The Construction and Transfer of Knowledge in the Pre-Modern Era

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Since the dawn of humanity, people have developed concepts about themselves and the natural world in which they live. Concepts that have been developed or employed in ancient and medieval cultures can still be traced and studied in textual, iconographical and material remains.

This volume aims at investigating the construction and transfer of concepts and knowledge between and within various ancient and medieval cultures. We have subsumed these often complicated and entangled processes under the three keywords "finding", "inheriting", and "borrowing". In order to take a great variety of different processes into account, we define these keywords in a broad sense. "Finding" should be understood as any form of construction, invention, or discovery of knowledge. The two other terms describe different transfer processes. "Inheriting" refers to a transmission of knowledge in time from an older to a more recent culture, i.e. a transfer in vertical direction, while "borrowing" denotes a horizontal transfer when a culture receives, adopts, and adapts knowledge from another, roughly contemporary culture.

Methodological Considerations

Talking about construction and transfer of knowledge, we in a first step have to discuss the difficult question what we understand by "knowledge". Our understanding of this term in this book is very manifold and depends on the

context in which knowledge is developed, stored or transmitted. We, therefore, take concepts[1] expressed in words (contributions of Beck, Cooley), symbols (contribution Ellen), phrases, metaphors (Lehmhaus) and rituals (Ellen, Brandes) into account. Besides, certain practices of arts or crafts, ways of systematization (Bardi, Brandes), categorization, classification, etc. in our view fall under the term "knowledge" as well as overarching complex ideas or concepts about certain features of reality (e.g. the moon) or only imagined realities (e.g. the end of the world in fire).[2] In all these fields of knowledges, the human mind is actively combining and interpreting perceived facts and constructing interrelations and more abstract concepts. Never are the pure facts just objectively stated or documented but the human way of understanding and explaining these facts (or imagined facts) plays a central role. The concept of knowledge(s) used in this volume, therefore, combines a social-constructivist perspective[3] with the methods of the history of science and covers all possible forms of knowing.[4]

The common assumption of this volume is that knowledge is handed down in traditions and is transferred between cultures. This presupposes that knowledge is stored in some form (mostly spoken or written words, but also monuments, pictures, rituals, etc.), because otherwise a transfer would not be possible. Moreover, storing knowledge in a certain form will here (as in many other publications) be assumed as a conscious and intentional act on the part of human beings. Two main intentions seem to be relevant: first, to store knowledge for individual purposes (especially in Egypt), and, second, to offer knowledge for transfer – from one person to another, for the future, or for other groups and cultures.

In the field of research on cultural transfer, however, the attitude has changed since the 1990s. Up to that time, the basic assumption was that some primary culture, group, or person had a specific interest in diffusing knowledge to some secondary culture, group or person that was considered inferior (teacher–student, parent–child, sophisticated culture–"primitive" culture, etc.).

1 Concept is understood here as a culturally and cognitively formed and organized conglomerate of properties or knowledge components, cf. e.g. MURPHY, 2002; POMMERENING, 2017, p. 168.

2 See BURKE, 2015. A similarly broad definition is used for the equivalent term "Episteme" in CANCIK-KIRCHBAUM/TRANINGER, 2015, pp. 1f.

3 In the attributions of DETEL, 2007, pp. 670-678. Fundamental are BERGER/LUCKMANN, 1966. See also PÖRKSEN, 2015.

4 LANDWEHR, 2007, pp. 801-813; BURKE, 2015.

More recently, the focus has shifted towards the borrowing- or target-culture, to which a conscious process of choosing and embedding the associated pieces of knowledge is ascribed. This shift in focus is also expressed in the title of this volume: "Finding, Inheriting or Borrowing". We want to examine how target-cultures[5] adopt and adapt these knowledges from other cultures and how they reflect on these adoptions. These mechanisms will be investigated in their historical dimensions as well as through a synchronic perspective by microanalysis of particular texts in the following chapters of this book.

In the past, an oft-used criterion of defining "knowledge" was its legitimation, i.e. that knowledge only counted as "real or true" when it was secured by facts, reasonable and "objective". In this respect, we follow Detel and Landwehr: we do not regard legitimation as the only possible criterion.[6] For, it may happen that mere opinions or beliefs, when taught by some powerful institutions (school, university, church, state, etc.), may in certain cultures become secure knowledge. Moreover, at this point the difficult question arises (and cannot be answered here): what makes knowledge scientifically valid?[7]

One of the many possible answers to this question is that knowledge is valid when it is adequately authorized by generally acclaimed and renowned researchers or legitimized by being part of a long tradition. This strategy can, for example, be observed in ancient texts. It must, nevertheless, be asked whether such a strategy of legitimation must be assumed in all the cases where details about the sources of knowledge are documented. From an intra-cultural (emic) perspective, it may be more adequate to expect many different reasons lying behind the naming of sources. Also, the circumstances of inventing or transmitting knowledge can be manifold and determined by different intentions. Oversimplification and hurried conclusions should be avoided.

These things being said, the real transmission processes often cannot be divided easily purely into vertical or horizontal categories, as the ways by which transmission took place are often entangled. It is at times difficult to determine which is the borrowing and which is the lending culture (see especially Ellen's contribution on this topic). Moreover, one has to bear in

5 The term "culture" is used here in a broad sense, like in the context of research on "knowledge cultures" (Wissenskulturen) and "transfer". It will be understood according to LÜSEBRINK, 2012, *passim*.

