The Early Dynastic origin of the *water-lily* motif

The association of the water-lily (*Nymphaea*) with architecture and art is one of the most familiar visual aspects of the ancient Egyptian culture. For example during the Middle and New Kingdoms, large quantities of different types of objects are decorated with water-lilies ([1]). During the Early Dynastic period, the number of representations is more limited and the find contexts more restricted. Nevertheless, early representations are crucial for understanding the origin of the water-lily motif that becomes popular in ancient Egypt during subsequent periods.

Botanical identification

In the following paper, the term 'water-lily' is used for the *Nymphaea* plant (typically referred to as 'lotus' by Egyptologists) in order to avoid confusion with the Indian lotus *Nelumbo nucifera L.* The Indian lotus was introduced in Egypt probably not before the Persian occupation. In Egypt, two species of *Nymphaea* are indigenous: the white water-lily (*Nymphaea lotus L.)* and the blue water-lily (*Nymphaea caerulea Sav.* = *Nymphaea*

(1) Several examples can be found in W.J. Darby *et al.*, *Food: The Gift of Osiris*, London, 1977, 619-641; W.D. Spanton, "The water lilies of Ancient Egypt," *Ancient Egypt* (1917), 1-20; N. Beaux, *Le cabinet de curiosités de Thoutmosis III. Plantes et animaux du «jardin botanique» de Karnak,* OLA 36, Leuven, 1990, 142-157; L. Keimer, "La signification de l'hiéroglyphe rd, , , etc.," *ASAE* 48 (1948), 89-108; H.J. Kantor, *Plant Ornament. Its Origin and Development in the Ancient Near East,* Chicago, 1945, 8-91; L. Keimer, "Nouvelles recherches au sujet du Potamogeton lucens L. dans l'Égypte ancienne et remarques sur l'ornamentation des hippopotames en faïence du Moyen Empire," *Revue de l'Égypte Ancienne* 2 (1929), 210-253; J. Dittmar, *Blumen und Blumensträuße als Opfergabe im alten Ägypten,* MÄS 43, Berlin, 1986; S. Weidner, *Lotos im alten Ägypten. Vorarbeiten zu einer Kulturgeschichte von Nymphaea lotus, Nymphaea coerulea und Nelumbo nucifera in der dynastischen Zeit,* Pfaffenweiler, 1985; C. Ossian, "The Most Beautiful of Flowers: Water Lilies & Lotuses in Ancient Egypt," *KMT* 10, 1 (1999), 49-59. Especially for the New Kingdom, the texts deliver a wide range of symbolic-religious interpretations for the water-lily, associated with regeneration. In this context, the scent, behaviour of the flowers' opening and closing during night and day, and reproduction under water are relevant.

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stellata Willd. = *Nymphaea nouchali ssp. caerulea* (Savigny) Verdc.) (Fig. 1) ([2]). Both are perennial herbs with creeping rhizomes and one-flowered scapes ([3]). The leaves are floating or submerged, orbicular or ovate to oblong. The leaf margin of *Nymphaea lotus L.* is dentate, while that of *Nymphaea caerulea Sav.* is entire ([4]). The flowers of *N. lotus* are white and have a diameter of 15-22 cm when fully opened. *N. caerulea Sav.* has blue flowers with a diameter of 8-16 cm. Both species have four sepals, 4-7 cm long. Contrary to *N. lotus,* the sepals of the blue water-lily are marked with dark purple lines and dots. The petals are numerous and linear-oblong to lanceolate for *N. lotus* or oblong to round for *N. caerulea*. The centre of the water-lily flower consists of numerous carpels, which are enclosed in the cup-shaped floral axis and merged with this structure. On the flowers' surface, the upper part of the carpels, called stigma, is visible and acts as a receptor of pollen for pollination.

