LESSON SIX STUDY GUIDE

Last Revision Date: 2013 Apr 26

REVISIONIST HISTORY. You'll study the royal nomenclature in this lesson. Here's part of list of kings from the University of Pennsylvania Museum in Philadelphia. Kings' names, as you'll infer later on, can be political statements. Here are historical statements as well. The nine names of eight kings are listed here. They are portrayed in the order of their succession. Reading from right to left the monarchs are

MenKheperRa Djehutymes III
AaKheperuRa Amenhotep II
MenKheperuRa Djehutymes IV
NebMaatRa Amenhotep III
DjeserKheperuRa SetepEnRa Horemhab
MenPehtyRa Rameses I
MenMaatRa Seti I
WeserMaatRa Rameses II
Rameses Mery Amun (also known as Rameses II - he gets double billing here)

But we now know that between Amenhotep III and Horemhab came into the entire Amarna interlude, ruled by Amenhotep IV (Akhenaton), somebody named Smenkhare (and maybe another king, too), Tutankhamun, and Ai. Yet, according to this list, the Amarna period never really happened! This is called “damnatio memoriae” and you don't have to know Latin to figure out what that means.

In the lesson you're going to learn about three constructions which all look alike and can act alike.

- Hr + infinitive
- m + infinitive
- r + infinitive
- and a lot about what a future tense is - and isn't.
- Oh, and we'll throw some arithmetic and calendar stuff as well.

Section: #58, page 73

If you ever needed more proof that infinitives are primarily nouns, look no further. The object of a preposition must be a nominal, it's the law. '*ḥr*' + infinitive literally means: "upon" plus whatever the infinitive is, which gives you the idea of immediacy. "Upon" is usually not a good translation, but it is the root meaning of the preposition - and you should know the basic, root meaning. It'll not only help you get the flavor of the Egyptian, it will immediately suggest more idiomatic English translations.

That's why it's invaluable to learn the root meanings of the words rather than a bunch of translated formulas. Let the English come naturally. It will be more expressive and actually closer to the meaning of the original than it would be by picking, rather arbitrarily, a translation from a list of suggestions.

Again, treat the infinitive as a noun and you won't have to worry about "logical direct objects" or whatever. Again, the English idiom will come to you naturally because the grammar is really simpler and much more accurate this way.

The construction '*ḥr*' + infinitive is a prepositional phrase, true enough, but to say that it is adverbial is to add no more useful information about it. So forget that stuff. Also, where Hoch talks to you about "pseudo-verbal", forget that. Read this footnote if you want to know why[1].

The two sentences in this section provide more practice of using this technique of learning a simple, single paradigm and then letting it suggest your translation. Here goes.

'*wḏ3 pw ỉrỉ.n.f ḥnꜥ.f r mryt ḥr rdỉt n.f ꜥ.f*'
"It was a trip that he made together with him upon the giving to him of his hand."
evolves rather naturally into
"It was a trip that he made together with him while giving him his hand."

'*gmỉ.n.f sw ḥr prỉt m sb3 n(y) pr.f*'

1 This kind of terminology is not at all helpful to beginning students. At this stage you really couldn't care less about the terminology that **some** (not all) Egyptologists use in their discussions. Your job is to learn the grammar and your text should be making that easier for you, not harder by throwing in extraneous stuff that doesn't help you learn. So, if you decide to pursue this further and only if you decide to pursue it further, if you start to read the journals, etc., you'll pick up this terminology anyway, you'll actually understand what they're talking about better at that point anyway, and you'll be able to critic it more knowledgeably, so why worry about it now?
Note to introduction to any foreign language textbook writers: Know your target audience. Know what they need. Know what they don't need. It's not that hard.

“So he found him upon the going from the door of his house.”
evolves rather naturally into
“So he found him just when he was going from the door of his house.”

One final note on this section. I don't think '*ḥnꜥ*' ever just means “and”. This is a technical point but I think it's important for you to know. More on this below.

Section: #59, Pages 73 and 74
Here we go with this “adverbial” stuff again. Look, all he's saying is that one prepositional phrase can be treated like another.

'*ỉw.f m pr.f nfr.*'
'*ỉw.f ḥr ȝtp ꜥȝ.f*'

“He is in his nice house”
“He is loading his donkey.” literally: “he is upon the act of loading his donkey.”

Two prepositional phrases treated exactly alike in Egyptian. The meanings are rather different and the English constructions don't match each other nor do they, being translations, have to mimic the Egyptian constructions, but they're both prepositional phrases in Egyptian and they're treated exactly alike in that language. Which means that the ancient Egyptians understood them as - well - prepositional phrases and handled them accordingly. They go in the A slot - which does not stand for “adverbial”.

The second paragraph on page 74 is the really interesting stuff. It has to do with people's perception of time. It is almost always true that when we talk about, for example, “the present”, we are not talking about a specific moment in time. Nor are we necessarily even talking about a single event. The translations from one language to another follow the interpretation of the translator and the idiom of the language he or she is translating into.

The note on '*m.k*' being followed by a dependent pronoun is correct. It comes from the fact that '*m.k*' is originally a verb and its subject and the dependent pronoun is originally a direct object. So none of the grammar here is really new. What is new is that fact that in Middle Egyptian '*m.k*' has lost most, if not all, of its original verbal force and has evolved (or devolved, if you prefer) into a particle - all without losing its original grammatical structure![2]

The same thing happened in English, as you'll see from the next example.

'*m.k sw ḥr wnm.f*'
“Look, he is eating it”.
But the translation offered of “Look at him eating it” is wrong as far as I can tell. '*m.k*' is not an imperative, nor is “look” in this instance, although originally, like '*m.k*', it was an imperative in English. Now it's actually a particle (although English grammarians, trapped by their hidebound traditions) don't admit to that.

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2 Where can you put '*m.k*' or '*m.k sw*' or whatever in the grid? In the P slot.

Here's more proof. The idiom “look”, if not used as a particle but rather as a true imperative: “Look at him eating him it” might mean, in English, “I don't believe he's actually eating that” or “He's eating like a pig” or “Wow, he must really like that stuff” or even (although almost certainly not) “Your orders are to observe him eating it”. None of those things mean *“As you can see, he's eating it”*, which is all that the Egyptian means and what we understand that in this case “Look, he's eating it” means. English particle. They're all over the place - you read that here, not in an English grammar.