6 See DETEL, 2007 or LANDWEHR, 2007.

7 See CHALMERS, 2013.

mind that conceptual similarities between two cultures could be the result of knowledge transfer, but similar concepts could also have developed independently in the different cultures. In the latter case, we would like to speak of "universal" concepts.[8] Since concepts of humans and nature are often very complex, it is crucial to carefully study and analyse the constituent elements of concepts, ideally with an emic perspective, rather than resort to simplistic and rash generalizations.

It is obvious that some of the extant documents concretely refer to their sources, for example, by naming a real or assumed author or place of origin. Egyptian texts often place the origin of certain practices or concepts in the sphere of the gods and assume that the first application of a process or concept happened in a distant past: For example, a passage (Incantation 60 [14.8-15.4]) of the medical papyrus London 10059, written about 1350 BCE, explains the origin of an incantation for the expulsion of male or female *nsy.t*-demons as follows:

> It was at night time that this incantation had been found, it came down (from heaven) into the halls of the temple of Koptos, as a secret of this goddess (i.e. Isis), through the hand of the lector priest of this temple. While this country (Egypt) lay in darkness, it was the moon that shone upon this book-roll on all her ways. It was brought to the majesty of the king of Upper and Lower Egypt, the blessed Kheops.[9]

The end of the reign of Kheops was about 1250 years before the production of this copy. While very long traditions can be traced in ancient Egyptian medical texts,[10] such ascriptions may also have served the purpose to improve the efficiency of the remedy.

Besides such narratives of inventing or first applications of remedies, which deserve a more detailed investigation in an emic perspective, some texts offer an opportunity to understand who (allegedly) compiled already existing knowledge for teaching purposes. In such contexts, masterly scribes are

8 The term "universal" is used neither in the sense of strict nor quasi-universals, but of relative universals. By this, we mean similar phenomena that lead to identical or comparable mechanisms, independent of time and place, i.e. regardless of cultural contacts.

9 Translation: T. Pommerening; the recent edition of pLondon 10059 is LEITZ, 1999. Cf. the translation of this spell IBID., p. 81.

10 See POMMERENING, 2014. In fact, corresponding documents are attested from that time (names and titles of healers; reports about medical texts, pEdwin Smith, etc.).

mentioned as working in the "house of life", a kind of scriptorium and school. In the introduction of the so-called Ramesseum Onomasticon, for example, we read:

> Beginning of the teaching of understanding and instruction of the ignorant. Knowledge of all that exists, which Ptah has created and Thot generated: sky with its signs, earth with everything in it: what the mountains spew out, what is moistened by Nun, (created and generated) as everything useful which Re illuminates: everything that grows on the back of the earth. Devised by the scribe of the Books of God in the house of life, Amenemope, son of Amenemope, […].[11]

Also the Rhind Mathematical Papyrus (approximately 1550 BCE) begins with the following statement:

> Reckoning the "descending", knowing all that exists, [every] darkness, every secret. Indeed, the reckoning is the topic. This book was copied in the regnal year 33, month four of the inundation season, [day … under the majesty of the king of Upper and] Lower Egypt, Aa-User-Re, given life, in resemblance to writings of the ancient times, made in the time [of the king of Upper and Lower Egypt], [Nima]at[re]. It is the scribe Ahmose who copies this writing.[12]

The text, therefore, presupposes an early date of composition as part of a long-standing tradition, and informs the reader about the process of the transmission of knowledge. Writings were copied and reproduced and by that kept at hand for a longer period of time. Archives, libraries, and temple walls served as storage places for collections of knowledge, accessible only to a small group of initiated people, priests for example.

In contrast to such examples, Egyptian administrative texts offer details about how specific knowledge, knowledgeable persons, objects, and concepts spread in the multi-cultural environment of that time. These details can today more easily be understood. The correspondences in cuneiform script from the archives of Amarna and Bogazköy may serve as examples. Medical knowledge was exchanged between these cultures, as can also be demonstrated by medical papyri from Egypt. In these processes, foreign concepts were integrated in and

11 Edition: GARDINER, 1947; translation: T. Pommerening.

12 British Museum, EA 10058. Editions: PEET, 1923 and ROBINS/SHUTE, 1987. See IMHAUSEN, 2016, pp. 66f. for dating. Translation: T. Pommerening.

assimilated to the borrowing culture (cf. Beck's contribution).[13] A reference to the original sources is, however, usually missing.[14] Conversely, foreign origin was put into the foreground in many texts in order to stress acquisitions of precious material goods in particular (plants, minerals, animals).

Latin and Greek texts from Classical Antiquity often feature citations and quotations from authorities such as Homer, Hippocrates, Plato, or Aristotle – to name just a few very prominent examples. In this respect, similar to the Jewish Rabbinic texts discussed by Lehmhaus in this volume, the Egyptian practice differs from the Classical texts, in that human authorities are hardly ever mentioned.[15]

The citation of eminent experts in Classical texts, however, is frequently used to grant an argument authority and legitimize a thesis. Quotations and citations of authorities can also serve the self-fashioning of the author as learned and cultivated and can furthermore highlight the "scientific" character of a work or a part of it (see, for example, Taub's contribution to this volume). This does not mean, of course, that such citations and quotations are always correct according to modern academic standards.[16] Instead, quotations were at times attributed to the wrong person, or taken out of their original contexts where they would have a very different meaning. They are often adapted, or even distorted, or simply fabricated to fit an author's own argument. Bärsch will demonstrate some of these techniques in his contributions to this volume.

