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The use of cattle for curing the "torso / belly" (Xt) according to the Ebers papyrus, in ancient Egypt

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Abstract:
The medicine of the ancient Egyptians is some of the oldest documented. The Ebers Papyrus is full of incantations and foul applications meant to turn away disease-causing demons, and also includes 877 prescriptions. It may also contain the earliest documented awareness of tumors, if the poorly understood ancient medical terminology has been correctly interpreted. It is imported to collect the use of given materia medica in other fields of life at that time: their role in every day life, in cultic and funeral worlds. We could understand of conceptr of theis medical and/or pharmaceutical properties and their iatromagical application, especially the role of cattle curing.

Keywords: Eberts papyr, materiae medica, animals, cattle

Ancient Egyptian medicine was famous in the Near East because of its effectiveness. I wondered how this fame could have been achieved, what materials were used and how they were used. In reviewing the various types of curative materials, I found that less than 1/5 of the types of *materiae medicae* came from animals, but among them the products and parts of the cattle appeared conspicuously. I wondered whether these could be thought of as being helpful by magical or by medical means.

Ancient Egyptian medicine had two main directions in healing practice. One was to treat the cases rationally and physically, the other to get divine aid for the success in curing. The ratio between these activities depended on the type of process, as determined by the medical man. In the case of the swnw (civil physicians) who mainly used the prescriptions, the divine aid seems to be slight for the first glance. We have just a few magical spells on the medical papyri. These utterances say, however, that they had to be spoken before each appropriate treatment, or during the preparation of the medicaments, thus they were used very often. Some of the materials seem to be too fantastic to understand them as rational *materiae medicae*. They point also to a magical use. What is the situation regarding cattle?

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The longest ancient Egyptian medical papyrus[1] named after its first owner, Georg Moritz Ebers who purchased it in the winter of 1872/73 in Thebes and published it in part during his return-trip, contains more than 300 titles (§4-§335 in 52 columns[2]) for remedies in a so called "*collected book of medicines to drive away the illness in the torso/belly*" (dmDt nt pXrt dr mrt m Xt). The prescriptions were rearranged several times before they were copied unto this papyrus scroll, sometime before the 9th ruling year of the pharaoh Amenhotep I of the 18th Dynasty. The organ shown by the word Xt is written with the (Gardiner's) sign F32, representing the front part of the torso of a mammal. In the medical language, it also meant this same organ, though it could be restricted to the belly or in the vernacular tongue extended to the whole body.[3]

In this article I examine the above-mentioned section of the scroll in relation to the *materiae medicae* originating from cattle – having the milk (jrTt) and the fat (aD, mrHt) excluded. Out of 25 formulas containing animal materials[4] – with the above restrictions –, cattle is mentioned in 15, in the form of the gall (bnf and wdd), the liver (mjst), the intestines (As), the marrow (jmAx, tbn) and the meat (jwf, xnd). The sign for cattle is usually written beside the organ the animal is written usually by the sign of the cattle, but sometimes the whole word is written out. The method is the same with the other animals, thus both the specification of the animal and its part were considered important.

The animal

In the section analysed, there are only four cases where the origin of the animal material is omitted. In the case of the marrow / tbn (Eb288, Eb330), the extant medical texts mention it usually in connection with cattle or its leg and only once with the (jaw-bone of a) donkey. It seems thus appropriate to think that in the above mentioned cases cattle was not written out, being trivial. Concerning the meat/ jwf (Eb284, Eb293) these cases seem to be even more certain, as in both times the epithet *fat* (DdA) is standing behind the word. Though ancient Egyptians fattened several sorts of animals, the fat meat was connected to the "*fat cattle*" i.e. cattle that are fat, which was called by its own name, jwA. In all of these prescriptions the cattle represents the only animal drug among the curing materials, not counting honey, or milk and fat frequently used without a determinate origin.

Materials originating from cattle were used in the case of a wide variety of unhealthy conditions:

- for killing of roundworm / *Ascaris* (Eb75: smA pnd – which lives in the lungs and small intestine),

[1] Papyrus Ebers. Das hermetische Buch über die Arzneimittel der alten Ägypter in hieratischer Schrift. Herausgegeben, mit Inhaltsangabe u. Einleitung versehen von Georg Ebers. Mit hieroglyphisch, lateinischem Glossar von Ludwig Stern, Bd.1. Einleitung und Text, Tafel I-LXIX -- Bd.2. Glossar und Text, Tafel LXX-CX, Leipzig 1875 (reprinted in 1987) ; W. Wreszinski, Der Papyrus Ebers. Umschrift, Übersetzung und Kommentar, I. Teil: Umschrift, Leipzig 1913; Wolfhart Westendorf, Handbuch der altägyptischen Medizin (Handbuch der Orientalistik, Abt. 1, Der Nahe und Mittlere Osten, Bd. 36) Leiden-Boston-Köln 1999 (Handbuch der altägyptischen Medizin 1.) with further literature.

[2] The ancient Egyptian numbering for this book goes from the 2nd to the 55th column, but the scribe left out the numbers 28th and 29th pages. He finished the scroll with numbers 103-110 on the end of the backside of the papyrus.

[3] James H. Walker, Studies in ancient Egyptian anatomical terminology, The Australian Centre for Egyptology, Studies 4. Warminster, Aris and Phillips 1996, p. 91-110.

[4] I again did not count honey, a special product of bees, which was a basic medicament from the most ancient times in Egypt, and used later on still very frequently. It is present in almost one third of the prescriptions in the „*collected book*" examined.

