

Chapter 2

Egypt

“δῶρον τοῦ ποταμοῦ ”

(revised: 09/12/22)¹



The land of Egypt is “the gift of the river” (Herodotus, Histories, 2.5).² The Nile, the longest river on the planet, differs from others in its spatial configuration: agriculture can only be practiced in a valley which is a narrow strip 800 kilometers long, followed by the delta, with a spot on the side, the Fayum. The two parts are about the same area. All the arable land is within a short distance of the mighty Nile and its branches that innervate the delta. The satellite image shows a picture that has changed little over the past five thousand years: In ancient times, the delta was a little smaller, the strip of cultivated land along the river was a little narrower, and the Aswan Dam did not exist. The desert presents two formidable barriers, sand dunes on the left and rocks on the right, that prevent the expansion of agriculture but also protect the valley from hostile invasions.

¹Everything in this chapter comes from my reading of articles (first-hand accounts) and books (mostly second-hand accounts). As in other chapters, my contribution is from an economist’s point of view. Extracting information from articles is easier than from books. First-hand accounts are usually (not always...) close to the facts without much interpretive noise. Most second-hand accounts are not written by economists. They synthesize first-hand studies, and the mix may be contaminated by the author’s interpretive bias. These interpretations are often not very useful to an economist and are sometimes wrong. Of course, my reading of the literature must also be wrong from time to time, but I don’t think this affects too much the essential goal here, which is to show how constraints from exogenous factors and the past affect current economic decisions and institutions, which in turn set the stage for the future.

²This expression is also attributed to [Hecataeus](#) of Miletus by Arrian (Anabasis, 5, 2).



Like the Yangtze, Indus, Tigris and Euphrates, the Nile is subject to a very important annual cycle. From a relatively low level (the average flow of the Rhine in Strasbourg) during the first half of the year, the water begins to rise gradually around the time of the summer solstice. The volume increases quietly, mightily, to reach its peak during the torrid summer months when the sun would burn the tender 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 Aegean sea. At this season boats no longer keep the course of the river, but sail right across the plain.”

The average profile of water volume is shown in Figure 2.1. By October, the land is ready to be seeded for germination and crop growth under the benevolent winter sun. The harvest takes place in the spring, before the next flood. The timing of the cycles is exquisitely orchestrated. It has shaped life in Egypt for millennia.

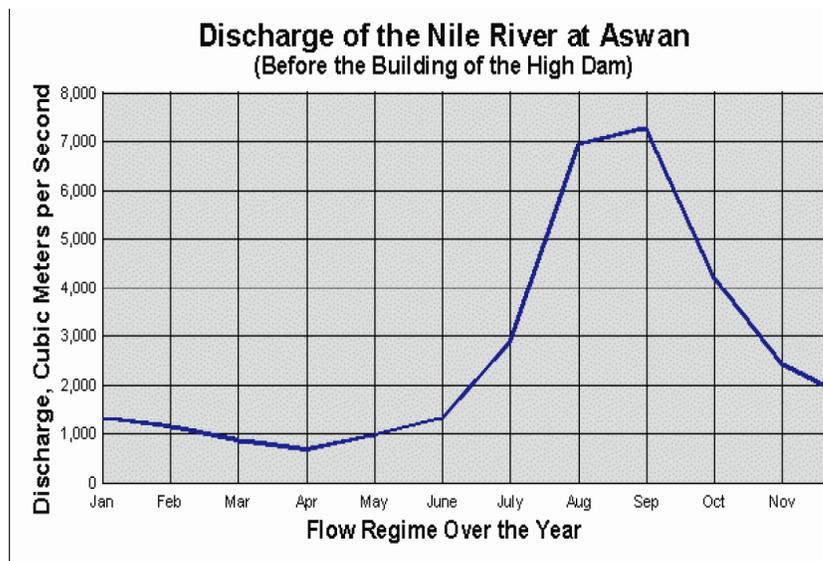
The arrival of the water is only part of the story. By the time it recedes in September, the land has been covered with a highly fertile brown silt carried from the mountains of Abyssinia and around Lake Victoria. Finally, and no less important than water and silt, the flood washes away the salts that could accumulate and turn the region into a barren land.³

Herodotus was curious about the source of all this water, but he did not find an answer. We now know that it is fed by rainfall in the high mountains of East Africa and by the overflow of Lake Victoria, which can be seen at the bottom of the inset. The overflow mechanism of the lake can amplify the annual rainfall cycle and sometimes lead to consecutive years of drought or devastating floods, as shown in the biblical story of Joseph with the seven good and seven bad years⁴ with the seven good and seven bad years. The variability of the water level is illustrated in Figure 2.1 by the maxima and minima in the modern record. Because the water level determines most of life in Egypt, some records of this level have been kept for more than 5000 years.⁵

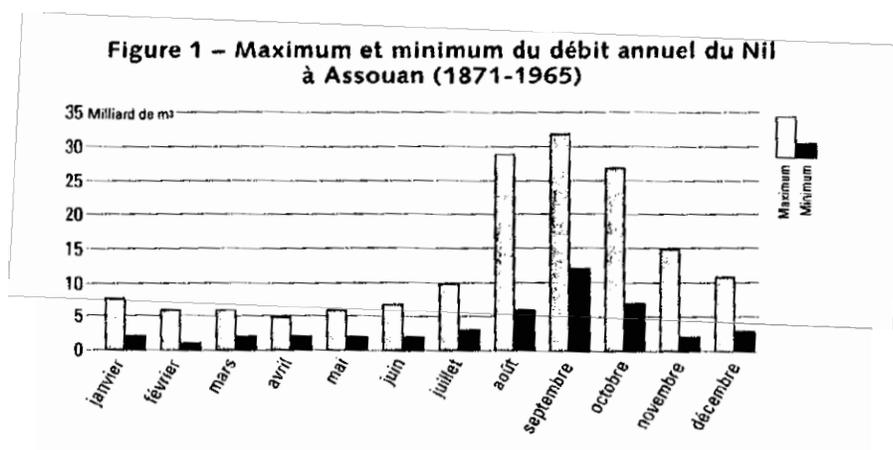
³For the case of Mesopotamia with other references, see Altaweel and Watanabe (2012).