Occasionally, it is assumed in Classical texts that knowledge is of foreign origin. This is the case especially for certain "scientific" disciplines such as astrology and the casting of horoscopes, said to have been imported from Babylon or Chaldea,[17] and for geometry, which is generally believed to have

13 For a description of ways of transfer in Egyptian healing practices see POMMERENING, 2018. The adaption of Egyptian concepts within Greek and Latin tradition is subject in EAD., 2015.

14 References to authors in medical texts are only found in Egypt since the Roman era. Cf. on this topic POMMERENING, 2012, p. 35f.

15 In Pharaonic Egypt, human author names occur only in the case of the so-called wisdom or teaching texts, which offer moral approaches and social skills. This also demonstrates that different categories of knowledge existed contemporary to one another.

16 See e.g. DARBO-PESCHANSKI, 2004; TISCHER/BINTERNAGEL, 2010 for discussions of the complex topic of quotations in ancient literature.

17 Altmann-Wendling argues in her contribution to this volume that the Greeks might have actually adopted the Mesopotamian tradition by way of the Egyptians, as stated in several Greek sources.

been borrowed from the Egyptian practice of land survey.[18] Herodotus, for example, is especially eager to find parallels between the Egyptian and the Greek culture in the second book of his *Histories* (e.g. 2.43-53 [name of gods and other religious practices], 2.109.3 [geometry], 2.167 [low societal status of craftsmen]). But as Lloyd puts it:

> This trait (i.e. of finding similarities) can, however, lead to pernicious consequences, since Herodotus has a marked tendency to assume that such similarities are the result of cultural influence, that is, that the older culture[19] has bequeathed the feature to the younger (the *post hoc ergo propter hoc* fallacy).[20]

At times, therefore, our sources tend to postulate foreign influence where there was none, because similarities could also have developed independently and for that reason could be universal in the sense we understand this term in this volume (see above). Besides, it has been shown that knowledge is altered during processes of transfer between cultures. It is crucial to bear this in mind when dealing with texts. König and Schjødt will consider similar processes in their contributions to the present volume.

Another way of attributing authority to knowledge and denoting it as "foreign" in ancient Greek and Latin texts is by referring to myths and reports of events from a mythical past. Such a reference to the foreign can also be used to separate it from a more "scientific" Greek (or other) understanding and thus to stress some kind of progress achieved. In Plato and Plutarch, however, the use of myth as a strategy of authorization seems to be more important, although this needs to be interpreted meticulously in every single case.[21] A famous example is the myth of Atlantis as it is told through several layers of narration by an Egyptian priest in Plato's *Timaeus*. Plutarch's myth about the nature of the moon told by a Carthaginian stranger and deriving ultimately

18 Cf. NEUGEBAUER, 1969, pp. 122-137; LLOYD, 2007, p. 319; IMHAUSEN, 2016 on Egyptian geometry.

19 The Egyptian culture is in Greek sources often regarded as the oldest culture, in that they have the longest continuous history. This is, for example, expressed in Herodotus, *Histories* 2.142 and in Plato, *Timaeus* 22 B 4-23 E 4 (see also the contributions by Taub and Bärsch in this volume, as well as the latter's forthcoming doctoral dissertation on the construction of foreignness in this Platonic dialogue).

20 LLOYD, 2007, p. 235.

21 Cf. COLLOBERT, 2012; JANKA, 2014.

from the chamberlains of the god Kronos is probably an imitation of Plato. Both of these myths serve to convey some knowledge – in Plutarch even supported by more "scientific" arguments – and obviously try to demonstrate an honorable and cross-cultural historical tradition of explaining certain natural concepts. Plutarch's use of this literary technique will be discussed in more detail in the chapter by Taub.

In Egyptian medical texts, the reference to the knowledge of some god of ancient times (as in the incantation quoted above) seems to serve a different purpose. Egyptian gods in medical texts often serve as healers, for example, or as patients in mythical precedents. Doctor and patient are seen in the healing-process as identical to these gods.[22] The aforementioned story about an incantation against demons can be understood as Isis the divine healer treating King Kheops (who, in his capacity as Horus, reigns the country) as her patient. According to this precedent everyone else afflicted by a demon will also be healed.

Divine knowledge plays a role in classical Greek and Latin literature as well (as just seen in the case of Kronos). According to the traditional concept of epic poetry, the poet sings being inspired by the muses.[23] Invocations of the muses and of other gods are therefore often found at the beginning of epic and didactic poetry. Moreover, the Platonic Timaeus (in the dialogue named after him) invokes the gods before recounting the "probable myth" (εἰκὼς μῦθος) about the *demiurgos* creating the world (*Timaeus* 27 C 1-D 4).

The invocation of the muses, however, soon became a *topos* without implying that people generally believed in it.[24] In Greek and Latin "scientific" works proper, especially those of later centuries, divine knowledge does not seem to be as important as it is, for example, in the ancient Egyptian culture, or in Jewish and Christian texts, as Cooley, Lehmhaus, and Bärsch will

22 There are of course many instances where a god acts as a healer in the Graeco-Roman culture(s) as well. Probably most institutionalized examples are Asclepieia, temples of the god Asclepius, where people came to sleep overnight, with the god thought to appear during sleep in a dream and to treat diseases and ailments of all kinds. Aristophanes has described such a scene in his comedy *Plutus* (verses 653-747).

