

Chapter 2

“δῶρον τοῦ ποταμοῦ ”

Egypt

(revised: 09/12/22)¹



The land of Egypt is “the gift of the river” (Herodotes, Histories, 2.5).² The Nile, the longest river on the planet, differs from others by its spatial configuration: 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 roughly equal in area. All the cultivable land is within a short distance from the mighty Nile and its ramifications that innervate the delta. The satellite photo presents a picture that has changed little over the past five thousand years: In antiquity, the delta was a little smaller, the cultivated strip along the river was a little more narrow, and the Aswan dam did not exist. The desert presents two formidable barriers, sand dunes on the left and rocks on the right, that prevents the extension of agriculture but also protect the valley from hostile invasions.

¹Everything in this chapter comes from my readings of articles (1st hand account) and books (most of them, second-hand accounts). As in other chapters, my contribution is the point of view of an economist. 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 done by economists. They synthesize first-hand studies and the mix may be contaminated by the author’s interpretative bias. These interpretations are often not very useful for an economist and sometimes wrong. Of course, my reading of the literature must also err from time to time, but I don’t think that affects too much the essential goal here, which is to show how constraints from exogenous factors and the past impact current economic decisions and institutions that, in turn, generate preconditions for the future.

²The 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 Herodotes (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 the volume of water is presented in Figure 2.1. By October, the land is ready to be seeded for germination and crop growth under the benevolent winter sun. Harvesting takes place in the spring, before the next flood. The cycles have, in general, an exquisite timing. They have shaped the life of Egypt for millennia.

The inflow of 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 that has been carried from mountains in Abyssinia and around Lake Victoria.³ Finally, and that is no less important than water and silt, the flood washes the land from salts that could accumulate and transform the region into a barren land.⁴

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 side image. The overflow mechanism of the lake can amplify the annual rainfall cycle and sometimes lead to consecutive years of droughts or destructive floods, as shown in the story of Joseph in the Bible shows, with the seven good and seven bad years⁵ 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. As the water

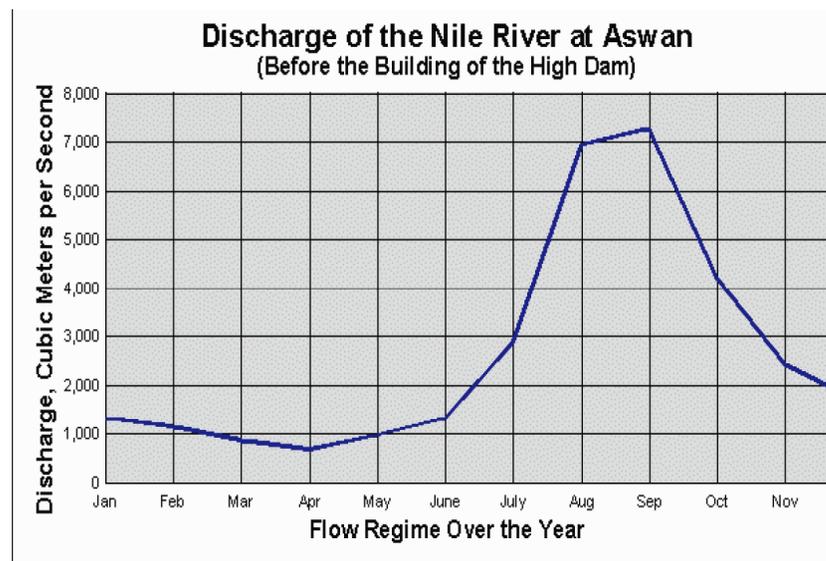
³Today, the silt is stopped by the Aswan dam and has to be replaced by chemical fertilizers)

⁴For the case of Mesopotamia with other references, see Altaweel and Watanabe (2012).