⁴Genesis, 41.

⁵Bell (1970). These records have been exploited by recent studies about the impact of the river level on political uprisings (Chaney, 2013), or about the impact of volcanic eruptions in Iceland on the river level and political events (Manning, 2017). The variability of the Nile may have had a positive effect on the growth of the state and Egyptian civilization by controlling the population and maintaining the agricultural surplus for the state. (personal speculation)



Average of the yearly circle



Manning (***)

Irrigation

Irrigation methods in the two parts of Egypt, the river valley and the delta, are different because of their geography. The valley is narrow (see the satellite photo). During the flood, the mass of water was enormous. No dam could be built. (The Nile was not dammed until 1970, with great difficulty.) In fact, no dam would be possible or desirable: the Aswan Dam holds back the silt, which must now be replaced by chemical fertilizers. Geography dictates that all irrigation must be organized locally (Manning, 2002). Through a local network of dikes and canals, water is brought in, retained when it recedes, and drained when it is needed, as shown in Figure 2.2.

A local network generated local economic externalities, but there were no externalities

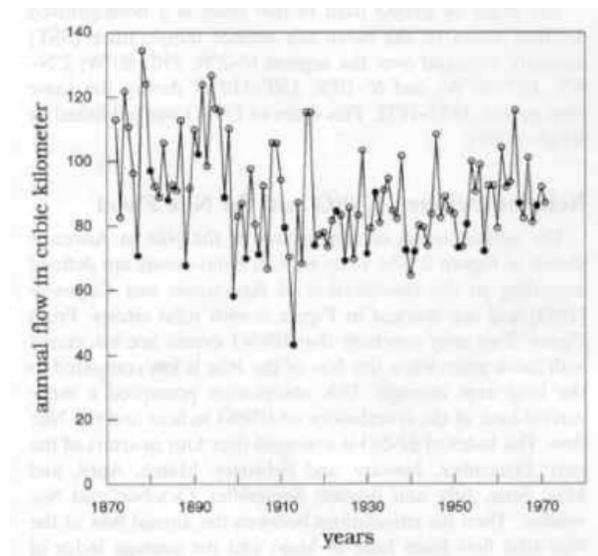


Figure 2.1: Fluctuations of the Nile (Manning, 2002, 2017)

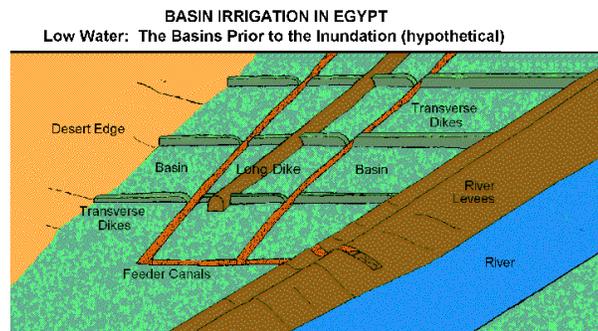


Figure 2.2: Local irrigation (Manning, **)

Manning (***)

between different regions. Water capture had no downstream effects. Not surprisingly, the land was administratively divided into regions, called *nome*, that followed each other along the river. The geographical constraints on the irrigation process have consequences for the structure of the state, which we will discuss below.

2.1 Time and perennial cycles

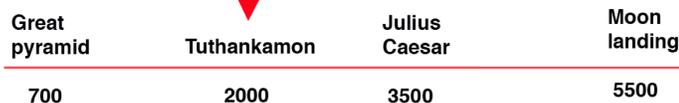
The regularity of the annual water cycle and the daily cycle of the sun (most days are cloudless and water does not come from rain), combined with the protection of the desert on both sides of the river, have given the valley a stability that is unique in the history of the world. This stability has allowed the Egyptian state to endure, with some ups and downs, for thousands of years. Our sense of time in Egypt can be distorted: we shrink the past and expand the future. Imagine we are living in the reign of King Tutankhamen and we are thinking about the past and the future. We see the pyramids of Giza: they were built well in the past, in the seventh century before Charlemagne (and the tombs have probably already been robbed). But what is impressive is the future: Julius Caesar? he will come in the year 3500. Some predict something incredible for us who live every day under the same returning sun, that man will set foot on the moon, but this will happen in 3500 years, around the year 5500!

The time perspective is necessary to understand the duration and characteristics of Egyptian culture. Things changed very little over centuries, millennia. (The Archimedean screw was still in use in the second half of the 20th century to lift water). The immutability of production and culture was a key to a successful public administration: an efficient administration entails enormous fixed costs (culture of officials, promotion scales, information on taxable activities). Given the administrative technology, the fixed costs of administration could only pay off if the social environment and productive activities were stable over time.

Time line

Assume we are in the reign of
Tutankhamon (year 2000)

NOW



The People's Worldview

The perennial cycles gave the inhabitants a unique sense of security. Herodotus (the first historian, in the 5th century B.C.) visited Egypt when more than 20 centuries had passed since the Great Pyramids had been built. However, because so little has changed in the repeated annual cycles, his descriptions are relevant to earlier times. His account of life in the Delta may be too idyllic - we don't know - but it should not be dismissed. (See other reviews of his work). The main point is the contrast between life there and in other regions that Herodotus visited during his many travels.

“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.”

“ 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.” (Herodotus, *Histories*, 2,13).