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- to expel skin disease and ease ("break") pain in general (Eb113, Eb117: dr wHAw, Sd.t wxdw),
- to ease ("break") pain in the belly(?) (Eb86: Sd wxdw m Xt),
- to expel pain in the rectum (Eb141: dr wxdw Hr pHwjt),
- to lower temperature probably in the rectum (Eb156, Eb157: sqbb – administered into the pHwyt),
- to cure an unhealthy rectum (Eb162: ssnb pHwjt mr=s),
- to treat contracting in the urine (Eb267: n mn Hnaw m mwyt=f)
- against lack of appetite and general weakness (Eb284, Eb288, Eb293: it aims *the heart to let it receive the bread* / rdjt Ssp jb t)
- for vomiting flu / cold(?) - *when the* rA-jb *is ill, is vomiting much, the nose is toward the front, both of his eyes are burning, his nose is moistured* (Eb192=Eb195: mn rA-jb=f, jw=f qAs=f aSAw, xnty r HAt=f, jw jrtj=f Ssmty, jw fnD=f tAxb=f),
- to cure ("kill") asthma /or diphtheria(?) (Eb330: ds gHw)

Taking in account the symptoms and aims given in the above prescriptions, the different parts of the cattle were used mainly in treating digestive problems and pains, in unspecified part of the Xt, in the lung, in the belly and intestines, in the heart and around it, or in the rectum.
The role of the *materia* seems to be again different in the various prescriptions. In case Eb192=Eb195, it is mentioned in the instruction. It belongs then to the part that describes how the medicament has to be consumed. Thus ancient Egyptians thought it not to belong to the medicament itself. As the medicament was a sort of cake made of special wheat, absinthe and onion, its taste would be strong and bitter. That is why I think the beef served to make this medicament edible. It seems to be used to counter these easily sensible side effects. In most cases, however, cattle is listed, among the ingredients of the medicaments, thus it was part of it.
In ancient Egypt cattle had many names, according to the species, race, age, skin pattern etc. In medical texts, and especially in the above book for the Xt, cattle are called gw-bull, jwA-cattle, or simply the cattle sign kA is drawn. Classifying these terms, we can say, that the gw-bull is employed only once, when the gall of the animal is meant (Eb75), while the jwA is mentioned twice (Eb156, Eb157), in two prescriptions which have, with all probability, common origin, and were used for the same reason. When fat meat is advised, however, we can assume the same jwA-cattle, thus four more prescriptions (Eb284, Eb293, Eb192=Eb195) might need the same animal. In all other cases, I think, it was unimportant, what sort of cattle was used, as any comment on the animal's type was missing.
The most often used specific term for the animal is thus jwA[5], expressing originally the domesticated and fattened long horned *Bos primigenus*, whose relatively new role in ancient Egyptian culture is shown by the fact that it appears in religious texts first during the Middle Kingdom. It was not only a typical offering from this time on,[6] but also important for the nourishment in ancient Egypt. Generally we can regard it as "*fattened-cattle*".[7] In some pictures it seems to be so fat that he could hardly walk, or it had to be put in a vehicle and

[5] jwA – R. Hannig, Großes Handwörterbuch, Ägyptisch-Deutsch, Hannig-Lexica 1. Mainz 1995. (later: HW.I), p. 50-51, R. Hannig, Wörterbuch, Mittleres Reich und Zweite Zwischenzeit, Mainz 2000. (HW.II.), p. 136-137; ZÄS 59, 1924, 24-25.
[6] c.f. Jean Leclant, La „mascarade" des boeufs gras et le triomphe de l'Égypte, MDAIK 15, 1956, 128- 145.
[7] e.g. written as „*became fat because of fattening*" is written during the reign of Amenemhat II in Memphis (Altenmüller H, Moussa AM., Die Inschrift Amenemhets II. aus dem Ptah-Tempel von Memphis. Ein Vorbericht. SAK 18, 1991, p. 7.)

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drawn to the place of the offering. As this type of animal is typically corpulent, the beef was necessarily fat. Thus the jwf DdA / „*fat meat*" are possibly gained by its slaughtering.

The name gw-bull is well known in funeral and economic texts. It is the shortened version of the widely used ngAw,[8] and appeared again first during the Middle Kingdom. Although this form was less popular than the full one, it was used among the Coffin texts[9]. The ngAw originally meant the native long-horned *Bos primigenus*, which was considered either as game living in the desert with its herd, often hunted and harnessed[10] for domestication until it disappeared during the New Kingdom, or as the semi-domesticated cattle and oxen which were used as draught-animals.[11] Its wild nature and vigour is expressed even by the root of the animal's name. The verb ngA meant namely „*kill*" and „*break, ruin*". It was reared domestically, but also offered to the gods, and had several religious connotations known from the first Egyptian writings. Among the Pyramid Spells Apis[12], Mnevis[13] or even Seth[14] was described by the word ngAw. A spell said his horns were the fingers of the god Geb.[15] He was so strong, that Horus had to control his head, Isis the tail and Atum the horn to succeed in stopping him.[16] As the bull of Ra, he had four horns looking to the four directions of the sky. He was a typical funeral offering[17] from the beginning, and had also connection to Anubis, being his follower.[18] Moreover, the ngAw bull lifted the deceased to the sky with its tail, while standing on the side of the boat of Anubis.[19]

The most popular term for cattle was the kA[20]. Being a masculine word it expressed the bull in general. It could name even the king in his particular role as the protector of *maat* (kA nxt / „*strong bull*"), and belonged to the royal titulary during the whole New Kingdom, and even during the 21st Dynasty. Favourite word assembling was the kA (n) pt / „*bull of the sky*" [21] for the earth god Geb, who is trampling down his enemies, but bowing his horns for the dead king to allow him to proceed to the lake of the Otherworld. It could also be the name of a planet.[22] Other places had a bull, too, as the *bull of Hierakonpolis* / kA nxn,[23] or *of Heliopolis* / kA Jwnw,[24] also with the name Mnevis, whose head adorned the Heliopolitan pillar.[25] He