'*m.k sw m ỉỉt*'
“Look, he's arriving.” is better than “there he is coming”.

Section #60, pages 74 and 75

'*m*' + verb of motion - Literally something like: “I am in the act of going...”

The Egyptians kept this prepositional phrase in the A slot, just like '*ḫr*' + infinitive. So, again, the translation into English switches the idiom from prepositional to verbal. But again, if you know the basic meaning “in the act of ...”, things come easily and correctly.

That the translation is a matter of interpretation is illustrated by Hoch's example:

ỉm.t wỉ m hɜt r Kmt r ỉnt ꜥqw ỉm n ḫrdw.ỉ'
Hoch: “Look, I'll be going down to Egypt to bring back some provisions from there for my children.”
Me: “Look, I am in the act of going down to Egypt for the purpose of bringing back provisions from there for my children.”

These two translations are not exactly identical. In the part highlighted in red, Hoch's version uses a future tense indicating intent, I used a present tense which could mean “I'm on my way as we speak” but also, more generally, “I'm fixing to go...” which is, of course, intent. Hoch's is less ambiguous. Is it therefore more correct? Nope. Given my version, which uses the simple underlying meaning, your translation can evolve in your head into Hoch's version. Learn simple things and let them work for you.

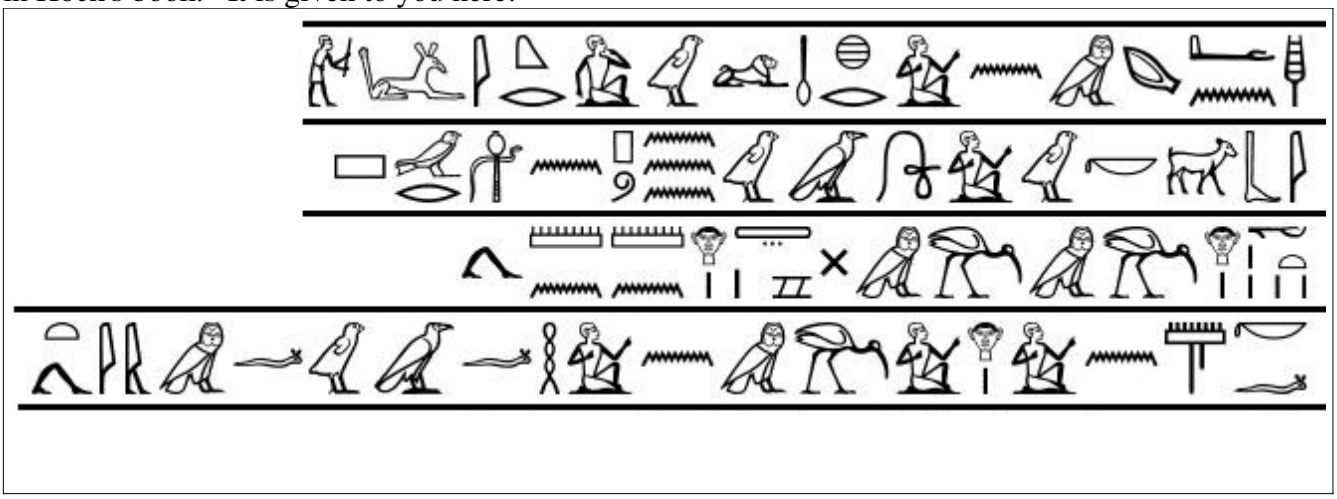
Section #61, page 75

I am so sick of the use of the word “modify” in this context that it's difficult to maintain composure.

But before I even come to that subject, I want to clear up an issue with the first sentence in this section. That sentence would lead you to think that section #16 told you that the absence of '*ỉw*' indicates “subordination” (whatever that means) and that this holds only for noun subjects. No, that's not what section #16 told you, it didn't mention noun subjects at all. It was a general statement, the absence of 'iw' in **any** subsequent clause while it does appear in the initial clause, qualifies the subsequent clause as a “circumstantial clause”.

“Circumstantial clauses”, “subordinate clauses” - all this stuff means is that when you read them you are getting some additional/clarifying information. That's all. That's all you have to remember. Let's look at the examples - and pay close attention to the rather arbitrary way in which those terms are used:

The examples start out with the lead-in phrase translated for you because the Egyptian does not appear in Hoch's book. It is given to you here:



'*ʿḥʿ.n sḏm.n.i ḫrw ḳri*
ib.kwi w3w pw n(y) w3d-wr
ḫtw ḥr gmgm t3 ḥr mnmn
ḳf.n.i ḥr.i gm.n.i ḥf3w pw iw.f m iit'

Two translations (Hoch's and mine):	
Hoch: "I heard a thunderous sound. I thought it was a wave of the ocean, but the trees were breaking, and the ground was shaking. It was a serpent that was coming."	Me: "Then I heard the noise of a storm. I thought: 'it is a wave of the great-green (sea)' because the trees are breaking and the earth is shaking.' But it was a serpent, and he was coming (toward me)."

Line one starts everything off. After that everything is additional information, "circumstantial clauses" in Hoch's parlance. How do I know that the first line contains a "circumstantial" *sḏm.f*'? 'Cause I'm smart?! Well, I am, but no, really, because of some grammar you haven't had yet - and Hoch should have told you about before springing this example on you. '*ʿḥʿ.n...*' in a case like this, literally: "stood up" is another case where a verbal construction has evolved (or devolved, your preference) into a particle. It means "then..' in this case. Such a sentence is handled grammatically the same way as one beginning with '*iw*'.

Now compare the translations. The first thing you'll notice is the difference in tense caused by the fact that Hoch maintains the narrative tone throughout while I interpret the stuff after "I thought" more vividly by translating it is at appeared to the sailor at the time. Which is better? Your choice. Again, it's a matter of interpretation[3].

3 Just don't use "interpretation" as an excuse for being sloppy or unsure of your translation. You do nobody any good that way, and one of those people you're not helping is you, yourself!

Also, both of us wrote line four as an independent sentence - when all it is really is more "circumstance", "subordination", "additional information", whatever. Which shows you that where someone's clause exists - there is someone else's sentence. Arbitrary? Yes. How could you translate it while retaining the original structure? One way is simply to put "but it was really" in place of "it was". Voila! Retention of original structure - and not a bit of difference in meaning!

Interpretation - and personal preference.

