tion maps that show the situation from the middle Epi-Palaeolithic period to the end of the Neolithic and beyond. In fact, as already indicated, occasional finds of O. have been noted on a few sites as early as the Upper Palaeolithic period. The picture is no different in the middle Epi-Palaeolithic: only two sites in the north Zagros, and two in the north of the Levantine corridor have produced O. In the final Epi-Palaeolithic, occurrences of O. become a little more frequent. Two sites in the north Zagros (Šānidār and nearby Zāwi Čemi), and five sites in the Levantine corridor (among them Tall Mureybet, Abu Ḥureyra and Eynan) have small amounts of O. Hallan Çemi, near Batman in southeast Anatolia, which was first occupied late in the final Epi-Palaeolithic, is exceptional. It is situated relatively close to the Bingöl O. source, and has produced large amounts of O., accounting for more than half (57%) of its consumption of chipped stone.

At the beginning of the Neolithic, the proportion of sites with O. increases, but it remains an infrequent occurrence on archaeological sites. Many sites are known where no O. is documented. In general, amounts of O. in the exchange network of settlements at some distance from the source areas were very small indeed. Cauvin and Chataigner (1998, 333) comment on the more systematic presence of O. on sites across the northern arc of the hilly flanks zone, into the north Zagros at one end, and into the Syrian middle Euphrates at the other, which may be related to distance from the sources. Although O. from Göllü Dağ in Cappadocia has been identified on sites in the Levantine corridor, and although it is thought that at least one of the chipping workshops adjacent to a major source was already in use, no contemporary settlements are yet known in central Anatolia. If O. was passed through a network of settlements, we lack most of that network, particularly the sites in the first three or four hundred kilometres radius around the central Anatolian sources.

By the beginning of the PPNB period, the proportion of sites that are known to have O. rises to 70%. By contrast with the previous period, we know of the existence of communities living close to the Cappadocian sources. The rest of the PPNB period follows essentially the same pattern as the beginning of the period, and we can conveniently take the whole of this long period as one. Cauvin and Chataigner (1998, 335) describe how the usage of O. varies from one part of the region to another. The whole process of production is represented on sites in central Anatolia and (relatively) near to the east Anatolian source areas of Bingöl and Nemrut Dağ; these sites, for example Aşıklı Höyük, Çayönü and Cafer Höyük, have produced blocks of O. direct from the sources, cores and débitage, as well as blades and retouched tools. In north Mesopotamia and the north Zagros, some cores and pre-forms, as well as some chipping débris are found, along with the tools that were in actual use. Whereas almost all the range of tools and weapons might be made in O. at Aşıklı Höyük or Çatalhöyük, at Nemrik, in north Mesopotamia, the excavators noted that O. was used for some tools and not for others; the projectile points, for example, were all made from flint or chert. In the area of the Euphrates in north Syria and the Damascus basin, quantities of O. are much less than further north, and only a little débitage has been noted. In such circumstances, we may suspect that the débitage is the by-product of re-working damaged or broken O. pieces. Sites in Israel and Jordan produce very small percentages of O. usually in the form of blades and bladelets, as well as some small flakes and odd splinters.

Whereas we saw in earlier periods that amounts of O. in use increased over time, towards the end of the aceramic Neolithic period, in the last quarter of the PPNB, there are signs at one or two sites that amounts of O. in circulation were reducing.

H.-G. Buchholz 2000: Ergänzungen zu einer Obsidian-Bibliographie, Studia Troica 10, 251–277. – M.-C. Cauvin 1991: L'obsidienne au Levant préhistorique: Provenance et fonction, in: Cahiers de l'Euphrate 5/6, 163–190. – (ed.) M.-C. Cauvin/A. Gourgaud/B. Gratuze/N. Arnaud/G. Poupeau/J. L. Poidevin/C. Chataigner 1998: L'Obsidienne au Proche et Moyen Orient: Du volcan á l'util (BAR Int.Ser. 738). – J. R. Cann/C. Renfrew 1964: The characterization of obsidian and its application to the Mediterranean region, Proceedings Prehistoric Society 30, 111–33. – A.-O. Pollmann 1999: Obsidian-Bibliographie, Artefakt und Provenienz. Der Anschnitt. Beih. 10. – C. Renfrew/J. E. Dixon/J. R. Cann 1966: Obsidian and early cultural contact in the Near East, Proc. Prehist. Soc. 32, 30–72; eid. 1968: Further analyses of Near Eastern obsidians, Proc. Prehist. Soc. 34, 319–31. – C. Renfrew/J. E. Dixon 1976: Obsidian in western Asia: a review, in: (ed.) G. de G. Sieveking/I. H. L. Longworth/K. E. Wilson, Problems in economic and social archaeology, 137–50.

T. Watkins

Obst und Gemüse (Fruits and Vegetables). A. I. Mesopotamien.

§. General. – § 2. Methodology. – § 3. Fruits. § 3.1. General. § 3.2. Apple. § 3.3 Apricot. § 3.4. Cherry. § 3.5. Date. § 3.6. Fig. § 3.7. Grape. § 3.8. Hackberry. § 3.9. Medlar. § 3.10. Mulberry. § 3.11. Olive. § 3.12. Peach. § 3.13. Pear. § 3.14. Plums. § 3.15. Pomegranate. § 3.16. Quince. § 3.17. Other. – § 4. Vegetables. § 4.1. Greens. § 4.2. Cucurbitaceae. § 4.3. Roots, bulbs, etc. § 4.4. Beans, peas and other legumes.

This article attempts to place "fruits and vegetables" within the food culture of ancient Mesopotamia and to list in sense-related groups the ancient plant names that can, with some probability, be identified with modern genera or species. The terms "fruit" and "vegetable" as used in English and in most languages have no systematic botanical significance, and this article makes no attempt to deal with this problem. Edible plants that are identifiable in the cuneiform sources are almost exclusively cultivated forms and constitute only a small fraction of words denoting plants. Those not usually thought of as "fruit" or "vegetable" are noted only in passing (s. Getreide°, Gewürze°, Küche°, Öl°, Frucht°).

§ 1. General. Food culture in ancient Mesopotamia, as in most ancient societies rested primarily on plants. Although crop plants dominate the archaeobotanical record from the 8th mill. on, wild plants continue to be gathered as foods, medicines and materials. This type of gathering, always in a state of more or less slow change, is almost impossible to identify in written or archaeological evidence. Methodologically, however, we must keep its existence in mind, because it constitutes the social and scientific background of the materia medica as well as of the food culture.

In the food culture of ancient Mesopotamia, grains played the dominant role, particularly barley (*Hordeum spp.*) and emmer wheat (*Triticum dicoccum*). Species identification of other wheats and grains mentioned in cuneiform texts remains problematic. The proportional role of cultivated grains must have varied considerably over time and especially geographically. It seems probable that opportune gathering of plant foods played a more important role in the 3rd mill, and earlier than in later times, and, likewise, that grains increased in importance as one moved from the highlands into the alluvium and from countryside to city. The way in which grains were consumed varied over time as well as within societies. Bread was probably primarily an urban and upper class phenomenon down through the 1st mill. B. C. (discovery of ovens in towns fits this theory, because that was, after all, where the elite was concentrated). A great deal of grain, perhaps the majority, was consumed in forms other than bread, as in porridges and soups, and in the form of malted or sprouted grain. This is a function of economics, because preparation of bread prior to the invention of the rotary mill (ca. 200 B. C. in Italy) was extremely costly in terms of labor (mostly done by women).

It is, therefore, within a larger food culture dominated by grain, where foods of animal origin are consumed primarily by animal herders and by the elite, that we must try to envision the role played by fruits and vegetables. But, beyond this, we must keep in mind what was not there in ancient times. Rice seems to have come from India after Alexander the Great. Eggplant, okra, spinach, and perhaps even the watermelon, are probably immigrants of the 1st mill. A. D. The chicken, which came westward in the 9th cent. B. C., probably originally from amusement (fighting cocks) rather than food has left no visible trace in the cuneiform sources. Moreover, one must keep in mind the absence of all "New World" plants, since many of them are now ubiquitous throughout the Near East and even specialists seem only subliminally

aware of the significance of this obvious fact: tomatoes, potatoes, most of the squashes, all of the peppers (capsicum), hot as well as sweet, and, above all, that ubiquitous, immensely variable, and delicious vegetable, the "bean". It comes as a surprise to speakers or readers of European languages to learn that the "beans" one reads about in translations of ancient texts do not even have genera in common with the ubiquitous "beans" of modern times which are *Phaseolus* and come from the "New World".

Similarly with "fruits", not only is there no evidence for the various species of citrus fruits like lemons, limes, and oranges, but even peaches and the now ubiquitous apricot are not identifiable in the ancient evidence. What all this means is that, though the food culture of ancient times shares some foods in common with the modern food culture, it was profoundly different. This confronts us with a serious methodological problem. Are we to assume that the important segments of the ancient food culture now occupied by introduced crops from India, Africa, Central-South-and-East Asia, Europe, and the New World were simply blank, or filled out by those relatively few species we can identify in the cuneiform sources and in the archaeological evidence? Or, were there other plants that filled these niches that we still cannot identify in the available evidence? Our limitations reveal themselves in the fact that these questions cannot be adequately answered. In all probability, one must reckon with a situation like that revealed in the Greek and Latin sources where many plants are eaten that later went out of fashion, especially in and around towns, where this great variety is gradually replaced by a relatively small number of reliable domesticates. What this means is that comparison of the modern food culture of the Near East with the evidence from the ancient cuneiform sources will not necessarily help much in identifying plants where one has little more than names and very limited contextual evidence. What can be inferred with some probability is summarized below.

