

Eye diseases in the Ebers Papyrus

Part 1: Eb 336–357

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1 Introduction

The Ebers Papyrus is the longest known medical papyrus and one of the most important documents in medical history. According to the Egyptian dealer, it was found around 1861 “between the legs of a mummy” in the necropolis of el-Assasif in West Thebes. In early 1873, Georg Ebers purchased the papyrus from a consular agent of the German Empire. The University of Leipzig was involved in the purchase, and the papyrus ended up in their library.

The well-preserved papyrus is inscribed parallel to the fibers in hieratic script with the reading direction from right to left. The headings and the pharmaceutical doses are written in red, and the rest of the text is written in black. The roll was originally 18.6 m long and 30 cm high. On 46 papyrus sheets glued together, there were a total of 108 columns, numbered from 1 to 110 (numbers 28 and 29 are missing for unknown reasons²). The scroll was cut into 29 panels and glazed in Leipzig. During the Second World War, three of the panels were lost and two others were severely damaged. However, since Ebers published a facsimile in 1875, the entire text has survived.

The Ebers Papyrus was dated on the basis of paleography and ¹⁴C dating to the period of the 17th to early 18th dynasties, which corresponds to the 16th century BC. It is a medical composite manuscript that contains 877 individual texts (teaching texts, prescriptions for remedies, and magic spells) that are probably copies of older texts. They refer to diseases of the intestines, eyes, skin, heart, vessels, lungs, teeth, parasitic infections, gynecological diseases, obstetric problems, contraception, surgery, and injuries. Beneath some columns

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² These columns were not cut out because there is no glue line between columns 27 and 30.

are notes from an ancient Egyptian user, such as nfr (“Good!”).³

The present work deals with the “Eye Book”, the ophthalmological part of the Ebers Papyrus with 96 prescriptions (Eb 336–431). The aim of the work was to translate the ancient Egyptian descriptions of eye diseases from the papyrus and to interpret them from a modern ophthalmological perspective. The hieroglyphic transliteration by B. Lalanne and G. Métra (2017) of the hieratic original text was used as the text base. In addition to my own translation, the translations of these two authors as well as those of B. Ebell (1924, 1938), A. Erman and H. Grapow (1897–1961), R. Hannig (2006), L. Popko (online) and W. Westendorf (1999) are occasionally given in footnotes.⁴

As will be shown in the following chapters, most disease descriptions are short and vague and therefore cannot be associated with a definitive diagnosis. At best, one can narrow down possible diagnoses and argue to support them. I preferred common diagnoses to rare ones. I also took into account the environment and living conditions in ancient Egypt. Some prescriptions provide treatment instructions for non-specific symptoms common to various eye diseases, such as inflammation, blurred vision, or blindness. All statements should be considered hypotheses.

2 Eye diseases (Eb 336–357)

The following chapter headings are based on the numbers of the prescriptions. The numbers of the papyrus sheets and lines are given in brackets. However, only the heading describing the eye disease is quoted and translated. The hieroglyphs are numbered


³ All information about the papyrus comes from L. Popko (online), metadata, <<https://sae.saw-leipzig.de/de/documents/papyrus-ebers>>, with literature overview (last accessed November 08, 2023).

⁴ Dictionaries and translations used:

- A. Erman and H. Grapow, *Wörterbuch der ägyptischen Sprache*, Vols I–VII, (Berlin, 1897–1961; unchanged reprint; Berlin, 1971), hereinafter referred to as “Wb” for short;
- R. Hannig, *Die Sprache der Pharaonen: Großes Handwörterbuch Ägyptisch – Deutsch, Marburger Edition* (KAW 64; 4th revised edn; Mainz, 2006), hereinafter referred to as “Hannig” for short.
- B. Ebell, *Alt-ägyptische Bezeichnungen für Krankheiten und Symptome* (Oslo, 1938), hereinafter referred to as “Ebell” for short.
- B. Ebell, „Die ägyptischen Krankheitsnamen“, *ZÄS* 59 (1924), 55–59, hereinafter referred to as “Ebell, ZÄS” for short.
- B. Lalanne and G. Métra, *Le texte médical du Papyrus Ebers: Transcription hiéroglyphique, translittération, traduction, glossaire et index* (Langues et cultures anciennes 28; Brussels, 2017), hereinafter referred to as “Lalanne and Métra” for short;
- L. Popko, „Papyrus Ebers: Übersetzung und Kommentar“, in *Science in Ancient Egypt* (Leipzig, online) <<https://sae.saw-leipzig.de/de/dokumente/papyrus-ebers>> (last accessed November 08, 2023), hereinafter referred to as “Popko (online)” for short.
- W. Westendorf, “Handbuch der Altägyptischen Medizin“, Vols 1 and 2, in H. Altenmüller et al. (eds), *Handbuch der Orientalistik, Erste Abteilung: Der Nahe und Mittlere Osten* (Boston, Cologne and Leiden, 1999), hereinafter referred to as “Westendorf” for short.