And through it all, nothing in the original statement "I thought it was a wave of the ocean" was ever modified. Nothing. No change at in that statement at all. Just more information came your way.[4]

Section #62, page 76.

One thing to keep in mind here is that although these '*ỉw.f r sḏm*' constructions are called "future tenses" that is only from the point of view of English grammar. These were not future tenses in the grammar of Middle Egyptian - we can tell that because they don't appear in the V slot. The '*ỉw*' is a particle and the '*r sḏm*' part goes in the A slot along with all the other prepositional phrases. But such phrases became idiomatic futures - most of the time. The basic, underlying meaning is one of intent.

This meaning of "intent" can produce rather laughable translations in English:

'*ỉw dpt r ỉit m ḫnw*'
"A boat intends to come from home."

Ummm, no.

There really is a future tense that exists as a true verb in Egyptian but it always reflects the uncertainty associated with the future. After the idea of "in sha'Allah" in Arabic ("God willing"). You'll encounter it later on in chapter seven. And the true Egyptian future tense always ends up in the V slot. So, while the construction we're studying here can be translated as a future, sometimes, and may have been understood that way, sometimes, at least colloquially, sometimes, it is not treated grammatically as a future tense in Egyptian.

'*r*' + infinitive means "intent". The concept of "intent" does not necessarily rest with the subject. As we've just seen, this can produce some strange results in English, like boats intending to come from home. But there's a way or two out of this problem. In our case an interpretation can be that a crew intends to bring a boat from home - or that the magical serpent (who is speaking in this part of the Shipwrecked Sailor) can actually see the future so there ain't no uncertainty about it: this here boat is a-comin' fer shur, fer shur.[5]

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4 So "modify" joins "adverb" as being misleading and therefore useless. The slavish retention of such terminology only serves to confuse students. The only way we can get grammarians to stop using these terms is to stop using them ourselves, and to criticize them when we see them.

5 One additional note on this subject: James Allen interprets "compulsion" in the next sentence which reads "Look, I will take your donkey". He translates it as "Look, I have to take your donkey". This interpretation is peculiar to Allen and he is inconsistent in its application (i.e.: here only), so if you're familiar with that book and that quotation, you've been warned.

Try translating all the remaining examples in this section as intent, rather than as the futures which Hoch presents. You'll be able to do it in all but one of them and you'll be closer to the original idea. Where you'll run into trouble in English is if the subject is inanimate, such as this one:

'*ỉb n(y) ḥm.k r ḳbb...*'
"Your Majesty's mind will be refreshed..."
treating the king's mind as being inanimate. But really, it's just a matter of English idiom that throws you here, the basic concept is this: "it's our intent that your Majesty's mind be refreshed...".

So again, learn just the basic concept and then let the English take over. You don't have to learn a whole slew of examples.

One more note on this section:
I cannot understand Hoch's footnote #4 on page 76. In the sentence:
'*m.k wỉ r nḥm ꜥ3.k sḫty ḥr wnm.f smꜥ.i*'
"Look, I will take your donkey, peasant, on account of its eating my Upper Egyptian barley"
he claims that '*ḥr wnm.f* ' is NOT the "progressive" '*ḥr*' + infinitive. Without no alternative in sight I have no other way of interpreting it.

Section #64, page 77

No, I didn't skip the previous section. I just have no comments on it.

For this section, it would have been nice of Hoch to define "vocative" for those of you who don't know what it is. Here goes, and it takes a couple of sentences:

In languages like Greek or Latin, which is where this term comes from, nouns change their endings depending on whether they are the subject, direct object, etc., or in this case, are the name of something or someone who is being addressed. So if my name is "Marcus", I am "Marcus" if I am the subject of the sentence, "Marcum" if I am the direct object, "Marce" if I someone is talking to me. "Marce" is the vocative of "Marcus".

Since Egyptian nouns do not change like this, calling this a vocative is misleading and downright wrong.

Now you know what he's talking about.

Section #65, pages 77 - 79

The only thing I want to add to this section is a mnemonic. There are two kinds of numerals: cardianal numbers and ordinal numbers. "One, two, three..." are cardinal numbers, "first, second, third..." are ordinal numbers. Here's one way of remembering the difference: who elects the pope? Cardinals, not ordinals.

Section #66, pages 79 - 80
I just want to comment on the last paragraph on page 80. It's **baloney**. The Egyptian system of writing fractions was eminently practical and logical - it only seems "cumbersome" to non-mathematicians like

Hoch and most other Egyptologists. But not all. Anyway, in actual practice the Egyptian system required far less rote memorization than our clumsy system does and it produced values that could be understood at a glance.

How much is 18/31? Quick! Is it one half, one quarter, whatever? How would you divide, oh, let's say 18 loaves of bread among 31 workers if you were a scribe? To see how, read Appendix 1 where I'll provide a visual example of one way of handling the arithmetic (a rather novel way, actually). I put it there because the illustration of how to solve the problem really has nothing to do with grammar, so if you want to skip it and take my word for it that Hoch is completely wrong when he says “cumbersome” in this instance, you won't miss much. But if you do read Appendix 1 look out. If you're not very careful you might learn something.

Read sections #67, #68 just to have an idea of what's there, but most of you will need it only for reference later on.

Section #69, page 81

Dates are more important but there is also some fundamental misunderstanding about them - and about ours, too. Ooops. Here's another appendix, Appendix 2, for those interested. You don't have to know this stuff so that's why it's in an appendix.

The royal titulary is also important and you should know how it works. My terminology differs somewhat from Hoch's (what's new?). I'm not alone in this.

1. Horus name
2. Two Ladies Name
3. Golden Horus Name
4. Throne Name
5. Birth Name

The Birth Name is, of course, the King's name as known to his family. It was, usually, the name given to him at birth by his mommy and daddy.
The Throne Name is how he is known to the world. It's a custom still in use. The pope, for example, assumes a throne name by which he is called thereafter (I'm not so sure about the pope who used to Benedict XVI). The British monarch does as well. In both cases the selection is not arbitrary and is meant to send a political message.