23 The *locus classicus* is Hesiod, *Theogonia* 22-34. A detailed discussion about this conception is also found in Plato's dialogue *Ion* 533 C 8-536 E 7.

24 Seneca, for instance, challenges this view on the production of poetry in his 84th *Letter to Lucilius* (see BERRENS, 2015). It has to be noted, though, that we do not know for certain what the early poets Hesiod and Homer believed when employing this strategy.

demonstrate.[25] In the context of personal or political advice, however, it was assumed by many people from different cultures that divine knowledge was revealed through oracles, *omina*, horoscopes, etc.[26]

In Classical Antiquity, such use of quotations referring to foreign or even divine knowledge was, of course, not the only means of gaining (and legitimizing) knowledge. Quite to the contrary, personal observation and logical conclusions such as syllogisms were often regarded as of higher epistemic value than book-knowledge.[27] Aristotle, for instance, had a clear "scientific" programme, which he explains, for example, in his *First Analytics* (I 30. 46 a 17-27).[28] According to his method, it is important to collect empirical evidence first and derive a theory explaining the single phenomena in a second step.[29] But he, nevertheless, systematically reviews the ideas and

25 In the *Corpus Hippocraticum*, for example, we find the famous short treatise *On the Sacred Disease* (περὶ ἱερῆς νούσου), which fiercely opposes all assumptions of a divine causation for this specific condition; it is, instead, emphatically explained by natural factors. Cf. VAN DER EIJK, 1990, pp. 87-119.

26 There is an abundance of literature on this topic; see e.g. TRAMPEDACH, 2015; STRUCK, 2016 for Greece and Rome, QUACK, 2010, NÄTHER, 2010 for Roman Egypt, MAUL, 2018 for Mesopotamia.

27 Even in the literature concerning natural phenomena of the Roman Imperial Era, which is often regarded as more literary and anecdotal than "scientific", authors like Aelian (see e.g. KINDSTRAND, 1998, p. 2971f.) and Plutarch give the impression of relying on empirical evidence. Although this is probably not true, the fact that they claim to have own observations or reliable eye-witness accounts clearly demonstrates that they acknowledge the priority of empirical evidence over book-learning. A useful example of this is found in Plutarch's dialogue *On the intelligence of animals* 8. 965 D where the participants of the dialogue state they would prefer to rely on Optatus' *empeiria* rather than on Aristotle's authority. Cf. e.g. BERRENS, (forthcoming), but also MOSSMANN, 2005, p. 154 for a slightly different interpretation of this passage.

28 See e.g. KULLMANN, 1974, pp. 204-220; ID., 2007, pp. 156-181; ID., 2014, pp. 157f.; ALTHOFF, 2018 for detailed discussions of Aristotle's research programme and how it was opposed to Plato's epistemology. For the latter see e.g. ERLER, 2007, pp. 354-375 and also the contribution by Taub in this volume.

29 If observations had not been made so far – such as in the case of the generation of bees –, Aristotle resorts to theoretical considerations, but highlights that these theories have to be revised according to new observations (*On the Generation of Animals* III 10. 760 b 27-33). Cf. e.g. FÖLLINGER, 1997, p. 385; BERRENS, 2018, p. 153.

explanations of earlier thinkers and takes them as serious starting points for his own enquiry.[30]

In the Roman Imperial Era, we again find very different ways of constructing and transferring knowledge. Scholars commented on the works of older researchers (especially Aristotle, but also Hippocrates) with different purposes in mind. Their basic attitude was that the older authorities deserve to be read, carefully studied and kept in mind. In the case of Aristotle's biological writings, this philological treatment of older texts is strangely accompanied by a growing neglect of serious biological research. Encyclopaedic works like that of Pliny the Elder's (ca. 23-79 CE) thirty-seven-volume *Natural history* rely heavily on older written sources, which are extensively mentioned. Such texts can at least partly be understood as literary projects of epitomizing and collecting knowledge and wisdom of a globalized world from older authorities in order to praise nature in all its aspects and demonstrate its relevance for humans. They are also examples of the cross-cultural appropriation of the wisdom of earlier cultures on the basis of Greek texts by the politically dominant Romans, and that even holds true for Roman citizens writing in Greek (such as, for example, the commentators on Aristotle, Lucianus, Galen, or Diogenes Laertius). Knowledge about humans and nature became in these examples primarily a part of a general educational programme. The practice of commenting on or extracting from older works is, of course, no invention of Greek or Roman authors. Both ways of dealing with texts can already be found in much older Mesopotamian or Egyptian literature. The intentions behind these strategies, however, may be different.

Nevertheless, knowledge in this era was not only gained by reference to older authorities. In some more practical disciplines like medicine (Galen), architecture (Vitruvius), and warfare (Frontinus), new insights were provided by empirical observation and logical reasoning. This is also the case in certain mathematical sections (Diophantus, Pappus). Although even the authors of such works were conscious of the older tradition and built on it (Galen, for example also commented on the works of Hippocrates), they were also interested in finding substantially new knowledge.

30 Many of his works begin with what modern scholars call a "doxography": a survey of older positions on the topic. This is quite similar to what modern scholars do when they summarize the state of research in the introduction of their books. For Aristotle, see ALTHOFF, 1999, pp. 57-94.

