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 is 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 Thebes West. In early 1873, Georg Ebers bought the papyrus from a consular agent of the German Empire. The University of Leipzig participated in the purchase, so the papyrus was ultimately kept in their library.

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

The Ebers Papyrus was dated on a paleographic basis and ^{14}C dating to the period of the 17th to early 18th dynasties and the 16th century BC, respectively. It is a medical composite manuscript that includes 877 individual texts (teaching texts, prescriptions for remedies, and magic spells), which 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 columns there are sometimes notes from an ancient Egyptian user, such as nfr ("Good!").[2]

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

[1] These columns were not cut out because there is no glue seam between columns 27 and 30.

[2] 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 08.11.2023).

from a modern ophthalmologic perspective. The hieroglyphic transliteration by B. Lalanne and G. Métra (2017) of the hieratic original text was used as the text basis. 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 listed in footnotes.[3]

As will be shown in the following chapters, most disease descriptions are short and vague and therefore cannot be assigned to a definitive diagnosis. At best, one can narrow down possible diagnoses and provide arguments in favor of them. I preferred common diagnoses to rare ones, and took into account the environmental and living conditions in Ancient Egypt. Some prescriptions provide treatment instructions for non-specific symptoms common to various eye diseases, e.g. inflammation, blurred vision or blindness. All statements must be viewed as hypotheses.

2 Eye diseases in the Ebers Papyrus (Eb 336–357)

The following chapter headings are based on the numbers of the individual texts. The numbers of the papyrus sheets and lines are indicated in brackets. However, only the heading describing the eye disease is quoted and translated. Hieroglyphs are numbered according to A. Gardiner's system.[4]

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[3] Dictionaries used:

- A. Erman and H. Grapow, *Wörterbuch der ägyptischen Sprache*, Vols I–VII, (Berlin, 1897–1961; unchanged reprint; Berlin, 1971), subsequently 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), subsequently referred to as "Hannig" for short.

Other translations used on a case-by-case basis:

- B. Ebbell, *Alt-ägyptische Bezeichnungen für Krankheiten und Symptome* (Oslo, 1938), subsequently referred to as "Ebbell" for short.
- B. Ebbell, „Die ägyptischen Krankheitsnamen", *ZÄS* 59 (1924), 55–59, subsequently referred to as "Ebbell, *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), subsequently 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 08.11.2023), subsequently 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), subsequently referred to as "Westendorf" for short;

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

The article does not contain images of eye diseases, as such images could cause unpleasant feelings in the reader. Instead, I refer interested readers to specific images in the online "Atlas of Ophthalmology" (https://www.atlasophthalmology.net).[5]

Eb 336 (55,20–56,6)

Text:	
Transcription:	jrr.(w)t r r(w)ḏ.t n(j).t wḫd.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)ḏt in the above spelling means "growth, flourishing",[6] which in my opinion means numerical growth and spreading. The word wḫd.w, which is derived from the verb wḫd for "suffering, enduring (with pain)", [7] poses greater translation difficulties. As this medical phenomenon, which can occur in many parts of the body,[8] is always mentioned in the plural, it must in the broadest sense be composed of several or many "parts". wḫd.w were traditionally interpreted as circulating "pain substances", "pain demons", "disease triggers" or "impure substances",[9] since similar ideas have also been passed down from other ancient peoples.[10] In contrast, I am thinking of rashes (efflorescences, a collective term for spots, papules, vesicles and pustules), which are

[5] Such references consist of the abbreviation "AoO" and an image number. To access an image on the website <https://www.atlasophthalmology.net>, please select the "Search" function in the green menu bar, enter the image number in the search field that opens ("Search phrase") and click the "Search" button.

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

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

[8] Ebbell, 16.

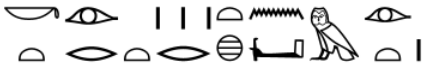
[9] Hannig, 229 (8261); Westendorf, 609; Popko [online], Eb 336; H. Fischer-Elfert [personal communication]). Translations by other authors: pain or inflammation (Wb I, 356.9); suppurative foci (Ebbell, 16–18); or the word remained untranslated (Lalanne and Métra, 115).