§ 2. Methodology. A few words about citation of evidence, identification of species, and methodology. Akkadian is cited here in preference to Sumerian. The lexical evidence on which most of the readings of Sumerian words are based is cited in the Akkadian dictionaries (AHw., CAD). The Sumerian names are often problematic, and the graphic symbolization of many names seems artificial (i.e., post-Sumerian). The Latin binomials are given only to make clear what plant is implied by the English name. Species identification in the dictionaries is a rather uncertain affair, since they do not, as a rule, use the Latin binomials. Thus, one finds in AHw. under *kamūnu* (AHw. 434) the definition "Kümmel", which in German normally denotes *Carum carvi* (caraway seed), but what AHw. really means is "Kreuzkümmel", which is "cumin" (*Cuminum cyminum*), under which unambiguous name it is now (Dec. 2001) being sold in the Münchener Viktualienmarkt. The situation in CAD is similar but often more complex. CAD began its life in a world in which confidence in etymology prevailed but has gradually drifted toward a reasonable agnosticism, particularly where the identification of plant species is concerned. However, failure to use the botanical binomial system frequently leads to conclusions like that expressed in CAD's discussion of *kasû* (CAD K 1971, 250) where the opinion is expressed that *saḫlû* probably meant "watercress" (a notion one encounters elsewhere, e.g., BSA 2, 127). This is, of course, impossible, because *saḫlû* grows in fields and in dry places and cannot therefore be watercress, which is *Nasturtium officinale*, and which has nothing to do with the flowering, and also edible, peppery tasting "nasturtium", which belongs to the topical genus *Tropaeolum*. In short, *saḫlû* is one of those cases in which the early philologists were probably right (cf. Gartenkresse*, there identified as *Lepidium sativum*; there are a number of closely related species native to Iraq: Flora of Iraq IV/2 [1980] 886–891). The literature is filled with contradictions and guesses that range from educated to unfounded. This results from the fact that

attempts to identify species take place in that dangerous terrain where not just two but a whole group of disciplines meet and where any specialist is inevitably going to find oneself on uncertain ground. It seems fairly clear that most species of plants mentioned in cuneiform texts will never be identified with certainty, but precision in terminology and attention to the natural distribution and history of flora do permit at least an encouraging residue of probable identifications that may be increased in the future as new evidence accumulates. After all, cuneiformists now universally agree (a rare phenomenon) that the words *amussu*, *ezinnu*, *andaḫsu* denote bulbous plants rather than *Vicieae*, vetches, etc., as postulated by R. Campbell Thompson (DAB, published posthumously 1949, 89 ff.). And most cuneiformists also agree that *šamaš-šammū* means sesame, despite that fact that CAD (Š/1 1989, 301–307) has opted for "linseed" (contra: Powell, AulaOr. 9 [1991] 155–165; there is much additional evidence in both cuneiform and classical sources against the linseed theory). From a methodological point of view, species identification must always proceed from etymology to a consideration of context, with an awareness of the history of flora in the region (including the Mediterranean) and of the evidence of archaeobotany. If the etymological and other evidence agrees, then probable solutions become possible. However, where the linguistic evidence itself is confused or ambivalent, as in the case of legumes, it may never, given the nature of what is normally recorded in cuneiform sources, be possible to arrive at satisfactory identifications.

For fruits and vegetables in general, see the articles in BSA 2 (1985) and 3 (1987), and, for use in cooking, see J. Bottéro, Textes culinaires Mesopotamiens (1995) with rev. by Powell, JAOS 118 (1998) 290 f.

§ 3. Fruits.

§ 3.1. *General.* In the lowlands, we find a group of four basic fruits from the beginning of writing (ca. 3000) onward: apples, grapes, figs, and dates. All of these seem to be fully domesticated by the end of the 4th mill. Toward the end of the 3rd mill., pomegranates begin to turn up in the sources from S. Mesopotamia. Of these five, only the date is native to that region. The fact that the pomegranate is absent from lowland sources down through the Presargonic period points to the Akkad-Ur III period as the beginning of extensive lowland cultivation. Species identifications of these five rest on etymology and context and are about as certain as most other translations from cuneiform texts. Noteworthy is that none of these belong to the highly perishable fruits: apples, figs, and grapes can be and were dried, and neither pomegranates nor dates are susceptible to immediate spoilage, which probably accounts in part for their enduring popularity.

In the uplands, these five also occur. Dates, however, though they must have set fruit, as today, probably ripened as a rule not much beyond the northern reaches of the alluvium, except in special ecological niches and in unusually hot years. Nevertheless, green dates are edible, and, moreover, in ancient times other parts of the palm were consumed as edibles (e.g., palm heart: *uqūru*). In addition, pear, quince, and plum seem likely.

These then represent, by and large, the limits of certitude as far as identification with modern botanical species is concerned. Of some interest is that the fruits which we can identify with some confidence are also those (with the exception of the date palm) that turn up in early classical sources (cf. A. Gutsfeld "Obst" and K. Ruffing "Obstbaum" in Der Neue Pauly VIII [2000] 1087–1090). Specifics are given below in alphabetical order of the English names.

§ 3.2. *Apple* (*Malus pumila* L.) (cf. B. § 1.1!) *ḫašḫūru* (Assyrian *šaḫsūru*) / ḫaš=ḫur, ubiquitous, 3rd mill. on. As in many languages, "apple" is used with adjectives or nouns (at least in the real or artificial Sumerian writings of the names) to denote other fruits and things that have some real or imaginary connection with apple. E.g., in the lexical series Hh. (III 30 ff., s. Powell BSA 3, 146 f.) "upland (or foreign?) apple"

(ḫašḫur-kur-ra) is equated with Akkadian words for "pear", "quince", and *armannu* (unidentified), and twelve other ideographic/logographic qualifiers of ḫašḫur are equated with thirteen Akkadian names, two of which are "pear" and one the aforementioned *armannu*. In other words, the lexical evidence points in the general direction of the *Rosaceae* but does not allow unequivocal identification of species.

It seems probable, despite the rarity of archaeobotanical finds, that the name *ḫašḫūru* denotes the domesticated apple, but it may have included wild species. Since most of the fruit domesticates depend for their genetic stability on propagation by cuttings and analogous clonings, and, since this method of propagation is practically mandatory for grape culture, it seems likely that it was also practiced with other fruits. However, since propagation of apples by seed is attested even into modern times, we cannot exclude this in antiquity, which would have led to a much greater genetic diversity and to a corresponding variety in the resulting fruit.

The fact that the apple is not now extensively cultivated in S. Iraq has led to the – otherwise unjustified – assumption that *ḫašḫūru* must denote something else in cuneiform texts. Apricot (s. below) has been the preferred alternative. This assumption has no basis in fact. The apple was the preferred species among the *Rosaceae* in the 3rd mill. precisely because it had been domesticated and filled an important niche in the available domesticates. Apples were cultivated in the same way that *Citrus* species are grown in modern S. Iraq, namely in the micro-climate created by date groves. Flora of Iraq IV/1 (1980) 465 f. notes that, though citrus trees (native to southeast Asia, etc.) are too sensitive to stand the climate of S. Iraq when grown in the open, oranges (*Citrus sinensis*) can produce enormous harvests in properly spaced date groves.

Apfel*. Flora of Iraq I/2 (1966) 110. – J. N. Postgate, BSA 3 (1987) 116–119, 128–132. – M. A. Powell, BSA 3, 155 f. – C. Hünemörder, "Apfel", Der Neue Pauly I (1996) 831.

§ 3.3. *Apricot* (*Prunus armeniaca* L.) (cf. B. § 1.2). Like the peach, this fruit seems to be a westward migrant from China/Central Asia whose appearance in the Near East probably post-dates the conquests of Cyrus the Great and Darius, i. e., roughly the half-century 530–480 B. C. Proposals to identify either of these fruits with Akkadian (to say nothing of Sumerian) words must be, until clear archaeological evidence to the contrary, regarded as unfounded.

Aprikose*. Postgate, BSA 3, 117–120, 131 f. – Powell, BSA 3, 153–156. – Hünemörder, "Aprikose", Der Neue Pauly I 914 f.

§ 3.4. *Cherry* (cf. B. § 1.3). Not yet identified in cuneiform sources. It is not impossible that the sweet (Mazzard) cherry (*Prunus avium* (L.) L.) or the sour (Morello) cherry (*Prunus cerasus* L.) could have been known in the uplands, but the domesticated cherry seems to have become widespread only after the Persian Empire. A more likely fruit (though very small) is the Mahleb or perfumed cherry (*Prunus mahaleb* L. Mill.), but nothing in the cuneiform sources points clearly in this direction. If a word for cherry existed, one would expect to find it in the "berry" sections of Hh. III, since the olive is also entered there (s. below). It is barely possible that ĝiš gi-ri-zum = *girīṣu* (Hh. III 230 = MSL 5, 112) contains the ubiquitous word that turns up in various forms in Near East languages as well as in Greek *kerasia* and Latin *cerasia* (NB: not derived from Kerasous!), but certainty is impossible, since the Near Eastern words from which *kerasia* etc. derive come from some unknown language (or group of languages), and, moreover, the Hh. III entry remains isolated.

Flora of Iraq I/2, 166–170. – Hünemörder, "Kirschbaum", Der Neue Pauly VI (1999) 489 f.

§ 3.5. *Date* (*Phoenix dactylifera* L.) (cf. B. § 1.6). *gišimmaru* / ĝišimmar, the basic fruit of S. Mesopotamia, attested from early 3rd mill. on. The vast date palm plantations known from modern times probably began to take shape in the Ur III period but did not reach anything like their modern proportions until the Chaldean-Persian era.

Dates came to constitute, along with barley, one of the food staples of the south and, above all, served as the major source of sugar, since grapes and figs were much more expensive and honey, even more expensive, was available only as import. The date was probably not cultivated for its fruit in the uplands (as shown by its absence in upland texts which mention fruits or fruit trees – cultivation north of Tikrīt is restricted by winter cold), but the fruit itself was doubtless imported from the south.

Dattelpalme*, Palme*; Flora of Iraq VIII (1985) 263–265. – Postgate, BSA 3, 117 (with lit.). – Renfrew, BSA 3, 155.

§ 3.6. *Fig* (*Ficus carica* L.) (cf. B. § 1.8). *tittu* / peš, one of the five basic fruits from the 3rd mill. on, ubiquitous, lowlands and uplands. Like dates and grapes, a major source of sweetness, as the Sumerian writing giš làl, "syrup tree", suggests. Hh. III (cf. Powell BSA 3, 146) lists four "foreign" varieties, all more or less from the uplands: Marian (from Mari on the Euphrates), Subarian (i. e., from the Assyrian-upper Tigris region), Elamite (SW. Iran), Gutian (prob. W-NW. Iran). One should note that the sycamore fig (*Ficus sycomorus* L.) does not occur in Iraq.

Feigen(baum)*. Flora of Iraq IV/1 (1980) 87–89. – Hünemörder, "Feige", Der Neue Pauly IV (1998) 456 f.