according to A. Gardiner's system.⁵ The article does not contain images of eye diseases, as such images may cause unpleasant feelings in the reader. Instead, I refer interested readers to specific images in the online "Atlas of Ophthalmology" (AoO; <https://www.atlasophthalmology.net>).⁶

Eb 336 (55,20–56,6)

Text:	
Transcription:	jrr.t r r(w)d.t n(.j).t whd.w m snf m jr.t
Translation:	Something that can be done against the growth of papules along with blood in the eye

The verbal noun r(w)d̄t in the spelling above means "growth, flourishing",⁷ which in my opinion here means numerical growth and spreading. The word wh̄d.w, which is derived from the verb wh̄d for "to suffer, endure (pain)",⁸ is more difficult to translate. Since this medical phenomenon, which can occur in many parts of the body,⁹ is always referred to in the plural, it must, in the broadest sense, be composed of several or many "parts". wh̄d.w have traditionally been interpreted as circulating "pain substances", "pain demons", "disease triggers" or "impure substances",¹⁰ as similar ideas have been passed down from other ancient peoples.¹¹ In contrast, I am thinking of rashes (efflorescences, a collective term for spots, papules, vesicles and pustules), which are actually the visible result of

⁵ A. Gardiner, *Egyptian Grammar: Being an Introduction to the Study of Hieroglyphs* (Oxford, 1978), 544–548.

⁶ Such references consist of the abbreviation "AoO" and an image number. To access an image on <<https://www.atlasophthalmology.net>>, select "Search" from the green menu bar, enter the image number in the search field ("Search phrase"). and click the "Search" button.

⁷ Hannig, 493 (17720). Translations by other authors: exacerbation (Lalanne and Métra, 115); growth (Popko [online], Eb 336; Westendorf, 609).

⁸ Hannig, 229 (8256, 8257); Wb I, 356.1–2. Severe itching is just as difficult to tolerate as pain.


⁹ Ebbell, 16.

¹⁰ Hannig, 229 (8261); Westendorf, 609; Popko [online], Eb 336; H. Fischer-Elfert [personal communication]]. Translations by other authors: pain or inflammation (Wb I, 356.9); suppurative foci (Ebbell, 16–18); or the word remained untranslated (Lalanne and Métra, 115).

¹¹ The Egyptian theory of disease included four disease-causing principles: 'ꜣ' (substances introduced by demons, which in turn stimulate the production of wh̄d.w), st.t (substances introduced by vermin), wh̄d.w (commonly interpreted as "pain substances"), and "blood". This teaching is similar to Hippocrates' teaching of the four humors, i.e. blood, yellow bile, black bile, and phlegm (white or colorless secretions), the imbalance of which is the cause of disease. It was also adopted by the Romans and the Islamic scholars of the Middle Ages. K. Sudhoff, *Essays in the History of Medicine* (New York City, 1926), 67, 87, 104; U. Verhoeven, book review of T. Bardinnet, *Les papyrus médicaux de l'Égypte pharaonique* (Paris, 1995), *BiOr* 55 (1998), 736.