[10] Egyptian disease theory included four disease-causing principles: ꜣꜣ (substances introduced by demons, which in turn stimulate the production of wḫd.w), st.t (substances introduced by vermin), wḫd.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. Bardinet, *Les papyrus medicaux de l'Egypte pharaonique* (Paris, 1995), *BiOr* 55 (1998), 736.

actually the visible result of circulating substances.[11] There are papules in the eye in the form of numerous small, glassy bumps on the inside of the eyelids, which are the main symptom of certain eye infections. Histologically, they are so-called 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")[12] probably refers to an intense inflammatory redness of the eyelid conjunctiva, which gives the impression that blood is collecting underneath (AoO 4194).[13] In 56.1, the prescription also contains an instruction for "treating its [the eye's] water" (srwḫ mw=s). This probably means increased tear flow (epiphora). Both redness and epiphora[14] 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"). The causative pathogens are bacteria (*Chlamydia trachomatis*).[15]

Eb 337 (56,6–10)

Text:	
Transcription:	k.t jrr.(w)t r tḫn m jr.t
Translation:	Something else that can be done against a tḫn-injury in the eye

[11] The circulating "substances" that may cause rashes include microorganisms, inflammatory mediators, antibodies and heavy metals. It appears that wḫd.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 settlement/accumulation (srdd), tumor (ḥnḥn.t), heat (qꜣd), or blaze (ꜣmw). Hannig, 8 [258], 229 [8263], 579 [20982], 918 [34014]). This fits well with inflammatory rashes, which were perhaps summarized under the term wḫd.w without further distinction. The frequent expression wḫd.w m ḫ.t (e.g. Eb 86, 87, 97, 100, etc.) does not necessarily have to be an illness inside the abdomen.

[12] The preposition m has also 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).

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

[14] The ancient Egyptians may have differentiated between water on the outside and water inside the eyes, because the term ꜥḫ.t n(j).t mw jr.tj (literally "impoundment of the water in the eyes") was interpreted by Ebbell as cataract (clouding of the lens). Ebbell, 11.

[15] *Chlamydia trachomatis* is spread by transmitting 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 regions of Africa and the Middle East.

The word k.t ("something else")[16] is a recurring sentence element that introduces the beginning of a new prescription.

The ancient Egyptians had different words for wound or injury. Since tḫn in medical texts was exclusively used in connection with the eye,[17] it could be a rather common kind of eye injury. The word is related to the verb ṯḫnj (translated as "to hurt, to attack, to harm"),[18] but the root tḫn with different determinatives also occurs in the words for ibis (with the long, pointed beak) and obelisk[19]. This might indicate that tḫn was a scratch wound or puncture wound of the eye.[20] There are many possible reasons for this, from fingernail to tools to acacia thorn.

The following prescription Eb 338 (56,10–11) contains treatment instructions without a heading. It may be intended as an adjunct or alternative for the treatment of the tḫn-injury.

Eb 339 (56,11–15)

Text:	
Transcription:	k.t n(j).t dr ḥꜣt.j m jr.t
Translation:	Something else for eliminating blur in the eye

The word ḥꜣt.j in this spelling means "blur", and in connection with weather also "misting, cloudiness".[21] The determinative, which depicts the sky with dew or rain falling, indicates increased tear production or secretions as the cause of the blurred vision.[22] This is a general symptom of inflammation of the anterior segment of the eye, so it is not possible

[16] Hannig, 949 (35139); Wb V, 112.12.

[17] Popko (online), Eb 337, note 2. Unlike in this text, the word is usually determined with the hieroglyph D4, the eye (Hannig, 1010 [37405]; Wb V, 327.7).

[18] Hannig, 1010 (37403, 37404); Wb V, 327.2–6.

[19] Hannig, 1010 (37394, 37402); Wb V, 326.15, 326.25.