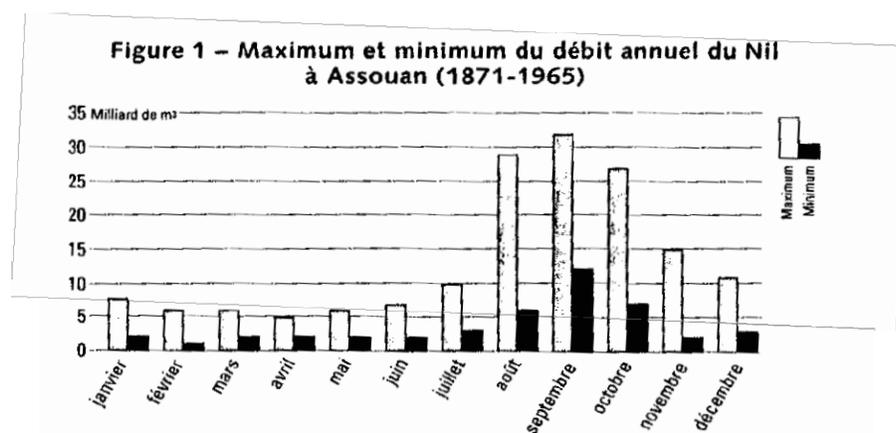
⁵Genesis, 41.

level predetermines most of the life in Egypt, some records of water level have been kept for more than 5000 years.⁶

The variability of the Nile may have had a positive impact on the growth of the state and the Egyptian civilization by controlling the population and maintaining the agricultural surplus for the state. (personal speculation)



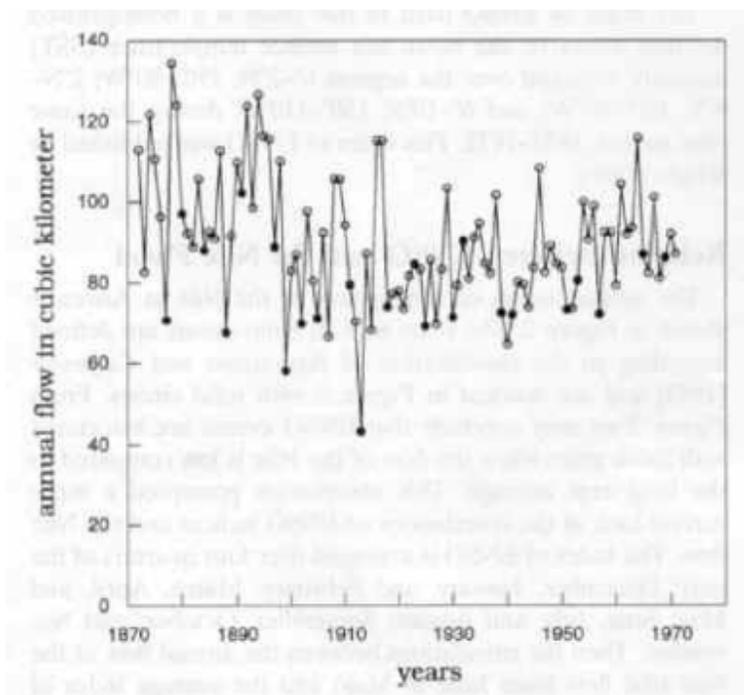
Average of the yearly circle



Irrigation

The methods of irrigation in the two parts of Egypt, in the valley along the river and in the delta, are different because of their geography. The valley is narrow (satellite

⁶Bell (1970).



Source: Manning (2002, 2017).

Figure 2.1: Fluctuations of the Nile

photo at the head of this chapter. During the flood, the water mass was formidable. No barrage could be built. (The Nile was dammed only in 1970, with great difficult.) Indeed, no dam would be possible, nor desirable: the Aswan dam stops the silt which now has to be replaced by chemical fertilizers. The geography imposes that all irrigation must be organized locally (Manning, 2002). Through a local network of dikes and canals, water is fed in, or retained when receding, and also appropriately drained out as illustrated in Figure 2.2.