[8] gw – HW.II.2589, Blackman 1935: 3 és 5). ngAw – HW.I.664, HW.II.1353. Also used the ngAw TAy „*masculin cattle, bull*". See also Eberhard Otto, An Ancient Egyptian Hunting Ritual, JNES 9, 1950, 164-177.
[9] CT.IV.351d, Sp.343.
[10] PT286e, Sp.254, CT.V.23j, Sp.363.
[11] Péter Gaboda, III. Amenhotep nagy emlékskarabeusza, Kóthay A.K. -Liptay É (szerk.), A Szépművészeti Múzeum egyiptomi gyűjteménye, Budapest 2012, p. 64-65.
[12] PT286e, Sp.254. JNES 9, 173-74, n. 39-40. cf. CT.II.162, Sp. 400c, PT.2047c, Sp.683.
[13] PT470a, Sp.304, ld. PT.914a. PT.416a, 1266c. Cf. Weill, Le Champ des Roseaux et le Champ des Offrandes. Paris, 1936; Capart J., Un hiéroglyphe mystérieux. Kemi II, 1929, p. 1-2: 1-2. Mercer Samuel A. B. The Pyramid Texts, Excursus XIX., 1952; PT.386b, Sp.270 – cf. the sed festival of Osorkon II., Naville Éduard. The festival-hall of Osorkon II in the great temple of Bubastis (1887 - 1889) II. Kegan Paul, Trench, Trubner & Co., London .1892, pl. IX.
[14] PT.1544c, Sp.580, CT.V.214a+c, Sp.407, CT.V.225n-o, Sp.408.
[15] PT504a, Sp.314.
[16] PT.1302a, Sp.538.
[17] CT.III.281d, Sp.228, CT.III.282d és 283d, Sp.228,
[18] CT.IV.351d, Sp.343,
[19] PT.547a, Sp.336, CT.IV, 366d-f, Sp.344
[20] HW.I.1350-1351, HW.II.2554-2559.
[21] PT.293b, Sp.254, PT.397a, Sp.273, PT.1432b, Sp.568, PT.280b-c, Sp.254.
[22] PT.332a-b, Sp.262, PT.803a, Sp.437.
[23] PT.276a, Sp.254,
[24] CT.III.160b, Sp.207, CT.III.161b, Sp.208, CT.III.167c, Sp.210, CT.VII.347e, Sp.1076, CT.VII.475g+m, Sp.1132.
[25] PT.283a, Sp.254, PT.486b-d, Sp.307.

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controlled the north wind carrying the birds of Su,[26] and could belong to several other gods, as to Atum, making the deceased fresh, [27] to Ra, being the kA (n) psDt / „*the bull of the Ennead*",[28] to Osiris as kA jmnt / „*bull of the West*",[29] or even to the king himself, who is the „*bull of the night*", without whom life comes to an end. [30] The dead person itself could reach the fields of the Otherworld by transforming himself into this bull,[31] and the ferryman there was called the „*bull of the gods*".[32] Already in the most ancient snake charms, the kA-bull was present.[33] It was the bull of Seth, or a metaphor for any male animal, showing up the masculinity.[34] That is why Horus trampled with his sandals the kA TpHt / „*bull of the hole*", that is, the dangerous snake. The kA-bull promoted the renewal in the Otherworld,[35] helped the deceased through the river there being „*the bull of the river*",[36] not mentioning „*the house of the big bulls"*, where he took his food,[37] or the strange notion of the fnT-worm, having again bulls, for the supervisor of whom the god Anubis prepared the horns.[38] There existed still many other pieces of knowledge concerning them, and various mythical stories, the traces of which can still be found in the ancient religious literature, but it would be too long to list them all. Indeed, the bull took a central place in ancient Egyptian beliefs.[39]

All these facts suggest ancient Egyptian people believed that any part or product of this powerful animal carried the divine character, and thus could transmit the divine healing power. On the other hand, practice had shown them, that the animals were not always healthy and prosperous, thus the gods did not continuously take care of them. Thus they needed divine protection as well. Even so, they realised that rich and prosperous people ate more often beef, than poor and less healthy people, and could establish some connection between eating habits and general health conditions.

Bodily parts used for medical purposes

Taking in the prescriptions from the point of view of the bodily parts of the cattle, it turns out that they were all inner organs, as opposed to other animals, where the outer parts and their products predominate.[40] Inner organs are rarely prescribed: as at the mSa-bird, where the HAtj-heart (Eb81), and the Nile perch, where gnw nw aHA / *its bone* (Eb248) was needed. In

[26] CT.II.254h, Sp.150.
[27] PT.701a, Sp.403, PT.716e, Sp.408.
[28] PT.1238c, Sp.524, PT.717a, Sp.409.
[29] CT.I.100a, Sp.31, CT.I.102-3a, Sp.32, CT.I.107b, Sp.32, CT.I.110c, Sp.32, CT.I.140e, Sp.36, CT.III.294f, Sp.229, CT.III.307c, Sp.237, CT.III.328a, Sp.242, CT.III.347e, Sp.251, CT.IV.94a, Sp.314, CT.V.329h, Sp.456, CT.VI.72h, Sp.492, CT.VI.223e, Sp.609, CT.VI.279d, Sp.658, CT.VII.28r, Sp.828, and Otto, Stierkult.
[30] PT.516c, Sp.320.
[31] CT.III.167c, Sp.210, CT.III.161b, Sp.208. Or he could be transformed also into the sAb.wt / the calf of the spotted cow. (CT.III.166c-e, Sp.211.)
[32] PT.925c, Sp472.
[33] PT.227a, Sp. 227, PT.418a, Sp.277, PT.511a, Sp.318, PT.690, Sp.394, PT.430a, Sp.289.
[34] PT.443c, Sp.298, PT.689b, Sp.393, CT.VI:318e, Sp.688 (hippo), CT.I.270,Sp.62 (goose), etc.
[35] CT:I:45b-c, Sp15.
[36] CT.III.46d, Sp.172.
[37] CT.I.146d, Sp.37.
[38] CT.IV.1b-2c, Sp.268.
[39] Cf. *Otto* Eberherd. Beiträge zur Geschichte der *Stierkulte* in Aegypten. Leipzig, 1938, p. 2-3, Pascal Vernus - Jean Yoyotte, Bestiaire des pharaons, Paris 2005.
[40] For example nHdt nt SA / *the tusk of the pig* (Eb316), pAkyt nt Stjw / *the shell of the turtle* (Eb124), pxt aA / *the secration of the donkey* (Eb334), ryt mjw / *the pus of the cat* (Eb208), Hsw mjw / the excrement of the cat (Eb213) are the medical ingredients.