circulating substances.¹² In the eye, papules are numerous small, glassy bumps on the inside of the eyelids. They are the main symptom of certain eye infections. Histologically, they are lymph follicles, i.e. small clusters of inflammatory cells, which are accompanied by swelling and redness (AoO 4908). The phrase *m snf m jr.t* (“along with blood in the eye”)¹³ probably refers to an intense inflammatory redness of the conjunctiva of the eyelid, giving the impression that blood is collecting underneath (AoO 4194).¹⁴ In line 56.1, there is an instruction to “treat its [the eye’s] water” (*srwḥ mw=s*). This probably means increased tear flow (epiphora). Both redness and epiphora¹⁵ are always an accompanying symptom of any inflammatory condition of the eye. Therefore, the eye disease in Eb 336 is most likely a so-called follicular conjunctivitis, which is typical for stage 2 of trachoma (from the Greek *τράχωμα*, “rough eye”). It is caused by bacteria (*Chlamydia trachomatis*).¹⁶

Eb 337 (56,6–10)

Text:	
Transcription:	<i>k.t jr.t r thn m jr.t</i>
Translation:	Something else that can be done against a <i>thn</i> injury in the eye

The word *k.t* (“something else”)¹⁷ is a recurring phrase that introduces the beginning of a new prescription.

¹² Circulating “substances” that can cause rashes include microorganisms, inflammatory mediators, antibodies and heavy metals. It appears that *wḥd.w* were associated with three general signs of inflammation (pain, swelling, local hyperthermia). This is supported by the fact that the word was used in connection with sedimentation/accumulation (*srdd*), tumor (*ḥnhn.t*), heat (*q̄d*), or blaze (*ḥmw*). Hannig, 8 [258], 229 [8263], 579 [20982], 918 [34014]). This fits well with inflammatory rashes, which may have been summarized under the term *wḥd.w* without further distinction. The frequent expression *wḥd.w m ḥ.t* (e.g. Eb 86, 87, 97, 100, etc.) is not necessarily an illness inside the abdomen.

¹³ The preposition *m* also has a comitative meaning (“with, together with, provided with”). Hannig, 329 (11837); Wb II, 1.13, 1.15. The translations “in the blood”, “through blood” or “(consisting) of blood” are also possible and would have to be understood from the perspective of ancient Egyptian disease theory (see note 11).

¹⁴ However, the Egyptians had a term for “(red) inflammation” (*šsmw.t [dšr]*), which we will find in Eb 408 (62,9–10). Hannig, 905 (33583); Wb IV, 545.12.


¹⁵ The ancient Egyptians may have distinguished between water on the outside and water inside the eyes. Ebbel interpreted the term *ḥ.t n(j).t mw jr.tj* (lit. “accumulation of the water in the eyes”) as cataract (clouding of the lens). Ebbel, 11.

¹⁶ *Chlamydia trachomatis* is spread by the transfer of infectious conjunctival secretions from person to person via contaminated fingers, shared towels, or flies. Trachoma, which leads to blindness if left untreated, remains a serious health problem in rural areas of Africa and the Middle East.

¹⁷ Hannig, 949 (35139); Wb V, 112.12.

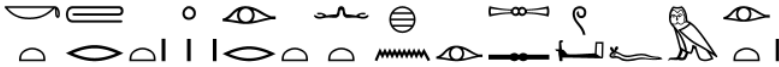
also a common cause of s.ḥd.w.

Eb 348 (57,6–8)

Text:	
Transcription:	k.t n(.j).t dr znf m jr.tj
Translation:	Something else to eliminate blood from both eyes

The most harmless case of blood in both eyes would be a conjunctival hemorrhage. However, this rarely occurs in both eyes at the same time, and people would probably not have sought medical help for it in those days. Instead, as mentioned on page 4, I consider “blood” to be a description of severe inflammatory redness of the conjunctiva (AoO 4194). It can be assumed that the ancient Egyptian physicians were aware of the function of the vessels as transporters of blood and colloquially equated the dilated conjunctival vessels with blood.⁴² Thus, the prescription seems to be an instruction to alleviate a local symptom that occurs in many diseases of the anterior segment of the eye.

Eb 349 (57,8–9)

Text:	
Transcription:	k.t pḥr.t jrr.t n(.j) ṯn t̄(3)z=f m jr.t
Translation:	Another remedy made for a ṯn wound, so that it may “bind together” in the eye


The ṯn injury has already been discussed in the explanation of prescription Eb 337. Opinions differ on the translation of the subordinate clause.⁴³ In my opinion it is an adverb clause (clause of purpose, adverbial subjunctive) with the verb t̄(3)z for “to knot, tie, join, fasten” (also in a broader sense)⁴⁴. The remedy is intended to cause a scratch or puncture wound in the eye to close more quickly.