A local network generated local economic externalities but there were no externalities between different regions. Capturing water had no downstream impact. It is not surprising that the land was administratively divided into regions, called a *nome*, which followed each other along the river. The geographic 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

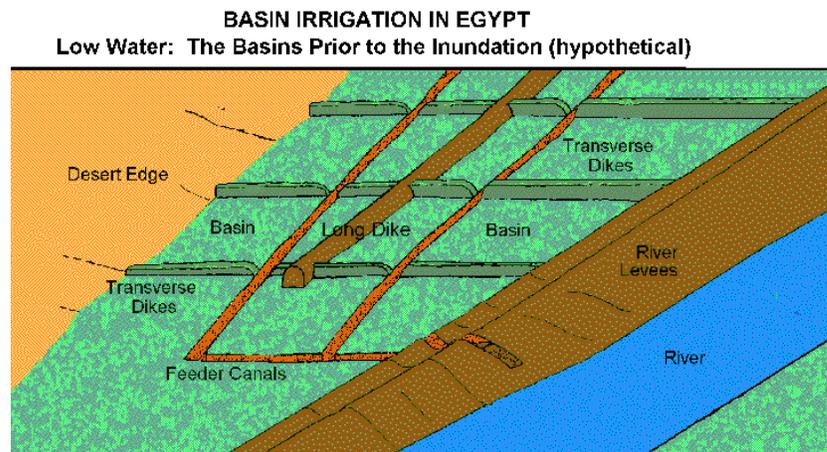


Figure 2.2: Local irrigation

Source: Manning (**).

desert on both sides of the river, have provided the valley with a stability that is unique in the history of the world. This stability has allowed the Egyptian state to endure, with a some ups and downs, for millennia. Our appreciation of time in Egypt can be skewed: we shrink the past and extend the future. Imagine we are living in the reign of King Tutankhamen and we think 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 each 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 temporal perspective is necessary to understand the duration and the features of the Egyptian culture. Things changed very little over centuries, millenaries. (The Archimedean screw was still in use during in the second half of the 20th century to raise water.) The invariance of production and culture was 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.

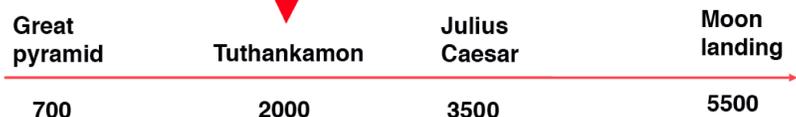
The Weltanschauung of the people

The perennial cycles gave the inhabitants a unique sense of security. Herodotus (the first historian, in the 5th century BC) visited Egypt when more than 20 centuries had passed since the building of the Great Pyramids. Nevertheless, since so little changed in the repeated annual cycles, his descriptions are relevant to earlier times. His account

Time line

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

NOW



of life in the delta may be too idyllic—we don't know— but it should not be dismissed. (See other evaluations 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).

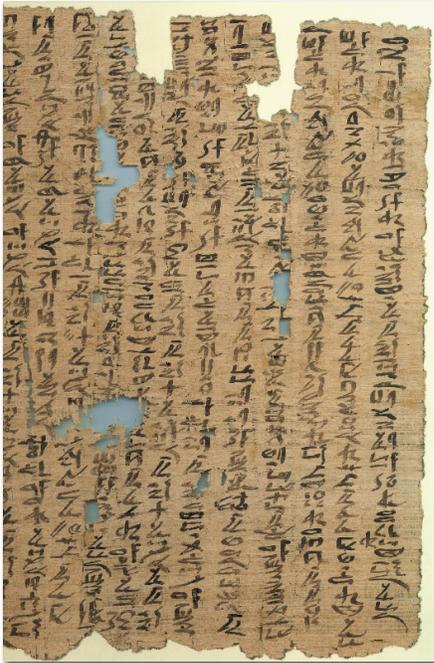
These Egyptians trusted their river. The repetition of cycles of the sun each day, and of the river over the year, the desert's protection from foreign influence, gave a sense that things were immutable. The priests kept the records of history and the monuments of the past were proofs of stability. The rulers emulated these monuments and built new ones, confident that their memories would be perpetuated 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).