These Egyptians trusted their river. The repetition of the daily cycles of the sun, of the annual cycles of the seasons and the river, the protection of the desert from foreign influence, they all gave a sense that things were unchanging. The priests kept the records of history, and the monuments of the past were evidence of stability. The rulers emulated these monuments and built new ones, confident that their memories would endure in this unchanging world.

“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.” (*Histories*, 2.37).

Documents

The geography of Egypt determines the political regimes, but also what we know about Egyptian history. Most of our knowledge comes from the artifacts left in the

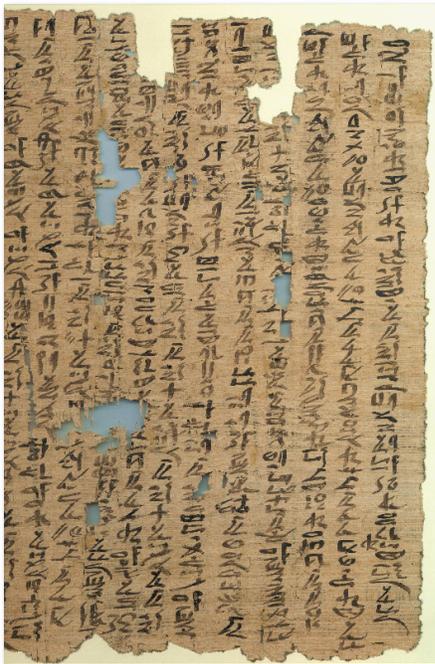
tombs, well protected in the dry climate of the desert. Very little remains in the Delta. But we should be aware that, as always in history, the sieves of time and weather distort the evidence. Posener estimates that we have 0.0001 percent of the written record (Manning). Nevertheless, it is amazing that we have so much information and a fairly accurate chronology for such a distant past.⁶

For the most recent period after Alexander the Great's conquest, the problem is not the scarcity of documents, but their abundance (more than a million). The records of some estates were piled up and recycled into *papier mâché* for the mummies (including animal mummies). We have better records for some of these estates than we do for some households today. Most of this evidence is waiting to be processed.

Life in Egypt

The Hekanakht letters (around 2000 BC)

These papyri are preserved at the Metropolitan Museum in New York.



A message from the ka-priest Hekanakhte to Merisu. Whatever can be inundated on our land, you are the one who ploughs it. A warning to all my people, and to you! Listen, I consider you responsible for it. Put your back into ploughing, do your utmost; look after my seed cor, look after all my property See, I consider you responsible for it; take great care with all my property! ...

Take great care! Hoe all my land, sieve with the sieve, hack with your noses into the work. Look, if they are diligent god will be thanked for you and I will not have to make things hard for you.

⁶Milestones of evidence are the Stone of Palermo (Dynasty V and earlier), essentially in the Museum of Palermo, the papyrus in the Museum of Turin (Dynasty XVII and earlier), the History of Manetho, written in the Ptolemaic area. Ingenious methods are used to date artifacts.

From the letters one can infer the following (to be edited):

- Economic decisions of an individual
- Household consumption/ budgets
- Owned more than 70 arouras-providing for household, 23 ar.
Leased out (one aroura=2700m²) one acre 4000m²
- Crops-cereal & flax for consumption, cloth, surplus barley
for purchase of other items
- 2 bad years (low Nile floods)-no income, hence the urgency of the letters
- Note: half the Nile valley floodplain still used as
unimproved pasture or fallow

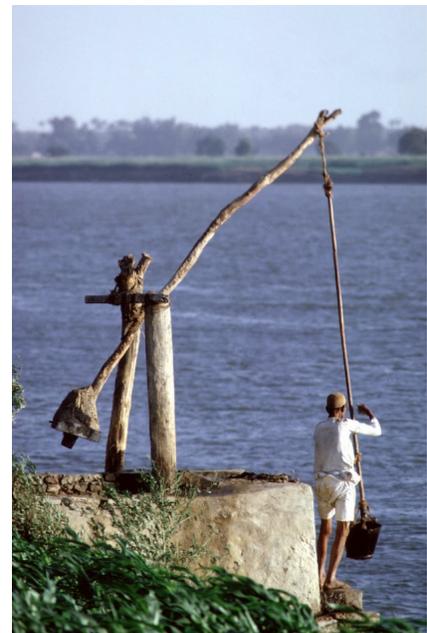
Technology

The technology was very primitive.⁷ Three devices supplemented gravity irrigation.

The *shaduf* (in use by 2000 BC) lifted a bucket of water with a long lever. Its use was occasional, apparently for special purposes or in low-water years.

The *saqiya* (inverted water mill for lifting water) was connected to a horizontal wheel operated by circling animals). It did not exist before the 4th century BC. Some of them were still in use in the second half of the 20th century.

The ingenious *Archimedian Wheel* (still in use in the 1950s)⁸ was invented during the time of the Ptolemies (2nd century BC), when they pushed Egypt's manufacturing capabilities to a new limit.



⁷See the Wikipedia [note](#).

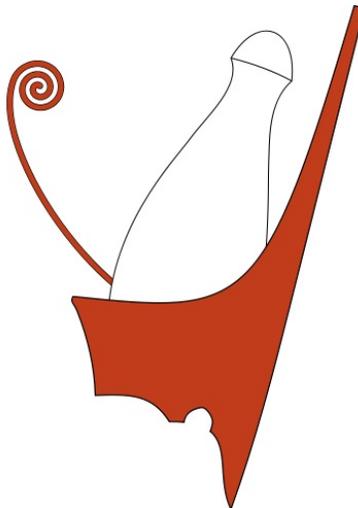
⁸Photo by Helen and Frank Schreider of the National Geographic staff.



The perennial environment in the Nile basin did not stimulate innovation. The wheel has left its earliest testimony through pottery at the time of the Great Pyramids. But its use for chariots is due to the Hyksos who invaded Egypt in the 17th century BC and introduces horses. Ramses II (1279-1213 BC, 19th Dynasty) made good use of them, as represented in his mausoleum.



