

Pim de Klerk

Peatland prose from the past:
the Sudd in the south

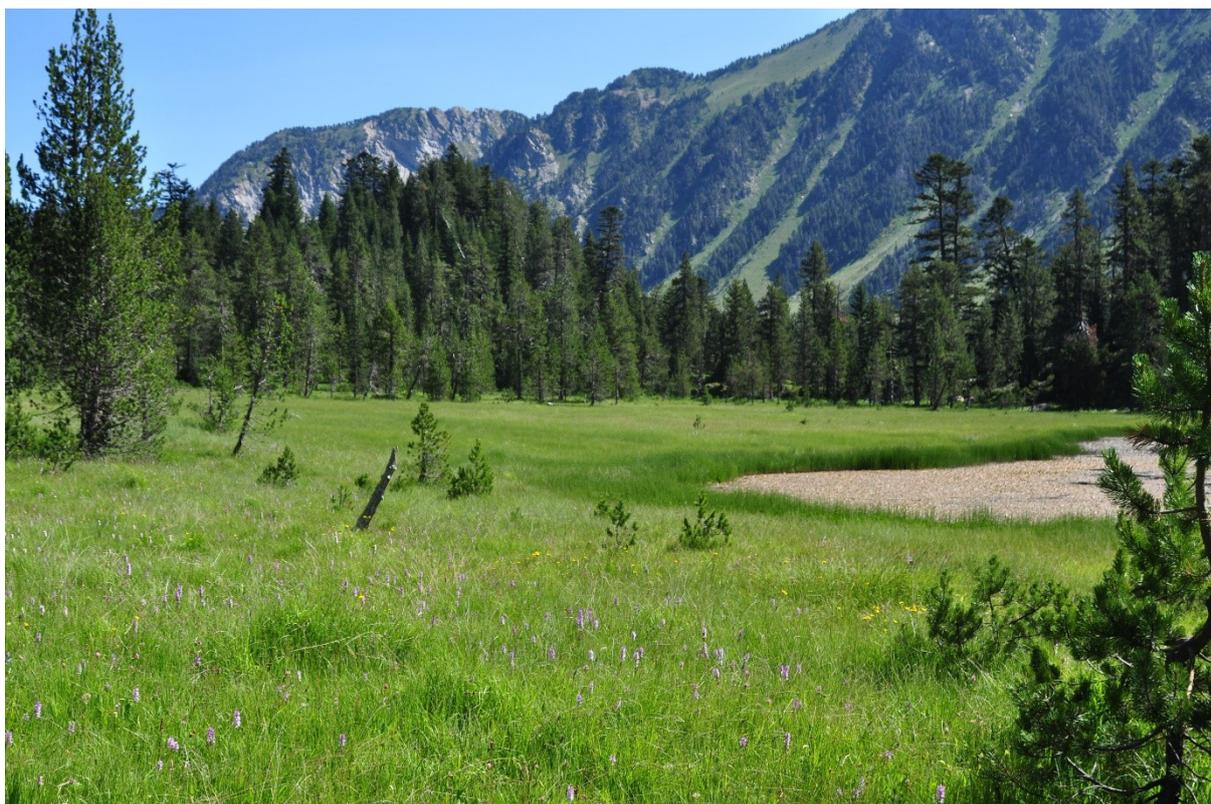
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„Inde, ut quidam aiebant, peruenimus ad immensas paludes, quarum exitum nec incolae nouerant nec sperare quisquam potest: ita implicatae aquis herbae sunt et aquae nec pediti eluctabiles nec nauigio, quod nisi paruum et unius capax limosa et obsita palus non fert.”

Correction:

The assessment on p. 9 that caves do not occur in NE Africa is wrong. Although karst processes do not occur anymore in present-dry hyperarid regions, palaeokarst landforms are abundant in African limestone regions.



Bassa Nera peatland in the Spanish Pyrenees Mountains. Photo: Hans Joosten.

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Papers

Peatland prose from the past: the Sudd in the south

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Introduction

The Nile River is the longest river in the world, and according to Seneca the Younger the most famous ('Natural questions' IV:2). One branch originates in the Rwandan mountains and flows through Lake Victoria northward (the White Nile), whereas another branch comes from Lake Tana in the Ethiopian Mountains (Blue Nile). Both branches meet at the present-day city of Khartoum (Republic of the Sudan).

