sides of the river provided the valley with a stability that is unique in the history of the world. That stability enable the Egyptian state to last, with a few ups and downs, for millennia. When we look backwards towards the Egyptian civilization, our appreciation of time may be shortened. Just imagine that we live in the reign of King Tutankhamen. Let us settle in that time and think about the past and the future. We see the pyramids of Giza: they were built in the seventh century, before Charlemagne, well in the past. But the truly impressive is the future. Let us imagine the future: Julius Caesar? he will come in year 3500. Some say that man will send a craft to the moon, but this will happen around the year 5500, 3500 years from now (a few centuries before or after that, it does not matter).
The time perspective is necessary to understand the length of the Egyptian culture. Things changed very little over centuries, millenaries. The invariance of production and culture is a key for a successful public administration. An efficient administration entails enormous fixed cost (culture of the officials, promotion scales, information about the taxable activities). Given the administrative technology, the fixed cost of the administration could only pay off if social setting and the production activities were stable over time. The history of Egypt shows a state that was exceptionally strong and yet suffered from periods of decline from which it recovered. That history is summarized in four periods of organized states separated by “intermediary periods” with no strong central administration, disorders and foreign invasions, according to the following chronology.

**Old Kingdom (2700-2150)**
- pyramids

**First intermediary period (IP).** (2150-2050): disorders

**Middle Kingdom (2050-1650)**

**Second IP (1650-1550): disorders**

**New Kingdom (1550-1050):** Tut, Ramses

**Third IP (1050-700): disorders**

**Late period (700-332)**

**Macedonian, then Ptolemaic period (332-30 )**

add dynasty numbers for the kingdoms

Dates before the Ptolemites are approximate.

Figure 2.4: Summary of history

That we have such a chronology is amazing\(^5\). There is some disagreements about details and we have good information about the sequence of the main rulers but the exact dates

\(^5\)Milestones evidence are the stone of Palermo (dynasty V and before), essentially in the museum of Palermo, the papyrus in the museum of Torino (dynasty XVII and before), the history of Manetho, written in the Ptolemaic area.
are subject to some uncertainty\textsuperscript{6}.

We still have precisely little. Few documents have survived the millennia. For the Old Kingdom, most of the evidence is inscriptions in stones or on tomb walls ***. As time goes on, more documents become available. Posener estimates that we have 0.0001 percent of the written documentation. Yet we know more about Egypt than about many more recent civilization.

The geography of Egypt determines the political regimes but also what we know about Egyptian history. Most of our knowledge is from the artifacts that were left in the tombs that were well protected in the dry climate of the desert. Very little has been left in the Delta. But we should be aware that, as always in history, the sieve of time and weather is skewing the evidence. For the most recent period after the conquest of Alexander the Great, the problem is not the scarcity of documents but its abundance (more than a million). The records of some estates were piled up and recycled into *papier maché* for the coffins. We have better records on some of these estates than for some households today. Most of this evidence is waiting to be processed. ***

**The intermediary periods**

The Great Pyramid is the mausoleum of king Khufu. Its construction began immediately when he became a pharaoh. The pyramid exists today because king Khufu has a stable state for more than 20 years. The record in the Pharaohs shows that for some periods the state was disorganized. Pharaohs came in short succession, other evidence points to disorders, famines, invasions. These are the intermediary periods.

As river and climate have such a dominant influence on the life of Egypt, a natural question is whether the intermediary periods were correlated with the exogenous shocks of the river regime. The main investigation has been done by Butzer and is summarized in Butzer (1984). The flood level has been recorded for some years beginning in the Old Kingdom (e.g., stone of Palermo), but there is no sufficiently detailed record. Texts mention a number of famines, but it not always clear that they refer to specific historical events\textsuperscript{7}. Butzer finds that there is more evidence of famines, sand storms and low water level at the time of the intermediary periods with sudden recovery of good conditions for

\textsuperscript{6}A standard research project is to fix some the dates through improvements in carbon dating or astronomical computations.

\textsuperscript{7}For example, famines induced by low waters occurred even during glorious reigns as under Djoser, the pharaoh of the first stone buildings and the first pyramid. Moreno-Garcia (1997) mentions that during the First Intermediary Period, the relatively well off tombs are those of intermediary officials. This could be explained by the fragmentation of the state and does not seem compatible with famine conditions.
irrigation. However, it seems that the dates do not always coincide perfectly with the dates of the intermediary periods. There are also periods of disastrously high floods. However, such crises do not seem to have brought a collapse of the state and may actually have reinforced the need for coordination in building protective levees.

2.2 World view

That stability provided the inhabitants with a unique sense of security.

On hearing that the whole land of Greece is watered by rain from heaven, and not, like their own, inundated by rivers, they observed: some day the Greeks will be disappointed of their grand hope, and then they will be wretchedly hungry.’ (Histories, 2.13).

These Egyptians had confidence in their river. The repetition of cycles of the sun every day, and of the river over the year gave a sense that things were immutable. The priests kept the records of history and the monuments were proofs of unchanging times.

It happened that the people of the cities Marea and Apis, who live in the part of Egypt that borders on Libya, took a dislike to the religious usages of the country concerning sacrificial animals, and wished no longer to be restricted from eating the flesh of cows. So, as they believed themselves to be Libyans and not Egyptians, they sent to the shrine to say that, having nothing in common with the Egyptians, neither inhabiting the Delta nor using the Egyptian tongue, they claimed to be allowed to eat whatever they pleased. Their request, however, was refused by the god, who declared in reply that Egypt was the entire tract of country which the Nile overspreads and irrigates, and the Egyptians were the people who lived below Elephantine, and drank the waters of that river. (Histories, 2.18)

They are religious to excess, far beyond any other race of men, (2, 37).

Egypt is an isle with a central feed/highway but the model of Oriental despotism (Wittfogel), of a river with a steady and limited flow that requires a ruler to allocate the distribution of water throughout the valley with a sequence of dams and canals, does not

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8Between 1840 and 1700 B.C., the level of the flood was more abundant but erratic on the high side. 27 inscriptions record a catastrophic level at least twice the basin-water depth of a normal year.
apply to Egypt. It does not fit the plain facts about irrigation in Egypt. The Pharaonic regime was indeed "despotic", but the relation between geography and despotism will have to be reexamined later in this chapter.

There was no need for central coordination of irrigation but the central government was involved in some public projects to water: the building of canals and the irrigation of the Fayum, especially during the later period of the Ptolemies.

It is also critical to plan adjust ahead of time as much as possible the levees and the canals for the right amount of water. A precious indication was the speed of the rise of the water at the beginning of the flood, hence the importance of special measuring rods to keep track of the evolution of the river. A number of nilometers provided information on the level of the water at different points in the valley. When a central administration was in place, the viziers was informed more than once, daily.

The country is linear that is well isolated from outside interaction by the desert; it may not be an accident that the uniqueness of Egyptian civilization is associated with this unique feature of a linear economy. The geographical conditions offered a long time a protection against invasions. Hence, the government was able to use its revenues for public works which we can contemplate today. The ideal conditions for public finance in the Nile valley were necessary for these public works. Note that other cultures build around rivers with irrigation systems (e.g., Iraq, China) did not have a strongly linear feature as Egypt.

2.3 The state

To summarize, the state could be strong only if there were favorable conditions for surplus that could support its social structure (the ruling class and administration). This condition was necessary but not sufficient. There remained the task to make a surplus was generated and to capture it through taxation. But if natural conditions reduced the output to subsistence level, the state could not survive.