2.2 The state



How does state formation in Egypt differ from that in Mesopotamia? We have seen that there was a (gradual) shift from foraging to agriculture in northern Mesopotamia around 8000 BC. It took more than 4000 years for cities to appear and states to form in the southern part. In Egypt, the transition to agriculture has been shown to have taken place around 4000 BC, and the formation of a state "only" a thousand years later. Moreover, there was no phase of city-states: the state was centralized from the beginning, first in two parts, south and north,

then unified when the south conquered the north, around 3000 BC. The two crowns of Upper Egypt (white) and Lower Egypt (red) were united in the double crown (left image).

The absence of cities (except perhaps Alexandria) is remarkable. The state in Egypt, in the stable periods (below), is an autocratic state in which a high caste, the pharaoh, his court, the priests and the administration, dominate and exploit the surplus generated by the unique conditions of the Nile Valley.

There has been much speculation about the mechanism that led to this condition. The fact is that the Nile Valley was not densely populated to begin with. The Letters of Hekanakht (c. 2000 BC) indicate that some of the flood plain was still used as unimproved pasture or fallow land. Note that the conditions were never those of the rainy plateaus of northern Mesopotamia. Fertile land was regularly washed away by the Nile floods. We have seen that irrigation, when established, was local, but this required a minimum of social organization. Let us remember that once irrigation was used, the yields were very high. At the same time, the population did not increase. The Malthusian mechanism does not seem to have been very strong in Egypt. Life expectancy was relatively short (more on this topic, diseases?).⁹ All of this led to a very large surplus and thus a strong incentive for a ruling class to capture and increase that surplus.

Other factors also favored an authoritarian state. Between July and September, the valley was flooded. The population could be used as forced labor for the construction of public works. The fluctuations of the flood from year to year created special conditions for a ruling class. The effects of these fluctuations could be reduced by storage. Large granaries were attached to temples, controlled by the priests, and provided storage for bad years. The storage initiative is how Joseph (above) gained his position in the Pharaoh's administration. The Egyptian farmer was a religious person.

In the centuries that followed, the surplus was captured by foreign occupiers. First the Persians, then, after Alexander's conquest (332 B.C.), the Greeks ruled the country, and the Ptolemies took the mantle of the Pharaohs. After the suicide of the last one, Cleopatra, the Romans took over (to feed Rome). Finally, the fall of Rome gave way to the Ottomans, who ruled until the early 20th century.

In Pharaonic times, capturing the surplus required the unification of the land to prevent the flight of inhabitants to another state and "tax competition".¹⁰ The unified state also spared the costly rivalries between smaller states, as the lands around the Mediterranean were later pacified by Rome, or even later the Scottish clans by England. The memory of these wars was preserved in later myths and in important objects. In the previous figure, the king, showing his power, wears the crown of Upper

⁹However, Moreno Garcia (p. 10 ***?), using data after the 7th century, does not find much of a relationship between flood levels and population growth. See also Butzer (1976).

¹⁰Allen, R (1997). "Agriculture and the Origins of the State in Ancient Egypt," *Explorations in Economic History*, 34, 135-154

Egypt. After the unification around 3100 by King Menes, the pharaoh wore the double crown, white for Upper Egypt and red for Lower Egypt. From then on, pharaohs and priests could take the surplus for ostentatious consumption and buildings. The central regime broke down several times later, during *intermediate periods*, which were characterized by a return to fiefdoms and **so-called anarchy**.



General view of the pyramid complex of Djoser in Saqqara built by the famous architect Imhotep

It is remarkable that we have a fairly good **account** of the rulers of Egypt. History, from the point of view of the rulers, has been divided into three kingdoms separated by intermediate periods. In each of these kingdoms, Egypt was united under a strong pharaoh in a series of apparently orderly successions. The first pyramid was that of King Djoser (c. 2592-2566) of the 3d dynasty, in Saqqarah. This was part of an architectural complex that had been built under the supervision of his extraordinary talented minister and architect, Imhotep. The wall of the complex is the oldest known stone structure. Part of it still stands in a pristine condition.

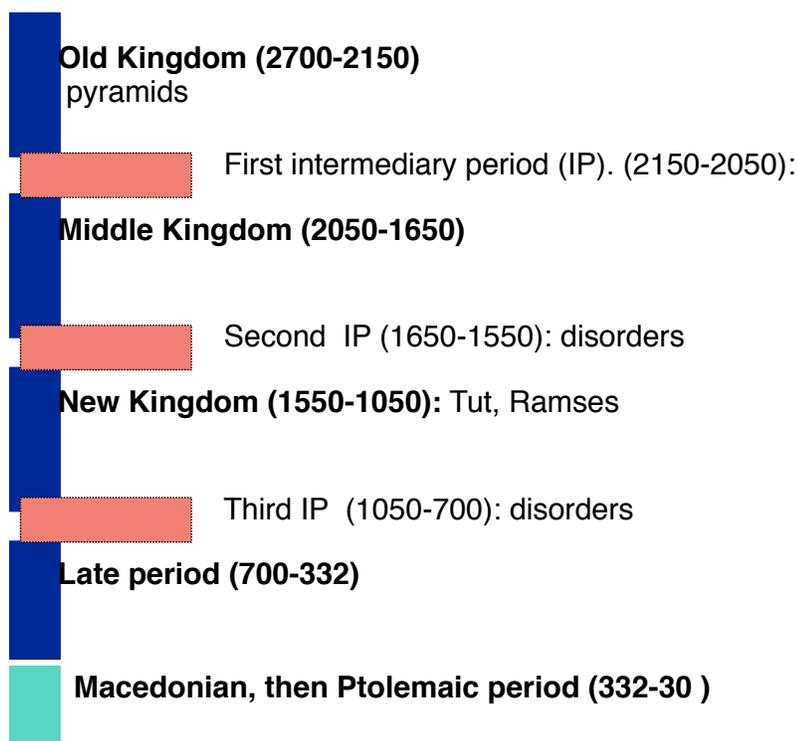
The intermediary periods

The records of the pharaohs show that the state was disorganized for some periods during which pharaohs came in short succession. These are called the *intermediary periods*. Other evidence points to disorder, famine.¹¹