§ 3.7. *Grape* (*Vitis vinifera* L.) (cf. B. § 1.9). *karānu* / ĝeštin (*išḫunnatu*, "cluster"), ubiquitous, from early 3rd mill. on, widely and extensively cultivated in the north, especially for wine, in the south apparently more for fruit, which was probably consumed more often as raisins (*muzīqu* / ĝeštin UD), and for juice, which was turned into syrup (*dišpu* / làl), i. e., the so-called "honey" that turns up in modern translations of Sumerian and Akkadian texts. Likewise, the "wine" that turns up in lowland texts is almost all beer that has been flavored and/or fortified by the addition of grape syrup during the fermentation process. That, as a fruit crop, the grape was first in importance in the uplands and second only to the date in the lowlands is suggested by the elaborate terminology for the various parts of the plant in Hh. III (Powell BSA 3, 146). Texts from the 2nd mill. on suggest that grape cultivation for wine was concentrated particularly in the Syrian uplands and in the south sloping mountain terrain where modern Syria, Turkey, Iraq and Iran come together.

Flora of Iraq IV/1, 443–448. – Powell, "Wine and the vine in ancient Mesopotamia", in: (ed.) P. MacGovern et al., The origins and ancient history of wine (1996) 97–122.

§ 3.8. *Hackberry* (*Celtis* spp.) (cf. B. § 1.10). Not identifiable in the cuneiform sources. Powell (BSA 3, 149) suggested identifying the *mēsu* / mes tree with *Celtis australis* L., but this is probably wrong. *Celtis* (cf. *caucasia* L.) berries are known from Tall al-Dēr but are thought to be upland imports (Renfrew BSA 3, 158), whereas *mēsu* / mes trees were actually cultivated in S. Mesopotamia, especially for wood, and *Celtis* does not grow well in southern Iraq (Flora of Iraq IV/1, 69–75).

§ 3.9. *Medlar* (*Mespilus germanica* L.) (cf. B. § 1.12). Not identifiable in cuneiform sources. Identification by Thompson (DAB 305 f.) of *šallūru* / šennur as medlar is unlikely (s. below under plum), because it occurs from Ur III on in the south, as well as widely in the north, where it turns up in large numbers as shoots for planting, alongside pomegranate and fig. The medlar, from the fact that its fruit becomes palatable only in a bletted, softened condition, has always played a minor role in fruit culture, and this will have hardly been different in ancient times (cf. Flora of Iraq I/2, 118 f.).

§ 3.10. *Mulberry* (*Morus*) (cf. B. § 1.13). *tuttu*, attested only a couple of times in Persian period texts. Heimpel (Maulbeere*) is correct in rejecting identifications with other Akkadian or Sumerian words. *Morus alba* L. (the preferred mulberry for silkworm culture) was unknown in the west in ancient times, and *Morus nigra* L. seems to be a 1st mill. B. C. immigrant from the east

(but cf. B. § 1.13 for earlier mulberry wood at Uruk).

Flora of Iraq IV/1, 79–85. – Hünemörder, "Maulbeerbaum", Der Neue Pauly VII (1999) 1043.

§ 3.11. *Olive* (*Olea europaea* L.) (cf. B. § 1.14) *serdu* (*sirdu*). No independent Sumerian word is known, which fits the attested cultivation pattern (uplands: Syria, Assyria, but not in the lowlands), and only the domesticated form is known from Iraq. References to olive wood in lowland texts begin in the Akkad period. The olive is listed in the "berry" section of Hh. III (Powell BSA 3, 149 f.) and was probably grown mostly for oil, forming the upland counterpart to lowland sesame (H. Waetzoldt BSA 3, 77–96).

Flora of Iraq IV/1, 511.

§ 3.12. *Peach* (*Prunus persica* (L.) Batsch) (cf. B. § 1.15). Not identifiable in cuneiform sources and probably only comes into the west after the eastward extension of the Achaemenid Empire. Apparently unknown to the Romans prior to the Mithridatic Wars (88–63 B. C.). This fact and the name *persica*, i. e., "a Persian" (which is the origin of the western European words for peach) suggest that it was not widely known in Asia Minor until the 1st cent. B. C. and that "Persian" was what it was called locally. See "apricot" above.

Flora of Iraq I/2, 160 f. – Hünemörder, "Pfirsich", Der Neue Pauly IX (2000) 703.

§ 3.13. *Pear* (*Pyrus communis* L.) (cf. B. § 1.16). *kamiššaru*, identified on the basis of words in Aramaic and Arabic. In the lexical series Hh. (III 33 f. = MSL 5, 96) the "Sumerian" equivalent ḫašḫur-kur-ra, "apple of the uplands", may be artificial (i. e., post-Sumerian), and the graph ḫaš-ḫur UD cannot be interpreted with certainty. Identification with pear is suggested by the close linkage with apple and quince in the few texts which contain lists of two or more fruit(trees), however, a puzzling section of Hh. III (126–132 = MSL 5, 103) that is sandwiched in between words for incense (trees) and nut trees treats both pear (*kamiššaru*) and quince (*supurgillu*) as synonyms of *šallūru* / šennur. The latter term begins to turn up in lowland texts from Ur III on. If the Hh. III text is valid (i. e., not corrupt), this may mean that *šallūru* is yet another word for pear, perhaps dialectical, a distinctive variety, or deriving from a different language from *kamiššaru* (cf. also below under plum). None of these words appear to be either Sumerian or Semitic. It is possible that the wild Syrian pear (*Pyrus syriaca* Boiss.) is represented in one of the words associated with *kamiššaru* in Hh. III, however, though reportedly eaten in modern times by the mountain people, it is not likely to have been cultivated for fruit in ancient times. Part of the ambivalence in the lexical texts must be attributed to limited cultivation in ancient Mesopotamia (only in the north), and it is not commonly cultivated in modern Iraq.

Birnbaum*. Flora of Iraq I/2, 108–110. – Postgate, BSA 3, 130. – Hünemörder, "Birnbaum", Der Neue Pauly II (1997) 693 f.

§ 3.14. *Plum* (*Prunus x domestica* L.) (cf. B. § 1.17). Identification is problematic, but Postgate (BSA 3, 129 f.) is probably right in suggesting that *angāšu* is the Assyrian word for plum. It occurs in the description of Ashurnasirpal's garden in the order pear, quince, fig, grape, *angāšu*, where one does not expect another word for "pear" but a distinct kind of fruit tree. The fact that it is sometimes translated "pear" reflects the ambivalent nature of our evidence. As Postgate has noted, *ʿanǧās* (or *ʿinǧās*) means "plum" in Iraq but "pear" elsewhere in the Near East, a situation which is partially explained by the fact that neither the Assyrian nor Arabic word is Semitic in origin but from some unknown language. This same situation seems to have prevailed in ancient times as well, because Hg., the commentary series to Hh., probably equates *angāšu* with *kamiššaru* (pear) and with "Sumerian" ĝiš ḫašḫur-kur-ra, "apple of the uplands" (this is the more likely restoration of this entry than the ĝiš šennur-kur-ra of MSL 9, 166 that is accepted by CAD s. v. *angašu*). A similar ambivalence is reflected in the equations šennur = *šallūru* and šennur-gal (big šennur) = *ḫaḫḫu*. As Postgate has noted (BSA 3, 129 f.), *ḫauḫ*, which must be the Arabic counterpart to *ḫaḫḫu*, denotes "peach" in modern Iraqi and Egyptian but "plum" in Syrian. However, since there is no evidence for peach in cuneiform, it is possible – though by no means certain – that *šallūru* and *ḫaḫḫu* denote respectively the cherry plum (*Prunus cerasifera* Ehrh.) and the domesticated plum (*Prunus domestica* L.). This would fit with the Sumerian terms šennur and big šennur, since the fruit of the cherry plum is normally not more than half the size of the domestic plum. Unfortunately, Hh. (III 128–132 = MSL 5, 103) also equates big šennur, šennur UD, and šennur of the uplands with "pear" (*kamiššaru*), and the upland šennur is also equated with "quince" (*supurgillu*) and *marmaḫḫu* (meaning unknown), and the latter is also equated with big šennur. One is therefore faced with two equally unpalatable alternatives: either the text of Hh. is corrupt or, what is inherently more likely, a single ancient name can, like the modern names, dialectically denote entirely different species or the same species could be denoted by different names. For example, Iraqi *ʿinǧās* and *gauǧa* both denote the cherry plum (*P. cerasifera*), the former being the red/purple variety and the latter yellow/green.

Flora of Iraq I/2, 153–171. – Hünemörder, "Pflaume", Der Neue Pauly IX (2000) 704.

§ 3.15. *Pomegranate* (*Punica granatum* L.) (cf. B. § 1.18). *nurmû*, *lurmû*, *lurimtu* / nu-úr-ma, ubiquitous, lowlands and uplands. Not attested in Presargonic texts from Lagaš, therefore probably introduced into the lowlands in the Akkad-Ur III period. The name apparently derives from some unknown language. Most of the derivatives share the consonants *n r*, some *n m r*, as in Arabic *rummān*. Hh. III (186–194 = MSL 5, 107 f. + MSL 9, 161) runs eleven entries that seem to focus primarily on taste (sweet, sour, etc.), but the Sumerian ĝiš làl-dar-ra seems to reflect the tendency of the pomegranate rind, when fully ripe, to split open and drip syrup. As in the Mediterranean, it is a fruit with religious associations. Its importance is indicated by the fact that it is the biggest fruit(tree) entry in Hh. III, following date and grape.

Granatapfel*. Flora of Iraq IV/1, 403–405. – Postgate, BSA 3, 116, 121, 130. – Hünemörder, "Granatapfel", Der Neue Pauly IV (1998) 1203.

§ 3.16. *Quince* (*Cydonia oblonga* Miller) (cf. B. § 1.19). *supurgillu* / ḫašḫur- // šen-nur-kur-ra, only attested uplands (this fits modern cultivation patterns). Identified on basis of Arabic *safarǧal*. "Sumerian" equivalents are probably based on resemblance of quince to apple and pear (cf. plum above).

Flora of Iraq I/2, 106 f. – Postgate, BSA 3, 130 f. – Hünemörder, "Quitte", Der Neue Pauly X (2001) 727.

§ 3.17. For other, unidentified, fruits mentioned in the 3rd mill. texts (gipar, ÚR × A.NA, mudum) see J. N. Postgate, BSA 3 (1987) 115–127.

§ 4. Vegetables. Reasonably certain are lettuce, cucumbers, garlic, onions, leek, and two or more kinds of legumes. Much of the contextual evidence is ambivalent, and, species identification is more often than not problematic. S. also Garten*, Gewürze*, Küche*.