⁴² Similarly, in the German vernacular, people speak of “water” when they mean swollen legs due to edema.

⁴³ Translations of the subordinate clause by other authors: injury that binds [the tissue] in one eye (Lalanne and Métra, 119); ṯn injury that has settled in the eye (Popko [online], Eb 349); scratch wound when it settles in the eye (Westendorf, 611).


⁴⁴ Hannig, 1034–1035 (38268–38294); Wb V, 397.1, 397.15, 397.21.

Eb 350 (57,10–11)

Text:	
Transcription:	k.t n(.j).t dr nh̓.(w)t m jr.tj
Translation:	Something else to eliminate nh̓.(w)t from both eyes

Some authors have suggested that nh̓.(w)t is the correct or alternative spelling for wh̓.(w)t (the disorder in Eb 346).⁴⁵ Alternatively, nh̓ may mean “to be uneven, rough” or “bumpiness, roughness” (e.g. of stone or metal).⁴⁶ If so, this would be another recommendation for the treatment of trachoma or a rash around the eyes. Another plausible possibility is that nh̓.(w)t is a disease derived from the verb nh̓ for “to be dangerous, terrible, fierce”.⁴⁷ This indicates intense pain. Significantly, the prescription contains labdanum (resin of *Cistus ladanifer*), which in ancient times was believed to have analgesic properties.⁴⁸ The description as “terrible” or “fierce” would fit well with the extreme pain of acute glaucoma (glaucoma attack⁴⁹) or neuralgia (trigeminal neuralgia, cluster headache⁵⁰). However, these are usually unilateral.⁵¹

Eb 351 (57,11–12)

Text:	
Transcription:	k.t n(.j).t š̓.w m jr.tj
Translation:	Something else for š̓.w in both eyes

⁴⁵ Ebbell, 26; Hannig, 223 (8051), 445 (16043); Westendorf, 611 note 92. Other translations for nh̓.(w)t: something rough, not smooth (Lalanne and Métra, 119 and note 48); nh̓.t affliction (Popko [online], Eb 350); an eye disease (Wb II, 290.19).

⁴⁶ Hannig, 445 (16041, 16049); Wb II, 291.2. Nineteenth-century authors translated nh̓.t as “turning around” and suggested that the condition described by nh̓.(w)t m jr.tj was strabismus (H. Joachim, *Papyros Ebers: Das älteste Buch über Heilkunde* [Berlin, 1890], 86; J. Hirschberg, “Geschichte der Augenheilkunde” in J. Hirschberg (ed.), *Handbuch der gesamten Augenheilkunde*, Vol 12, chapter 23 [2nd edn, Berlin, 1898], 15). However, newer dictionaries and vocabularies do not list the word nh̓.t (or nh̓t, nh̓t) with this meaning.

⁴⁷ Hannig, 445 (16036, 16039, 16046); Wb II, 290.5–14.

⁴⁸ P. Dioscurides, *Arzneimittellehre in fünf Büchern* (translated by J. Berendes; Stuttgart, 1902), 1st book, 112–113. Labdanum is not to be confused with laudanum, a liquid opium preparation.


⁴⁹ Acute glaucoma is an acute increase in pressure inside the eyeball due to a blockage of the anterior chamber drainage.

⁵⁰ Cluster headache is an intermittent neuralgia with severe pain in or around the eye, accompanied by redness of the eyeball and tearing.

⁵¹ It cannot be completely ruled out that in some prescriptions, jr.tj (both eyes) is a writing error out of habit.

The eye disease š̄.w, also š̄r.w,⁵² has traditionally been equated with night blindness.⁵³ However, this is only based on the instruction to treat the eyes with the juice of roasted beef liver.⁵⁴ Night blindness is caused by vitamin A deficiency, and liver contains plenty of vitamin A.⁵⁵ In modern ophthalmology, eye ointments containing vitamin A are prescribed for superficial abrasions of the cornea, as vitamin A promotes the regeneration of the epithelium. Topically applied vitamin A does indeed have the “excellent” healing effect claimed in Eb 351. Such corneal epithelial defects are primarily caused by foreign bodies (e.g. sand), chemical burns, decreased tear production with age, advanced vitamin A deficiency,⁵⁶ or and after prolonged exposure to the blazing sun in a bright environment such as the desert (AoO 6791⁵⁷). Regardless of the cause, corneal epithelial defects are always associated with a painful burning sensation due to the exposure of fine nerve fibers. Attempts to derive the etymology of š̄.w (or š̄w) yield the verb š̄w, with hieroglyph Q7 as determinative, which means “burn” in the medical sense.⁵⁸ Less helpful as clues are the words š̄rw for a unit of measurement for flax and š̄r.t for “(plant) bundle”.⁵⁹