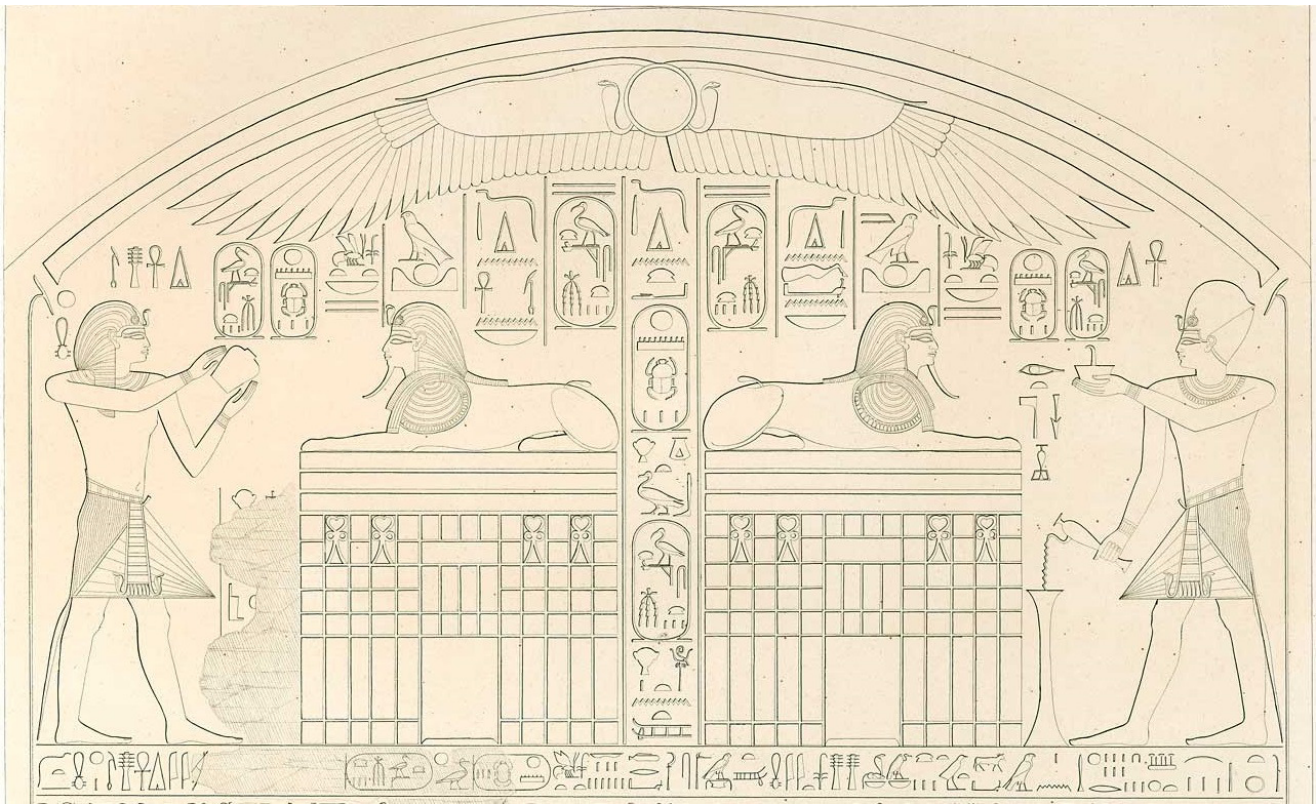
The last two names are much more commonly used. Previously, scholars would refer to a king only by his birth name and, if he shared it with other kings, they would put a Roman numeral after it. Some modern scholars have begun referring to both the throne name and the birth name with the appropriate Roman numeral. The throne name was usually, not always, unique to the king who bore it.

Obviously, the ancient Egyptians did not use Roman numerals[6].

Here are some examples of the royal titulary with a date thrown in for good measure. This is a drawing made by Lepsius in the middle of the 19th century. It's a copy of the Dream Stela which sits, to this day,

6 Which aren't “cumbersome” either.

in between the front paws of the sphinx at Giza. We are often indebted to drawings and paintings like this from the early students of Egyptology because, all too often, they are the only or the most complete records we have. The Dream Stela has been significantly eroded in the 150 years or so since Lepsius was active. Much of the text he copied is now gone - forever.
Anyway, in the top register, which reads from both ends in toward the center you can see the king's throne and birth names.



Here's the first line of text from the Dream Stela, containing the entire titulary of MenKhepruRa Djehutymes IV, and a date, presumably of the commission of the stela.

First comes the date:
'*ḥsbt/ḥ3t-sp 1 3bd 3 3ḫt 19*'
"Year 1, Month 3 of Inundation, (day) 19"
I think that the majority scholarly opinion prefers '*ḥsbt*' to '*ḥ3t-sp*' which Hoch writes. I ain't sure.
Anyway, something weird happened in the text here. Look at how the numeral appears and how it intrudes on the following word '*ḫr*'. Unusual.

The date refers, of course, to the very accession year itself, year one. Whenever that was. The regnal dates of kings of this period are debatable, in this case ranging over a period of 31 years.

Now the honor:
'*ḥr ḥm n*'
"Under/in the reign of the Majesty of"
(You'll see this phrase a lot in inscriptions, learn it. Also note that what looks like a circle can stand for both '*ḫ*' and '*rˁ*'. We know they were different signs and you've learned as separate signs, but they are often indistinguishable in inscriptions - not just drawings like this one, but actual inscriptions. You'll have to be flexible with this.)

And here comes the full name, all five of 'em. Horus name first:
'*ḥr kȝ nḫt twt ḫˁw*'
"HORUS: Victorious/Strong/Champion Bull, the Image of Glory"
'*ḫˁw*' is related to the verb '*ḫˁi*' (= "Rise (of the Sun, Shine, Appear in Glory - referring to the crowning of the king at his accession), and it is also related to the word '*ḫˁw*' (= "crown"). All of these things happen multiple times, including the coronation ceremony - up and down the length of Egypt to demonstrate the king's universal power).

'*nbty ḏd(.wy) (n)swt mi (i)tm*'
"TWO LADIES: "How enduring is (his) royalty, like Atum"
Not "endearing", but "enduring". Djehutymes doesn't care if you love him, just as long as you fear him. I admit I'm reading a dual into this word, but it seems to emerge out of the double spinal column which spells the word. The basic word is not '*ḏḏ*' as it appears here but '*ḏd*', so in this case I think a dual might be appropriate. It's certainly more impressive.

'*ḥr nbw wsr ḫpš dr psḏt*'
"HORUS OF GOLD: Strong is the sword which subdued the nine bows"
Here's a numeral inside the king's name. The "nine bows" are the traditional enemies of Egypt. The actual identities of the various nine bows changed over time.