With the river and climate having such a dominant influence on life in Egypt, a natural question is whether the intermediate periods were correlated with the exogenous shocks of the river regime. The main investigation was done by Butzer and is summarized in Butzer (1984). The flood level has been recorded for some years since the Old Kingdom (e.g., Palermo Stone), but there is no sufficiently detailed record. Texts mention a number of famines, but it is not always clear that they refer to specific historical events.¹² Butzer notes that there is more evidence of famine, sandstorms, and low water levels at the time of the Intermediate Period with a sudden recovery of good irrigation conditions. However, it seems that the dates do not always coincide

¹¹There may also be some evidence from skeletons that people may have been healthier during the years of the Intermediate Periods, perhaps because of a lower rate of extraction from the Pharaoh and the administration.

¹²Famines caused by low water occurred even during glorious reigns, such as under Djoser, the pharaoh of the first stone buildings and the first pyramid. Moreno-Garcia (1997) mentions that during the First Intermediate Period the relatively well-off tombs are those of Intermediate officials. This could be explained by the fragmentation of the state and does not seem to be compatible with famine conditions.



Dates before the Ptolemies are approximate.

Figure 2.3: Summary of history

Source: Ray (2002).

perfectly with the dates of the Intermediate Periods. There are also periods of catastrophically high floods¹³. But such crises do not seem to have caused a collapse of the state, and may even have reinforced the need for coordination in the construction of protective levees. New techniques from “real science” have completely renewed research on the relationship between climate, Nile levels, and political unrest, as will be seen below.

Despotism

Egypt is a corridor 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 series of dams and canals, does not apply to Egypt. It does not fit the simple facts of irrigation in Egypt. The

¹³Between 1840 and 1700 B.C., the flood level was more frequent, but erratic on the high side. 27 inscriptions record a catastrophic level of at least twice the basin depth in a normal year.

pharaonic regime was indeed “despotic”, but not because of Wittfogel’s chain of arguments: irrigation \Rightarrow need for coordination \Rightarrow need for central authority in planning \Rightarrow despotism.



Nilometer

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

It was also important to plan in advance, as much as possible, the adjustment of dikes and canals for the right amount of water. A valuable indication was the rate of 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 series of nilometers provided information on the water level at different points in the valley. When there was a central administration, the viziers were informed several times a day.

It is no coincidence that the uniqueness of Egyptian civilization is linked to these unique geographical conditions. For a long time they provided protection against invasions. At the same time, however, the region was more inward-looking. There was no preparation or training against invasion, leaving the people vulnerable to a strong invader like the Persians, Greeks, Romans, or Ottomans. There was no real opening to the sea until the Greeks came.

Therefore, with a few exceptions (Ramses II), the government did not spend the surplus on foreign military commitments. The surplus was devoted to the consumption of the elite and to public works that would later attract visitors of all kinds.¹⁴ The ideal conditions for public finance in the Nile Valley were necessary for these public works.

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 sure 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. The relation between the level of the Nile and political stability is analyzed below.

¹⁴After the Battle of the Pyramids, Bonaparte addressed his army: “Du haut de ces pyramides quarante siècles vous contemplent.”

Taxation, information and monitoring



When the population was tied to the land, the Nile Valley offered an exceptional opportunity to obtain the information necessary to collect the surplus through taxation: the parcels could be surveyed and carefully monitored from the river. The yields of some crops (cereals) were highly predictable if the main factor was known: the level of the flood. In fact, during the flood, the vizier received frequent reports on the water level. His team probably had the equivalent of an econometric model: say, if the level is this high for this many days, we can expect this yield. The product of the land was therefore highly taxable.

Monitoring production was greatly facilitated by geography. No farmland is far from a major waterway, either in the Delta or along the Nile.

Borders could be well controlled: Alexandria was the only port for trade with the Mediterranean, and its real development came late. There is no good protection for a port. Napoleon learned this later... [See towards the end of the course]. Crossing the desert was not so easy. This situation allowed the government to impose high tax rates on imports. Similarly, until recently, many developing countries with poor domestic tax administration imposed high tax rates on imports.

Another important feature is the long duration of civilization combined with its stagnation in technology. The Archimedean screw was used until recently because it is well suited to Egypt: the Nile Valley is flat, and a small increase in water (the range of the screw) can greatly expand the irrigated area. Because there was so little change, the information collected by previous administrations for tax collection could be used for a long time. In order to collect information, monitor production, and actually intervene in planting decisions, the central administration had to rely on a storm system.

The bureaucracy

It seems that an efficient bureaucracy was in place very early (around 2700 B.C.), with career plans, rotation between jobs, high positions and high salaries for officials with long experience, and so on. This is quite remarkable. France could not do this before the Revolution of 1789. The body of civil servants came from a highly educated class of scribes. We see some of them represented in statues in our museums.

Once the administration - the bureaucracy - is in place, it can grow and find means (taxation) to grow, which brings the second characteristic. An existing bureaucracy creates a hierarchy, career paths. Once there are career paths, the younger generations

want to get the fruits of their investment in the earlier stages of their careers and have an interest in promoting the bureaucracy.