§ 4.1. *Greens* (leafy vegetables). *Lactuca sativa* L., lettuce, is probably what is meant by *ḫaššu* / ḫi-is, but there is no way to be certain that this is not as ambivalent as "salad" with regard to species. The green tops of leeks, onions, and garlic were probably eaten, as seems to be implied by *kismu*, "cut", applied to a number of vegetables with green tops, including what is probably turnip (*laptu*), but cuneiform sources are taciturn about perishable commodities. One should probably assume that the young green tops of herbs like coriander (*ku/isibirru* / še-lú), a delicious but pungent green now known widely under the name "cilantro", were also eaten. Among the *Cruciferae*, *Lepidium* (presumably *sativum*, but there are a number of closely related native species: Flora of Iraq IV/2 [1980] 886–891), identified with *saḫlû* / za-aḫ-li, seems likely. This is the "cress" (Germ. "Kresse") that appears in

Assyriological literature, a peppery plant that can be eaten green but which seems to have been cultivated primarily for its peppery seeds. The cabbage and mustard genus, *Brassica*, (Flora of Iraq IV/2, 847–853) must also have been known, but none have been identified with absolute certainty. Mustard has been sought in Akkadian *kasû*, like "cress" grown for seed, but gazi, the corresponding Sumerian term (or graphic representation) is still troublesome and may refer to two (or more) plants. Moreover, no one is in a position to say whether the Akkadian term would refer to *Brassica nigra* or *Sinapsis alba*. Neither cabbage nor any of its closely relatives in the *Brassica oleracea* group is identifiable, but they will not have resembled the modern cultivars closely enough for us to recognize them anyway.

§ 4.2. *Cucurbitaceae* (cf. B. § 2.1.2). In this group the cucumber, *qiššu* / ukuš, presumably *Cucumis sativus* L., is relatively certain. The Akkadian term seems to denote primarily the cucumber, whereas the Sumerian ukuš is a collective term for all the *Cucurbitaceae* (cf. Gurke*). The canteloupe or sweet/musk melon (*Cucumis melo* L.) is represented by a still occurring wild form in Iraq (Flora of Iraq IV/1, 203–206) and, therefore, may be implied by the term "sweet" (*matqu*) and the Sumerian terms ukuš-lâl and ukuš-ku_7-ku_7, lit. "syrup ukuš" and "sweet sweet ukuš" (MSL 10 p. 98, p. 115, MSL 11 p. 127 f.), but if it were an ancient cultivar in Mesopotamia, it is curious to find so little evidence of it in the ancient Mediterranean. There are around twenty Sumerian and Akkadian names for *Cucurbitaceae*, but it is difficult to distinguish species, varieties/cultivars, etc. from names that merely denote characteristics like stage of growth, taste, appearance, etc. Two or more of these names probably denote the colocynth (*Citrullus colocynthis* (L.) Schrad., perhaps *tigilû*) and the squirting cucumber (*Ecballium elaterium* (L.) A. Rich), but these two are inedible. It has generally been assumed that "bitter" in Akk./Sum. denotes inedible species, but unfortunately, that too is not necessarily true, because, under certain circumstances (age, drought, temperature, etc.), the cultivated cucumber can also be quite bitter, or, on the other hand, rather sweet. Other species that may lurk in these names are the bottle gourd (*Lagenaria siceraria* (Molina) Standl.) and the *luffa* gourds (*Luffa aegyptiaca* Mill. or *Luffa acutangula* (L.) Roxb.). The latter two are edible when young, but the first is thought to be of African origin, and the latter two of tropical and Indian origin respectively. We have as yet no clear evidence for the watermelon (*Citrullus lanatus* (Thunb.) Matsum/Nakai), which may not have arrived in the ancient Near East from its putative south African homeland. In any case, given the rather unique character of the watermelon and the large role played by it in modern Iraq – where, with irrigation, it flourishes, it would be rather surprising not to be able to recognize it in the economic texts. The ancient history of the cultivated *Cucurbitaceae* is not well understood, and one should keep in mind that the cucumber (*Cucumis sativus*), which cuneiformists assume without question to be represented by *qiššu* / ukuš and which occurs widely in texts from the latter half of the 3rd mill. on, is thought to be from India or Central Asia. Most of the cultivated squashes and pumpkins are from the New World (e.g., *Cucurbita pepo*, *C. moschata*, *C. maxima*).

Flora of Iraq IV/1, 190–208. – M. P. Charles, BSA 3, 6–10. – M. Stol, BSA 3, 81–91.

§ 4.3. *Roots, bulbs*, etc. (cf. B. § 2.2). Among these, turnip (*Brassica rapa* L. ssp. *rapa*), *laptu* / lu-úb, and radish (*Raphanus sativus* L.), *puglu* / (Sum.?) seem relatively certain, beet (*Beta vulgaris* L.), *šumuttu* / sumun-dar less so. That these vegetables would have looked very similar to the varieties familiar to us is not likely when one considers the enormous variation in modern cultivars, somewhat less so. Among the bulbs (lily family), garlic (*Allium sativum*), *šūmu* / sum, onion (*Allium cepa* L.), *šuskillu*, *šamaškillu* / sum-sikil, and leek (*Allium porrum*), *karašu* / ga-raš, seem quite certain. Among *Allium* species one also expects chives (*Allium schoenoprasum* L.), but, given the rather complex terminology attested for these species and the limited nature of the contextual evidence, it is often impossible to distinguish species from cultivar or phase of growth, e.g., chives from, let us say, young leeks or green onions (scallions) or even young garlic. In any case, garlic played a central role in vegetable culture. It is the basic name for "bulbous" plant in Sumerian, and the sign serves to denote bulbs even outside the lily family, as in *andaḫšum*, perhaps a crocus, of which two edible species are native in Iraq (*Crocus biflorus* and *C. cancellatus*: Flora VIII 226–232). That garlic was regarded as the primary bulb vegetable is probably because it is, by far, the least perishable of the *Allium* crops. The cloves tend to dry out rather than rot like onions, and the loss of a single clove does not mean loss of the whole bulb, as with onions or other juicy *Allium* species. And, it is also for this reason that garlic cloves are represented in the archaeobotanical record.

Flora of Iraq VIII (1985) 137–177. – Charles, BSA 3, 11–13. – Waetzoldt, BSA 3, 23–56. – Stol, BSA 3, 57–80.

§ 4.4. *Beans, peas and other legumes* (cf. B. § 2.4). Identification of species still poses serious problems. The cultivated plants we expect are lentils (*Lens culinaris* Medik.: Flora of Iraq III 544–548), chickpeas (*Cicer arietinum* L.: Flora of Iraq III 505–512), broad beans (*Vicia faba* L.: Flora of Iraq III 542–544), and common peas (*Pisum sativum* L.: Flora of Iraq III 573–578). However, bearing in mind the case of the cucumber with its putative Indian-Central Asian origin, we cannot exclude *Vigna unguiculata* (L.) Walp (Flora of Iraq III 581 f.), known variously as cowpeas and in America under a number of variety names (black eyes, crowders, purple hulls) and in Iraq as *lubia*, a popular summer grown vegetable, nor *Vigna radiata* (L.) R. Wilczek (Flora of Iraq III), known as green gram or mung beans and in Iraq as *mas*. The former is of African or Indian origin, the latter from India and has not been identified in any ancient sources, but, like the cucumber, the precise era in which they were introduced into the Near East remains unclear, and, if mung beans seem rather unlikely, the same cannot be said of cowpeas, for which we must await more archaeobotanical evidence. If archaeobotanical evidence indicates its presence in the ancient Near East, it may be difficult to identify lexicographically since, in the first part of the twentieth century it was cultivated by digging holes in the wet soil after the spring inundation and putting in a few seeds. One thinks of terms like *šegunû*; but, as usual, the contextual evidence is ambivalent.

There are two sets of words in Akk./Sum. interpreted as legumes by cuneiformists: *kakkû* / gú-tur and *ḫallūru* / gú-gal. In the past, these have usually been interpreted as lentils (e.g., Linse*) and chickpeas. Moreover, like many commonly occurring commodities, the Sumerograms gú-tur / gal (lit. little/big bean or pea) are often used instead of writing out the Akkadian words syllabically. Thus, it is a matter of faith rather than evidence, when one transcribes these Sumerograms with *kakkû* and *ḫallūru*. In fact, in texts of the Achaemenid period, it is now clear that either *ḫallūru* is the word for bean/pea with a very broad semantic range or, more likely, that *ḫallūru* is not the Late Babylonian reading for gú-gal. In Late Babylonian texts, the word *ḫallūru* clearly denotes 1/40th of a shekel (Powell, AOAT 205 [1979] 101 f. and Maße und Gewichte* § V A. 1b, p. 511 f.), and it is only in these contexts that it is written syllabically. Thus, it cannot denote the chickpea, and this has the further implication that gú-gal, which occurs frequently in Late Babylonian texts from the Murašû archive, is also not likely to be the chickpea. From modern cultivation patterns, one does not expect chickpeas in S. Iraq, and there is a northern term (*appānu*: "nosey"), which also has etymological support for identifying it with the chickpea. The leguminous vegetables one expects in the south are lentils (*Lens*), common peas (*Pisum*), and broad beans (*Vicia faba*), but how these species relate to the various gú words in Sumerian (or to their ideographic-logographic use in the writing of other languages) and to *kakkû* and *ḫal-*

lūru remains unclear. A rather unhappy conclusion. However, among other species identification proposals that one encounters in the literature, one can exclude bitter vetch (*Vicia ervilia* L. [but cf. B. § 2.4.5]: Flora of Iraq III 526), common vetch (*V. sativa* L. [but cf. B. § 2.4.4]: Flora of Iraq III 534–536), and chickling vetch or grass pea (*Lathyrus sativus* L.: Flora of Iraq III 554–556). These are all fodder crops, though the first two have been used as scarcity/famine foods (cf. B. §§ 2.4.4–5), and the third, occasionally for human food. However, since there is virtually no evidence for fodder crops in cuneiform sources and since land use in the irrigated south (from which most of our evidence comes) is not likely to have tolerated the planting of an inferior crop, none of these are likely to turn up in the cuneiform sources as human food.

Flora of Iraq III (1974) 505–586 (Vicieae, Phaseoleae). – Charles, BSA 2, 39–45. – Renfrew, BSA 2, 67–71. – K. Maekawa, BSA 2, 97–118. – Stol, BSA 2, 127–139. – J. Eidem, BSA 2, 141–143. – Hünemörder, "Bohnen", Der Neue Pauly II (1997) 729.