A specific feature of *N. lotus* is the act of night-flowering: the flowers open at sunset and close in the morning. *N. caerulea*, on the other hand, is diurnal. The two species reproduce with both seeds and rhizomes. The shoots appear from the rhizome and grow up to the surface. After the bud has completely emerged above the water surface, the flower opens. Pollination is performed by beetles and bees. After two to five days of flowering, according to the species typical timing, the flower wilts. The outer parts of the flower decay and abscise, while basal parts of the stamens and the flower axis completely merge and become part of the fruit. The fruit develops below the water surface into a spongy, berry-like capsule of globular or ovoid form. The seeds are released when the fruit wall splits, caused by the swelling mucilage, and bursts longitudinally. The disk formed by the stigmas and the peduncle is detached. Today, *N. lotus* plants growing in the north-eastern Ivory Coast release up to 10,000 seeds per fruit ([5]).

(2) L. Boulos, *Flora of Egypt. Volume 1: Azollaceae-Oxalidaceae,* Cairo, 1999, 152f.

(3) Cf. M. Zohary, *Flora Palaestina. Part One: Equisetaceae to Moringaceae,* Jerusalem, 1966.

(4) For a discussion regarding the manner in which different *Nymphaea* leaves are represented in ancient Egyptian art, cf. L. Keimer, "Note sur la représentation exacte d'une feuille de *Nymphaea Lotus* L. sur un bas-relief de Basse Époque," *ASAE* 28 (1928), 38-42.

(5) G. Hirthe & S. Porembski, "Pollination of Nymphaea lotus (Nymphaeaceae) by Rhinoceros Beetles and Bees in the Northeastern Ivory Cost," *Plant Biology* 5 (2003), 670-676.

Landscape and archaeobotanical remains

Water-lilies were an inseparable part of the ancient Egyptian landscape (6). During the Predynastic period and the Old Kingdom, lakes, swamps and marshes still covered large areas of Egypt. Examples include the large palaeolakes in the Fayum depression, south of Fayum, and between Akhmim/Sohag. Also, the northern marshes separating the country from the Mediterranean Sea still covered a large part of the delta (7). These watery environments were suitable for water-lilies that need shallow water habitats (depth no more than 3 m) with muddy bottoms (8).

Remains of water-lilies were found at the Late Palaeolithic site Wadi Kubbaniya in Upper Egypt (9) and the early Holocene site Nabta Playa E-75-6 in the Western Desert (10). The plant is attested during the Predynastic period by pollen samples from Naqada KH3 (11), demonstrating that water-lilies were part of the Upper Egyptian landscape at that time. Water-lilies have not been identified elsewhere, e.g. during the extensive archaeobotanical research in the settlement and cemeteries of Hierakonpolis (12) and Adaïma (13). The lack of evidence from sites other than Naqada KH3 may be due to the plant's tissue softness. Tubers, leaves and mericarps are

(6) M. Herb, "Landscape and Logistics — The Success of Ancient Egypt," in O. Bubenzer *et al*. (eds.), *Atlas of Cultural Environmental Change in Arid Africa,* Africa Praehistorica 21, Köln, 2007, 96-99.

(7) Herb, *op. cit*.; R. Said, *The River Nile,* London, 1993.

(8) *Idem*; M.A. Zahran & A.J. Willis, *The Vegetation of Egypt*, London, 1992, 187.

(9) G.C. Hillman, "Late Palaeolithic Plant Food from Wadi Kubbaniya in Upper Egypt: Dietary Diversity, Infant Weaning and Seasonality in a Riverine Environment," in D.R. Harris & G.C. Hillman (eds.), *Foraging and Farming: The Evolution of Plant Exploitation,* London, 1989, 207-239.

(10) J. Hather, "Parenchymatous tissues from the Early Neolithic site E-75-6 at Nabta Playa, Western Desert, South Egypt. Preliminary report," *Acta Palaeobotanica* 35, 1 (1995), 157-162. Cf. also C. de Vartavan & V. Asensi Amorós, *Codex of ancient Egyptian plant remains,* London, 1997, 181-183.