'*(n)swt bity <mn ḫprw rˁ>*'
THE KING OF UPPER AND LOWER EGYPT: Established/Firm/Enduring are the evolutions of Ra"
Each day is a metaphor of life and, ultimately, of the universe. The Sun rises young and strong and full of rejuvenating power. His growing strength culminates at noon when the power of his heat and glory are most manifest. But as evening approaches his power weakens. He becomes so feeble that you can look at him as he descends into the western horizon, the west where all the dead go to descend into the Earth. But as he follows the underground celestial river which carries his boat back to the east, Ra is resurrected, renewed, restrengthened, as are the souls of the blessed dead. And a new day begins for all of us, the living and the dead, and so even the world we know passes away and ultimately is reborn.

Also note the honorific precedence awarded to the god's name.

'*sȝ rˁ <ḏḥwti ms(.w) ḫˁw>*'
"SON OF RA: Djehuty (Thoth), he is born. A glorious appearance"

That last word, '*ḫʿw*' is a later insertion, not given to him at birth. The king's birth name appears several times later on in the stela and this word is always missing. So this is something he threw in here to make his name a little more impressive.

Then comes a damaged portion. We can read
'*mry*' (= "beloved") and then, to fill in the gap, read something like "... of Amun" followed by some epithets or "... Ra-Horakhty," etc.

Final honorifics:
'*di(.w) ʿnḫ ḏd wȝs mi rʿ ḏt*'
"Given/may he be given life, endurance, power, like Ra, forever."

An issue with birth names is how they are presented. We see things like "Tothmes" and "Thutmosis" (same guy), "Rameses" and "Ramses" and "Ramesses" (same guy), "Amenhotep" and "Amunhotep" and "Amenhotpe" (same guy), Cheops (some guy, but not the same guy), and Menes (maybe no such guy), and so on and so forth.

For the most part these are names that were transliterated from Egyptian into Ancient Greek (with limitations and grammatical additions) and then transliterated again into some yo-yo form of English. It can get pretty bad, these names can lose a lot in transliteration. Ancient Greek, for example, had fewer sounds than modern English and not many that paralleled Egyptian. So in a name like "Thutmosis" there seems to have been an "m" and an "s" in the original Egyptian name - nothing else survived the initial transliteration, well, maybe the "u" but even that may have come over in garbled form.. The "-is" ending is a Greek inflectional addition made to allow the word to function within the Greek grammatical system. "Djehutymes" is what some of us call him. It's an improvement. Not much. But it's an improvement[7]. It moves us in the right direction.

Section #70, page 83

Ditto.

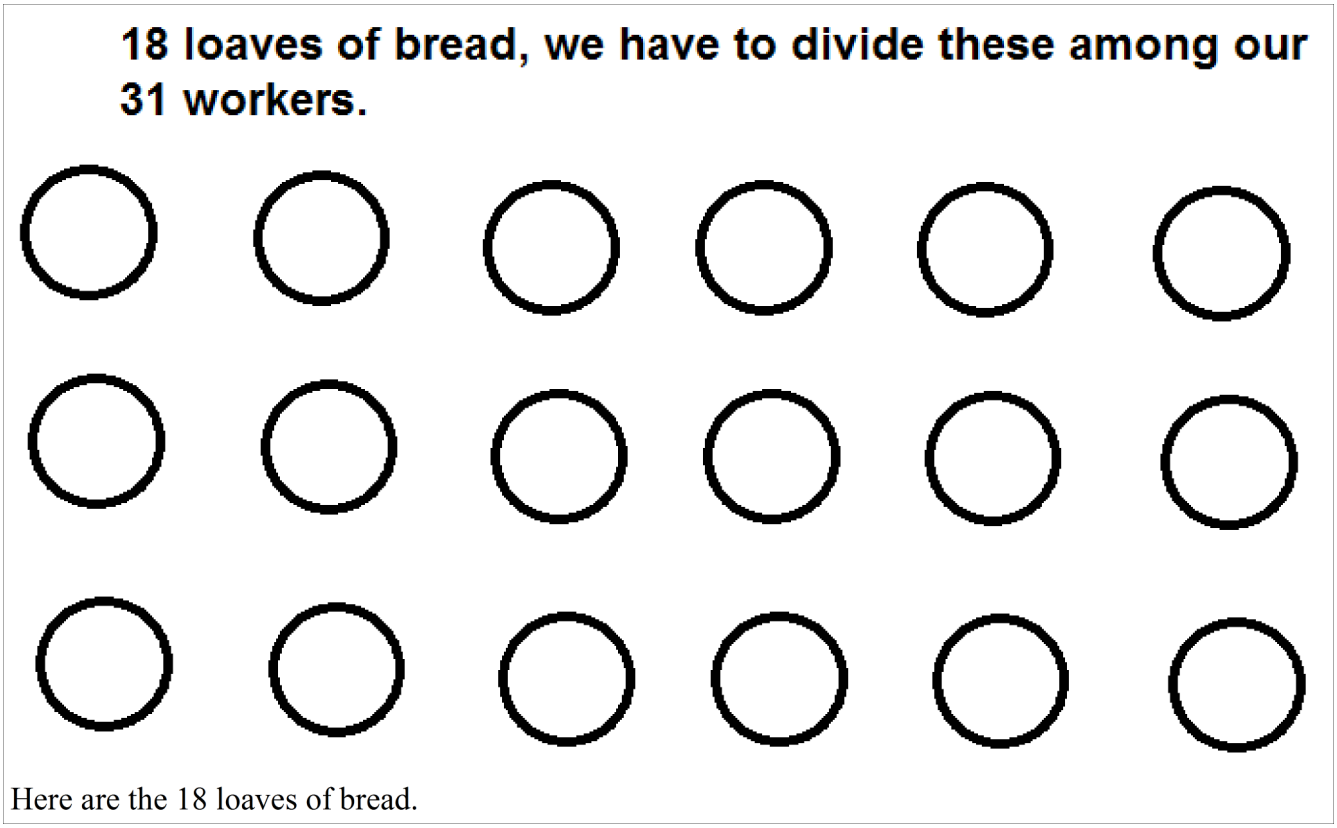
ONE VOCABULARY NOTE:

'*ḫt*' is a masculine word despite the '*-t*' ending. See Study Guide for how words like this are "alphabetized" in the screwy, cockamamie scheme that Egyptologists have produced for making their dictionaries.