M. A. Powell

Obst und Gemüse. A. II. In Anatolien.

s. a. Apfel*, Birnbaum*, Fenchel*, Garten*, Gartenkresse*, Gerste*, Gurke*, Maulbeere*, Öl, Ölbaum*, Sesam*, Wein*.

§ 1. Allgemein. – § 2. Quellen. – § 3. Obst und Gemüse. – § 4. Bestimmung.

§ 1. Allgemein.

Zu den Grundnahrungsmitteln in Anatolien (Gerste*, heth. *ḫalki-*/ŠE), Dinkel und Emmer, die man zu Mehl- und Brotzubereitung und zum Bierbrauen verwendet hat) kamen Obst- und Gemüse, deren Kultivierung im Laufe der Jahrtausende verschiedene Phasen durchlaufen hat (Schachner 1999, 18 ff.).

Baumpflanzungen, Weinberge und Felder sowie Gemüse- und Kräutergärten bildeten einen festen Bestandteil der Landwirtschaft. Man kannte den „Garten" (^{giš}KIRI$_6$), den „Gemüse- und Kräutergarten" ^{giš}MÚ.SAR (KUB 7, 1+ i 19, KUB 13, 18 Vs. 15), den „kleinen Garten" ^{giš}KIRI$_6$ TUR (KUB 12, 55+ 57 i 7′), den „Olivengarten" (^{giš}KIRI$_6$ ^{giš}*SE$_{20}$-IR-TUM*) und „Weingarten" ^{giš}KIRI$_6$.GEŠTIN (s. Haas 1988, 121 mit Anm. 2 und 3; 123).

Bewässerungssysteme waren auch bekannt (ein „bewässertes Feld" A.ŠÀ *šiššuraš*; A. ŠÀ *ŠA* PA$_5$ KUB 8, 75+ i 61), 212), obwohl diese eine kleinere Rolle in der Landwirtschaft spielten als in Mesopotamien (s. heth. Gesetze, Hoffner LH [1997] § 109: S. 201, § 162/47: S. 212; ders. 1974, 22–24; s. a. Bewässerung*, Kanal(isation)*).

§ 2. Quellen.

1. Die älteste Quelle für Obstbäume in Anatolien ist das *šar tamḫāri-Epos* (ca. um 2300). Hier werden Obstbäume auf kleinasiatischem Gebiet während des Sargon-Feldzuges genannt, deren Identität aber ungewiß ist (bearb. H. G. Güterbock, ZA 44 [1938] 45 ff.).

2. Zu den ältesten sicheren Erwähnungen gehören die *Landschenkungsurkunden* (LS), die Schenkungen des Königs, hauptsächlich Vieh, Felder, Baumpflanzungen und Gärten betreffend (bearb. von K. Riemschneider, MIO 6 [1958] 321–381).

5 IKU ^{giš}MÚ.SAR 18 IKU ^{giš}TIR ^{giš}ḪAŠḪUR.KUR.RA ^{giš}ḪAŠḪUR ^{giš}ŠENNUR [...] *ŠA* É.GAL *INA* ^{uru}Zantananta ...

„5 Iku Gemüsegarten, 18 Iku Wald/Baumpflanzung (mit) Birnen (?)-, Apfel- und Pflaumenbäumen dem Palast gehörig in Z. ..." (LS 4 Vs. 13, S. 362 f., ähnlich LS 1 Rs. 32, S. 352 f.; LS 1 Rs. 44, S. 352 f.).

3. Der Text zur *Wiederherstellung des Kultes der Göttin Išḫara* in Kizzuwatna gibt ebenfalls Aufschluß über Baum-, Obst- und Olivenpflanzungen (KUB 40, 2; bearb. als Bo. 4889 bei A. Goetze, Kizzuwatna [1940] 61–74, s. a. Öl, Ölbaum* B. § 2.2).

4. Obst-, Öl- und Weinpflanzungen stellten einen großen Wert dar (s. Öl, Ölbaum* B. § 2), was in den *Hethitischen Gesetzen* bestätigt wird. Es wurde Buße bei Baumfrevel* aufgelegt, s. H. A. Hoffner, Jr., LH 1997, § 104/*4, S. 100 f., 199; ebd. § 105/*5, S. 101 f., 199 f.

5. *Mythologische Texte*, Beschwörungsrituale.

E. Laroche: CTH Nrn. 321–370; Nrn. 390–500. – V. Haas 2003: Kap. XIII.

§ 3. Obst und Gemüse.

Obst und Obstbäume

(die Seitenzahlen beziehen sich auf Hoffner 1974, 95–112)

Deutsch	Heth. Hatt. Hurr. Luw. Pal.	Sumerogramm	Akkadisch u. Akkadogramm	Eigenschaften	Hohlmaße und Behälter
Obst, Obstbaum	*ḫaš(š)ik-* (38 f.) *šeša(nt)-* (38 f.) (s. Eichner 1982, 26 ff.)	GURUN	*INBI* *INBU*	ḪAD.DÙ.A „trocken" *mijant-* „frisch"	BÁN, PA *NAMMAND/TUM, ŠÚTU*
Apfel (S. 38, 113–115); CHD *s. v. ša-m(a)lu*	heth. [*ḫik-karza*] *šam(a)-lu-*, *šamal(u)-wan(t)-*; hatt. *ša-a-wa$_3$-at*(?); hurr. *ḫinzuri*; pal. *šamluwa-*	^{giš}ḪAŠḪUR, ^{giš}ḪAŠḪUR-*lu*, ^{giš}ḪAŠḪUR-*luwanza*, ^{giš}ḪAŠḪUR-*anza* ^{giš}ḪAŠḪUR-*az* ^{giš}ḪAŠḪUR-*it*	*ḫašḫūru*		
Birne (S. 115) Bergapfel (?) (S. 38, 115 f., 118)		^{giš}ḪAŠḪUR.KUR.RA	*armannu*, *kamiššuru*, *šapargillu*, *šarmannu*, *supurgillu*		
Pflaume (?) (S. 38; 118) (Früher: Aprikose, Mispel)		^{giš}ŠENNUR	*šallūru(m)*		
Dattel (S. 118) Feige (S. 116)	heth. *ḫaš(š)-tika-*(?) hurr. *zilumpa*	^{giš}ZÚ.LUM ^{giš}PEŠ	*suluppū* *tittu*, *tinu*, *ti'u*, *tillatu*		*UPNU* „Handvoll"
Granatapfel (-baum) (S. 119 f.)	heth. *nurati-*(?) hurr. *nuranti-*	^{giš}NU.ÚR.MA	*nurmû*, *nurmatu*		
Kornelkirsche(?) (S. 38) (zuletzt als Weide identifiziert, s. Steinkeller 1987, 74)		^{giš}MA.NU	*ēru(m)*, *e'ru*		
Olive (S. 116 f.), s. a. Öl, Ölbaum* B.			^{giš}*SE$_{20}$-IR-TUM*		^{dug}BUR.ZI TUR
Weintraube (S. 39, 113; s. Wein, Weintraube*)	*wijan(a)*$^{?}$*)-*	^{giš}GEŠTIN	*karānu*		

Gemüse und Kräuter

Deutsch	Heth. Hurr. Luw.	Sumerogramm	Akkadisch	Eigenschaften	Hohlmaße und Behälter
Hülsenfrüchte					
Breite-/ Saubohne (S. 98 f.)	*šumeššar* (nur in Boğ.)	GÚ.GAL.GAL	*ḫallūru(m)*		
Erbse Kichererbse (S. 97 f.)		GÚ.GAL	*ḫallūru(m)*		BÁN *PA(RÍSU)*
„eine kleine Erbsenart", Linse (S. 95 f.)		GÚ.TUR	*kakkû(m)*		
Wicke (als Viehfutter) (S. 99–101)		GÚ.ŠEŠ GÚ.ŠE.ŠEŠ			DUG.KA.-DÙ.A TUR
Knollengewächse und Wurzelgemüse					
Gurke/Kürbis (?) (S. 106)	*lakkarwan*^{sar} (S. 112)	ÚKUŠ	*qiššû(m)*		
Lauch (S. 107)		GA.RAŠ^{sar}	*kar(a)šu(m)*		
Knoblauch/ Zwiebel (S. 108)	*wašḫar*$^{(sar)}$ *šuppiwaš-ḫar*$^{(sar)}$ (s. Rieken 1999, 311–314) *šuppiwašḫanal-li-* („Zwiebelbündel"?)	SUM^{sar} SUM.SIKIL^{sar}	*šūmū(m)* *šuškillu(m)* *šamaškillu(m)*		
Knoblauch, bitter (S. 109)		SUM.ŠEŠ^{sar}	*ḫazannu*^{sar}		*SÛTU*
Krokus (S. 109 f.)		AN.TAḪ.ŠUM^{sar}			
Kräuter					
Fenchel*					
Gartenkresse* (S. 110 f.)		ZÀ.AḪ.LI	*samīdu*		
Koriander (S. 104 f.)	*tarpatarpa-*(?)	$^{(ú)}$ŠE.LÚ^{sar}	*ki(s)sibirru*, *ku(s)sibirru*		
Kümmel* (S. 103 f.)	heth. *kappani-*	Ú.TIN.TIR (GE$_6$, BABBAR)	*ka(m)mūnu*		^{kuš}DÙG.GAN „Medizinbeutel"

Gemüse und Kräuter

Deutsch	Heth. Hurr. Luw.	Sumerogramm	Akkadisch	Eigenschaften	Hohlmaße und Behälter
Kräuter (Fortsetzung)					
Lorbeer					*ḫupuwai-* „Gefäß"
Minze		Ú.KUR.RA^{sar}	*nanaḫu, ninûn* ass. *nenia*		
Asa foetida (S. 110)		Ú.NU.LUḪ.ḪA^{sar}	*nuḫurtu*		
Pflanzen zur Ölgewinnung					
Olive s. Öl, Ölbaum*	luw. *dain*(i) hurr. *zinti*		^{giš}*SE$_{20}$-IR-TUM*		
Sesam	heth. *šāpšama*, hurr. *šumi-šumi*	ŠE.GIŠ.Ì	*šamaššammū*		

§ 4. Bestimmung.

Nach den Untersuchungen in den mes. Quellen (s. Obst und Gemüse* A. I. In Mesopotamien) bleibt zu fragen, wieweit unsere Übersetzungen im Hethitischen überhaupt zutreffen.