[20] Translations by other authors: hit onto the eye (Ebbell, *ZÄS*, 58); eye injury/tḫn-injury (Hannig, 1010 [37405]; Lalanne and Métra, 117; Popko [online], Eb 337; Wb V, 327.7); scratch wound (Westendorf, 609).

[21] Hannig, 543 (19675, 19678); Wb III, 35.8–9.

[22] Translations by other authors: watery eyes/*lippitudo* (Ebbel, 32; Hannig, 543 [19675]); blepharitis (Ebbell, 33; Hannig, 543 [19675]); blur (Hannig, 543 [19675]; Popko [online], Eb 339; Westendorf, 610); leukoma (Hannig, 543 [19675]); impaired vision (Lalanne and Métra, 117); eye disease of humans and cattle (Wb III, 35.13–14).

to narrow down the diagnosis more precisely. However, the weather-associated determinative is certainly also justified for the "foggy" vision in the case of lens opacification (cataract, AoO 9353).[23]

The following prescription Eb 340 (56,15–16) is simply titled "Something else" and contains the prescription for a mixture to be applied to the "back" of the eye.[24]

Eb 341 (56,16–17)

Text:	
Transcription:	k.t n(j).t ḫsf wḫd.w m jr.tj
Translation:	Something else to ward off the papules in both eyes

As already stated in my comments on Eb 336, I think wḫd.w in connection with the eye stands for the typical lymph follicles of the early stages of trachoma (see page 5). They can also be described as "papules" (bumps with solid content). Since the verb ḫsf ("to avert, to ward off, to reject") was used instead of the usual ḏr ("to eliminate, to expel"), the prescription is intended for prophylaxis. Clients are advised to make up their eyes with a mixture of galena (lead sulfide[25]) and red ochre. Some scientists suspected that eye makeup in ancient Egypt was originally used for medical purposes before it was also practiced for cosmetic or ritual reasons.[26]

Eb 342 (56,17–19)

Text:	

[23] In countries with high UV light exposure, cataract emerges earlier on average than in areas with little sunshine.

[24] It is unclear whether sꜣ jr.t ("back" or "outside/surface" of the eye; Hannig, 706 [25712]; Wb IV, 9.18–20) means the outside of the eyelids or the surface of the eyeball. However, patients would hardly tolerate a granular and mineral mixture applied to the eyeball (in this case a mixture made from pond sediment and ground fruit capsules, among other things). Thus, I translate sꜣ jr.t here and subsequently as "outside of the eyelids" (as in Hannig, 706 [25719] and Wb IV, 9.18). See also the discussion in Popko (online), Eb 340, note 3. One cannot conclude from this instruction that there was a disease of the eyelids, because a medical poultice applied to the "back of the eye" was common in a variety of diseases of the eyeball and in cases of visual impairment, as further examples will show.

[25] Main component of msdm.t, the black eye paint (Hannig, 387–388 [13992]).

[26] Cf. Westendorf, 147.

Transcription:	k.t n(j).t wbꜣ mꜣꜣ m dd.t ḥr sꜣ n(j) jr.tj
Translation:	Something else for “opening” the eyesight by means of something placed on the outside of the lids of both eyes

This formula is used to treat impaired vision, which is not specified. It can primarily be the result of refractive anomaly (*ametropia*),[27] clouding of the lens (cataract),[28] glaucoma,[29] late-stage trachoma,[30] or a variety of congenital or acquired diseases of the cornea or retina.

The following two prescriptions, Eb 343 (56,19–21) and Eb 344 (56,21–57,2) with their simple heading “Something else” describe instructions for making a paste or powder to be applied on the outside of the eyelids.

Eb 345 (57,2–4)

Text:	
Transcription:	k.t n(j).t sꜣq ḏfḏ n(j) jr.t
Translation:	Something else for contracting the pupil of the eye

The need to make the pupil[31] contract through medical treatment only arises in the case of pathological pupil dilation (*Mydriasis*). This may occur as a result of iritis (AoO 5174), after a blunt eye trauma (AaO 3050), in neurological diseases, in poisoning[32] or as part of a congenital malformation.