(11) A. Emery-Barbier, "L'homme et l'environnement en Egypte durant la période prédynastique," in S. Bottema *et. al*. (eds.), *Man's role in the shaping of the Eastern Mediterranean landscape*, Rotterdam - Brookfield, 1990, fig. 1.

(12) Not attested in A.G. Fahmy, "A Fragrant Mixture: Botanicals from the Basket in B333," *Nekhen News* 15 (2003), 20; A.G. Fahmy *et al*., "Plant Macroremains from an Elite Cemetery at Predynastic Hierakonpolis, Upper Egypt," *International Journal of Botany* 4 (2008), 205-212.

(13) C. Newton, "Upper Egypt: Vegetation at the Beginning of the Third Millennium BC inferred from Charcoal Analysis at Adaïma and Elkab," *JAS* 32 (2005), 355-367; Id., "Growing, Gathering and Offering: Predynastic Plant Economy at Adaïma (Upper Egypt)," in R. Cappers (ed.), *Fields of Change. Progress in African Archaeobotany,* Groningen Archaeological Studies 5, Groningen, 2007, 139-156.

underrepresented plant materials in comparison to harder remains such as fruit stones, which *Nymphaea* does not produce. On the other hand, Fahmy argues that Hierakonpolis, in particular, is situated in a region with remarkable preservation conditions for plant tissues (14), indicating that the water-lily was not used at that site. Nevertheless, the absence of particular plant remains does not categorically exclude the presence and use of *Nymphaea* in Predynastic times. To clarify this question, more refined methods for analysis are needed. For example, phytolith or other analyses which allow to trace decayed and strongly decomposed material of plant origin.

It is important to note that there are no archaeobotanical attestations for the Old Kingdom, either (15). In this case, the absence may be explained by the still limited extent of archaeobotanical research for that period, since water-lily representations in Old Kingdom tombs indicate beyond doubt that *Nymphaea* was used (cf. infra and Fig. 23) (16).

Early Dynastic *Nymphaea* representations

The oldest objects known for certain to represent (parts of) *Nymphaea*, date to the Early Dynastic period (17) and are small vessels of stone or faience showing a detailed rendering of the flower (Tab. A, Figs. 2-11). For the stone vessels, the difference between the four sepals and the petals is most obvious through the use of different types of stone. These well-shaped objects (Tab. A.7-10, Figs. 8-11) have sepals made of mudstone / greywacke and petals of calcite alabaster, approximately representing the colours of *Nymphaea lotus*. The four stone vessels as yet known are remarkably similar; and although a small conical base is preserved for only one of them (Tab. A.9, Fig. 10), all four seem to have had this element, as is

(14) Cf. A.G. Fahmy, "Missing Plant Macro Remains as Indicators of Plant Exploitation in Predynastic Egypt," *Vegetation History and Archaeobotany* 14 (2005), 287-294.

(15) Cf. de Vartavan & Asensi Amoros, *op. cit.*

(16) G. Pieke, "Der Grabherr und die Lotusblume," in M. Bárta (ed.), *The Old Kingdom Art and Archaeology. Proceedings of the Conference held in Prague, May 31 - June 4, 2004,* Prague, 2006, 259-280.

(17) Recent discussions concerning the interpretation of clay models from Naqada I-II tombs include: U. Hartung, "Friedhof U," in G. Dreyer *et al*., "Umm el-Qaab. Nachuntersuchungen im frühzeitlichen Königsfriedhof 9./10. Vorbericht," *MDAIK* 54 (1998), 97-98 where they are considered as poppy heads, which was refuted by R. Germer, *Die Heilpflanzen der alten Ägypter,* Düsseldorf, 2002, 139; Id., *Handbuch der Altägyptischen Heilpflanzen,* 2008, 310, who considers them lotus buds; however, neither interpretation seems correct. Further investigation on these enigmatic objects currently is being prepared by the authors.