More later

The economy of the temples, the relation between state and religion

More later

Money (more in the chapter on money)

Money is both a unit of account and a store of value used as a medium of exchange (as described in any textbook). Before the introduction of paper money, most money had a physical backing in coins containing some valuable metal (as discussed in the next chapter on money). Money was invented in Anatolia in the eighth century BC. In Egypt, archaeology has found no consistent evidence of coins before the conquest by Alexander the Great in 332 B.C. After Alexander, the Greek Ptolemies brought a number of their own techniques to Egypt. Metal money was one of them.

Precious metals were more scarce in Egypt than in other regions. Silver in particular was a rare commodity, and its price seems to have been at least half that of gold. Before the Ptolemies, the only possible exception to the absence of money is some copper rings in the New Kingdom. However, there is strong evidence for the existence of money as a unit of account, and this evidence dates back to the earliest period of the Old Kingdom. Near the funerary temple of Khufu (the second pyramid, c. 2,500 B.C.) the following engraving was found: ¹⁵

I have purchased this house from the scribe Tjenti. I gave him 10 shats for it; one piece of cloth with four thread (?), 3 shats; one bed, 4 shats; one piece of cloth with two threads (?), 3 shats. Another engraving (in Karnack) states that Given the face that I received its price, 60 debens of gold, in the form of various objects... In another text, I gave him] two cows, which makes 16 shats and [2] veals [...]

The shat and the deben (12 shats) were units of account. We can see from these documents that money is not used as a medium of exchange. Since the transaction does not involve credit, payment must be made in goods. We still have a form of barter, but the various goods are valued in terms of the unit of account. Since temples held large amounts of assets, they may have provided services similar to banking. More research is needed on this question, but some general observations can be made. The existence of a unit of account is consistent with a high level of administrative sophistication.

¹⁵See Dumas (1977). Weill (1925), Pirenne and Van de Wall (1937).

Taxes were paid in kind during the pharaonic period. Since most of the revenue came in the form of grain, no money was needed. However, it was important to keep good accounts of the quantities paid as taxes. In this case, cash is the fuel of an underground economy that the vizier would have suppressed.

Law and order

No state has ever survived solely by extracting surplus. Every state began by providing the most basic of all public goods, law and order. It may not be the most expensive item in the budget, but no sedentary individual can do without it.

During the First Intermediate Period, an official wrote:

Horus wanted me to restore order [in the Nome of Edfu] since he had brought me in that Nome to restore order. I found the district of Khufu flooded as a ??, neglected by the one who had been in charge and ruined by a wretched person. I acted such that a man would embrace the murderer of his father or of his brother, with a view to reestablish order in the nome of Edfu.

Around the beginning of the New Kingdom, the Vizier received the following instructions¹⁶:

“As for anyone who shall petition the vizier concerning land, he is ordered to him, the vizier, aside from listening to the overseers of land, together with the magistrates of the Cadastre Survey. He will act within two months for his fields in Upper and Lower Egypt. As for his fields which are in the vicinity of Thebes or the Residence, he will act within three days, as corresponds to the law. He must listen to every petitioner according to this law which is at hand. he also must bring together the land-courts, and it is he who sends them out that they may report to him the state of their lands. Every testament arrangement is to be brought to him, and it is he who seals them.

It is he who makes land-endowments with each plot. As for any petitioner who says, “our boundary line has been shifted,” and it is demonstrated that this is the case, under the seal of the appropriate official, he will read the plots to the magistrates, who will cause that they be shifted (back). And as for any mine whose “owner” shall come to it, examining the things within it: a petition shall be made in writing. He will not be

¹⁶Warburton, 178-180.

permitted to petition a judge, and the same applies to any of the lord's petitioners, after he has made it in writing. [...] It is he who shall dispatch the courts of the land to make weirs [dykes or pools] in the entire land.

It is he who dispatches the mayors and district officials to plough in summer. [...] It is he who dispatches the expeditions and scribes of the cadastre survey in order to conduct the business of the lord. The Nome records will be kept in his office, for hearings concerning any fields. It is he who fixes the borders of the Nome, all fields (?) of divine offerings, and all changes of ownership. It is he who makes all proclamations. It is he who judges conflicts, when a man speaks out against his fellow. It is he who makes every appointment to the Hall. Every inquiry from the Palace should come to him. It is he who notes every decree. ”

This remarkable text provides a number of details. Note the difference that distance could make in the administration of the land: three days for the near, but two months for the far. The pharaoh embodied the state and its relationship to the gods, the other world, and the afterlife. He could not be involved in the day-to-day affairs of the country. This would be incompatible with his role, and his prestige would be constantly threatened by mismanagement. Running the country (and there was a lot to do) was the job of the vizier. A similar principle is in the French constitution today. The president is responsible for foreign policy and general strategy. Domestic affairs are handled by the prime minister, who is expendable.

The cadastre

In the previous text, one of the important functions of the Vizier is to settle disputes over the boundaries of lands. These disputes are mentioned many times. Property was very important. More importantly, since the Nile flood sometimes covered everything with water, there may have been no obvious landmarks in many cases. Hence the need for a cadastre, which provided a guarantee of ownership. At the same time, it provided the vizier with essential information about the land to be cultivated. By providing the quintessential public good of law enforcement, which was highly demanded by individuals, the state gained the means to control the economy.

Some suggested that the Egyptians developed geometry because of the need to re-establish the boundaries of land parcels after the floods.¹⁷

¹⁷P. Cartier interview.

2.3 The Ptolemies

This section needs revisions

After 1000 BC, the state in Egypt degenerated and the country was ruled by various invaders. In 332, Egypt was conquered (by the Persians) by Alexander the Great. After Alexander's death (323), one of his generals, Ptolemy, started a new dynasty that lasted until the suicide of Cleopatra on August 9, 30 BC. This Greek dynasty brought a new culture to Egypt. It was the beginning of the expansion of Alexandria as a center of trade and knowledge (think of the famous library). The dynasty quickly recognized the fantastic revenue opportunities in Egypt and brought a new level of sophistication to the administration of the country.