The White Nile passes the Sudd region (South Sudan), a large inland delta and one of the most important wetlands of Africa and the world (Mohammed 2005; Rebelo & Moghraby 2018). The Sudd contains opulent vegetation that grows mainly in floating mats and floating islands. These developed in a landscape with channels, lagoons and inundated areas that are constantly interacting and changing in time and space (Petersen et al. 2007; Rebelo & Moghraby 2018). This makes the area hardly accessible (Petersen et al. 2007) and the name Sudd actually derives from the Arabic word for obstruction (Rebelo & Moghraby 2018).

The Nile River triggered fascination and curiosity already in Antiquity, and automatically the question arises how far upstream the knowledge of ancient cultures reached, and if they were aware of the Sudd.

The Nile floods

There were mainly two reasons for the interest in the Nile. The first was the annual inundation in summer when the river deposited a layer of fertile silt that was crucial for ancient Egyptian agriculture. The Greek historian Herodotus (c. 484-425 BCE) described this silt as: "...reclaimed land by the Egyptians as gift from the river" ("*... ἐστὶ Αἰγυπτίοισι ἐπίκτητός τε γῆ καὶ δῶρον τοῦ ποταμοῦ*") ('Histories' II:5).

Especially the fact that the Nile transported the highest amount of water in summer instead of spring - when European rivers had an increased discharge because of snowmelt - triggered curiosity. Many authors provided various explanations that were summarised by e.g. Herodotus ('Histories' II:20-27), Pomponius Mela ('Description of the world' I:53), Seneca the Younger ('Natural questions' IV:1-30), Lucan ('On the civil war' X:194-267), Pliny the Elder ('Natural history' V:10) and John Lydus ('The months' IV:107). The Egyptian view was rather simple: it was all the work of the gods. This was still propagated in the text of the 'Famine stela' that was written in Ptolemaic times (305-30 BCE) but tells a story placed around the 27th century BCE. Egyptian science – that was mixed greatly with religion and magic - had reached a rather high level in ancient Egypt: architecture, hydrological engineering, anatomy and medicine, metallurgy and mineralogy, astronomy, and various other disciplines flourished greatly (Ead 2014; Warburton 2016). Egyptians, however, were seemingly not interested in the functioning of the natural landscape, even in the last centuries BCE when Greek natural science had already developed. Herodotus wrote in his 'Histories' (II:19/28) with an apparent undertone of wondering that he could not find anybody in Egypt who could explain the causes of the annual summer inundation, apart from one official of whom Herodotus suspected that he made fun of him. The 3rd century BCE work 'The flooding of the Nile' - that is not unambiguously attributed to the Greek philosopher Aristotle (384–322 BCE) - provided the correct answer: heavy summer rainfall in Ethiopia caused the (Blue) Nile to transport excessive amounts of water. Aristotle's grandnephew Callisthenes (c. 360-327 BCE) had accompanied Alexander the Great during his expeditions in Egypt and Asia and may have participated in an expedition along the Nile into Ethiopia. His work has not been preserved apart of some quotes by other authors: the 6th century CE Byzantine author John Lydus stated that Callisthenes had visited Ethiopia and had written - similar to Aristotle - about excessive rain that made the Nile swell ('The months' IV:107). Lucan (39-65 CE), however, wrote that this alleged Nile/Ethiopia expedition had been terminated because of the great heat ('On the civil war' X:268-285) and, thus, had not reached Ethiopia. The discussions of Pomponius Mela (died c. 45 CE) in the 'Description of the world', Seneca the Younger (c. 4 BCE-65 CE) in the 'Natural questions', Lucan in 'On the civil war', and Plutarch (c. 46-120 CE) in 'On the Opinions of the Philosophers' show that the thoughts of Aristotle and Callisthenes had already sunk considerably into oblivion in the first century CE. Their theories were, however, mentioned among various other theories by Pliny the Elder

(23-79 CE) ('Natural history' V:10) and John Lydus ('The months' IV:107) and, thus, were not completely forgotten.