Wenn das dort unter Aprikose (Apricot § 3.3), Kirsche (Cherry § 3.4), Mispel (Medlar § 3.9) und Pfirsich (Peach § 3.12) Gesagte sich als haltbar erweist, dann scheiden alle diese Obstarten auch für das Hethitische aus. Das hätte zur Folge, daß man bei den Reihen wie ^{giš}ḪAŠḪUR, ^{giš}ḪAŠḪUR.KUR.RA und ^{giš}ŠENNUR (z. B. in den heth. Gesetzen oder in den Landschenkungsurkunden) am wahrscheinlichsten „Apfel, Birne und Pflaume" zu übersetzen hat, wobei man die Pflaume nur mit Vorbehalt einbeziehen kann. Dies würde dann auch für die beiden Obstarten Feige (^{giš}PÈŠ) und Granatapfel (^{giš}NU.ÚR.MA) gelten, über deren Identität in den mes. Quellen kein Zweifel besteht.

Bei den Gemüsearten sieht es noch schwieriger aus. Denn während die heth. (hatt., hurr., luw. und pal.) Aussprache für Apfel, Granatapfel und Pflaume(?) durch syllabische Schreibungen bekannt ist, werden einige andere Obst-, aber vor allem die Gemüsearten durchwegs sumerographisch wiedergegeben. Das würde bedeuten: Wenn Unsicherheit über die Interpretation von solchen Wortzeichen schon in mes. Quellen besteht, überträgt sich diese Unsicherheit erst recht auch auf das Hethitische. Wenn man zwischen Kichererbsen (*Cicer arietinum*), Erbsen (*Pisum sativum*), und Saubohnen/Breitbohnen (*Vicia faba*) nicht klar unterscheiden kann, so gilt das auch für die heth. Texte.

Man kann daher den vorläufigen Schluß ziehen: Alle Obst- und Gemüsearten, die nur mit Wortzeichen geschrieben sind und die in mes. Texten mit Unsicherheit belastet sind, können auch in den heth. Texten nicht bestimmt werden. Vor allem, weil zusätzlich noch gar nicht sicher ist, ob die Hethither ein Sumerogramm X mit demselben Sinn erfüllt haben wie die Mesopotamier. Man müßte sich folglich aufs Neue mit diesem Bereich des materiellen Lebens im alten Anatolien auseinandersetzen, vor allem unter Berücksichtigung der von H. A. Hoffner, Jr. (1974) zusammengestellten Speisen und Speisekultur der Hethither, ferner der jetzt ziemlich gründlich erforschten

Flora der Türkei (s. P. H. Davis 1965–1988), der zuwachsenden paläobotanischen Daten sowie der philologischen Untersuchungen.

Allgemein: A. Archi 1975: Rez. von H. Hoffner, Jr., *Alimenta Hethaeorum*, Or. 44, 326–329. – H. Berman 1976: Rez. von H. A. Hoffner, Alimenta Hethaeorum, JCS 28, 243–246. – Y. Daher 1970: Agricultura Anatolica (= StOr. 42). – H. Eichner 1982: Zur heth. Etymologie ..., in: Gs. H. Kronasser, 16–28. – H. Ertem 1974/1987²: Boğazköy metinlerine göre hititler devri anadolu'sunun florası (Flora des hethiterzeitlichen Anatoliens nach den Boğazköy-Texten). – V. Haas 1988: Magie in heth. Gärten, in: Fs. H. Otten, 121–142; ders. 2003: Materia et Magica Hethitica. Ein Beitrag zur Heilkunde im Alten Orient. – H. A. Hoffner, Jr. 1967: An English-Hittite Glossary, RHA 25/80, 7–99 (s. v. fruits, pp. 43–45; vegetable, pp. 92–93; plants p. 69); ders. 1974: Alimenta Hethaeorum (= AOS 55); ders. 2001: Alimenta Revisited, in: StBoT 45 (Akten des VI. Internationalen Kongresses für Hethitologie. Würzburg, 4.–8. Oktober 1999) 199–212. – W.-D. Hütteroth/V. Höhfeld 1982, 2002²: Türkei (= Wissenschaftliche Länderkunde).– H. Otten 1974: Rez. von H. A. Hoffner, Alimenta Hethaeorum, ZA 64, 293–297. – E. Rieken 1999: Untersuchungen zur nominalen Stammbildung des Hethitischen (= StBoT 44). – A. Schachner 1999: Von der Rundhütte zum Kaufmannshaus (BAR Int. Ser. 807). – O. Soysal 1989: „Der Apfel möge die Zähne nehmen!", Or. 58, 171–192. – P. Steinkeller 1987: The Foresters of Umma: Toward a Definition of Ur III Labor", in: (ed.) M. A. Powell, Labor in the Ancient Near East (= AOS 68) 74. – J. Tischler 2002: Hethitische Äpfel, in: Fs. M. Popko, 345–350. – Chr. Zinko 2001: Bemerkungen zu einigen heth. Pflanzen und Pflanzennamen, in: StBoT 45, 739–757.

Botanisch und Paläobotanisch: P. H. Davis (ed.) 1965–1988: Flora of Turkey and the East Aegean Islands I–X, für hier bes. VI (1978). – H. Helbæk 1961: Late Bronze Age and Byzantinie Crops at Beycesultan, AnSt. 11, 77–97. – M. Hopf 1992: Plant Remains from Boğazköy, Turkey. Review of Palaeobotany and Palynologie 73, 99–104. – M. Nesbitt 1993: Ancient crop husbandry at Kaman-Kalehöyük: 1991: Archaeobotanical Report, BMECCJ 7, 75–97. – R. Pasternak 1998: Übersicht über die Ergebnisse der archaeobotanischen Arbeiten in Kuşaklı 1994–1997 und ein Interpretationsansatz zu den Befunden, 160–170, in: A. Müller-Karpe et al., Untersuchungen in Kuşaklı, MDOG 130, 93–174. – A. Ünal 1998: Hittite and Hurrian Cuneiform Tablets from Ortaköy (Çorum), Central Turkey 47. – D. Zohary/M. Hopf 1988: Domestication of Plants in the Old World.

G. Frantz-Szabó

Obst und Gemüse (Fruits and Vegetables). B. Archäobotanisch.

§ 1. Fruits. § 1.1. Apple. § 1.2. Apricot. § 1.3. Cherry. § 1.4. Christ's thorn. § 1.5. Citron. § 1.6. Date. § 1.7. Russian Olive. § 1.8. Fig. § 1.9. Grape. § 1.10. Hackberry. § 1.11. Hawthorn. § 1.12. Medlar. § 1.13. Mulberry. § 1.14. Olive. § 1.15. Peach. § 1.16. Pear. § 1.17. Plum. § 1.18. Pomegranate. § 1.19. Quince. – § 2. Vegetables. § 2.1. Cucurbitaceae. § 2.2. Roots, bulbs, etc. § 2.3. Greens. § 2.4. Pulses.

Plant remains recovered from archaeological contexts are the most direct form of evidence for the use of plants in the past. Where waste from crop-processing is present – for example cereal chaff – then archaeobotanical remains are also evidence for local cultivation. Recovery of seeds from kitchen contexts can demonstrate that plants were used as human food in the past; two important examples are of grass pea and bitter vetch, often thought of only as animal feed. However two factors limit the usefulness of archaeological data in resolving ambiguities in philology.

Firstly, most plant remains will only survive if charred by contact with fire. Seeds and fruits are much more likely to survive charring than fleshy roots or leafy vegetables. Seeds and fruits that are very abundant in a farming settlement – for example, grains and pulses – are in turn more likely to be charred than those of uncommon or valuable plants such as spices or imported fruits. Oil-rich seeds such as those of sesame or cress are also more vulnerable to disintegration during charring. However, it has proved possible to use archaeobotanical data to build up a fairly comprehensive list of the important grains, pulses and fruits of ancient Mesopotamia. Those fruits that are absent from the Bronze Age archaeobotanical record – apple, plum, peach, apricot – are indeed likely to have been absent or rare in that period.

The second limitation is in the uneven application of modern recovery techniques for plant remains at excavations. These have been adopted most enthusiastically at prehistoric sites, but we have little data for the first mill. B. C., when many new crops certainly arrived in Mesopotamia. Fortunately we can draw on evidence from excavations in surrounding regions to map the arrival of new crops from Europe or Central Asia. Where a crop is found in the Levant, Turkey or Iran it can usually be assumed that it would have been available (if not cultivated) in Mesopotamia. Equally, absence (as with so many of the fruits) from these regions supports the view that the plants were also absent from Mesopotamia.

§ 1. Fruits.

§ 1.1. *Apple* (*Malus pumila* Mill.) (cf. A. § 3.2). Crab apples (*Malus sylvestris* (L.) Mill.) were found in an EB tomb in the Royal Cemetery at Ur, Iraq, dried, cut in half and threaded on string. These are either imports of wild apples from Turkey or northern Iraq, or might derive from local cultivation of wild apples, which are not native to Iraq. Domesticated apple (*Malus pumila*) is now known to have been domesticated from wild populations in central Asia, and then to have spread westwards. The date of its arrival in the Near East is unknown, but may be as late as the classical period. The scarcity of apple seeds at Near Eastern or Egyptian sites sits uneasily with the identification of *ḫašḫūru*/ḫaš=ḫur as apple. Apple cultivation in southern Iraq is also problematic: unlike sub-tropical fruits such as orange, apple buds require low winter temperatures to break bud rest.

Although cultivated apples do occur today, rarely, in southern Iraq, "neither tree or fruit attains great size" (Flora of Iraq II [1966] 110). Neither the archaeological nor ecological evidence are consistent with large-scale cultivation of apples in ancient Iraq.

§ 1.2. *Apricot* (*Prunus armeniaca* L.) (cf. A. § 3.3). Taken into cultivation in central Asia; like domesticated apple archaeological evidence suggests a late arrival to the Near East. There is one archaeobotanical record, Iron Age (Urartian) from Bastam, Iran, but the absence of apricot stones from other Iron Age sites suggests it did not spread to Mesopotamia and the Levant until later.

§ 1.3. *Cherry* (cf. A. § 3.4). *Sweet cherry* (*Prunus avium* (L.) L.) and *sour cherry* (*P. cerasus* L.) were probably taken into cultivation in Europe, perhaps in the Classical period. Mahaleb (*Prunus mahaleb* (L.) Mill.) is a wild tree that grows in northern Iraq. Its fruits are usually reported as inedible, but the pulp and the roasted kernels are used for flavouring. There are no archaeobotanical finds of cherry from the Near East, apart from *Prunus mahaleb* at EB Ḥammām al-Turkmān.