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the case of the shell-fish, xt jmjt wDayt / *the whole animal* (Eb326) was considered to be the *materia medica*.

We presume, that the cattle's organs were fresh, taken from cattle recently slaughtered. This is certain, when *expressis verbis* the anx / „*living*" is written out (Eb86). It is, however, a question to answer in the other cases. We know about meat suspended for longer time in pantries. Ancient Egyptians also kept food in fat / oil. In addition, it was customary to stock medical ingredients, when they were plants and minerals. Thus animal materials might also be stored for later use. Our sources are mute, however, in this respect. Or, thinking of the relatively rare use of the animal ingredients, it might not have been worthwhile to keep a supply. Experience might also have shown that they got spoiled; their original efficacy reduced over time, or perhaps transformed into an undesired effect. Indeed the difficulties in keeping the proper effects of the organs safe for longer periods of time might have decreased the administration of the ancient Egyptian organ therapy.

In the case of cattle, the situation was, however, a bit different. Here, it could be that it was unnecessary to store the organs, as Egyptian temples needed cattle offering quite frequently, which made their fresh inner organs often available both for the physicians and the patients. This might give the explanation of its different style of use in the animal world. Its relatively rare use compared to that of vegetal materials could be explained in this case by the prices. Cattle was the most expensive animal, thus even to buy a priestly share of it was not be a cheap action.

Beef

The use of the material

As a general rule, open wounds needed treatment the first day with jwf anx / *fresh meat* (e.g. Eb522[41]) by Egyptian experience. In addition, it was also considered good for easing pain. Eb86 prescribed fresh beef with three plant materials and t wAD / „*green bread*", all put into beer and passed through a sieve. The pulp gained this way was then eaten for four days long. Although the prescription seems to be easy to understand, there are various opinions on the meaning of the „*fresh beef*" used.

Guido Majno presents a painting, in which a calf is shown with three legs after the ritual of the Opening of the Mouth has been done,[42] which also needed fresh beef. I do not think, however, that taking a thigh from a living calf could be a general custom to fulfil this or any other ritual. A calf had also a high value, which had to be protected – the veterinary papyrus of Kahun was occupied predominantly with cattle, and the curing performed here by the Sachmet priests concentrated principally on cattle. The yearly counting of the cattle herd was a very important part of the economic life; the number of animals reflected the richness of the owner. Injured and defective animals perished much more easily than their healthy fellows, causing loss for the owner. Their illnesses also endangered the condition of the herd, adding more damage. Altogether, I do not think the amputation of living animals could ever been in

[41] According to the prescription Eb522, decay started by putting the meat on the bleeding wound with suppurating (*pus laudabile* as Roman physicians called it). And this was the first sign of the healing process. Majno Guido. The Healing Hand: Man and Wound in the Ancient World. Harvard University Press, Cambridge, Mass., London, 1975 (rept. 1991), p. 105-106) explained the method to be effective indeed, because the muscles in the meat are working as mechanical stoppers, and the meat has also a clotting effect. Ancient Egyptian explanation was most probably based on the theory of the „*similis similibus*".

[42] *Majno G*. The Healing Hand: Man and Wound in the Ancient World. Cambridge, MA: Harvard University Press; *1975*, 107, fig. 3.19 = Weigall Arthur EPB. , An ancient Egyptian funeral Ceremony. JEA 2, 1915, p. 10-11, and Griffith Francis Llewellyn [Note to the article of Weigall 1915]. JEA 2, 1915, p. 11-12.

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general use. The purchase of the meat of the slaughtered animal could have been, however, a common practice. Slaughtering regularly took place in temples and for funerals. Priests got their shares after the ritual. As these were their salaries they naturally used the pieces to purchase other things for themselves. It was thus advisable to seek the origin of that beef here.
There are however two more possibilities. The fresh, I.e. „*living meat*", may also mean the *raw meat*, without any preparation, cooking, roasting or frying. Now, the fresh beef is written in Eb86 by the expression of jwf n kA anx / „*meat of the living bull*". That seems to support the idea of Majno. But thinking on the ancient Egyptian vocabulary, a new possibility emerges, namely the anx can be a noun with the meaning of the „*young cattle*, i.e. *calf*". If we take this translation into consideration, than the *meat of a cattle's calf* is the ingredient listed.
The beef occurs still in two further forms in the book analysed. The next one is called in the Eb330 as HwA / *rotten* or *decayed* beef. It was applied against lung and throat complaints (gHw) together with several other ingredients. They are mostly vegetal, but goose oil and a probably minerals can also be found among them. They were eaten with beer, after a cooking process.
The third, *fat meat* is expressed by DdA[43], and was used in four prescriptions, although the first two are pairs repeating the same text word by word (Eb192 = Eb195). This is the case mentioned above where the beef helps mask the strong taste of the other ingredients in the prescription. The next two prescriptions refer to the heart which does not want to accept food (Eb284, Eb293). They are again oral medicaments.