suggested by traces on their bases. On the other hand, it is not obvious that the vessels are just imitations of the plant itself. The objects consist of two parts, a vessel, of which the pronounced shoulder is well discernable, surrounded by the petals and sepals of the water-lily ([18]). Despite the limited number of preserved examples, these stone water-lily vessels must represent a well known type. This is confirmed by the equally uniform faience vessels that can be considered imitations of the stone pieces, but which — black spots being applied on the sepals of most of them — represent not *N. lotus* but *N. caerulea*. An additional characteristic of the vessels is the shape of the rim, surrounding the opening as a circle, which is of course functional, but also may have been inspired by the appearance of the generative part of the flower with its stamina and the stigmata of the carpels ([19]).

The provenance of most of the little vessels is known (Tab. A). They come from very specific contexts. All of the faience vessels (Tab. A.1-6, Figs. 2-7) are from the early temples at Abydos and Hierakonpolis. The deposits in which the objects have been found are not chronologically homogeneous, making it impossible to define an exact date for the faience vessels within the Early Dynastic period or the early Old Kingdom. Conversely, the stone vessels (Tab. A.7-10, Figs. 8-11) have been found in tombs and therefore offer better possibilities for chronological considerations. The first example (Tab. A.9, Fig. 10) is from Emery's excavations in the elite Early Dynastic mastabas at Saqqara. Unfortunately, its exact provenance is unknown. As the vessel is not mentioned in Emery's publications on the First Dynasty mastabas, it may well date to the Second Dynasty, the tombs of which are published less extensively — some even remained unpublished. This date was also suggested by el-Khouli ([20]), but without argumentation. A second water-lily vessel comes from tomb 429 at Qau (Tab. A.8, Fig. 9). This is a large stairway tomb, which contained an important number of pottery and stone vessels, as well as a copper

(18) Similar to the stone imitation of a jar in a basket from Abydos (Berlin 17967, A. SCHARFF, *Die Altertümer der Vor- und Frühzeit Ägyptens. I: Werkzeuge, Waffen, Gefässe,* Staatliche Museen zu Berlin, Mitteilungen aus der ägyptischen Sammlung 4, Berlin, 1931, n° 623).

(19) W.M.F. PETRIE, *Abydos. Part II. 1903,* EEF 24, London, 1903, 26 links the disk-like shape of the rim on top of the lotus vases to architecture (for supporting the architrave) and considers it evidence for the existence of lotus columns at that early period. This is confirmed by the little ivory lotus column found at Helwan (Tab. B.4, Fig. 15).

(20) A. EL-KHOULI, *Egyptian Stone Vessels. Predynastic Period to Dynasty III. Typology and Analysis,* Mainz am Rhein, 1978, n° 5565.

ewer inscribed for the 'priest Nemti-hetep' (*ḥm-nṯr Nmtj-ḥtp*) ([21]). The tomb was tentatively dated by the excavator to the late Second Dynasty ([22]). A third water-lily stone vessel with known provenance comes from tomb 743 in the Bashkatib cemetery at Lahun (Tab. A7, Fig. 8), dated by Petrie to the late First or Second Dynasty ([23]). In addition to the water-lily vessel, the tomb contained nine stone vessels, a seal, and three copper tools. The funerary assemblage certainly surpasses the average number of objects found in the tombs of that cemetery, and, as far as can be ascertained for the heavily disturbed Bashkatib cemetery, tomb 743 was most likely the richest pit burial discovered.

The excavation reports neither describe any residue in the water-lily vessels, nor state positively the absence of such matter.