§ 1.4. *Christ's thorn* (*Ziziphus spina-christi* (L.) Willd.). Seeds of this wild tree are common at sites in the Arabian Peninsula and occasional in the Levant and Egypt. The fruits are eaten and might have been an item of trade in Mesopotamia.

§ 1.5. *Citron* (*Citrus medica* L.). Introduced to the Near East by the Hellenistic period (4th cent. B. C.); one isolated archaeobotanical record from Hala Sultan Tekke, Cyprus, LB (1200 B. C.) and one unconfirmed find from Nippur.

E. Isaac 1959: Science 129, 179–186.

§ 1.6. *Date* (*Phoenix dactylifera* L.) (cf. A. § 3.5). Early records are from around the Arabian Gulf, including Dalma Island, U. A. E., and 'Oueili, Iraq, 5th mill. B. C.; then at many sites in the Levant and Mesopotamia, e. g., in Iraq Ur Royal Cemetery (EB), Uruk (LB), Nimrūd (Iron Age). Archaeological evidence for uses includes a Bronze Age (1750 B. C.) *madbasa* for extracting date honey at Failaka, Kuwait.

L. Costantini 1985: in (ed.) G. Gnoli/L. Lanciotti, in: Gs. J. Tucci, 209–217. – M. Nesbitt 1993: Arabian Archaeology and Epigraphy 4, 20–47.

§ 1.7. *Russian olive*, *Oleaster* (*Elaeagnus angustifolia* L.). Edible, olive-shaped fruits. No archaeobotanical records of fruit, and probably not native to Iraq. However wood remains have been identified from an undated context at Uruk, Iraq (Kat. 1939) and from Neo-Assyrian Tall Šēḫ Ḥamad, Syria.

§ 1.8. *Fig* (*Ficus carica* L.) (cf. A. § 3.6). Common at Near Eastern sites from Neo-

lithic period, but probably not domesticated until the fourth mill. B. C. Present at Mesopotamian sites, e. g., Abu Ṣalābīḫ (EB), Nimrūd (Iron Age). Although archaeobotanical remains are sometimes identified as sycomore fig (*Ficus sycomorus* L.) this is unlikely because this species was mainly grown in Egypt.

§ 1.9. *Grape* (*Vitis vinifera* L.) (cf. A. § 3.7). Wild grape seeds are occasional at Neolithic and Chalcolithic sites; slender seeds with long beaks, typical of domesticated grapes are common from the EB onwards in the Near East and Egypt. Claims of chemical evidence for wine-making (and, thus, probable domestication) in the Chalcolithic period are controversial.

M. A. Murray/N. Boulton/C. Heron 2000: in (ed.) P. T. Nicholson/I. Shaw, Ancient Egyptian materials and technology, 577–608. – R. L. Zettler/N. F. Miller 1995: in (ed.) P. E. McGovern/S. J. Fleming/S. H. Katz, The origins and ancient history of wine, 123–131.

§ 1.10. *Hackberry* (*Celtis australis* L.) (cf. A. § 3.8). A wild fruit, common at Neolithic sites in Turkey and occasionally found at later sites, e. g., Tall al-Dēr, Iraq, c. 1650 B. C.

§ 1.11. *Hawthorn* (*Crataegus*). Several species, small but sweet fruits often casually consumed, occasional at Near Eastern sites. In Iraq, restricted to upland areas.

§ 1.12. *Medlar* (*Mespilus germanica* L.) (cf. A. § 3.9). No archaeobotanical records from the Near East. Thought to have originated in Transcaucasia or Iran, the first textual evidence is from the classical period and cultivation has been largely restricted to Europe.

§ 1.13. *Mulberry* (*Morus nigra* L.: common or black *m.*; *Morus alba* L.: white *m.*) (cf. A. § 3.10). Introduced from central or south Asia; one archaeobotanical record for seed of *M. nigra* from Samos, Greece, 7th cent. B. C. Earlier introduction is suggested by wood finds from EB Uruk, Iraq, (Kat. 1914) and Iron Age Pella, Jordan.

§ 1.14. *Olive* (*Olea europaea* L.) (cf. A. § 3.11). Probably domesticated in the Levant in the Chalcolithic period. Numerous records from many Near Eastern sites, including in Iraq Tall Tāya (Akkadian) and Nimrūd (Iron Age).

§ 1.15. *Peach* (*Prunus persica* (L.) Batsch) (cf. A. § 3.12). Taken into cultivation in central Asia. Present at Samos, Greece, in the 7th cent. B. C., but other records are post-classical: Byzantine (6th cent. A. D.) Upper Zohar, Israel, and Sasanian Merv, Turkmenistan (6–7th cent. A. D.).

§ 1.16. *Pear* (*Pyrus communis* L.) (cf. A. § 3.13). Wild pears (*Pyrus syriaca* Boiss.) are occasional on prehistoric sites, though not yet found in Mesopotamia. They are common wild plants in northern Iraq. In Persia wild pears were ground into flour in the 19th cent., while in Turkey today they are eaten, like quince and medlar, after bletting. Wild pears seem an unlikely candidate for trade to southern Mesopotamia. Pears may have been domesticated in Europe, by the classical period.

§ 1.17. *Plum* (*Prunus*) (cf. A. § 3.14). The little archaeobotanical evidence for cultivated plum (*Prunus x domestica* L.) is from classical period Europe. The earliest definite record from the Near East is of European plum (*domestica* group) and damson (*insititia* group) from Islamic (c. 1250 A. D.) Qaryat Midād, Syria. As with apple and pear, the absence of archaeobotanical data suggests plums of any species were not cultivated in the ancient Near East.

§ 1.18. *Pomegranate* (*Punica granatum* L.) (cf. A. § 3.15). Grown in the Levant from the EB onwards. Only rarely found at sites in Iraq (Nimrūd, Iron Age) but today cultivated throughout the country, and likely to have been cultivated in the past.

§ 1.19. *Quince* (*Cydonia oblonga* Miller) (cf. A. § 3.16). Domesticated in Caucasia or central Asia, usually thought to be a late arrival in the Near East, perhaps in the classical period. One archaeobotanical record, from Iron Age Ḥasanlū, Iran, but incompletely published and in need of dating.

§ 2. Vegetables.

§ 2.1. *Greens* (cf. A. § 4.1).

§ 2.1.1. *Lettuce* (*Lactuca sativa* L.). Probably grown in ancient Egypt, based on artistic and textual evidence only; no other records until the classical period.

§ 2.1.2. *Cress* (*Lepidium sativum* L.). Cress seeds were found in the tomb of Tutankhamun. Probably domesticated in the Near East, but no archaeobotanical records.

§ 2.2 *Cucurbitaceae.*

§ 2.2.1 *Cucumber/melon* (*Cucumis sativus* L. and *Cucumis melo* L.) (cf. A. § 4.2). Seeds of the two species are identical in appearance. Archaeobotanical identifications to one species must therefore be treated as uncertain. The dating of numerous uncharred seeds from EB Šahr-i Soḫta, Iran, requires confirmation. The earliest reliable records are from Iron Age Nimrūd and Samos. Evidence for melon in Pharaonic Egypt is stronger than for cucumber.

§ 2.2.2. *Watermelon* (*Citrullus lanatus*) (Thunb. Matsum/Nakai). Abundant archaeological remains are known from second mill. B. C. Egypt, but not found in the ancient Near East.

§ 2.3. *Roots, bulbs etc.* (cf. A. § 4.3).

§ 2.3.1. *Garlic* (*Allium sativum* L.). In cultivation at least from the 2nd mill. B. C., e. g., 350 cloves from Tall al-Dēr, Iraq, c. 1630 B. C. *Onion* (*Allium cepa* L.) is abundantly documented from 2nd mill. B. C. Egypt.

§ 2.3.2. *Radish* (*Raphanus sativus* L.). Radish is thought to have been independently domesticated in Europe and in southeast Asia. Evidence for radish in ancient Egypt is unclear, and it is not well attested as a crop in the Mediterranean until the classical period. No radish seeds have been found in the ancient Near East.

§ 2.3.3. *Turnip* (*Brassica rapa* L. ssp. *rapa*). Like radish, no secure records before the classical period. A root fragment has been identified from 13th cent. Byzantine Sparta, Greece.

§ 2.4. Pulses (cf. A. § 4.4).

§ 2.4.1. *Chickpea* (*Cicer arietinum* L.), *Lentil* (*Lens culinaris* Medik.), *Pea* (*Pisum sativum* L.). Common in the Near East, including Mesopotamia, from the Neolithic period. Chickpea appears more commonly in northern Mesopotamia, pea in the south; lentils are widely distributed.

§ 2.4.2. *Horsebean* (*Vicia faba* L.). Most pre-Bronze Age records are of small numbers of seeds and are of doubtful reliability, as several wild species have seeds of similar shape. The first certain records of horsebean as a crop are from the 3rd mill. B. C., e. g., at ʿArad, Israel, later occurrences are sporadic, e. g., Ḫorbat Rōš Zayit, Iron Age, Israel. Records from Mesopotamia are of few seeds and are thus ambiguous, except for a large store from Early Islamic Bāzmosiān, Iraq. Large seeded forms (broad bean) appear to be a very recent (Islamic?) form.

§ 2.4.3. *Cowpea* (*Vigna unguiculata* (L.) Walp). Domesticated in Africa; taken to India during the second millennium B. C., possibly reached the Mediterranean in classical times, and the Near East in the Islamic period. Seeds have been found at Tall Guftān (1000 A. D.) and Qaryat Midād (1250 A. D.), Syria. A variety of other beans are known from 2nd millennium India, including *black gram* (*Vigna mungo* (L.) Hepper), *green gram* or mung (*V. radiata* (L.) R. Wilczek), and *hyacinth bean* (*Lablab purpureus* (L.) Sweet). Although all are cultivated today in Iraq, we can be reasonably certain that none were cultivated or consumed in ancient Mesopotamia.

§ 2.4.4. *Grass pea* (*Lathyrus sativus* L.). Probably first domesticated in Neolithic southeast Europe. Finds of just a few seeds may be of closely related wild species. Definite finds in the Near East include Tall al-Sweyhāt, Syria, EB (c. 2200 B. C.); Ḥadīdī,

Syria, (MB, 1900–1500 B. C.) and Bāzmosiān, Iraq (Old Babylonian, 1900–1700 B. C.). Sometimes mistakenly said to be toxic; in fact safe for human consumption if well cooked, and sold today in Iraq for soup-making. An important food pulse in India.