Possible ancient Egyptian magical explanation

Fatness was the sign of prosperity and richness. The deceased itself „*became fat*" by the god, when he was transformed into the grain-god Neper. [44] He also grew fat „*on the ribs of Geb*" while he was transformed into lower-Egyptian barley.[45] Of course this all happened in the Otherworld. Fat animals in this world showed that they were well-raised and prosperous, thus giving delicious food – which made them favourite offering for the gods. According to the principle of „*do ut des*", gods gave the same thing to the human beings, thus making them prosperous people. The iatromagical healing worked exactly the same way. Parallel with this, the „*living beef*" was even stronger. It not only made the patient fresh, but kept him alive. The „*decayed, stinky beef*", by contrary, must have been so unpleasant for the illness-causing god living in the patient, that he left him, not wanting to feel the decay. Magical spells using this technique are attested to in the Pyramid Texts and the Coffin Texts. The deceased was also protected from disgusting food. Beef could thus be thought to be an efficient magical material. Considering of these notions, the beef could easily transmit divine help through the treatment of the patient.

Ethnomedical observations

By modernizing older traditions[46] today's industry produces beef in great and varied quantity in dry, powered form for straightening the body, and to feed weak patients. Sometimes physicians suggest its consumption, mainly because of its nutritional value and iron contents. In India, Charaka (born c. 300 B.C.) considered it to be a dietary food, but in India it was not

[43] HW.I.1532, HW.II.2892.
[44] CT.IV.168f, Sp.330.
[45] CT.IV.7g, Sp.269.
[46] E.g. Bartholow Roberts. A Practical Treatise On Materia Medica And Therapeutics, Appleton And Company, New York, 1876 (repr. 1877, 1879, 1881, 1883, 1887, 1889, 1893, 1896, 1899, 1908), pp. 30-33, 39, 46, 49, 56-58, 61-65, 108, 136, 178, 730.

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recommended for everyday consumption, even during much later times.[47] In Thailand, the consumption of beef is generally disapproved of still in the 21st century, but in two cases of flatulence it is *expressis verbis* prescribed.[48]

Potential scientific effects

Beef is an important resource for protein, fat, vitamin and mineral materials,[49] accepted and digested easier this way by human organism than when taken from plants. The average protein content is elevated, and the ratios of the lysine and metonym are higher. Beef assists through its protein, zinc and iron input the development and the unhindered operation of the immune system. Although the haemoglobin content seems to be the same in the various sorts of red meat and poultry, the amount of the myoglobin in beef surpasses that of other types of meat'. Its vitamins control the metabolism, energy circulation, and enzyme functioning and revitalise the organism. It supplies the body with a significant quantity of B-vitamins (B1, B2, niacin, B6, B12). The fat in *fat beef* (jwf DdA) also helps in the absorption of these vitamins. Ancient Egyptians must have experienced these effects during their everyday life.

The *fat beef*[50] is above all else the main source for the anticarcinogen conjugated linoleic acid, and contains much saturated fat, which increases the cholesterol level. They can improve the operation of the organism in case of certain diseases (although high intake can lead to an increased risk of cardiovascular disease and other related disorders). The saturated stearin acid with tails of 18 carbons, for instance, changes into monounsaturated oleic acid during the metabolism, which has favourable physiological effects. The polyunsaturated alpha-linoleic acid is an essential fatty acid, thus must be obtained from food. The distribution of the quantity and the types of the fatty acids in the meat depends on the animal species and even on the fodder, but in general it can be said, that mainly the beef of the young bullock contains less saturated fatty acids and significantly more omega-3 fatty acids than that of the bull. The distribution of the amount of the fat is, however, substantially different among the various members of the same species, than among the different species.[51] Probably ancient Egyptians made use of this phenomenon, too, when they needed explicitly „*fat*" (DdA) beef.

Liver

The use of the material

The liver occurs only once in the „*collected book"*, and is used to treat *contracting in the urine* (Eb267: n mn Hnaw m mwyt=f) which is yet an undetermined condition. It was cured by a sort of cake (pat). However, only two ingredients are, given: anise and liver. Either some sort of cereal is missing, certainly considered as trivial, being included in the expression jrj m pat („*make into a cake"*), or most probably the liver itself functioned as the pastry.

[47] e.g. Udoy Chand Dutt. The Materia Medica of the Hindus, Compiled from Sanskrit Medical Works, by Udoy Chand Dutt, Civil Medical Officer. With a Glossary of Indian Plants, by George King, M. B., F. L. S. Superintendent, Royal Botanical Garden, Calcutta. Calcutta, Thacker, Spink & Co, 1877, p. VII-VIII.
[48] Viraponggse Arika. Ethnomedicine and Materia Medica used by Kui traditional healers in Northeast Thailand. Khon Kaen Univ, 2006, p. 340, 381.
[49] The averidge contents of the domesticated cattle meat is: 70 mg/100g natrium, 381 mg/100g kalium, 10 mg/100g kalcium, 1,6 mg/100g iron and 3,1 mg/100g zink.
[50] Várhegyi Józsefné dr. – dr. Várhegyi József. A marhahús megítélése humán egészségügyi szempontból, http://miau.gau.hu/osiris/content/docs/atk/varhegyine_dec.html (retrieved at 2013.05.10)
[51] Várhegyi és Várhegyi.

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Possible ancient Egyptian magical explanation

From the Old Kingdom on the liver[52] is listed among the offerings, and from the Middle Kingdom it appears in ritual texts, such as the Coffin Texts. It could be a simple offering,[53] but was also identified in cultic anatomical lists with the boat of Osiris in Abydos, the nSmt.[54] The liver of Ra was Ax / „*splendid, useful, beneficial*" through Maat when the god was content,[55] and it had some role in the mythology, although the text mentioning this is a bit obscure.[56]

Human liver was thought an essential organ for life, as archaeological finds show it conserved and mummified from the 4th Dynasty onward. It was put in the so-called canopic vases and chests to be at hand for the deceased in his afterlife. Moreover, a divine being, the human headed son of Horus protected it. This Amset was then again under the protection of a goddess, who was called Selket. This double protection again highlights its importance.