With the rise of Christianity, a new attitude towards gaining and transferring knowledge developed. This new religion evolved from Jewish origins, and similarly depended on a specific series of holy books. The New Testament contains texts that are understood as revelations of the Christian god's plan and will to humans. By this, they are at times thought to represent an insuperable and unchangeable source of knowledge. Such an authorization by tying knowledge back to the word of a god (in this case, the only god) resembles the practice employed in some Egyptian texts and in some of the Platonic myths. In the case of the Bible, however, this strategy was stretched to the utmost: all human knowledge, and especially the knowledge of non-Christian authorities, was massively invalidated by comparison with the true knowledge of the Christian god. Humans can approach the wisdom of God, but they can never reach it.[31]

This attitude fundamentally changed how ancient pagan authorities were handled. At first sight, they have become useless for Christians. But because Christians strove to find a place among educated Romans, they had to take pagan knowledge into account. In the movement of the so-called Apologetics (second century CE),[32] Christian writers tried to defend the basic tenets of their belief against pagan polemic and distortion. This could only be done by entering into a pagan philosophical and literary discourse in order to argue on the same level as the opponents. By this "backdoor" the earlier pagan authorities regained some importance and became influential models for the development of literary strategies and a philosophically supported theology. A blending of Christian and pagan concepts was the inevitable consequence. Bärsch's contribution to this volume offers important insights into these ways of dealing with pagan sources. Lehmhaus demonstrates a similar process in the rabbinic discourse dealing with the medical knowledge of Late Antiquity.

The Christian faith was officially recognized by the Roman state under the reign of Constantine the Great (ca. 280-337 CE). The Christian religion was by this strongly linked to political power and its influence on all fields of culture steadily increased. This had a strong impact on the construction of knowledge, which also extended until the medieval period in Western and Eastern Europe (roughly from the fifth or sixth century until the fifteenth century). Nature as a whole was in this context regarded as God's creation working according to his plan. Nature was studied in symbolic terms as a means of recognizing God's

31 Cf. PIEPENBRINK, 2010, pp. 45-49; 104-106.
32 Cf. FIEDROWICZ, 2002, pp. 50f.

intention, with conclusions about the morally appropriate and faithful behaviour of humans drawn from natural phenomena. The ways in which nature was interpreted were similar to the allegorical interpretation of texts, especially of the Bible, which were, analogous to nature, regarded as a revelation of God's intentions. That lies behind the origin of the term "book of nature", a conception probably introduced to Christian thinking by Augustine, which became a much-repeated phrase in subsequent centuries.[33] Again the contribution by Bärsch sheds light on the ways in which medieval scholars used older textual authorities. Quite similar strategies of amalgamating religious and secular fields of knowledge are examined in Lehmhaus's paper. Understanding secular knowledge in the context of a highly valued holy book is, therefore, not restricted to Christianity, it is – in view to the cultures in this book – also quite common in the Jewish religion. From the twelfth century CE at the latest, however, the observation of nature became more and more important.[34]

At the beginning of the Renaissance, the reception of ancient scientific and medical knowledge was still important. But it soon became obvious that the traditional natural philosophical models in astronomy/cosmology, or medicine, for instance, could no longer explain more recent discoveries by, for example, Tycho Brahe, Johannes Kepler, and Andreas Vesalius. Personal observation, experiments and "facts" – a neologism of sense coined in this period[35] – soon became the key elements of scientific research and epistemology.[36] Ancient authorities, however, were still cited and honored, though often in order to fashion oneself as a "new Aristotle, Pliny or Galen" who would surpass even the achievements of these ancient authorities, correct their errors and shortcomings, or even find new knowledge themselves. Moreover, it was sometimes considered important to trace the history of a discipline back to Classical Antiquity or even beyond in order to grant one's own research authority as part of a long continuous tradition. In this case, even biblical figures like Abraham[37] or ancient gods and heroes[38] could be mentioned as the

33 Cf. SPEER, 1995, p. 30, note 53; NOBIS, 1999, pp. 814f.
34 Cf. e.g. SPEER, 1995; HARRISON, 1998, pp. 34-63.
35 Cf. WOOTTON, 2015, pp. 251-309.
36 Cf. e.g. SERJEANTSON, 2006, pp. 132-175; CHALMERS, 2013; WOOTTON, 2015, pp. 249-428. An interesting chapter on early modern scientific methodology (*Introitus de indagando vero*) can also be found at the beginning of the *Opuscula physica et chemica* (1779-1790) by the Swedish scholar Torbern Bergman.
37 Cf. REMMERT, 2015.

founding fathers of a particular scientific discipline. The Christian god was, however, still very much present in many scientific texts of this period. This was not least due to the fact that many of these texts were written by clergymen, Jesuits in particular. Carolus Linnaeus, for example, printed an invocation of God (Psalm 104.24) at the beginning of every edition of his *Systema naturae*, from the first edition of 1735 to the twelfth published 1766-1768.

Extensive travel during this period led to increased contacts between European and other cultures (e.g. from the newly "discovered" Americas). Travelling is, obviously, a characteristic feature of all the cultures treated in this book from early on. Encountering other cultures always leads to similar experiences of otherness and similar strategies of dealing with different people and their knowledge. Travellers usually adapt their newly acquired knowledge to their needs within pre-existing epistemological and ontological categories. For example, newly encountered species are named and classified according to pre-existing taxonomic or other systems.[39] Ellen will describe quite similar approaches and strategies to include newly introduced species by the Nuaulu people in eastern Indonesia.[40] Such processes of dealing with other cultures and their knowledge are, of course, not new and the mechanics that are at work in such situations have in the last decades been described using different models of cultural transfer.[41] Some of the contributors to this volume (e.g. Beck, Bardi) use terminology developed within these models.