Life around 2000 BC: the Hekanakhte letters (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

Part of the letters (kept in the NY Metropolitan Museum) read:

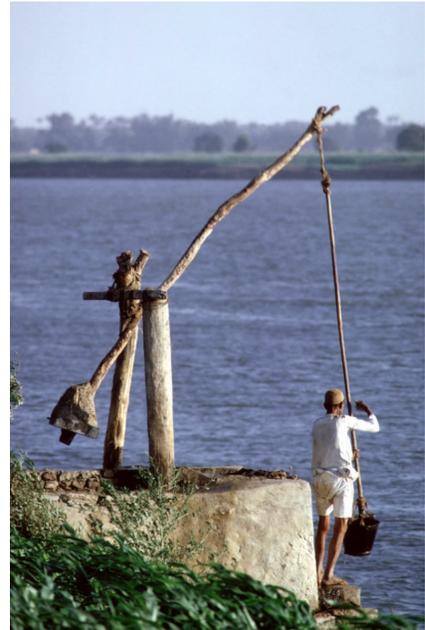
A message from the ka-priest Heqanakhte to Merisu. Whatever can be inundated on our land, you are the one who ploughs it. A warning to all my people, and to you! Listen, I consider you responsible for it. Put your back into ploughing, do your utmost; look after my seed corn, look after all my property.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

Documents

The geography of Egypt determines the political regimes but also what we know about Egyptian history. Most of our knowledge is from the artifacts 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 sieves of the time and the weather distort the evidence. Posener estimates that we have 0.0001 percent of the written documentation (Manning). It is nevertheless amazing that we have so much information and a fairly accurate chronology for such a distant past.⁷

For the most recent period after the conquest of Alexander the Great, 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 maché* for the mummies (including mummies for animals). We have better records on some of these estates than for some households today. Most of this evidence is waiting to be processed.



Technology

The technology was very primitive.⁸ Three devices supplemented the irrigation by gravity.

The *shaduf* (in place by the year 2000 BC) lifted a bucket of water with a long lever. Its use was occasional, obviously for specialized purposes or during low water years.

The *saquiyah* (inverted watermill to raise water connected to a horizontal wheel that was actuated by circling animals) does 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* (also in use in the early 1950s)⁹ was invented dur-

⁷Milestones 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. Ingenious method are used to dates artifacts.

⁸See the Wikipedia [note](#).

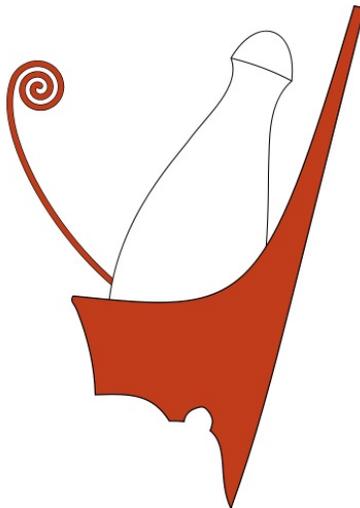
⁹Photograph by Helen and Frank Schreider of the National Geographic staff.

ing the time of the Ptolemies (2d century BC) when they pushed the production possibilities of Egypt to a new frontier.

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-building in Egypt differ from that of Mesopotamia? We have seen that a shift from foraging to agriculture took place (gradually) around 8,000 BCE in northern Mesopotamia. It took more than 4000 years for cities to appear and form states, in the southern part (Figure 1.2). In Egypt, it is proven that the transition to agriculture took place only around 4000 BC and that the formation of a state took place "only" a thousand years later. Moreover, there was no stage with city-states: the state was from the beginning a central-

alized state, 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 (image on the left).

The absence of city-states is remarkable. The state in Egypt, in the stable periods (below), is an autocratic state where 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 state. The fact is that the Nile Valley was not densely populated in the first place. The letters of Hekanakhte (ca. 2000 BCE) indicate that some of the floodplain 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 it was set up, was local, but this required a minimum of social organization. Let us remember that once irrigation was used, 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 subject, diseases?).¹⁰ All of this resulted in a very high surplus and thus a strong incentive for a ruling class to capture, and to augment, this surplus.