As mentioned above, we have much better information for this period. This may also be due to the careful administrative methods introduced by the Greeks (for private and public activities) to improve the use of the land. Jones' brief summary is based on the work of Préaux. The following description is based on Préaux (hereafter CP). In my opinion, the wealth of information available for this period still needs to be organized and discussed from an economic point of view, with a special emphasis on optimizing administrative efficiency.

The Ptolemies did not leave great buildings to posterity. Note that we have very few buildings in the delta and the Ptolemies coming from the sea ruled the country from the north. The most important public project that could have been undertaken at that time was the development of the Fayum. The Ptolemies applied techniques that had been used at Lake Copeia in Macedonia and tripled the irrigated area. The Fayum produced the highest yields in the country.

Taxation under the Ptolemies

The dominant tax base was agriculture and the methods of taxation were adjusted to fit the information and enforcement requirements for each type of product.

Direct taxes Wheat and other cereals

Wheat was to Egypt what oil is to Saudi Arabia and the world today. The main characteristics of cereals are that (i) the time of production is the same for all farms in the same district, (ii) the grain must be taken from the plant in a given clean place, (iii) the product is uniform and easy to handle. The administration took advantage of these features to require that all production from the same district be delivered to a specific location. Monitoring the production was easy. The cadastre recorded each parcel. Taxation of production varied from district to district and was integrated with the type of ownership. (A lease was levied as a tax). In the case of sharecropping contracts on royal land, the tax rate could be 50 percent, but the rate could be fixed in relation to the area, thus requiring effort to obtain a high yield. No wonder people tried to evade taxation (for an example of side deals, see CP 135).

The central government gave specific instructions for the allocation of land for various crops, but these instructions probably applied only to royal land. Seed was provided by the central government as a high-interest loan: another form of taxation. The provision of inputs is also a way of controlling the use of inputs by farmers. Another source of revenue was the interest on the seed (at a rate of 50 percent over a production cycle).

It is not clear how the central government controlled how much land was allocated to different crops. (The crown certainly controlled its own land). Seed was provided by the central government as a high-interest loan: another form of taxation. The provision of inputs also provides a way of controlling the inputs of the farmers¹⁸. Land must be measured if a flood changes the pattern of arable areas.

Indirect taxes and tax agriculture on fruit and wine (the Apomoira)

The control of the State on these products is much more difficult than on oilseeds and cereals. The manipulation of fruit requires careful timing and processing. The tax existed before the Ptolemies, but Ptolemy II reformed the tax and strengthened the administrative controls (CP 171). We know that wine is no less uniform than wheat. The tax rate on the net production (which is not the profit) was 1/6. There were three parties involved in the contracts that estimated the profit and the tax: the farmer, the taxman, and the tax collector. Jones, "Taxation in Antiquity". and the government official. They could check on each other and thus reduce the risk of corruption. Payment was made in kind (with specially measured vases for wine) or in money (silver and copper). The proceeds of the tax were originally earmarked for the temples, but some were also used for nonreligious purposes. Probably the efficiency of the tax after the reform allowed the secular use (and must have been a motive for the reform).

Other similar taxes were levied on wine and fruit. The tax rates varied from region to region (or parcel to parcel). One possible explanation is the diversity of soil types and yields.

Customs taxes

Customs taxes were high because the borders were relatively easy to monitor. (See above). The rates reached 50 percent.

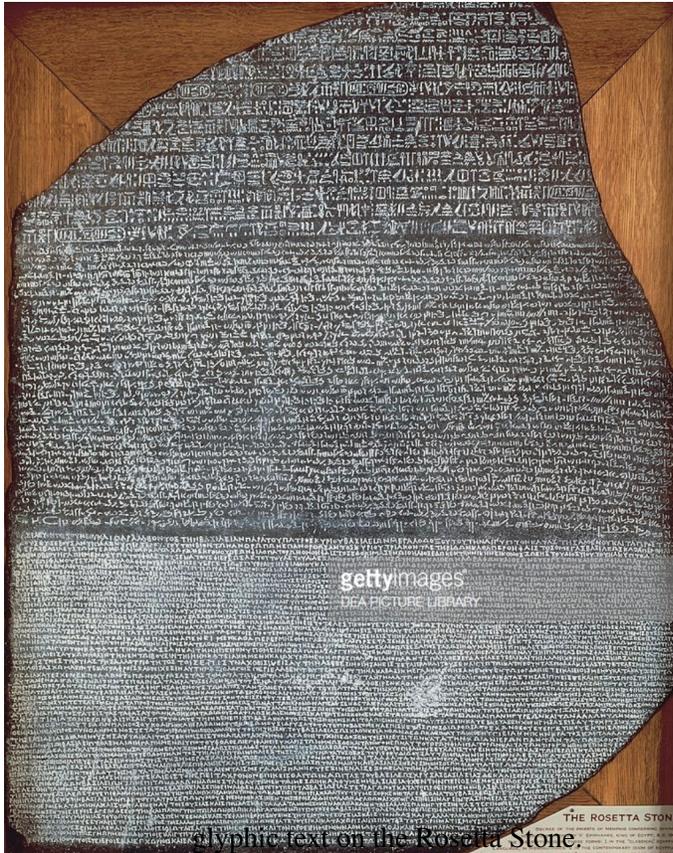
Monopolies and commodity boards

An important monopoly was that of oil. The seeds were supplied by the administration and the production was bought at a fixed price by the administration, which entrusted a monopoly to process it and market it at regulated prices. The same system was used in some countries of Africa until recently. In Ivory Coast for example, a parastatal

¹⁸. Poorly seeded land is an indication of "see evasion", Pr. 122, (P. Tebtynis 703, II. 49-57).

company was in charge of buying all the cocoa produced.