The sources of the Nile

Also the unknown sources of the River Nile triggered curiosity and speculation in Antiquity. Various ancient authors wrote that the Nile sprung in western Africa. They named Mauritania or the Atlas Mountains as its origin (Pliny the Elder, 'Natural history' V:10; Vitruvius, 'On architecture' VIII:2:6/7; Strabo, 'Geography' XVII:3:4 quoting other unspecified authors with whom he obviously disagreed personally; Cassius Dio, 'Roman history' 76:13; Ammianus Marcellinus, 'History of Rome' XXII): they thought that major west African rivers such as the Congo or the Niger - that they probably knew of from predominantly oral reports - were upstream reaches of the Nile. They claimed that in the west African stream(s) and in the Nile the same plants and animals occurred and that, thus, these rivers had to be connected. There were theories that the Nile run underground for a long trajectory from west to east that connected the different branches (Pliny the Elder, 'Natural history' V:10). Other authors placed the sources in the south, at a subterranean sea, or just left the question unanswered. Diodorus Siculus ('Historical library' I:32) - like Aristotle (see above and below) - placed the sources of the Nile in the Ethiopian Mountains, i.e. the actual source area of the Blue Nile.

The search for the sources of the Nile and the Sudd

Herodotus wrote in the 4th century BCE about the sources of the Nile: *"I heard from some men of Cyrene, who told me that they had gone to the oracle of Ammon [the region of present-day Amman in Jordan] and had spoken with Etearchus, the king of the Ammonites. Deriving from other subjects the conversation turned to the Nile and that no-one knew its sources. Etearchus told them that once he had been visited by some Nasamonians. These are a Libyan people that inhabit the land of the Syrtis and the region slightly east of the Syrtis [i.e. the present-day Libyan coast]. When these Nasamonians were asked if they brought any news concerning the uninhabited Libyan desert, they told Etearchus that when some sons of their leaders - proud and violent youths - came to adulthood, they planned various wild adventures and had chosen five of them by lot to visit the deserts of Libya and to see if they could progress further than those who previously had transgressed the farthest. [...] When the young men left their companions, well supplied with water and food, they journeyed first through the inhabited country and came to the region of wild beasts. They travelled over the desert, towards the west, and crossed a wide sandy region, until after many days they saw trees growing in a plain. When they came to these and picked their fruits, they were met by small men of less than common stature, who captured them and led them away. The Nasamonians did not know the language of these men, who in turn did not know the language of the Nasamonians. The men led them through vast marshes, after which they came to a city where all the people were of a stature like that of the guides, and had a black skin. A great river ran past this city, from the west towards the rising sun, in which they saw crocodiles."* ("ἀλλὰ τάδε μὲν ἤκουσα ἀνδρῶν Κυρηναίων φαρμένων ἐλθεῖν τε ἐπὶ τὸ Ἄμμωνος χρηστήριον καὶ ἀπικέσθαι ἐς λόγους Ἐτεάρχῳ τῷ Ἀμμωνίων βασιλεῖ, καὶ κως ἐκ λόγων ἄλλων ἀπικέσθαι ἐς λέσχην περὶ τοῦ Νείλου, ὡς οὐδεὶς αὐτοῦ οἶδε τὰς πηγὰς, καὶ τὸν Ἐτεάρχον φάναι ἐλθεῖν κοτε παρ' αὐτὸν Νασαμῶνας ἀνδρας. τὸ δὲ ἔθνος τοῦτο ἐστὶ μὲν Λιβυκόν, νέμεται δὲ τὴν Σύρτιν τε καὶ τὴν πρὸς ἠῶ χώρην τῆς Σύρτιος οὐκ ἐπὶ πολλόν. ἀπικομένους δὲ τοὺς Νασαμῶνας καὶ εἰρωτωμένους εἴ τι ἔχουσι πλέον λέγειν περὶ τῶν ἐρήμων τῆς Λιβύης, φάναι παρὰ σφίσι γενέσθαι ἀνδρῶν δυναστέων παῖδας ὑβριστάς, τοὺς ἄλλα τε μηχανᾶσθαι ἀνδρωθέντας περισσὰ καὶ δὴ καὶ ἀποκληρῶσαι πέντε ἐωυτῶν ὀψομένους τὰ ἔρημα τῆς Λιβύης, καὶ εἴ τι πλέον ἴδοιεν τῶν τὰ μακρότατα ἰδομένων. [...] εἶπαι ὧν τοὺς νεηνίας ἀποπεμπομένους ὑπὸ τῶν ἠλίκων, ὕδασι τε καὶ σιτίοισι εὖ ἐξηρτυμένους, ἰέναι τὰ πρῶτα μὲν διὰ τῆς οἰκεομένης, ταύτην δὲ διεξελθόντας ἐς τὴν θηριώδεα ἀπικέσθαι, ἐκ δὲ ταύτης τὴν ἔρημον διεξιέναι, τὴν ὁδὸν ποιευμένους πρὸς ζέφυρον ἄνεμον, διεξελθόντας δὲ χῶρον πολλὸν ψαμμώδεα καὶ ἐν πολλῆσι ἡμέρησι ἰδεῖν δὴ κοτε δένδρεα ἐν πεδίῳ πεφυκότα, καὶ σφεας προσελθόντας ἀπτεσθαι τοῦ ἐπεόντος ἐπὶ τῶν δενδρέων καρποῦ, ἀπτομένοισι δὲ σφι ἐπελεθεῖν ἀνδρας μικροὺς, μετρίων ἐλάσσονας ἀνδρῶν, λαβόντας δὲ ἄγειν σφέας· φωνῆς δὲ οὔτε τι τῆς ἐκείνων τοὺς Νασαμῶνας γινώσκειν οὔτε τοὺς ἄγοντας τῶν Νασαμῶνων ἄγειν τε δὴ αὐτοὺς δι' ἐλέων μεγίστων, καὶ διεξελθόντας ταῦτα ἀπικέσθαι ἐς πόλιν ἐν τῇ πάντας εἶναι τοῖσι ἄγουσι τὸ μέγαθος ἴσους, χρῶμα δὲ μέλανας. παρὰ δὲ τὴν πόλιν ῥέειν ποταμὸν μέγαν, ῥέειν δὲ ἀπὸ ἐσπέρης αὐτὸν πρὸς ἥλιον ἀνατέλλοντα, φαίνεσθαι δὲ ἐν αὐτῷ κροκοδείλους"). ('Histories' II:32).