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[27] Transparent crystals may have been used as visual aids for reading. The first blown or ground lenses did not appear until the early Middle Ages (ZEISS, *The history of glasses: From their origins as "reading stones" to lifestyle accessories*, <https://www.zeiss.com/vision-care/en/eye-health-and-care/understanding-vision/the-history-of-glasses.html> accessed 10.11.2013).

[28] In sunny areas of the world, exposure of unprotected eyes to UV radiation is a risk factor for the early onset of cataract. But there are also traumatic or innate forms of cataract.

[29] Increased pressure in the eye with damage to the optic nerve.

[30] Still today, trachoma is the most common cause of blindness due to infection.

[31] For the noun ḏfḏ the translations “iris”, “pupil”, or “iris with pupil” exist (Hannig, 1081 (40004); Lalanne and Métra, 118; Popko [online], Eb 345; Westendorf, 611; Wb V, 572.12).

[32] A classic case would be poisoning with *Atropa belladonna*, which may have been used by women in ancient Egypt to dilate their pupils for cosmetic reasons and to terminate a pregnancy (*Atropa Belladonna*, <https://encyclopedia.pub/entry/36591> accessed 10.11.2023).

Or the prescribed remedy is supposed to help against a pathologically constricted pupil ("Something else for the pupil contraction of the eye"). The causes of this are similar to the causes of a pathologically dilated pupil.

Eb 346 (57,4–5)

Text:	
Transcription:	k.t n(j).t dr wḥ3.(w)t m jr.tj
Translation:	Something else to eliminate wḥ3.(w)t from both eyes

The symptom wḥ3.(w)t is a matter of debate.[33] The verb wḥ3 described activities of collecting stones or rounded plant products (resin globules, grain, grapes).[34] With that said, the word wḥ3.(w)t could be translated as "collected round things". This reminds of the conjunctival lymph follicles in trachoma, which look like sago grains or a bumpy plaster (AoO 4908). This idea is also supported by the fact that the remedy consists of galena, ocher and yellow natron for application onto the outside of the eyelids, as was already recommended in prescription Eb 341 for the prophylaxis of wẖd.w. Hence, wḥ3.(w)t and wẖd.w could be two terms for the same symptom (the conjunctival lymph follicles),[35] or terms for two different stages of this symptom[36].

But possibly wḥ3.(w)t is a spelling variant of wḥ3.w, a word for skin rash.[37] If one translates the phrase m jr.tj as "at/near the two eyes"[38], various skin diseases in the eye area (AoO 5169), and especially childhood diseases (measles, rubella, chickenpox, etc.), which are often accompanied by eye inflammation, come into question.

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[33] Translations by other authors: eye disease/something pathological in the eyes (Hannig, 223 [8051]; Wb I, 347.11); wḥ3.t-affliction (Popko [online], Eb 346); bumpiness (Westendorf, 611); trachoma (Westendorf, 611); or the word was left untranslated (Lalanne and Métra , 119).

[34] Hannig, 223 (8045, 8047, 8048); Wb I, 346.15–347.2.

[35] The hieroglyph Aa2 with the phonetic value wḥ3 serves as a determinative for the word wḥ3.(w)t, and as an abbreviation for the word wẖd.w.

[36] The lymph follicles ulcerate and scar at a later stage.

[37] Cf. Ebbell 15–16; Hannig, 223 (8050).

[38] The preposition m is ambiguous (Hannig, 329–330; Wb II, 1.2–2.5).

Eb 347 (57,5–6)

Text:	
Transcription:	k.t n(j).t dr s.ḥḏ.w n(j).w jr.tj
Translation:	Something else to remove corneal scars from both eyes

The plural word s.ḥḏ.w literally means "the whitened", which probably refers to scars of the cornea (leukoma).[39] Such scars look like white spots because the cornea is no longer transparent in these areas (AoO 9873). Macroscopically visible scars on the cornea are a result of injury or severe inflammation (e.g. due to various infections[40]). In ancient Egypt, chemical eye burns due to strong alkalis such as quicklime or natron (AoO 9429) were certainly also a common cause of s.ḥḏ.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 conjunctival hemorrhage due to ruptured vessels. However, this rarely occurs on both eyes at the same time, and people would hardly have sought medical help for that back then.