M. E. Kislev 1989: Economic Botany 43, 262–270.

§ 2.4.5. *Bitter vetch* (*Vicia ervilia* L. Willd.). Common at archaeological sites in Turkey from the Neolithic period, uncommon in Mesopotamia. Present at EB Tall Qurtass and Iron Age Nimrūd, cultivation perhaps then, as now, restricted to northern Iraq. Today a fodder plant, but often found in archaeological kitchen contexts that strongly suggest use as a food for humans. Like grass pea, toxic unless cooked.

§ 2.4.6. *Common vetch* (*Vicia sativa* L.). A Near Eastern fodder crop. Seeds are similar to many wild relatives, no certain archaeobotanical records. Possibly a recent domesticate.

General: D. Zohary/M. Hopf 2000: Domestication of plants in the Old World; **Pulses**: A. Butler 1998: in (ed.) A. B. Damania/J. Valkoun/G. Willcox/C. O. Qualset, The origins of agriculture and crop domestication, 102–117. – M. P. Charles 1985: BSA 2, 39–61.

Fruits and vegetables in Egypt: M. A. Murray 2000: in (ed.) P. T. Nicholson/I. Shaw, Ancient Egyptian materials and technology, 609–655.

Sites: AEGEAN Samos: D. Kucăn 1995: JDAI 110, 1–64; **Sparta**: J. G. Hather/L. Peña-Chocarro/E. J. Sidell 1992: Economic Botany 46, 395–400. – **ARABIA Dalma**: M. Beech/E. Shepherd 2001: Antiquity 75, 83–89; **Rās al-Ginz 2**: L. Costantini/P. Audisio 2001: Paléorient 26/1, 143–156. – **CYPRUS Hala Sultan Tekke**: H. Hjelmqvist 1979: in (ed.) U. Öbrink, Hala Sultan Tekke 5, 110–133. – **IRAN Bastam**: M. Hopf/U. Willerding 1988: in (Hg.) W. Kleiss, Bastam II, 263–318; **Ḥasanlu**: M. V. Harris 1989: Expedition 31, 12–23; **Šahr-i Soḫta**: L. Costantini 1977: in (ed.) G. Tucci, La città bruciata del deserto salato, 159–171. – **IRAQ Abu Ṣalābiḫ**: M. Charles 1993: in (ed.) A. Green, Abu Salabikh excavations. Vol. 4, 203–220; id. 1994: in (ed.) R. Luff/P. Rowley-Conwy, Whither environmental archaeology?, 181–184; **Bāzmosiān**: H. Helbæk 1963: Sumer 19, 27–35; **Ćoġa Māmī**: H. Helbæk 1972: Iraq 34, 35–48; **Nimrūd**: H. Helbæk 1966: in (ed.) M. E. Mallowan, Nimrud and its remains, 613–620; **'Oueili**: R. Neef 1991: in (ed.) J.-L. Huot, 'Oueili. Travaux de 1985, 321–329; **Tall al-Sawwān**: H. Helbæk 1964: Sumer 20, 45–48; **Tall Tāya**: J. G. Waines 1973: Iraq 35, 185–187; **Ur**: R. Ellison/J. M. Renfrew/D. Brothwell/N. Seeley 1978: JArS 5, 167–177; **Uruk**: T. Engel/H. Kürschner 1992: in (Hg.) M. van Ess/F. Pedde, Uruk. Kleinfunde II, 263–264, 271–274. – **LEVANT Pella**: G. Willcox 1992: in (ed.) A. W. McNicoll, Pella in Jordan 2, 253–256; **Upper Zohar**: S. Boardman 1995: in (ed.) R. P. Harper, Upper Zohar, 113. – **SYRIA Ḥammām al-Turkmān**: W. van Zeist/W. Waterbolk-van Rooijen 1992: Vegetation History and Archaeobotany 1, 157–161; **Qaryat Midād**: D. Samuel 2001: in (ed.) S. Berthier, Peuplement rural et aménagements hydroagricoles dans la moyenne vallée de l'Euphrate, 343–481; **Tall Šeḫ Ḥamad**: W. Frey/C. Jagiella/H. Kürschner 1991: in (Hg.) H. Kühne, Die rezente Umwelt von Tall Šeḫ Ḥamad, 137–161; **Tall Guftān**: see **Qaryat Midād**; **Tall al-Šweyḥāt**: W. van Zeist/J. A. H. Bakker-Heeres 1985: Palaeohistoria 27, 247–316. – **TURKMENISTAN Merv**: M. Nesbitt 1994: Iran 32, 71–73.

M. Nesbitt

O'Callaghan, Roger Timothy. Historian of the ancient Near East. Born in New York City October 13, 1912; died in a traffic mishap near Baghdad March 5, 1954. He entered the Jesuit order in 1929 and was ordained a priest in 1939. He studied ancient Near Eastern languages, history, and archaeology under W. F. Albright at John Hopkins University 1942–45, where he obtained his doctorate, followed by post-doctoral studies at the University of Chicago 1945–46. He taught philosophy at Fordham University (1941–42) and ancient Near Eastern history and archeology at the Pontifical Biblical Institute, Rome (1946–52). He participated in excavations at Byblos, Tall Far'a (near Nablus), and Nippur. Author of *Aram Naharaim* (Analecta Orientalia 26, 1948), a study of the history of eastern Syria between 2300 and 900 B. C., and a series of articles, primarily on Hurrian and Phoenician subjects.

F. L. Moriarty 1954: Catholic Biblical Quarterly 16, 328–329. – E. Vogt 1954: Biblica 35, 258–259 (with a bibliography of O'Callaghan's writings). – Anonymous (March) 1954: Al Baghdadi 22/2, 1–2.

J. A. Brinkman

Oda (Hyde) s. Uda.

Ökologie. Das Wissen um ökologische Zusammenhänge beruhte in Mesopotamien auf Erfahrung. Es wurde jedoch nie systematisiert. Die drei Faktoren Boden, Wasser und Klima bestimmten weitestgehend Land- und Viehwirtschaft in den drei dafür nutzbaren Zonen:

1. Gebiete mit Regen- oder Bewässerungsfeldbau, 2. Palmenhaine (Palme*) und Garten* meist nahe Flüssen und Kanälen, aber auch in Städten, und 3. Weidegebiete. Bereits die frühesten Ackerbauern bzw. Hirten sahen sich mit der Gefahr der Versalzung* der Böden durch Bewässerung* oder zu hohen Grundwasserspiegel bzw. mit der Gefahr der Zerstörung der Pflanzendecke durch Überweidung konfrontiert.

Die Bauern entwickelten vorbeugende Anbaumethoden:

1. Einstreuen des Saatgetreides mit dem Säpflug (Pflug*) in Furchen im Abstand von ca. 50 bis 75 cm mit nur drei- bis viermaliger Bewässerung gezielt in diese Furchen, 2. Anlage von Drainagekanälen zur Absenkung des Grundwasserspiegels, 3. Auflockerung der obersten Bodenschicht in der heißen Jahreszeit zur Minimierung der Verdunstung von aufgrund der Kapillarwirkung des Bodens aufsteigendem Wasser und 4. Anbau salztoleranter Pflanzen, besonders Gerste* und bei den Bäumen die Tamariske* (Hruška 1990, 391 ff., bes. 411 ff.; Jas 2000).

Die Gärten waren wahrscheinlich wegen der geringeren Verdunstung aufgrund des mehrstöckigen Anbaus (Palmen*, darunter Obstbäume und Gemüse* und Gewürzpflanzen) weniger durch Versalzung gefährdet. Dort produzierte man auch Holz (Garten*). Die Hölzer stammen z. B. von Dattelpalme*, verschiedenen Obstbäumen, Pappel*, Weide* und wenigstens einer Kiefernart. Es gab auch Wäldchen und regelrechte Baumpflanzungen. Die gefällten Bäume bearbeitete man vor Ort z. B. zu Dachbalken, Pfosten, Schiffsplanken und Pflugscharen; die Äste wurden z. B. zu Sichelgriffen oder Spatenstielen verarbeitet (BM 14309 (unpubl.); Powell 1992, 99 f.; van de Mieroop 1992, 155 ff.; Steinkeller 1987, 75 ff., 92 ff.).

Überweidung konnte man trotz des hohen Viehbestandes vermeiden durch Verfütterung von Rohr* und der im Überschuß produzierten Gerste. Daneben dienten alle den Tieren bekömmlichen Pflanzen und Pflanzenabfälle als Futter (Waetzoldt 1992, 129 f.; Stępień 1996, 32 ff.; zu d u ḫ/*tuḫḫu* z. B. M. Sigrist, SAT 2/3, Nos. 852, 923, 928, 970, 1008, 1586, 1825; AHw. 1366).

Zur Sicherstellung der Be- und Entwässerung der Felder und Gärten in den Landesteilen mit zu geringen Niederschlägen war die Anlage und Unterhaltung eines umfangreichen Kanalsystems notwendig. Dies gehörte zu den Aufgaben des Königs, wie zahlreiche Jahresdaten belegen. Der König hatte für das „Wohlergehen des Landes" zu sorgen, d. h. alle notwendigen Maßnahmen zur Sicherung der Nahrung für Mensch und Vieh, aber auch des (Handels)verkehrs auf Kanälen und Flüssen zu ergreifen. Wegen der bedrohlichen Frühjahrshochwasser mußte er die Flüsse und Kanäle eindeichen lassen. Die Anlage großer Flutbecken diente bei Gefahr dazu, Wasser zur Entlastung der Deiche und zum Schutz von Mensch und Vieh abzuleiten (Kanal(isation)*; viele Beiträge in BSA 5, 1990).

Man experimentierte auch mit importierten Pflanzen; so gelangte in der altakkad. Zeit Sesam* als Ölfrucht (Bedigian 1985, 159 ff.; Waetzoldt 1985, 77 ff.) und wohl auch Bambus (gi-Mà-gan^{ki}) zum Anbau. In nA Zeit ließen die Könige zum Teil exotische Pflanzen (z. B. Baumwolle) und Bäume anpflanzen. An Tieren führte man im II. Jahrtausend Pferd*, Kamel* und Katze* ein (Akklimatisation*; Limet 1998, 33 ff.).

Ein frühes ökologisches Bewußtsein zeigt sich z. B. auch in Briefen und literarischen Texten; denn Felder, Weidegebiete, Kanäle, der Euphrat oder Wasser werden als „Lebensgrundlage" (wörtlich „Lebensodem") des Landes bezeichnet (CAD N/1, 302 f. b 2').

Ackerbau- und Ackerwirtschaft in sum. Zeit*; Landwirtschaft* bes. § 2–4, § 6–8, § 12.