This kind of hear-say story rises suspicion about its accuracy. The only reach where the Nile actually flows from the west to the east, however, is immediately north of the Sudd. Thus, the tale could very well refer to this wetland.

Diodorus Siculus mentioned in the first century BCE immense marshes and gigantic lakes upstream along the Nile ('Library of history' I:32) which will have been the Sudd, although the lakes may have been the Lakes Victoria and Albert, or the shallow Lake Kyoga that has numerous marshy settings that may have been included in oral reports from the southern regions.

Aristotle – around a century after Herodotus – wrote about marshes through which the Nile streamed after it left the mountains. Although his report dealt actually with the Blue Nile that comes from the Ethiopian mountains and does not cross the Sudd, he may have heard about vast marshes along the river that he wrote about without knowing that there were actually two different branches. In another work – within the context of migratory birds - Aristotle referred to: "...marshes above [i.e. upstream of] Egypt from where the Nile flows. Here it is said that they [i.e. the birds] attack pygmies. That is not entirely a fairy tale, since in reality small people live here, so they say, and their horses are small too, and they live their lives dwelling in holes." ("... εἰς τὰ ἔλη τὰ ἄνω τῆς Αἰγύπτου, ὅθεν ὁ Νεῖλος ρεῖ. οὗ καὶ λέγονται τοῖς Πυγμαίοις ἐπιχειρεῖν. οὐ γὰρ ἐστὶ τοῦτο μῦθος, ἀλλ' ἐστὶ κατὰ τὴν ἀλήθειαν γένος μικρὸν μὲν, ὥσπερ λέγεται, καὶ αὐτοὶ καὶ οἱ ἵπποι, τρογλοδύται δ' εἰσὶ τὸν βίον.") ('History of animals' VIII:12).