Ethno medical observations

The use of the liver of various animals is widely attested all around the world, and cattle are also counted among the deliverers. In the Levant for instance, during the early Muslim and Ottoman period the population is said to have used it for stomach pain.[57] A bit further afield, in Nepal asthma and dysentery were cured with the similar bear liver. It was even dried and preserved for future use.[58] The liver of cattle is also commonly used in the preparation of medicines in Brazil.[59]

Potential scientific effects

The liver is rich in amino acids, A, B12 and D vitamins, and is an important iron resource. Among the minerals the most characteristics are still the copper, magnesium, phosphorus, potassium, sodium, as well as a relatively high amount of zinc.[60] It also contains riboflavin and folic acid. All these reinforce the organism, and contribute to the restoration of the immune system. The potassium and sodium content regulate the water equilibrium in the body, and normalise the heart rhythm. The sodium influences also the blood pressure. Iron is important in the building of the red blood cells, and for the oxygen supply of the body. The zinc contributes to the work of the enzymes, to the production of the insulin, ensures the completeness of the cells, regulates the contractions of the muscles, and helps to preserve the mental acuity.

Gall

The use of the material

[52] mjst - HW.I.513-515, HW.II.1036-1037.
[53] CT.VII.143, Sp936.
[54] CT.VII.159t, Sp.945.
[55] CT.III.6b, Sp.165.
[56] CT.VII.476e, Sp.1133: The god Shu swA / „*cross*" it with his sledge(? / tm).
[57] Efraim Lev, Traditional healing with animals (zootherapy): medieval to present-day Levantine practice, Ethnomedicine, 2002, p. 110.
[58] Usha Lohani, Zootherapeutic Knowledge of Two Ethnic Populations from Central Nepal, Ethno Med, 6(1), 2012, 45-53 – p. 49.
[59] WMS SoutoI - RRD Barboza - JS Mourão - RRN Alves, Zootherapy in Brazil: an urgent necessity of interdisciplinary studies, West Indian med. J. 58/5, Nov. 2009, p. 494-495.
[60] Örsi Ferenc, Sarudi Imre, Lassú Istvánné, Különböző állatfajok májának megkülönböztetése ásványi összetétele alapján. Élelmiszervizsgálati Közlemények 43/2, 1997, p. 116.

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Ancient Egyptians used two words to express the gall, namely the bnf / „*gall*", and the wdd / „*gall (bladder)*". As we do not have any comment concerning the preparation of these materials for medical purposes, we do not know whether the gall bladder was cleaned from the gall or not. My view is that they did not do this as a clean gall bladder should be classified among the intestines in general, thus using this specific term in the prescriptions should be classified among the intestines in general, thus using this specific term in the prescriptions should signify a different meaning that is, using the gall bladder with its content. Our notion is confirmed by the fact, that for the same aim, i.e. to expel skin disease and break pain, ancient Egyptians prescribed practically the same ointment in Eb113 with the gall bladder (wdd), and in Eb117 with the gall (bnf). Another purpose using the gall was the killing of the roundworm (Eb75). In this case it was eaten with several other ingredients in the form of an fqA-cake. Neither of the words is extant from Old Kingdom texts, and only the wdd is attested during the Middle Kingdom.[61] This time it was used beside the noun „*gall (bladder)*" also as a verb with the meaning „*boil, cook and heat* (a liquid)."

Possible ancient Egyptian magical explanation

We do not know of any mythological role, but because of its strong effects on materials that come into contact with it, some supernatural power could be attributed to the gall. Its greenish colour had in any case special effects according to the colour magic.

Ethno medical observations

The gall of the cattle can also be observed in later times. Among others Rhazes (Al-Razi, died in 923) recommended it in his book „ *The Experimentation of Medical Science and its Application*" for „*expelling*" the sperm from the womb among such *materiae medicae* as the cabbage, the skin of the pomegranate, animal ear-fat, honey, faeces of the elephant, candy and ammoniac salt. The gall can be bought nowadays in Egypt, and is called *baqar*. An Indian medical book which appeared first in 1907 and was republished most recently in 2005, prescribes it for the treatment of measles, chicken-pox, coughing, problems in intestines and skin disorders. The traditional Chinese medicine uses the gall of bear, the content of which is similar, for the treatment of inflammation, convulsion and pain.

Potential scientific effects

The cattle gall takes its greenish yellow colour from the bilirubin, biliverdin and bilifuscin. Lecithin, cholesterol, various types of fatty and gall acids (mainly glycocholats and taurocholats) are also present. These emulsify fat during digestion, and contribute to the absorption of fatty acids. In the Eb75 the gall could emulsify the prescribed ingredients during the preparation process (papyrus crop, pine resin, fat and red natron), then it could help in the intestines through its role in the absorption of the fatty acids, or by contributing to the absorption of the vitamins into the blood. Similar absorption processes could be achieved in the ointment. The gall acid destroys the Gram-positive bacteria and the viruses even if they have a peplum, or lipid envelope. Thus it was indeed an active and effective substance against worms. It is still used today for roborative and purgative medicaments (Enzyme Star, Fel Bovis Purificatum), and in case of jaundice and dyspepsia of the intestines when caused by liver stasis, although it is sometimes substituted by the swine gall. Another property of the

[61] HW.II.757.

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gall acids is the hindering of joining the subunits of the endotoxins. By this process the gall could again play an important role in the prevention of the sepsis.[62]

Marrow

The use of the material

Among marrows ancient Egyptian distinguished the jmAx / „*spinal cord*" and tbn / „*(bone) marrow*". The first one was used in the „*collected book*" for the treatment of pain (Eb141) and sick rectum (Eb162), while the latter one was an ingredient to help the „jb-*heart to accept the bread*" (Eb288).