Tax relief



hieroglyphic text on the Rosetta Stone.

The Rosetta Stone was found during the Egyptian expedition of Bonaparte (to be met later in this course) near the town of Rosetta in the Delta. It is now in the British Museum. You can see on the picture that there are three texts, in ancient hieroglyphs, in demotic (a kind of shorthand for hieroglyphs), and in Greek. Bonaparte had taken a team of scholars with him, and their reports fueled his enthusiasm for Egyptology. At the age of 16, Champollion (1790-1832) dedicated his life to deciphering the hieroglyphs, which no one could read.¹⁹ The first step toward complete decipherment was made in 1823 when he identified the names of the pharaohs Rameses and Thutmosis in *cartouches*. A cartouche is an oval surrounding the name of a pharaoh. You can see one just after the beginning of the last line of hiero-

We owe the text (and the deciphering of the hieroglyphs) to fiscal policy, specifically a tax rebate by a Ptolemaic pharaoh. The bulk of the text is a paean to tax relief:

King PTOLEMY, THE EVER-LIVING, THE BELOVED OF PTAH, THE GOD EPIPHANES EUCHARISTOS, the son of King Ptolemy and Queen Arsinoe, the Gods Philopatores, has been a benefactor both to the temple and to those who dwell in them, as well as all those who are his subjects, being a god sprung from a god and goddess like Horus the son of Isis and Osiris, who avenged his father Osiris, being benevolently disposed towards the gods, has dedicated to the temples revenues of money and corn and has undertaken much outlay to bring Egypt into prosperity, and to establish the temples, and has been generous with all his own means; and of the revenues and taxes levied in Egypt some he has wholly remitted and others has lightened, in order that the people and all the oth-

¹⁹Reading the Wikipedia note is recommended.

ers might be in prosperity during his reign; whereas he has remitted the debts to the crown being many in number which they in Egypt and the rest of the kingdom owed;

REFERENCES

- Allen Robert C. (1997). "Agriculture and the Origins of the State in Ancient Egypt," *Explorations in Economic History*, 34, 135-154.
- Altaweel, M. and C. E. Watanabe (2012). "Assessing the resilience of irrigation agriculture: applying a social-ecological model for understanding the mitigation of salinization," *Journal of Archaeological Science*, 39 No4, 1160-1171
- Assmann J. (1989). *Maât, L'Égypte Pharaonique et l'idée de Justice Sociale*, Paris.
- Baer, Klaus, (1963). "An Eleventh Dynasty Farmer's Letters to His Family," *Journal of the American Oriental Society*, 83, 1-19.
- Bagnall, Roger, S. (1995). *Egypt in Late Antiquity*, (1st edition, 1993), Princeton University Press.
- Bell, B. (1970). "The oldest records of the Nile floods," *Geographical Journal* 136: 569-573.
- "Climate and the history of Egypt: the Middle Kingdom," *American Journal of Archaeology*, 79: 223-269.
- Butzer, Karl, W. "Long-Term Nile Flood Variation and Political Discontinuities in Pharaonic Egypt", **chapter 10** in Clark and Brandt (1984).
- Butzer, Karl (1976). *Early Hydraulic Civilization in Egypt, A study in cultural ecology*, Chicago, **chapter 9**, Conclusions and Implications
- Clark J. Desmond, and Seven A. Brandt (1984). *From Hunters to Farmers, the Causes and Consequences of Food Production in Africa*, University of California Press.
- Daumas, François (1965). *La Civilisation de l'Égypte pharaonique*, Arthaud.
- (1977). "Le problème de la monnaie dans l'Égypte antique avant Alexandre," *Mélanges de l'école française de Rome* **89**, 425-42.
- Eyre, C. (1999). "Review of D. Warburton, State and Economy in Ancient Egypt: Fiscal Vocabulary of the New Kingdom", *Journal of the Economic and Social History of the Orient*, 42, 575-77.
- Garcia-Moreno, J. C. (2019). *The State in Ancient Egypt*, Bloomsbury Academic.
- Herodotes (440 B.C.E). *Histories*, **Book 2**.
- Jones, "**Taxation in Antiquity**".

- Manning, Joe (2002). "Irrigation et État en Égypte antique," *Annales*, May-June, 611-623.
- Manning, Joe (2004). "Toward Modeling of the Ptolemaic State and the Ptolemaic Economy".
- (2009). "Economic Policy under the Ptolemies," **chapter 5** (part of) in *The Last Pharaohs: Egypt Under the Ptolemies, 305-301 B.C.*, Princeton University Press.
- (2017). *The Open Sea*.
- Menu, B. (1996). **Naissance du pouvoir pharaonique**, *Méditerranées*, **6/7**, 17-59.
- Mikhail, Alan (2011). *Nature and Empire in Ottoman Egypt: An Environmental History*, Cambridge University Press.
- (2012). *Water on Sand: Environmental Histories of the Middle East and North Africa*, Oxford University Press.
- Moreno-Garcia, J. C. (2019). *The State in Ancient Egypt*, Bloomsbury Academic.
- Murnane, William J. "**The organization of government under Amenhotep III.**"
- Park, Thomas, K. (1992). "Early Trends toward Class Stratification: Chaos, Common Property, and Flood Recession Agriculture," *American Anthropologist*, **94**, **90-117**.
- Ray, John (2002). *Reflections of Osiris: Lives from Ancient Egypt*, Oxford University Press.
- Russell, J. C. (1966). "The population of medieval Egypt," *Journal of the American Research Center in Egypt*, 69-82. (Widener Egp 6.5.)
- Weill, (1925). "L'unité de valeur shat et le Papyrus de Boulaq no11, in *Revue de l'Égypte ancienne*, 1, 1925, 45-87 and 243-244.