The Greek word "Πυγμαῖος" (pygmaios) relates to "πυγμή" (pygme) which, among others, is a length measure "from the elbow to the knuckles" (Liddell & Scott 1961). "Τρωγλοδύται" (troglodytai) literary means "cave-dwellers", but in many modern translations of ancient texts the designation "troglodytes" is retained. The word was in ancient times used for actual cave-dwellers north of the Caucasus and other regions, but caves did (and do) not occur in the northeastern African regions. According to Hornblower & Spawforth (2003) the name of the people in the northeast African realm was actually "Τρωγοδύται" (trogodytai), i.e. without λ and was in that form without any reference to caves. This form was also used in various ancient Greek/Roman sources and on Egyptian papyri, and was later read as or falsely "corrected" to "Τρωγλοδύται". Possibly the designation "trogodytai" was to northeastern African people along the Red Sea coast in general without denoting a specific ethnic group, but the etymology of the word is unknown. Liddell & Scott (1961) translated "Τρωγλοδύται" with "cave-dwellers" in general, i.e. geographically unspecific, and noted that "Τρωγλοδύται" were a people in northeastern Africa (for which they remarked that also the designation "Τρωγλοδύται" was used). Ziegler et al. (1975) included the entry "Trog(l)odytai" and, thus, implied that both words were synonyms. The mix-up already occurred in Antiquity by authors quoting others, and by the copyists of the ancient texts. For example, word forms with "Τρωγλο-" are included in the consulted original text editions of Herodotus ('Histories' IV:183), Aristotle ('History of animals' VIII:12), Strabo (who thought that the people west of the Red Sea were Arabs) ('Geography' I:1,3; I:2,34; II:5,33/36), and Josephus ('Antiquities of the Jews' I:15, II:11). Strabo added that the name "Erembi" of a group of Arabian people originally derived from "ἐραν ἐμβαίνειν" (eran embaínein; meaning "going into the ground") and was - according to Strabo - later replaced by the more sophisticated "Τρωγλοδύται" ('Geography' I:2,34). In the consulted original text editions of Pliny the Elder derived Latin forms with "trogo-" are used, but the Loeb edition provides an English translation with cave-dwellers anyway, whereas the Delphi and the Marix editions used anglicised/germanised terms with "troglo-" in the translations ('Natural history' VI:34; XII:35; XIII:52; XXXVII:32). Law (1967) addressed the designation "trogo-" in the work of Pliny and interpreted these as "troglodytes" and "cave-dwellers" too. Diodorus Siculus ('Historical library' III:31/32) also wrote about "trogodytai" which was retained in the consulted English translation in which a footnote was added that this spelling is remarkable. Trogodytai, thus, probably were a specific or unspecific population group that did not dwell in caves, although many people thought they did. Diodorus Siculus wrote that the Trogodytai were a nomadic people who during the hot season sheltered in marshes, possibly the Sudd ('Historical library' III:32).

A more specific report on the Nile marshes comes from Seneca the Younger. He told that before the Nile River had reached Philae in southern Egypt, it had already passed large deserts and had spread widely in marshes ('Natural questions' IV:2,3). In Book VI Seneca quotes some members of an expedition sent-out by Emperor Nero to seek the sources of the Nile: "I have heard of the long journey of those two centurions who were sent to investigate the sources of the Nile by Emperor Nero, who among other virtues primarily loved the truth [i.e. the actual specifics of the world]. They were helped by the king of Ethiopia, who had written recommendations for

the neighbouring kings, and thus they penetrated into the farthest regions. "There", they told, "we came to immense marshes of which the local population could not point-out a way through, nor could anybody hope to find someone who could. The waters are entangled with plants and cannot be penetrated by foot or by boat, because the muddy and completely overgrown marsh does not carry anything apart for a small one-person vessel. There", they told, "we saw two rocks from which with huge force the river arises". ("Ego quidem centuriones duos, quos Nero Caesar, ut aliarum uirtutum ita ueritatis in primis amantissimus, ad inuestigandum caput Nili miserat, audiui narrantes longum illos iter peregrisse, cum a rege Aethiopiae instructi auxilio commendatique proximis regibus penetrassent ad ulteriorem. Inde, ut quidam aiebant, peruenimus ad immensas paludes, quarum exitum nec incolae nouerant nec sperare quisquam potest: ita implicatae aquis herbae sunt et aquae nec pediti eluctabiles nec nauigio, quod nisi paruum et unius capax limosa et obsita palus non fert. Ibi, inquit, uidimus duas petras, ex quibus ingens uis fluminis excidebat"). ('Natural questions' VI:8,2-4).