Possible ancient Egyptian magical explanation

The word jmAx[63] can often be found in the funeral literature, as it was used to express the deceased's desire to reach the eternal life. It was used in the sense of „*provided, venerated / dead*". In anatomical sense is it only known from the Middle Kingdom on,[64] though the hieroglyph sign shows this bodily part. A Coffin Text says, for instance, that the deceased is accepting the offering in the shape of an hTt-ape, and in the description of his position the jmAx is mentioned as a body organ.[65] The situation is similar in some hymns,[66] and in the funeral ritual, e.g. on the inscription of the coffin of NTr-nxtj.[67]

Both prescriptions in the „*collected book*" aimed to alleviate the wxdw-pain. As among the causes of it the mwt and mwtt/„*dead man and dead woman*" is listed, who could return from the Otherworld, the medical use of the jmAx-„*spinal cord*" could be explained by a magical pun: by consuming the spinal cord, the jmAx-„*venerated dead*" moved into the body to the place of the mwt, that is the dead with bad intention, who had thus to depart relinquishing his earlier place.

The habit of marrow eating can be observed all over the word,[68] such as among the material found in the Olduvai excavations[69], and it was probably eaten also by the ancient Egyptians. In a predynastic colony, near the temple of Seti I. in Abydos many tubular bones were found broken up, and thrown in piles.[70] This may be the explanation, as to why the red marrow of the tubular bones, the tbn[71] was known from the time of the Old Kingdom in other meaning, expressing the verb „*to cut (the meat)*". In the Middle Kingdom text of the Ramesseum

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[62] Győry H, Blázovics Anna, "Amit Su készített magának" – Ősi egyiptomi receptek. Fitoterápia, IV/4, 1999, p. 98-103.
[63] HW.I.136-140.
[64] HW.II.251-263.
[65] CT.V.258f, Sp.421: jmAx=f m SS HaA.w „*he is in the nest of the children*"
[66] Erman Adolph. Hymnen an das Diadem der Pharaonen. Aus einem Papyrus der Sammlung Golenischeff, Abhandlungen der Königl. Preuss. Akademie der Wissenschaften zu Berlin, philosophisch-historische Klasse. Berlin, 1911; pPushkin M.314; Lacau Pierre, Chevrier Henri. Une Chapelle de Sésostris Ier à Karnak. I., Cairo 1956, 126-128, p. 126-128.
[67] Blackman AM., Some Middle Kingdom Religious Texts. ZÄS 47, 1910, p. 127, no. j. – on the coffin of NTr-nxtj, the inscription is listing various things for the cleaning of the kA. After the incense and the corn jj jmAx, prj psDw Wsjr – „the jmAx is coming, *the backbone of Ozirisz is coming out*" can be read.
[68] also examples for holocene America: Craig S. Smith, David A. Byers and Cynthia D. Craven, Bison Exploitation in the Wyoming Basin at the Middle/Late Holocene Transition: A View from the Graham Ranch Site, Plains Anthropologist 53, No. 207, 2008, pp. 313-332.
[69] Glynn L. Isaac, Rev: Bones: Ancient Men and Modern Myths by Lewis R. Binford, American Antiquity 48, No. 2 (Apr., 1983), pp. 416-419 – p. 418.
[70] William N. Bates, Archaeological News, AJA 17/1, Jan. - Mar., 1913, 95-147, p. 98.
[71] HW.I.1415, HW.II.2665.

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papyri, however, it expressed the anatomical „*marrow*".[72] The medical application expressed by this word is very rear. In the next „*collected book*" of the Ebers papyrus, for treating the eye, the synonym, the jft „*marrow*" is used (Eb340, Eb397).

Ethno medical observations

In one of the most important works of the Chinese Buddhism, Li Shizhen (1518–1593)[73] emphasized that among the 299 animal *materiae medicae* the cattle and swine marrows as well as the cartilage of cattle and sheep are food rich in protein, fat and gelatine, but they are also medicaments which straighten the bones and muscles, and nourish the human marrow. And this is one of the five main organs in the human organism which guarantee long and healthy life for mankind. But he warns his readers of excessive amounts, saying that it turns over the equilibrium, and with it produces other illnesses. In Ayurvedic medicine its functioning is also explained by a process of conversion of the marrow into the reproductive elements.[74]

The red marrow is not only fine snack on top of the bread, but has been an acknowledged medicament for a long time. Robert Bartholow[75] in his book published 11 times, recommends it particularly that extracted from the rib using glycerine, when the patient is anaemic. His dose is one tee spoon three times a day. According to his explanation, its consummation is suitable also for other deficiency illnesses. It also causes, according to his experiences, the decrease of the white blood cells, and significantly improves the body weight and the operations of the general life functions.

Potential scientific effects

The H shaped grey matter in the spinal cord constituted from neurons in various amounts and sizes, and is surrounded by the white matter being nervous fibre bundles going to the brain. The blood-sheets of the marrow stock a great amount of iron. New researches also discovered that the telomerase enzyme works here continuously (as in the skin and endothelium tissues) guaranteeing the synthesis and preservation of the telomerase which prolong the life by making the cells "immortal".[76]

Intestines / Bowels

The use of the material

The As / bowel[77] of the fat cattle jwA were used to cool the rectum (Eb156, Eb157). Pressed through a sieve together with the other *materiae medicae* it was administered to this organ. Again we do not know the word from early times, just from the New Kingdom, although certainly these organs were known before this time. The word itself is identical with the verb „*hurry, flow fast, hasten, overtake, quickly*", and the noun „*bald-headed vulture*.[78] This last name could probably be developed considering the life style of the carrion-eating vulture.