HOMEWORK:
Do exercise (B) on pages 85-86.

7 English hasn't worked well, either. For example, it will surprise some people to learn that there never was an ancient Roman named "Marc Anthony". Never. Never lived. There was a Marcus Antonius, and that's the guy that's meant by the barbaric appellation mentioned above (yes, we are barbarians). Caesar (as in "seize her"?). No such critter. The Germans came closer with their word "Kaiser". Not quite close enough for a hit, but closer.

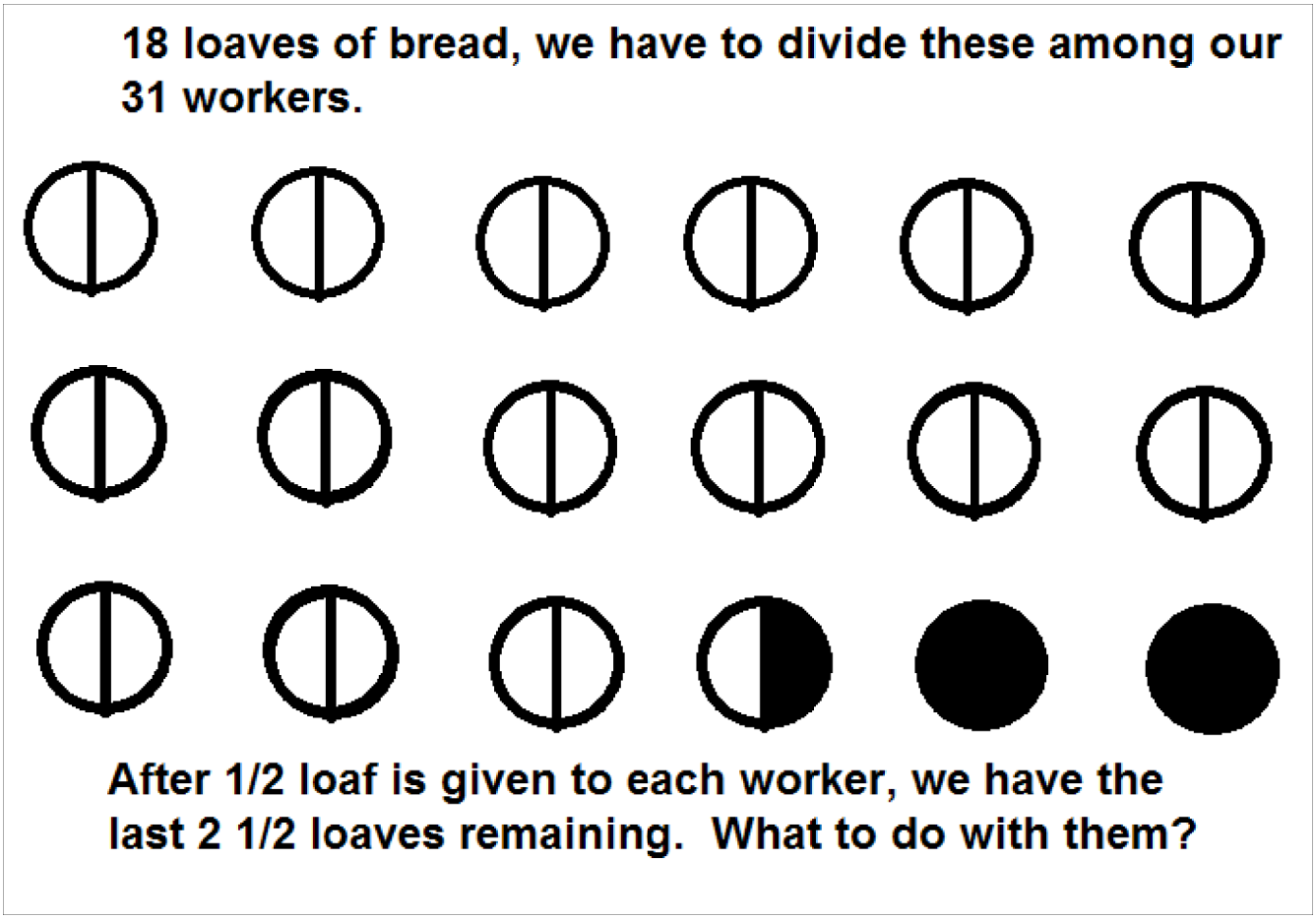
APPENDIX 1 - EGYPTIAN ARITHMETIC



Here are the 18 loaves of bread.

Don't go the next page yet. Take a few minutes to try to try to work the problem and figure it out for yourself. Here's a hint, just giving everyone 18/31 of a loaf of bread ain't gonna work. Why not?

Read on when you're ready.



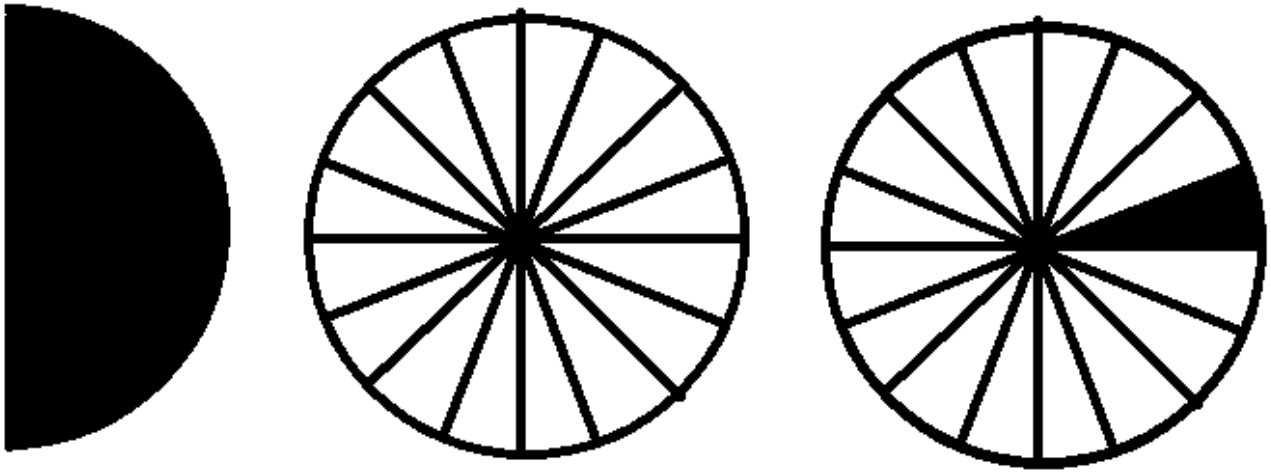
So start by giving every man half a loaf. That's equitable.