The depiction of these huge marshes greatly resembles the present-day situation of the Sudd, and it seems unambiguous that the expedition had actually reached this area. The account seems reliable: Seneca had heard it directly from members of the expedition and not along a sequence of hearsays. Yet, the concluding sentence is odd, since a setting with rocks and a cascade does not occur in the Sudd region. According to a note in the consulted German translation these rocks were those located between Elephantine and Aswan, i.e. in the southern Egyptian realm. Thus, it is likely that Seneca did not quote the centurions completely accurately after all. Noteworthy is that Seneca's nephew and ward Lucan did not mention marshes at all in his description of the course of the River Nile ('On the civil war' X:285-331).

Pliny the Elder gave another account of the expedition ordered by Nero: "*Certainly the praetorian soldiers and their tribune who were recently sent-out by Emperor Nero on an exploration mission, because - among other wars - he also thought about one against Ethiopia, reported only of deserts.*" ("*certe solitudines nuper renuntiauerunt principi Neroni missi ab eo milites praetoriani cum tribuno ad explorandum, inter reliqua bella et Aethiopicum cogitanti*"). ('Natural history' VI:35).

With this quote Pliny contradicted Seneca directly, not only on the purpose of the expedition but also on its results. The first inconsistency can be easily explained. Seneca lived and wrote during the emperorship of Nero and needed to be friendly and flattering (although in the end he was condemned to death anyway). Pliny wrote his 'Natural history' during the later reign of Emperor Vespasian and could write more freely about Nero. The second inconsistency has a less apparent origin: it must derive from an erroneous transmission of information. Indeed, although Pliny claimed that the expedition had only found deserts, he referred several sentences later to marshes anyway. Unfortunately, he did not specify his sources, but Aristotle (as quoted above) may have been one of these, as Pliny in fact wrote: "*There are some who report a pygmy people living among the marshes from which the River Nile rises.*" ("*quidam et pygmaeorum gentem prodiderunt inter paludes ex quibus Nilus oriretur*") ('Natural history' VI:35).

Conclusions

The Sudd was certainly known - or at least known of - by scientists from ancient Greek and Roman cultures, yet their knowledge on the area was restricted. First of all, it was known that vast marshes related to the River Nile existed far south of Egypt. However, there are no reports that anybody from the ancient Mediterranean cultures had actually seen these, except the members of the expedition sent by Nero. The other information available to authors from Antiquity must have come from African sources that will have reached the Mediterranean realm along (a sequence of) oral reports, e.g. the Nasamones mentioned by Herodotus.

Furthermore, a short-statured people was reported to live in the regions of the Sudd - but contrary to persistent views probably not in caves - which is currently not the case (Gowdy & Lang undated). The possibility thus exists that the actual oral sources were not fully reliable.

Finally, the description of Seneca suggests that the landscape of the Sudd has not changed considerably over the last two millennia.

I am grateful to Immanuel Musäus for his help with the translations and for advice.

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Peat extraction in Gishoma, Rwanda. Photo: Hans Joosten.

Peatland news

Global

Peatlands, a growing net source of greenhouse gasses since 1960

Ever since the last ice age, natural peatlands have been important carbon sinks, and intact peatlands still are today. However, drainage of peatlands for agriculture and forestry has transformed large areas from former sinks into net sources of greenhouse gasses. Especially in temperate and boreal regions, but increasingly also in the tropics. On a global scale, peatlands turned from a net sink into a net source of greenhouse gasses in 1960. Rehabilitation of these peatlands may greatly reduce additional emissions in the future.

The distinction between boreal and temperate peatlands, and peatlands in tropical regions is important. Where the first group of peatlands experienced widespread land conversions by the nineteenth century, drainage onset in the tropics commenced only from 1960. Between 1850 and 2015, temperate and boreal regions lost 26.7 million ha, and tropical regions 24.7 million ha, of natural peatland. By 2100, the loss of natural peatlands in