Possible ancient Egyptian magical explanation

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[72] pRam V. XVIII.54.
[73] Li Shizhen. Compendium of Materia Medica / Bencao Gangmu, 1553-1593 India – Ming Dynasty, China.
[74] Indigenious System of Medicine in India, The British Medical Journal, 2/3272, 1923 (Sep. 15, 1923), pp. 477-480: p. 479. – based on the report of the Government's committee.
[75] Bartholow 1876, 1877, 1879, 1881, 1883, 1887, 1889, 1893, 1896, 1899, 1908.
[76] Geraldine Aubert – Peter M. Landsdorp, Telomeres and Aging. Physiol Rev. April 2008, 88/2, p. 557-579.
[77] E. Iversen, Some Remarks on the Terms amm and Ajs, JEA 33, 1947, 47-51: "*viscera*".
[78] HW.I.18, HW.II.43.

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Intestines played a role in the religious life, as they were thoroughly cleaned and dried during the mummification process from the 4th Dynasty on, and preserved in the canopic vases of the hawk-headed Khebekhsenuf or in the canopic chests, for the eternal life. This Horus son was again protected by a goddess called Selket. Word magic could, however, play a role here too: the word As could speed the illness gods out of the body after the irrigation entered the bowels via the rectum.

Ethno medical observations

Intestines are delicacy in Japan, used for sausages in Hungary and applied various ways in everyday life at several places. However, officinal use can also be detected. In the modern Nigeria for instance, old zoo-therapeutical traditions are still in use in the capital, and there animal intestines are used for the treatment of stomach ache.[79] In Brasilia, according traditional treatment, bowel fat is needed for treatment of calluses on the feet.[80] Its rare medicinal application may be in connection with its nutritional use.

Potential scientific effects

It might be not by chance that the intestines of the fat cattle were prescribed. Their organs had thicker cholesterol and fat deposit on the wall of the intestines, and in them probably more A and D vitamins, enzymes and other materials. Using intestines with these deposits in the medicament, they might contribute to better processing and digesting of food. The enzymes might contribute to the breaking down of the materials which caused the inflammation in the rectum. Another possibility might be an eventual mechanical cleansing of the remnants of the digested foodstuff from the inner walls. Or contrary, the fat in the intestine put into the medicament stack to the wall of the rectum and made it slippery, in this way alleviating the constipation. Yet another possibility might be that the greasy material was needed to treat the inflammation caused by oedema – it could enter this way.

Conclusions

When ancient people use the same material for the same medical aim for hundreds of years, it means that they are the most efficient medicaments available for the given geographical area, technological level and spiritual background. Egyptian medical texts were passed on it this way from at least the Middle Kingdom until the Late Period, which means more than thousand years. It is thus worthwhile to study why they used the given materials, among them the organs of the cattle.

Considering the availability as an important factor, we can say that the various cattle' organs were very well positioned in this respect. Even though they were expensive, they were also relatively easily accessible *materiae medicae*, particularly so when compared to larger game. They were raised in relatively large quantity at the sacred places for liturgical reasons. The priests and other medical personal, among them the "civil physicians" (swnw), could get

[79] Oladapo Olukoya Oduntan - Abiodun Akinyemi - Olugbemiga Ojo - Oladipo Ogunyode- Oluwatosin Adesina , Survey of Wild Animals Used in Zoo-therapy at Ibadan, Oyo State, Nigeria, Intl. J. of Molecular Zoology, 2012, Vol.2, No. 9, 70-73 – p. 71: grey duiker and porcupine. In the case of crocodile-bowel, it is used as anti-poison drug; again for gastritis the pocupine's intestines in India: L.N. Kakati and V. Doulo, Indigenous Knowledge System of Zootherapeutic Use by Chakhesang Tribe of Nagaland, India, J. Hum. Ecol., 13/6, 2002, p. 419-423 – p. 420.

[80] Barros et al., Medicinal use of fauna by a traditional community in the Brazilian Amazonia, Journal of Ethnobiology and Ethnomedicine 8/3, 2012, p. 8.

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them without great difficulty. The aristocracy ate beef regularly; they provided another possible source to purchase any needed parts. They could then be used as an everyday stuff for the patients.

On the other hand, being a traditional offering meant that the animal was held in high esteem. Moreover, several magical connotations can be detected for almost every organ, which is also important from ancient Egyptian point of view. They were convinced that illness was caused directly or indirectly from divine beings, and they had to be expelled, killed or appeased. Not surprisingly, the organs of the cattle are often classified as magical materials which are favoured or detested by the gods. The expert or competent man could manipulate the gods by them, exploiting the opportunity given by the ancient Egyptian attitudes and beliefs.

These *materiae medicae* were, however, also utilised in other countries, by other cultures with different mental dispositions. Some organs of the cattle were used as curing material even in India, where the cow was venerated, and beef forbidden to be used as a food. This gives the idea that some positive rational benefit must indeed be found in their medical application. And in fact, the cure seems to have in certain cases a medical basis – apart of course from the placebo effect or the tender care treatment. Ancient Egyptian texts also attest to the notion that both the disease and the actual physical symptoms had to be treated and cured rationally.

It seems thus appropriate to conclude that the choice of the various parts of the cattle could be interpreted both by the theoretical-religious knowledge of the time and by the empirical and pharmaco-dynamical experiences valid even today. This would suggest that double viewpoints were chosen in the conscious decisions of the master physicians who made up the prescriptions, and also of the practitioner, who had to find the appropriate physical cure and divine contacts at the same time. The above examples were taken from the collected book of the Xt in the Ebers papyrus, and do not say anything about the other prescriptions. Their choice was, however, random and indiscriminate, so it is significant enough to suggest further scientific examinations about their contents and the mechanism that could potentially affect the treatment of patients.

The present work is a theoretical analysis that is based on ancient Egyptian sources, and collected material from medical literature. It gives only an encouraging theoretical background. Thus it would be worthwhile to make further study of ancient Egyptian use of cattle, and research about the bioactive compounds and pharmacological values of *materiae medicae* taken from cattle. Being aware of what materials were useful to people in ancient times, and indeed, that are useful in simpler societies today, and subsequently analyzing the properties of these materials can lead to new discoveries, useful in modern life as well.

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