Instead, as already mentioned on page 5, I consider "blood" to be a description of severe inflammatory redness of the conjunctiva (AoO 4194). It can be assumed that the ancient Egyptian doctors knew the function of the vessels as transport lines for blood and

[39] Translations by other authors: leucoma/*albugines*/white scars of the cornea (Hannig, 798 [29393, 29394]; Wb IV, 227.5; Westendorf, 611; *albugines* is an outdated medical term); white coating (Lalanne and Métra, 119); the whites/white spots (Popko [online], Eb 347; Westendorf, 611); eye affliction (Wb IV, 227.5).

[40] Also, the late stage of trachoma is accompanied by scarring of the cornea. Furthermore, there are forms of congenital degeneration of the cornea.

colloquially equated the dilated conjunctival vessels with blood.[41] 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 phr.t jrr.t n(j) thn ṯ(ꜣ)z=f m jr.t
Translation:	Another remedy made for a thn wound, so that it may "reassemble" in the eye

The thn-injury was already discussed in the explanations for prescription Eb 337. Opinions differ when it comes to translating the subordinate clause.[42] In my opinion it is an adverb clause (clause of purpose, adverbial subjunctive) with the verb ṯ(ꜣ)z for "to knot, to tie, to join, to fasten" (also in a broader sense)[43]. The remedy is intended to cause a scratch or puncture wound in the eye to close more quickly.

Eb 350 (57,10–11)

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

Some authors have held that nḥꜣ.(w)t is the correct or alternative spelling for wḥꜣ.(w)t (the ailment in Eb 346).[44] We would therefore be dealing with another recommendation for

[41] Similarly, in the German vernacular, people speak of "water" when they mean swollen legs due to congestion (edema).

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

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

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

the treatment of trachoma or a skin rash in the eye area. What is more, nḥꜣ can mean "to be uneven, to be rough" or "bumpiness, roughness" (e.g. of stone or metal).[45]

Another plausible possibility is that nḥꜣ.(w)t is an independent disease derived from the verb nḥꜣ for "to be dangerous, to be terrible, to be wild".[46] This indicates intense pain. Significantly, the prescription contains labdanum (resin of *Cistus ladanifer*), which was said in ancient times to have a pain-relieving effect.[47] The description as "terrible" or "wild" would fit well with the extreme pain of acute glaucoma (glaucoma attack[48]) or neuralgia (trigeminal neuralgia, cluster headache[49]). However, these usually occur unilaterally.[50]

Eb 351 (57,11–12)

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

[45] Hannig, 445 (16041, 16049); Wb II, 291.2. 19th century authors translated nḥꜣ.t as "turning around" and suggested that the condition described with nḥꜣ.(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, in newer dictionaries and vocabulary collections, no word nḥꜣ.t (or nhꜣt, nḥꜣt, nḥt) can be found with this meaning.

[46] Hannig, 445 (16036, 16039, 16046); Wb II, 290.5–14.

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

[48] Acute increase in pressure in the eyeball.

[49] The so-called cluster headache is an attack-like neuralgia, the pain of which is felt in or around the eye and is accompanied by redness of the eyeball and tear flow.

[50] It cannot be completely ruled out that in some prescriptions, jr.tj (both eyes) is a scribal error out of habit.

The eye disease šꜣ.w, also šꜣr.w,[51] is traditionally equated with night blindness.[52] However, this is only based on the instruction to treat the eyes with the juice of fried beef liver.[53] Night blindness is caused by vitamin A deficiency and liver contains plenty of vitamin A.[54] 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. The locally applied vitamin A actually has the "excellent" healing effect that is claimed in Eb 351. Such corneal epithelial defects are predominantly caused by foreign bodies (e.g. sand); chemical burns; reduced tear production in old age; advanced vitamin A deficiency;[55] and after a long, unprotected stay in the blazing sun in a bright environment, e.g. in the desert (AoO 6791[56]). Regardless of the cause, corneal epithelial defects are always accompanied by a painful burning sensation because fine nerve fibers are exposed. When attempting an etymological derivation of šꜣ.w (or šꜣw), one comes across the verb šꜣw, which is determined with the hieroglyph Q7 and means "burn" in the medical sense.[57] Less helpful as clues are the words šꜣrw for a unit of measurement for flax and šꜣr.t for "(plant) bundle" (both determined with the hieroglyph M2).[58]