This very brief overview of the manifold strategies employed in dealing with found, inherited, or borrowed knowledge illustrates that some of these

38 Think of Hercules and Atlas as the founding fathers of astronomy (cf. REMMERT, 2007) or Hermes Trismegistos as the founder of alchemy (cf. e.g. ABRAHAM, 1998, pp. 100f.). It was common in alchemy to interpret ancient myths as allegories for chemical reactions. An especially appealing example for this way of dealing with ancient myths is found in MICHAEL MAIER, *Atalanta fugiens* of 1617.

39 Cf. e.g. DE ASÚA/FRENCH, 2005 for Europeans' encounter with South American fauna.

40 These patterns and processes of lexical acculturation could be universal as e.g. GOLDWASSER, 2017 demonstrates with similar observations about the lexical integration of words for "horse" in the ancient Egyptian, Sumerian, and Nahuatl languages.

41 The following list contains only a few examples for a great variety of theories and methods from this thriving field: ESPANGE/WERNER, 1988; BISANG, 2004; ASH, 2006; WERNER, 2009; TOEPFER/BÖHME, 2010; LÜSEBRINK, 2012; HELMRATH et al., 2017.

strategies are attested throughout history up to the present, while others are specific to certain cultures and eras. It can be summarily stated that most of the cultures highlighted here (of Egypt, Greece, Rome, medieval and early modern Europe) were in contact to each other synchronically or diachronically. This makes it difficult to grasp whether episodes of the invention, borrowing, or adoption of concepts, as they are assumed in the sources, actually occurred. Identifying and understanding the interrelationship between diverse strategies of reception and the changes concepts undergo in this process leads to a more detailed comparative view of the key mechanisms at work. This is the aim of the contributions to this volume. An earlier volume attempted a cross-cultural comparison of the concepts associated with the beginning and end of the world.[42] One preliminary result was that the introduction of a new concept works most effectively when it is combined with well-known older concepts and familiar ways of presenting it. This result will here be reconfirmed by focusing on other topics.

In our Research Training Group, we in every case ask whether we are dealing with specific or universal phenomena. This question can be applied to the concepts of knowledge as well as to the strategies involved in the transfer of knowledge, which are the focus of this volume. It leads to several more specific questions, to which this volume tries to find answers, namely:

From which **sources** is knowledge derived (personal observation, divine revelation, studying authorities, etc.)? Is there a hierarchy of sources ranked in terms of authority? Are the sources as they are named in the documents historically correct or fictive and fabricated? What **strategies** are applied to invent or construct knowledge of humans and nature? Are there conscious or unconscious strategies involved in the legitimation of transferred knowledge? Does a **concept** or at least some part of it originate in one specific society at a certain period or is it taken over from another culture by an act of borrowing, or from an earlier era by an act of inheriting? How is such external knowledge integrated into the new context?

Naturally, these questions cannot be answered exhaustively in the present volume. It rather aims at giving a few insights into theoretical and methodological discussions by scholars, who tried to trace and study the construction, transfer, and justification of conceptual knowledge in premodern eras. Furthermore, the volume contains case studies that illustrate by way of example how knowledge was construed, legitimized, and transformed.

42 Cf. GINDHART/POMMERENING, 2016, p. 131.

The intention is to stimulate and foster further multidisciplinary investigations in this field, which may in the future not only be focused on ancient and medieval cultures. In the long run, further interesting questions could be examined, as for example: To what degree and why do other cultures and other disciplines refer to certain traditional or historical forerunners or construct such traditions anew? It would also be worth looking at the way such references are made in terms of language, rhetorical, or narratogical strategy.

The structure of this volume

The present volume consists of three sections. The first section contains five papers that treat various theoretical and methodological aspects of the construction, justification, and transfer of knowledge. The papers illustrate their findings through case studies in the fields of anthropology, Egyptology, Jewish, and Byzantine studies.

Ellen provides a broad overview of different approaches to the question of cultural transfer and demonstrates that over-simplistic methodological approaches are misleading. He states that the transfer of complex concepts similar to most of those examined in this volume may be too difficult to allow for an adequate level of understanding, due to too many aspects being involved. As the basis for his discussion, he concentrates on the Nuaulu people of the Seram island of Indonesia, who adopted formerly unknown plants into their own classification system. Ellen concludes by identifying several general problems associated with investigating cultural transfer. They all arise from a plurality of mechanisms involved in processes of transfer. Spatial movement (horizontal transmission, in our terms: “borrowing”) and temporal movement (vertical transmission, our “inheriting”) are basically the same and often overlap. The forms of transmission and the methods of analysing it may vary between different cases; the movement of ideas is not a mechanical process of simple “replication”, rather, it is much more complicated and often recursive. These caveats make it difficult to find the right methodological approach.

The contribution by Beck employs a model for researching cultural transfer that was developed by Karsten Heppner in the field of industrial management. The model is structured in terms of three entities: the producer of knowledge, the process of transfer, and the receiver. According to this model, the process of transmission works on different levels of which the highest and most

complex is “acculturation in the form of integration”. It leads to a detectable change in the receiving culture. In her example, Beck demonstrates this outcome for the transfer of the concept of the Mesopotamian demon Sāmānu to Egypt.