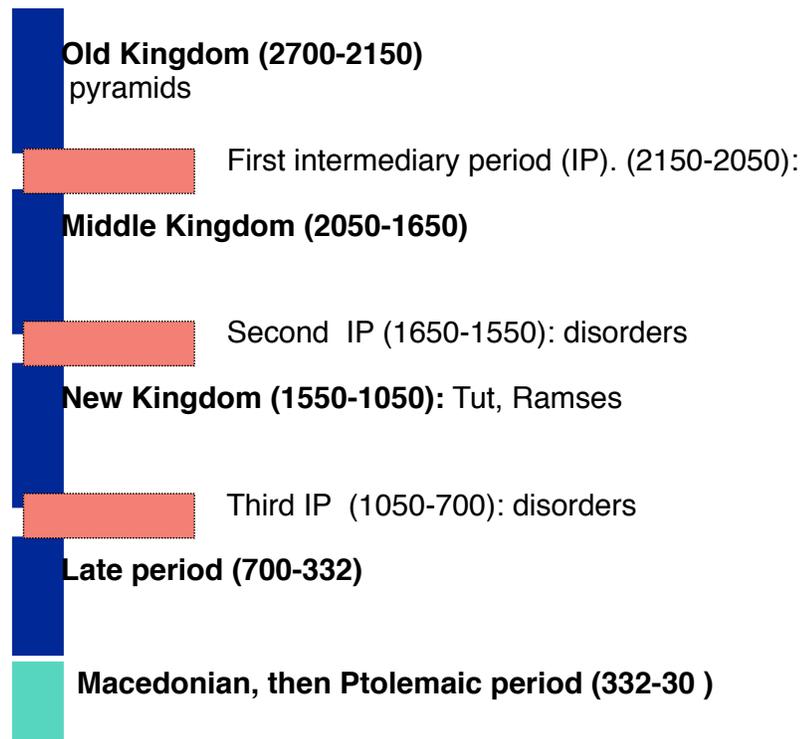
Other factors favored an authoritarian state. Between July and September, the valley was covered with water. The population could be used as forced labor for the construction of public works. The fluctuations of the floods from year to year created special conditions for a ruling class. The impact of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

In the following centuries, the surplus was captured by foreign occupants. First the Persians, then after Alexander's conquest (332 BC), 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 the Pharaonic times, the capture of the surplus required the unification of the land in order to prevent the escape of the inhabitants to another state and "tax competition".¹¹ The unified state saved also on the costly rivalries between smaller states, as the lands around the Mediterranean sea 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 adjacent figure, the king who shows his might wears the crown of Upper 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, the surplus could be captured by Pharaohs and priests for ostentatious consumption and buildings. The central regime broke down later a few times, during *intermediary periods* that were characterized by a return to fiefdoms and **so-called anarchy**. It is quite remarkable that we have a fairly good account of the rulers over Egypt. The history, from the rulers' point of view, has been divided in three kingdoms separated

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

¹¹Allen, R (1997). "Agriculture and the Origins of the State in Ancient Egypt," *Explorations in Economic History*, 34, 135-154



Dates before the Ptolemies are approximate.

Figure 2.3: Summary of history

Source: Ray (2002).

by intermediary periods. In each of the kingdoms, Egypt was unified under a strong Pharaoh in a line of what appears to be orderly successions. Of course, that orderly succession broke down during the intermediary periods. (This is actually how they seem to be defined...).

The next part needs to be edited.

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 had a stable state for more than 20 years. The record in the Pharaohs shows that for some periods the state was disorganized during which Pharaohs came in short succession. Other evidence points to disorders, famines, invasions. These periods are called the

*intermediary periods.*¹²

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.¹³ Butzer finds that there is more evidence of famines, sand storms and low water level at the time of the intermediary periods with a sudden recovery of good conditions for 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 floods¹⁴. But 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. New techniques from “real science” have completely renewed research on the relation between climate, level of the Nile and political unrest, as will be seen below.

Despotism

Egypt is an aisle 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 apply to Egypt. It does not fit the plain facts about irrigation in Egypt. The Pharaonic regime was indeed “despotic”, but not because of the Wittfogel chain of argument: irrigation \Rightarrow need for coordination \Rightarrow need for central authority in planning \Rightarrow despotism. In my view, the geography led to despotism but not because of th.