Eb 352 (57,12)

Text:	
Transcription:	k.t n(.j).t dr znf hr jr.tj
Translation:	Something else to eliminate blood from the eyes

⁵² Ebbell considered š̄r.w to be the correct spelling, as it is found several times in the Papyrus London 10059 (Ebbell, *ZÄS*, 57–58).

⁵³ Ebbell, *ZÄS*, 58 (Ebbell quotes ancient Greek sources). Night blindness is a reduced function of certain cells in the retina (rods) that impairs the ability to adapt to darkness. Translations of š̄.w/š̄r.w by other authors: night blindness? (Hannig, 869 [32185]; Popko [online], Eb 351; Westendorf, 149, 612); an eye disease (Hannig, 869 [32185]; Wb IV, 405.2, 411.12); impaired vision (Hannig, 869 [32185]); š̄{r}w-disease (Westendorf, 149, 612).

⁵⁴ This is also recommended for š̄r.w in the Papyrus London 10059.


⁵⁵ However, the absorption of vitamin A from a topical treatment of the eye is too low to be effective against night blindness.

⁵⁶ With the simple, grain-based diet of the poorer social classes in ancient Egypt, chronic vitamin A deficiency must have been common (and still is today). G. Wolf, “A History of Vitamin A and Retinoids”, *FASEB J.* 10 (1996), 1102.


⁵⁷ The image shows epithelial abrasions of the cornea after staining with fluorescein (green).

⁵⁸ Hannig, 867 (32099).

⁵⁹ Hannig, 869 (32183, 32184). There is no ocular symptom that is consistent with fibers or anything similar. Even the visual impression caused by vitreous opacities is described as “flying mosquitoes” (*mouches volantes*), not “fibers”.

near the edge of the cornea at the three o'clock or nine o'clock position (often in both eyes). The Latin medical term *pinguecula* is tellingly composed of *pinguis* (fat) and *macula* (spot).⁶⁶ Although it is not an accumulation of fat, the visual impression of fat is justified. Frequent unprotected exposure to the sun, wind, or dust is considered a risk factor for its development. If a *pinguecula* grows over the cornea, it is called a *pterygium* (AoO 477).⁶⁷ There was another eye disease called qnj.t (probably from qnj, "to hurt"), but it was spelled .⁶⁸

Eb 355 (57,15-17)

Text:	
Transcription:	k.t n(.j) dr pds.t m jr.t
Translation:	Something else for the removal of a globule on the eye

The traditional translation of pds.t as "small ball, globule" fits primarily an eye stye (*hordeolum* or *chalazion*, depending on the type of gland involved; AoO 2746, AoO 2637), or a small benign tumor of the lid margin or conjunctiva (AoO 5001, AoO 90).⁶⁹ But perhaps pds.t means a chipping that flies away when metal is hammered, since the verb pds for "to hammer flat, press flat" was also used in connection with metalworking.⁷⁰ Workers in the metal industry who present with a metallic foreign body in the cornea are still part of the routine in every eye clinic (AoO 2740).⁷¹ It is important to note that even though only one eye is affected by pds.t (m jr.t), the remedy should be applied to the outside of the lids of both eyes. This supports my suspicion that ir.tj is sometimes an error in writing out of habit.⁷²

disease (Lalanne and Métra, 119; Popko [online], Eb 354; Westendorf, 612; Wb V, 41.3); pinguecula (Westendorf, 612).

⁶⁶ Feminine Latin word, sometimes misspelled as "pingueculum".

⁶⁷ As long as vision is not affected, a pterygium is only cosmetically relevant. The exact cause is unknown. In Egyptian medical texts, there is another eye disease called ʒd.t/ʒdy.t, which Ebbell identified as a pterygium (Ebbell, 6).