Remember, these workers are math illiterate. Completely. Their total education is zero. They only way they will believe that everyone gets a fair and equitable share is by visually verifying that everyone has the same number of pieces of bread and that each man's piece look like everyone else's.

In other words, if one worker were to get ¾ of a loaf of bread and another worker were to get two pieces, one a ½ loaf and the other a ¼ loaf, our modern worker, with a bit of mathematical education, would say “yeah, that's the same”, but an ancient Egyptian laborer would not. He would not know that ½ + ¼ = ¾ unless you took the time to demonstrate it to him and by that time lunch would be over.

So everyone's share has to be exactly alike. And look exactly alike.

After 1/2 loaf is given to each worker, we have the last 2 1/2 loaves remaining. What to do with them?



Well, we can take the two full loaves remaining and divide them into 1/16 and distribute 31 of those pieces. It leaves us with 1/2 loaf and 1/16 of a loaf (colored black) to go.

And in this case, that can be the scribe's fee.

I'm pretty sure the scribe can convince the workers, uneducated as they are that it's not worth trying to cut the remaining loaves up. The half loaf on the left, cut into 31 pieces is … well, that's easy … it's 1/62 of a loaf per man. Not enough to notice.

And by dividing up the reamaining 1/16 of a loaf into 31 pieces … you're getting pretty close to the basic molecular structure there. Well, not really, but you get the idea. 1/496 of a loaf of bread ain't much! Unless it's a really big loaf.

So our modern - uh, “very uncumbersome” system - won't give you a good answer. 18/31. Everybody gets that much bread. How you gonna cut it? It's hard to look at this fraction and even guess at how large it is. Is it more than a half? Less than a half? You have to some interim math yourself in order to solve that much of the problem. And if you were to give every man 18/31 of a loaf you'd end up giving some one piece, others would get two smaller pieces. You could even end up giving some guys three really small pieces. How are these completely unschooled laborers going to know that everyone got, in total, 18/31 of a loaf of bread? They're not. And they will come looking for you - with clubs.

OK. Let's try another modern “very uncumbersome” representation of the same number 18/31. Ready? 0.58064516129... and so on. Try cutting bread with that number as your guide.

The Egyptian answer is simplicity itself: ½ + 1/16 + 1/62 + 1/496. Exactly. All you have to do to judge how large that number is look at it. It's a bit more than half, 1/16 more and the rest is vanishingly close to zero. Our “very uncumbersome” method of representation won't tell you that. Won't even come close.

The Egyptians were eminently practical people and their method is eminently practical arithmetic. Nothing “cumbersome” about it all.

APPENDIX 2 - THE EGYPTIAN CALENDAR

The Egyptians had at least three, maybe four different calendars.

There was the natural calendar, determined by the actual orbit of the Earth around the Sun which, couple with the axial tilt of the planet, results in our seasons. A better name for this is probably "agricultural calendar" since it was predicated upon the annual mid-summer flood of the Nile when most of Egypt went under several meters of water. This was a good thing because it brought down a new supply of nutrient-rich topsoil from central Africa. And it determined the planting seasons, of course, once the river had receded to its banks. Hence "agricultural calendar".

There was no formal calendar like this because the flood would have to proceed northward along the entire 900 kilometer length of Egypt. This progression took days or even weeks to accomplish. It produced the names of the three seasons (not four): '*ȝḫt*' (= "inundation"), '*prt*' (= "emergence"), '*šmw*' (= "harvest").[8] So if New Years was dependent on this, it would happen on different days in different parts of the country. And on different days in different years, too.

The average length of time between floods was, of course, 365 ¼ days. But in any given year this could vary by a week or more. This "natural" or "agricultural" calendar was dependent upon the flood. But there was an accurate way of predicting when the flood would occur and it didn't require anyone to count days. It depended upon an astronomical event, the heliacal rising of Sirius. There is a period of about 70 days when Sirius remains below the horizon. But then it can be seen in the east just before sunrise. This first time of visibility is called the heliacal rising. Throughout most of ancient Egyptian history this event occurred just before the flood began. So the Egyptians used this event as the harbinger of the flood[9]. The regularity of the heliacal rising was easily measurable to a 365 ¼ day interval between successive events. So the Egyptians knew the length of the year. And they used this as New Year's Day. Unfortunately, the moment that this event occurs also depends on your latitude. Days later the further north you go along the Nile. So it's not a calendar that people from different parts of the country would agree upon - exactly.

In addition to the agricultural calendar the Egyptians maintained an official, civil calendar. This calendar contained 12 months of exactly 30 days each and added to the end of the year an extra 5 holidays which were not members of any month. This calendar, of course, was 365 days long. Which means that there was a discrepancy of one day between the calendars every four years.

365 ¼ days per year * 4 years = 1461 days (agricultural calendar)
365 days per year * 4 years = 1460 days (civil calendar)

Which means that New Year's day in the civil calendar "advanced" in respect to the agricultural calendar. Civil New Year happened earlier and earlier in the Agricultural calendar until the two calendars were in synch again, 1460 agricultural (natural) years later, which was 1461 civil years.

365 ¼ days per agricultural year * 1460 agricultural years = 533,265 days

8 The season names I give are different than what Hoch presents. I like mine, he likes his. Mine are more descriptive of the original meanings of the words.

9 Due to precession it no longer would serve as a harbinger of the flood, even if the Nile floods were not now controlled by the dams upriver.

365 days per civil year * 1461 civil years = 533,265 days

Why did they do this?

Well, remember two things:

- that the Egyptians were a very practical people (see Appendix 1) and
- a calendar does NOT have to reflect the length of the year.

That last part surprises some people. All a calendar has to do is provide a way of uniquely identifying days, of telling one day from another. It need not say anything about the length of the natural year. In fact the Moon based Jewish calendar is like that. Well, it makes a stab every few years at catching up to the natural year but some Jewish years are not nearly as long as others. The Islamic calendar is completely Moon based and its year is considerably shorter than the natural year. The only reason the Gregorian Calendar is in general use around the world has nothing to do with its accuracy and everything to do with the economic and military power of the countries which use it regularly.