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

It was also critical to plan adjust ahead of time as much as possible the levees and the

¹²There may also be some evidence from skeletons that people may have been more healthy during years of intermediary periods, perhaps because of a lower rate of extraction from the Pharaoh and the administration.

¹³For 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.

¹⁴Between 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.

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.



Nilometer

It is not an accident that the uniqueness of Egyptian civilization is associated with these unique geographical conditions. They offered a long time a protection against invasions. At the same time, however, the region was more inwards oriented. There was no preparation or training against invasion, which made the people vulnerable to a strong invader like the Persian, the Greeks, the Romans or the Ottomans. There was no real opening toward the sea before the Greeks came in.

Hence, with some exceptions (Ramses II), the government did not use the surplus on foreign military commitments (as Philip II of Spain would do in the 16th century). That surplus was devoted to the consumption of the elite and the public works that contemplated visitors of all kind thereafter.¹⁵ 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.

Taxation, information and monitoring



When the population was tied to the land, the Nile valley offered exceptional condition to get the information necessary for the collection of the surplus through taxation: the plots could be surveyed and monitored carefully from the river. The yields of some crops (cereals) was highly predictable if one knew the main factor: the level of the water of the flood. Indeed, during the flood the vizier receives frequent reports about the water level. His team had probably the equivalent of an econometric model: say, if the level is so much for so many days, we may expect this yield. The product of the

¹⁵ After the battle of the pyramids, Bonaparte addressed his army: “Du haut de ces pyramides quarante siècles vous contemplent.”

land was therefore highly taxable.

The monitoring of the production was greatly facilitated by the geography. No agricultural land is far from a major waterway, either in the delta or along the Nile.

The borders could be well controlled: Alexandria was the only harbor for the trade with the Mediterranean and its real development came late. There is no good shelter for a harbor. Napoleon learned about this later... [See toward the end of the course]. Crossing the desert was not that easy. This situation enabled the government to implement high tax rates for imports. Likewise, until very recently, many developing countries with poor administration for domestic taxation implemented high tax rates on imports.

Another important feature is the long duration of the civilization combined with its stagnation in technology. The Archimedean screw was in use until recently as it is well suited in Egypt: the Nile valley is flat and a small raise of the water (the range of the screw) can extend significantly the irrigated area. Since there was so little change, the information that had been gathered by previous administrations for tax collection could be used for a long time. For the collection of information, the monitoring of the output and actual interventions in decisions about planting, the central administration had to rely on a strong bureaucracy. This bureaucracy may have been the strongest in Antiquity.

The bureaucracy

It seems that an efficient bureaucracy was in place very early on (around 2700 BC!), with career plans, rotation between jobs, high positions and high salaries for civil servants with long experience, etc... This is quite remarkable. France could not do it before the Revolution of 1789. The body of civil servants 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) for growth, which brings the second feature. An existing bureaucracy generates a hierarchy, career paths. Once there are career paths, the younger generations want to get the fruits of their investments 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 which is used as means exchanges (as described in any textbook). Before the introduction of paper money, most monies

had a physical support in coins containing some valuable metal (as discussed in the next chapter on money). Money was invented in Anatolia in the eighth century BCE. In Egypt, archeology has found no consistent evidence of coins before the conquest by Alexander the Great in 332 B.C. Following Alexander, the greek Ptolemies brought to Egypt a number of their own techniques. Metallic money was one of them.

Precious metals were more rare in Egypt than in other regions. Silver in particular was a rare commodity and its price seems to have been at least half 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 of the existence of money as a unit of account, and this evidence goes back to the earliest period of the Ancient kingdom. Near the funerary temple of Khafre (of the second pyramid, around 2 500 BC), the following engraving has been found: ¹⁶

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 see from these documents that money is not used as a means of exchange. Since the transaction involves no credit, the payment must be done in goods. We still have a form of barter, but the different goods are valued against the unit of account. Since temples owned large amounts of assets, they may have provided services similar to banking services. More research is need on this issue, but one can make some general remarks. The existence of a unit of account fits the high level of sophistication in the administration. Tax revenues during the Pharaonic times were paid in kind. Since revenues were mostly in cereals, no money was necessary. But it was important to keep good accounts about the quantities paid as taxes. In case, cash is the fuel of an underground economy, something that the vizier would have repressed.