Eb 352 (57,12)

Text:	
Transcription:	k.t n(j).t dr znf ḥr jr.tj

[51] Ebbell considered šꜣr.w as the correct spelling, as it can be found several times in the Papyrus London 10059 (Ebbell, *ZÄS,* 57–58).

[52] Ebbell, *ZÄS*, 58 (Ebbell cited ancient Greek sources). Night blindness is a reduced function of certain cells in the retina (rods), which impairs the ability to adapt to darkness. Translations of sꜣ.w/šꜣr.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]); šꜣ{r}w-disease (Westendorf, 149, 612).

[53] This is also recommended against šꜣr.w in the Papyrus London 10059.

[54] I find it hard to believe that the Egyptian doctors didn't know that patients with night blindness should be given fried beef liver to eat rather than dripping its juice into their eyes.

[55] 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.

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

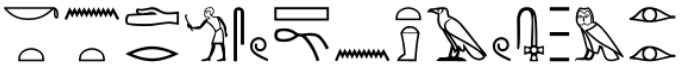
[57] Hannig, 867 (32099).

[58] Hannig, 869 (32183, 32184). There is no ocular symptom that can be reconciled with fibers or anything similar. Even the visual impression caused by vitreous opacities is described as "flying mosquitoes" (*mouches volantes*), and not as fibers.

Translation:	Something else to eliminate the blood on/from the eyes

The preposition ḥr allows for a local ("on") or directional translation ("from, away from"). Actual blood on an eye would be immediately washed away by tear fluid. Intraocular blood (e.g. after bleeding into the anterior chamber or the vitreous body) is not visible macroscopically. Therefore, see my comments on Eb 336 and Eb 348 where I interpret "blood" as a description for severe inflammatory redness.

Eb 353 (57,13–14)

Text:	
Transcription:	k.t n(j).t dr swš n(j) ꜣ.w m jr.tj
Translation:	Something else to remove a concentration of heat from both eyes

The verb swš stands for "to ball up, to roll up, to bale".[59] The associated noun swš, when spelled with the rope loop (V1) as the determinative, means "bulk, band, bale".[60] The following word ꜣ, in the spelling with the hieroglyph Q7 as the determinative, means "heat, blaze", also in a medical sense.[61] Thus, a kind of concentration of heat is described.[62] There is no such thing as perceptible fever in the eyes. What could rather be meant is an intense burning sensation in the eyes (even today this sensation is described with words from the area of fire and heat). It occurs primarily in corneal epithelial defects (like in Eb 351).

Eb 354 (57,14–15)

Text:	

[59] Hannig, 736 (26857); Wb IV 75.16.
[60] The word generally refers to cloth or plant material (Hannig, 736 [26862]); Wb IV 75.17).
[61] Hannig, 985 (36383, 36387); Wb IV, 76.1–3.
[62] Translation by other authors: agglomeration of heat (Hannig, 985 [36387]; Popko [online], Eb 353; Westendorf, 612); agglomeration of burning things (Lalanne and Métra, 119); something pathological (Wb IV, 76.1–3).

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

The word qn.t in this spelling means "fat vapor, fat as an eye disease" and seems to be derived from the root qn for "to be fat" or "fat (of the sacrificial animal)".[63] qn.t probably refers to a so-called *pinguecula*,[64] a circumscribed, yellowish-white thickening of the conjunctiva near the edge of the cornea in three o'clock or nine o'clock position (often in both eyes). If a *pinguecula* grows over the cornea, it is called a *pterygium* (AoO 477).[65] Although it does not consist of an accumulation of fat, the visual impression of fat is justified. The Latin medical term *pinguecula* is tellingly composed of *pinguis* (fat) and *macula* (spot). Frequent unprotected exposure to the sun, wind or dust is considered a risk factor for its development.