So the Egyptian civil calendar, with its utter regularity, 12 months of 30 days each, is eminently suitable for accounting purposes. When is the rent due and how much? How much yield can we expect next month and let's compare that with this month. We, with our wonderful calendar (read: snide comment here in "wonderful") have to make adjustments if we want to compare one quarter's income with another quarter in the same year! Oh, and every four years (almost) we get an extra day's sales and income (and expenses) to adjust for. No adjustments required in the Egyptian system. In addition, the civil calendar was not tied to the heliacal rising of Sirius which happened at different dates depending upon the observer's latitude, local weather, state of mind, sobriety, etc. None of that. Every New Year's Day happened exactly 365 days after the last one, all over the country, natural events be damned.

Here's the important point: *it did not matter that the civil calendar was not quite the same overall length as the natural year. It was an eminently practical system so they used it*.

Were there complaints? Yeah. But they didn't revolve around the length of the year. Rather, the complaints concerned the names of the seasons. You see, the civil calendar inherited the names of the seasons from the natural calendar. But as you can see now, things would eventually get out of whack. What the civil calendar might call, for example, the season of "emergence" might be happening in some years when most of the country was actually under water! A number of ancient Egyptians pointed out that this was pretty stupid but nothing was ever done about it. Anyway, all you had to do was wait a while and everything would come back to synchronization - every 1460 years! In the meantime, it brought a smile to some people's lips. And what's wrong with that?

As Hoch says, the year numbering system started over again with each new king[10]. The king might

10 One of the problems associated with this is that some kings ruled jointly. A father might appoint his son to be joint (although probably - junior) king, just to reward him or to prevent a contention for the throne. The youngster would then date his reign from that moment rather than the one where he became sole king. Such joint monarchies are difficult to detect since they don't seem to have been specifically identified as such.
Perhaps the most egregious case happened when Djehutymes III became king upon the death of his father. As a minor he needed a regent, that turned out to be his aunt, Hatshepsut, who eventually became (joint) king in her own right - the Egyptian political concept did not countenance the position of "regnant queen". She died twenty two years later, in year

decide to call the previous New Year's Day as the start of his reign, or he might opt for the actual date of accession (in the civil calendar, of course). It is possible that a special version of the civil calendar existed for this latter purpose. For example, the United States dates its independence from 1776 July 4. I'm not sure whether 2013 January 1 occurred in the 237th or 236th year of the United States. Whereas there would be no dispute that days on or after July 4 will be in the 237th year. That's the kind of thing that an amended civil calendar might deal with in ancient Egypt.

So that's three calendars! What's the fourth one? A lunar calendar which was used to set the dates of certain festivals. I'm not sure that anyone knows how that worked.

Back to our Gregorian Calendar for a final, parting shot. I've heard some people mutter nonsense about the Mayans inventing a calendar more accurate than western civilization could produce. More **baloney**. The mathematicians and astronomers of late 16th century Europe were very capable of producing a calendar which would stay in step with the natural year better than the Gregorian Calendar does (and better than the Mayans could and with greater understanding). In fact, they presented Pope Gregory with an example or two. He rejected them. Why? Because the purpose of the Gregorian Calendar is **NOT** to keep in step with the natural year. It's purpose is to provide the easiest possible method of calculating the date of Easter while maintaining the framework of the old Julian Calendar and keeping Easter as a spring-time festival in the natural year. And, oh, by the way, a fictitious Full Moon helps determine the actual date, that fake Full Moon (uhh, Paschal Full Moon, it's called by religious folk) being somewhat separate from the actual calendar (and from reality). And now you know some of the rest of the story.

When referring to calendar dates prior to 1582 October 15[11] historians almost always use the old Julian Calendar[12]. In four hundred years, the Julian calendar has 146,100 days while the Gregorian Calendar has only 146,097 days. The Gregorian Calendar is closer to the length of the natural year than the Julian which was invented long before Easter was and so had nothing to with it. In its own way, the Julian was OK as far regularity goes, a leap day every fourth year[13]. But the Gregorian Calendar says, no leap years in years evenly divisible by 400. So while 2000 was a leap year in our calendar, 1900, 1800, and 1700 were not. The previous Gregorian century leap year was 1600. Likewise 2100, 2200,

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22 of Djehutymes' reign.

11 The previous day was October 4.

12 But don't think they always use the Gregorian Calendar after that date. Because a pope had promulgated the change no Protestant country adopted the calendar, and some Catholic countries were slow to do so. England came on board only in 1752 by which time the difference was 11 days. September 2 was followed by September 14. Rent calculations went screwy and some people thought the government had shortened their lives by 11 days. Rioting ensued. For Americans, that's why George Washington has two birthdays: O.S. (Old Style = Julian) and N.S. (New Style = Gregorian). You have to know which is which if you want to celebrate his birthday.
Russia stayed on the Julian Calendar for much longer which is why, in 1917, the October Revolution happened in November. Oh, well. They changed over in 1918.
Greece held out until 1923.
Some Orthodox Churches are still on the Julian Calendar, which is why their Christmas, right now, happens on January 7. That same day is December 25th of the previous year for them.
I'm not telling you anywhere close to the whole story here. It would literally take a book. It has, actually.
Aren't Calendars fun?

13 The Romans actually screwed this up at first. The rule was: always insert an extra day every four years but the Romans always counted inclusively. It's like saying that 3 days + 3 days = 5 days because there are three days there, 3,4, and 5. Get it? Good. So they misinterpreted the rule and began to throw in a leap day every third year. But they quickly discovered their error and made the proper adjustments. We think.

and 2300 will not be leap years in our system. 2400 will be. They all were and will be in the Julian Calendar.

The two calendars were in synch in the 3rd century of the current era. They aren't now. As I write this the date is:
2013 Apr 25 Gregorian,
2013 Apr 12 Julian.

That 13 day discrepancy will increase to 14 days on 2100 March 1 (Gregorian). And so on.

This has ramifications for ancient Egypt. A historian who translates into Julian dates for ancient Egypt is using a calendar which was ahead (not behind in those days) of the Gregorian Calendar which is close to the natural year in length. How far is the Julian Calendar ahead? It depends on what year you're talking about. You do the math.