Law and order

No state has ever survived on surplus extraction alone. Any state has provided first the most fundamental of all public goods, law and order. It may not be the most expensive item on the budget but no sedentary individual can go without it.

During the First Intermediary Period, a public official wrote:

¹⁶See Daumas (1977). Weill (1925), Pirenne and Van de Wall (1937).

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 instructions¹⁷:

“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 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

¹⁷Warburton, 178-180.

can make in the management of the land: three days for the vicinity, but two months for distant places. The pharaoh embodied the state and its relation with the gods, another world and the world of the after life. He could not be involved in the day-to-day business matters of the country. That would not suit his role and his prestige would have been constantly jeopardized by management failures. 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 assumes the foreign policy and the general strategy. The domestic affairs are taken care of by the prime minister, who is expendable.

no so sure about this paragraph

The cadastre

In the previous text, one of the important function of the vizier is to arbiter between disputes about plot limits. These disputes are often mentioned. Ownership mattered a great deal. More important, since the flood of the Nile at times covered everything with water, there may have been no obvious landmark in many cases. Hence the necessity of a cadastre that provided a guarantee for ownership. But at the same time it provided an essential information to the vizier about the plots for cultivation. Through the provision of the quintessential public good of law enforcement, very much required by individuals, the state gains means to monitor the economy.

2.3 The Ptolemies

This section needs revisions

After 1000 BC, the state in Egypt degenerated and the country was ruled by different invaders. In 332, Egypt was conquered (from the Persians) by Alexander the Great. At the death of Alexander (323), one of his general Ptolemy started a new dynasty which lasted until the suicide of Cleopatra, 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 (recall the famed library). The dynasty recognized quickly the fantastic opportunities for revenues in Egypt and brought a new level of sophistication to the administration of the land.

As mentioned above, we have much better information for this period. This may also be due to the careful administrative methods that were introduced by the Greeks (for private and public activities) in order to improve the exploitation of the land. The short summary by Jones rests on the work of Préaux. The following description is based on Préaux (hereafter CP). In my view, the wealth of information that is available for this period remains to be organized and discussed from the point of view of economics with a special emphasis on the optimization of the administrative efficiency.

The Ptolemies did not leave great buildings to the posterity. Note that we have very

few buildings in the delta and the Ptolemies coming from the sea were ruling the country from the North. The main public project that may have been undertaken at the time was the development of the Fayum. The Ptolemies applied techniques that had been used for the lake Copais in Macedonia and expanded the irrigated area threefold. The Fayum produced the highest yields of 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 features of cereals are that (i) the timing of the production is the same for all farms of the same district, (ii) the grain has to be extracted from the plant in a given clean place, (iii) the product is uni-form and easy to handle. The administration took advantage of these features to require that all the production of the same district should be delivered to a specific location. The monitoring of the output was easy. There was a detailed cadastre recording each plot. The taxation of the output varied from district to district and was integrated with the type of ownership. (A lease was collected as a tax). In sharecropping contracts on royal land, the tax rate could be 50 percent, but the rate could be fixed with respect to the area, thus requiring the effort to obtain a high yield. No wonder that people tried to evade taxation (for an example of a side deal, see CP 135).

The central government gave specific instructions for the land allocation to various crops, but probably these instructions applied only to royal land. Seeds were provided by the central government as a loan with a high interest: another form of taxation. The provision of the in-puts provides also a way to check the inputs of the farmers

Another source of revenues was the interest incomes on the seeds (at a rate of 50 percent over a production cycle).

It is not clear how the central government controlled how much area was allocated to different crops. (The crown certainly controlled its own land). Seeds were provided by the central government as a loan with a high interest: another form of taxation. The provision of the in-puts provides also a way to check the inputs of the farmers¹⁸. Measurements of land have to be done as a flood changes the pattern of cultivable areas.