Cooley takes as his starting point the recent “constructivist turn” in the study of Mesopotamian cultures. Scholars applying this new approach have successfully demonstrated that the various Mesopotamian as well as the Jewish culture can be termed as “epistemic cultures”. The production and copying or adapting of texts was a central activity and the adequate explanation and understanding of texts was the most important aim. Even Jahwe was seen as a skilled scribe in the Jewish tradition, which proves the dominant role of text-related activities. Through two examples of how the name “Israel” was etymologized, Cooley demonstrates that the typical scribal attitude of comparing similarities in sound and writing of words are used to construct knowledge.

The topic of Lehmhaus’s contribution is the construction and transfer of medical knowledge within Jewish religious discourse in Late Antiquity. He specifically focuses on the analogies and metaphors used in describing and understanding the female body in rabbinic texts; the comparison to a house is central in this respect. Similar to the production of Christian literature, rabbinic texts develop within a cultural competition among and between elites. Their religious discourse combines with an interpretive practice trained on understanding the Bible and thus creates medical knowledge of the body.

Sections II and III consist of case studies on certain concepts that can be found in different cultures and historical periods. They stand in a roughly chronological order. In many instances, the evidence suggests a transfer of knowledge from one culture to another. The conclusions at the end of each section not only summarize the single contributions, but also highlight the conceptual commonalities and differences between the cultures or groups in question. They, moreover, aim at outlining the processes of the construction and justification of culturally specific pieces of knowledge and at identifying acts of finding, inheriting, or borrowing.

The first of these sections (i.e. Section II) discusses the knowledge of the moon in ancient Mesopotamian, Egyptian, and Graeco-Roman cultures. Since the earthly satellite is a prominent natural object that can be observed all over the world, it is an excellent case-study for intercultural comparisons. While the physical features of the moon (waxing, waning, eclipses etc.) are described in

more or less the same way in different cultures, their interpretation is normally shaped by the concepts prevailing within a specific culture and period. Such concepts can be transferred from one culture to another. The papers in this section examine varying ways of conceptualizing the moon and its physical features in different cultures, focusing especially on the justification and legitimation of knowledge of the moon.

In contrast to Section II, Section III deals with different ways of conceptualizing the end of the world in fire. Naturally, such apocalyptic visions, may they refer to the world alone or to the cosmos as a whole, cannot rely on direct observation. Insofar as this final destruction is mostly conceived as a natural (and sometimes even periodically recurring) process, it can be addressed as a concept of the working of nature. Similar concepts and visions can be found in many cultures and the question arises, whether these ideas developed independently (and thus are universal according to our terminology) or whether they were taken over from somewhere else. The papers in this section dealing with texts from Graeco-Roman, Iranian, Old Norse and medieval Latin literature try to answer this and other related questions.

Preliminary Results: Finding, Inheriting or Borrowing Concepts

Different strategies regarding finding or constructing of knowledge are applied in the various cultural contexts dealt with in this volume. Empirical evidence and observation are, of course, important and probably universal ways of gaining knowledge. Thereby, often similar concepts could develop independently as, for example, in the case of certain conceptions of the moon in ancient Mesopotamia (Brandes) and ancient Egypt (Altmann-Wendling). In the ancient Near Eastern, Jewish and Christian traditions – as demonstrated in the contributions by Cooley, Lehmhaus, and Bärsch – another, often not alternative, but rather complementary way of constructing knowledge is found: acquiring knowledge through the exegesis of sacred scriptures. Because biblical texts were regarded as the words of the Judaeo-Christian god through which he expressed his will directly to humans, knowledge gained from these sources was usually given a higher authority than knowledge gained by observing nature. This did not imply, however, that knowledge could not be gained from observation of natural phenomena (as was, e.g. Plato's

conviction[43]). Quite the contrary, because for Jewish and Christian writers the will of their god was also found in his creation, i.e. the phenomenal world, it was also possible for them to find some parts of the truth through empirical evidence.[44] Since in their view this kind of knowledge was not revealed directly, however, it was considered to be vague and less reliable. It is important to stress that knowledge constructed or acquired through these strategies is – from an emic perspective – not "new". On the contrary, as Cooley highlights, this pre-existing knowledge is supposed to be discovered or found.

A similar case of variant approaches to knowledge is discussed in Taub's contribution on Plutarch's work *De facie in orbe lunae*. In this dialogue, conceptions of the moon are presented in a more "scientific" way, while also appearing in a myth told by a Carthaginian stranger that ultimately goes back to the chamberlains of the god Kronos. Taub argues that these two different approaches of explaining the outlook of the moon are also not meant to contradict, but rather to complement each other.

As it has already been stated above, tracing knowledge back to a divine origin (demonstrated by many contributions, e.g. Cooley, Lehmhaus, Beck, Bardi, Taub, Bärsch) can be a means of legitimation in many different cultures. Another important way of legitimizing knowledge is through the reference to eminent human authorities (see, e.g. Bardi, Taub, Bärsch) or to the (alleged or real) antiquity of knowledge (see, e.g. Bardi, Brandes, Taub).