⁶⁸ Hannig, 929 (34409, 34410). According to Ebbell, qn.t and qnj.t were "undoubtedly" the names of one and the same disease, an injury or corneal ulcer (Ebbell, 56).

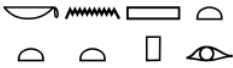
⁶⁹ Translations by other authors: hordeolum/chalazion (Hannig, 318 [11535]; Lalanne and Métra, 119; Westendorf, 612); globule/globules (Lalanne and Métra, 119; Popko [online], Eb 355; Westendorf, 612); pathological symptom in the eye (Wb I, 567.4).

⁷⁰ Hannig, 318 (11532); Wb I, 566.12, 566.16-17.

⁷¹ Ebbell rejected this possibility, because no procedure to remove the foreign body was described (Ebbell, 21). However, a small, sharp-edged metallic fragment that has struck the cornea with high kinetic energy can only be removed with special instruments at approximately 10x magnification.

⁷² The Ebers Papyrus is considered to be a copy of older manuscripts. Multiple styes in both eyes at the


Eb 356 (57,17-21)

Text:	
Transcription:	k.t n(.j).t šp.t
Translation:	Something else for blindness

It remains open whether šp.t (from šp, “to be blind”) here means total or unilateral blindness.⁷³ Blindness can result from most eye diseases if left untreated. The most common causes of blindness in ancient Egypt were certainly the terminal state of trachoma (AoO 4909) or an infection by other pathogens that could spread to the entire eye (AoO 597). Of course, other causes cannot be excluded.

Interestingly, the formula must be instilled into one of the patient's ears to achieve the declared “excellent” effect. In addition, a spell invoking ʒh(w) ʒd.w (“aggressive pain”⁷⁴) must be recited twice. This indicates a chronically progressive, very painful process, such as a serious infection. In such case, the throbbing pain can radiate into the ear area, which is why ancient Egyptian physicians believed that they had to treat the ear.⁷⁵ There is also a form of inflammation of the arteries (temporal arteritis, Horton's disease), which is accompanied by severe throbbing headaches and can lead to fatigue, pain in the chewing muscles, and blindness.

Eb 357 (57,21-58,2)

Text:	
Transcription:	K.t n(.j).t dr šp.t m ir.tj m bnn
Translation:	Something else to eliminate blindness in both eyes by means of a pellet

same time are rare.

⁷³ Hannig, 880 (32567); Wb IV, 449.12–13.

⁷⁴ Hannig, 10 (303), 18 (585, 591); Wb I, 12.4, 24.13. ʒd.w is determined with the hieroglyph I3, the crocodile. I interpret ʒh(w) ʒd.w as a noun followed by an imperfect participle active, because the pain should be “replaced” or “blocked” (ḏbʒ; Hannig 1077–1078 [39847, 39891]; Wb V, 556.1–3, 558.14). An alternative translation might be “the ailment that has been aggressive” (adverbial stative), which would emphasize the final state (blindness). Translations of ʒh(w) ʒd.w by other authors: something aggressive (Lalanne and Métra, 119); bad complaints (Popko [online], Eb 356); terrible suffering (Westendorf, 613).

⁷⁵ Westendorf suggested that ancient Egyptian physicians believed in an anatomical or functional connection between the eye and the ear.

This is another prescription for the treatment of blindness (explicitly in both eyes). There is no indication of the cause. In any case, the affliction does not seem to be associated with severe radiating eye pain, since no treatment of the ears was prescribed, as in Eb 356. As an exception, the main ingredient – a pellet (bnn) – is mentioned in the title of this prescription. It refers to myrrh resin,⁷⁶ which was very valuable, so that one pellet had to be enough to make the mixture.

To be continued in part 2.

Abbreviations

AoO: *Altals of Ophthalmology*; BiOr: *Bibliotheca Orientalis* (Leiden); Wb: Adolf Erman/Hermann Grapow, *Wörterbuch der ägyptischen Sprache*, Vols. I–VII (Berlin, 1897–1961), unchanged reprint 1971.

⁷⁶ Hannig, 270 (9,823); Wb I, 460.9. Myrrh resin was stored dried in the form of pellets.