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

The control of the state is much more difficult on these products than on oil seeds and cereals. The manipulations of the fruits requires careful timing and processing. The

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

tax existed before the Ptolemies, but Ptolemy II reformed the tax and reinforced the administrative controls (CP 171). We know that wine is not less uniform than wheat. The tax rate on the net output (which is not the profit) was 1/6. There were three parties involved in contracts which estimated the profit and the tax: the peasant, the tax farmer¹⁹ and the government official. They could check on each others and thus reduce the risk of corruption. Payment was in kind (with specially measured vases for the wine) or in money (silver and copper). The receipts of the tax were originally for the temples, but some of the proceeds were also used for non religious purpose. Probably, the efficiency of the tax after the reform enabled the secular use (and must have been a motive for the reform).

Other similar taxes were levied on wine and fruits. The tax rates varied from region to region (or plot to plot). One possible explanation is the variety of the types of soils and of the yields.

Customs taxes

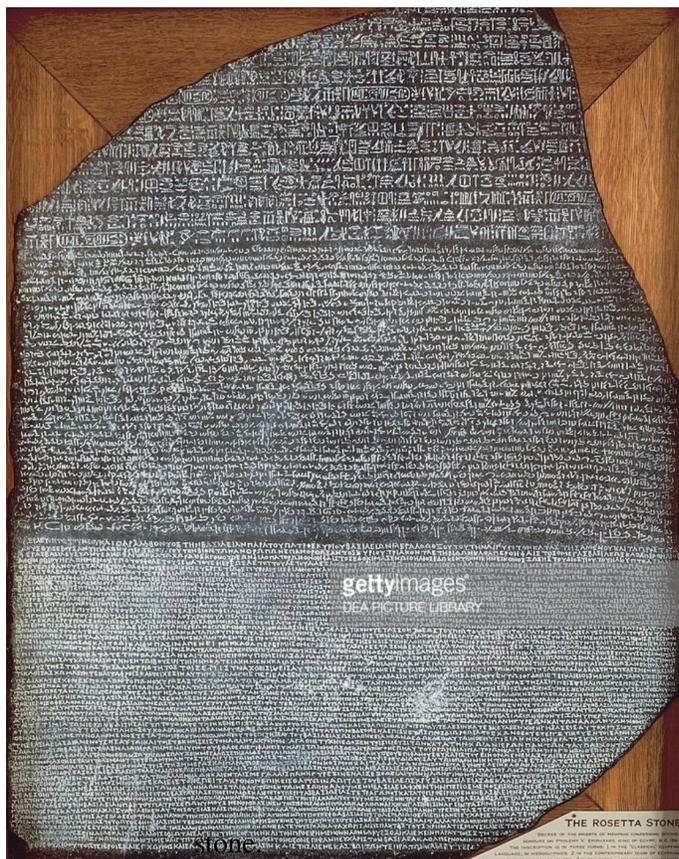
Customs taxes were high because the borders were relatively easy to monitor. (See above). The rates reached 50 percent.

Monopolies and commodity boards

An important monopoly was that of oil. Seeds were supplied by the administration and the output was purchased at a fixed price by the administration which entrusted a monopoly to process it and marketed it at regulated prices.

¹⁹Jones, "Taxation in Antiquity".

Tax relief



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. One can see on the picture that there are three texts, in the ancient hieroglyphs, in demotic (a kind of short-hand for hieroglyphs) and in greek. Bonaparte had taken with him a team of scholars and their reports fired the enthusiasm for Egyptology. At the age of 16, Champollion (1790-1832) set his life on deciphering the hieroglyphs that no one could read.²⁰ The first step towards the complete deciphering was achieved in 1823, when he identified the names of pharaohs Rameses and Thutmose in *cartouches*. A cartouche is an oval that circles the name of a pharaoh. You can see one shortly after the start of the last line of the hieroglyphic text of the Rosetta

We owe the text (and the deciphering of the hieroglyphs) to fiscal policy, in particular to a tax rebate by a Ptolemaic pharaoh. The main part of the text is a praise for a tax reduction:

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-

²⁰Reading 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;

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