The adaptation and incorporation of foreign knowledge are also important topics. Several contributions (see especially Ellen and Beck for theoretical considerations) clearly show that ideas and concepts were not just taken over from one culture to another. This is even true in cases of direct quotations or where the transport of clay tablets can be demonstrated (Brandes), i.e. where the physical "vessels" of knowledge were transferred from one region to another. Quite often, only certain elements of the original concepts were incorporated into another culture, where they were usually transformed, re-arranged, re-interpreted, etc. in the transmission process to fit pre-existing concepts and ideas of the culture that borrows or inherits it. Sometimes borrowed elements are only superficially actualized and transformed, for example, by way of translation, in order to serve practical needs, but often the

43 Cf. ERLER, 2007, pp. 354-375.

44 The phenomenal world was therefore also referred to as the "book of nature", see p. 24 with note 33 above.

borrowed or inherited knowledge has to be adapted further to cultural practice or moral and religious belief. This is, for example, the case with Christian texts that refer to pagan knowledge (Bardi, Bärsch) or the Babylonian astrology borrowed by Egyptians from Mesopotamian cultures (Altmann-Wendling).

There are different strategies for dealing with external knowledge. On the one hand, the fact that knowledge might stem from another culture is not explicitly mentioned in many cases. Indigenous and foreign elements are blended into quite a homogenous narrative in which the single parts can no longer be easily separated. This blending and the tacit appropriation of foreign material is one way of including external knowledge by concealing its origin either deliberately or (probably more often) inadvertently (e.g. Lehmhaus, Beck, Brandes, Altmann-Wendling, Schjødt).

On the other hand, there are examples, especially in ancient and medieval Greek and Latin texts, where the external origin of knowledge is highlighted. This can serve a social distinction by knowledge where an "in-group" tries to distinguish itself from a supposed "out-group" (see especially Bardi and Bärsch's contribution on Otto von Freising), of which the latter is often regarded as inferior. In order to legitimize the use of foreign knowledge, strategies of appropriation are employed, for example, by arguing that all knowledge ultimately derives from the Christian god and is revealed in different ways. Such an approach, on the contrary, leads to the levelling of social distinctions, because all humans in all cultures basically partake in the common knowledge of god.

A third model is presented in Taub's contribution. Plutarch seems to accept foreign and domestic modes of explaining the face in the moon as equivalent. Taub argues that the mythical account by the Carthaginian stranger is not meant to be of lower epistemic value than the more "scientific" Greek sources also referred to. The mythical account is rather meant to offer a different, yet complementary explanation. This is clearly not just a distinction between foreign and domestic knowledge but also between a mythical and a more "scientific" way of explaining natural phenomena.

Furthermore, it is sometimes difficult to clearly distinguish "source" from "target" in the process of transmitting knowledge. The reason is that the transmission of knowledge can go in two directions, rather than solely in a one-way horizontal or vertical direction (e.g. Ellen). Moreover, it is often difficult to determine whether similar concepts in different cultures are really

the result of a transfer process or have developed independently and can thus be regarded as universal (e.g. König, Schjødt).

Closely related to this point is the fact that we cannot always trace a "real" source of knowledge. It has been stated above that we sometimes find direct quotations of predecessors and authorities, especially in ancient and medieval Greek and Latin texts (Bardi, Taub, Bärsch). But since such citations of authorities can be a means to legitimize an argument, they are not always "correct" according to modern academic standards. Texts stemming from ancient Egyptian or Jewish cultures, by contrast, do not usually mention their sources explicitly nor cite specific human authorities (Beck, Lehmhaus). This can also be observed in classical Greek or Latin texts, for example, where Aristotle seldom expressly refers to his teacher Plato but quite often chooses a looser form of reference ("some say" or the like).[45]

To conclude, we can clearly see that there are various **sources** from which knowledge is in reality or allegedly derived. These can be, for example, divine revelation, the natural world, older or more recent authorities from one's own culture or from another culture. These different sources are often not strictly separated from each other as various sources can be adduced together. In some of these cases a hierarchy of sources ranked in terms of authority is established, for example, where knowledge from divine revelation is regarded as being of higher epistemic value than the observation of nature. A clear origin of the knowledge being employed in the argument is not given in every case, however, and even if an origin is stated, this does not imply that this ascription is always traceable and historically accurate.

The question of what **strategies** were used to find or construct knowledge is closely related to that of sources. An important and probably universal strategy is the diligent observation of natural phenomena. The close reading and exegesis of texts, of sacred scriptures in particular, communication with bygone or foreign contemporaneous cultures, often also through written texts, are further means of finding and constructing knowledge. Moreover, there are different strategies associated with the legitimation of knowledge. This could be done, for example, through citing an eminent authority (that could also be

45 This habit is the reason why the collection of Pre-Socratic fragments by Diels/Kranz is divided in the parts A (containing indirect references) and B (containing direct quotations), although there is agreement among scholars today that this division is often problematic.

foreign) or even claiming divine origin, quite often also through highlighting the antiquity of a tradition.

It is often difficult to determine whether similar **concepts**, or at least certain parts of them, in two different cultures are the result of an act of transmission or have developed independently. Therefore, they must be carefully studied in each case. It can be stated, however, that concepts are usually not just transferred unchanged from one culture to another, but rather they are adapted during the transfer process by employing a wide array of different strategies. Different strategies can be applied in order to facilitate the integration of foreign concepts. An especially fruitful, yet often unconscious strategy is to connect or even blend new elements with pre-existing concepts. This serves foreign knowledge in particular because it obfuscates the foreign origin. If the foreign or bygone culture from which knowledge is borrowed or inherited is, however, highly valued, this origin can even be highlighted to authorize, for example, a thesis. Another way of appropriating knowledge is to assume a common, often divine source from which all knowledge ultimately derives.

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