The eye disease called qnj.t (probably from qnj, "to hurt") is written .[66]

Eb 355 (57,15–17)

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

[63] Hannig, 926 (34293–34297); Wb V, 40.8–12, 41.19–20. Instead, Ebbell derived the word qn.t from qn for "evil, damage" (determined with the sparrow G37; Ebbel, 56).

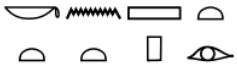
[64] Feminine latin word, but sometimes „*pingueculum*" is used erroneously. Translations of qn.t by other authors: corneal ulcer (Ebbell, 56); fat/fat in the eyes as a symptom of disease (Lalanne and Métra, 119; Popko [online], Eb 354; Westendorf, 612; Wb V, 41.3); pinguecula (Westendorf, 612).

[65] As long as eyesight is not impaired, a pterygium is only a cosmetically relevant phenomenon. The exact cause is unknown. In Egyptian medical texts, there was another eye disease named ꜣd.t/ꜣdy.t, which Ebbell identified as the pterygium (Ebbell, 6).

[66] Hannig, 929 (34409, 34410). According to Ebbell, qn.t and qnj.t were "undoubtedly" the name for one and the same disease, namely an injury or corneal ulcer (Ebbell, 56).

The traditional translation of pḏs.t as "small ball, globule" primarily fits an eye stye (*hordeolum* or *chalazion*, dependent on which kind of gland is infested; AoO 2746, AoO 2637), or a small benign tumor of the eyelid margin or conjunctiva (AoO 5001, AoO 90).[67] But perhaps pḏs.t means a chipping that flies away when metal in hammered, because the verb pḏs for "to hammer flat, to press flat" was also used in connection with metal processing.[68] Workers in the metal industry who present with a metallic foreign body in the cornea are still part of the routine operations of every eye clinic today (AoO 2740).[69]
It is noticeable that only one eye is affected by pḏs.t (m jr.t), but the remedy should be applied to the outside of the lids of both eyes. This supports my suspicion that ir.tj is sometimes a scribal error out of habit.[70]

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.[71] 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 may spread to the entire eye (AoO 597). But of course, any other cause cannot be ruled out.
Interestingly, the formula must be instilled into one of the patient's ears to achieve the declared "excellent" effect. In addition, a saying invoking ꜣh(w) ꜣd.w ("aggressive

[67] 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).
[68] Hannig, 318 (11532); Wb I, 566.12, 566.16–17.
[69] Ebbell rejected this possibility, because no procedure for removing the foreign body was described (Ebbell, 21). However, a small, sharp-edged metallic chipping that has hit the cornea with high kinetic energy can only be removed with special instruments at around 10x magnification.
[70] The Ebers Papyrus is viewed as a copy of older manuscripts. See also note 50. Only in exceptional cases can multiple styes occur in both eyes at the same time.
[71] Hannig, 880 (32567); Wb IV, 449.12–13.

pain/ailment”[72]) must be recited twice. This indicates a chronically progressive, very painful process, e.g. a serious infection. In such case, the throbbing pain can radiate into the ear area, so ancient Egyptian doctors believed that they had to treat the ear.[73] There is also a form of inflammation of the arteries (temporal arteriitis, Horton's disease), which is accompanied by severe throbbing headaches and which 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

This is another prescription for the treatment of blindness (explicitly in both eyes). There is no indication of the cause. At any rate, the suffering does not appear to be associated with strong radiating eye pain, since no treatment of the ears was prescribed, like in Eb 356.

In this prescription, as an exception, the main ingredient – a pellet (bnn) – is mentioned in the title. It refers to myrrh resin,[74] which was very valuable, so that one pellet had to be enough to make the mixture.

To be continued in Part 2.

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

[73] Westendorf, on the other hand, suspected that the ancient Egyptian doctors were convinced of an anatomical or functional connection between the eye and the ear.

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