	Site / tomb	**Museum**	**Material / size**
1	Abydos, M69 ([24])	Boston, 03.1733	faience, 6.8 × 6.3 cm
2	Abydos, M69 ([25])	Cairo JdE 36120	faience, diam. 5.8 cm
3	Abydos, M69 ([26])	Cairo JdE 36121	faience, 5.0 × 5.0 cm
4	Abydos (?) ([27])	ex Kofler-Truninger, Luzern	faience, 6.5 × 6.5 cm
5	Abydos (?) ([28])	private coll., Berlin	faience, 5.4 × 5.2 cm
6	Hierakonpolis, Main Deposit ([29])	London, UC.11013	faience, 6.5 × 6.0 cm

(21) E. GRAEFE, *Studien zu den Göttern und Kulturen im 12. oberägyptischen Gau,* Freiburg, 1980, made the new lecture '*Nmti*' plausible for the god of the 12th nome, which in Brunton's time was read 'Anti'. Cf. also C. LEITZ (ed.), *Lexikon der ägyptischen Götterbezeichnungen*, volume 8, OLA 129, Leuven, 2003, 296f.: *Nmty* (and not *Antj*).

(22) G. BRUNTON, *Qau and Badari I,* BSAE & ERA 44, London, 1927, 11-12.

(23) W.M.F. PETRIE *et al*., *Lahun II,* BSAE & ERA 33, London, 1923, 22.

(24) PETRIE, *op. cit.,* pl. I.7, VII.94; W.S. SMITH, *Ancient Egypt as represented in the Museum of Fine Arts, Boston,* 4th ed., Boston, 1960, fig. 5; R. BUSSMANN, *Die Provinztempel Ägyptens von der 0. bis zur 11. Dynastie*, Leiden - Boston, 2010, A3213, Abb. 5.883.

(25) PETRIE, *op. cit.,* pl. VII.93; BUSSMANN, *op. cit*., A3211, Abb. 5.881.

(26) PETRIE, *op. cit.,* pl. VII.95; BUSSMANN, *op. cit*., A3212, Abb. 5.882.

(27) H.W. MÜLLER, *Ägyptische Kunstwerke, Kleinfunde und Glas in der Sammlung E. und M. Kofler-Truniger, Luzern,* MÄS 5, München, 1964, A 70; H. SCHLÖGL (ed.), *Geschenk des Nils. Ägyptische Kunstwerke aus Schweizer Besitz,* Basel, 1978, n° 32.

(28) G. DREYER, *Elephantine VIII. Der Tempel der Satet. Die Funde der Frühzeit und des Alten Reiches,* AV 39, Mainz am Rhein, 1986, 58, Tf. 60.e.

(29) J.E. QUIBELL & F.W. GREEN, *Hierakonpolis II,* ERA 5, London, 1902, pl. XLVI-IIb; B. ADAMS, *Ancient Hierakonpolis,* Warminster, 1974, n° 151; BUSSMANN, *op. cit*., H3089, Abb. 5.193.

	Site / tomb	Museum	Material / size
7	Lahun, Bashkatib 743 ([30])	Oxford, AM 1921.1343	calcite / mudstone, 6.3 cm
8	Qaw, tomb 429 ([31])	Manchester University 7053	calcite / mudstone, 10,0 cm
9	Saqqara ([32])	Cairo, JdE 71299	calcite / mudstone, unknown
10	Unknown ([33])	Basel, on loan from private collection	calcite / mudstone, 4.5 × 4.7 cm
11	Abydos, M69([34])	Oxford, AM E.44	mudstone leaf, 7.7 cm
12	Abydos, M69([35])	Cambridge Fitzwilliam E.9.1903	mudstone leaf, 7.2 cm

Tab. A: Early Dynastic vessels in shape of a *Nymphaea* flower and separate leafs ([36])

In addition to the vessels bearing the shape of the *Nymphaea lotus* or *N. caerulea* flower, there are a few instances of imitation of the leaves of these plants (Tab. B, Figs. 12-14). The first item (Tab. B.2, Fig. 13) is an exceptional carved stone dish from the tomb of Djet at Umm el-Qaab. Because the contour of the dish is smooth, one might consider it to imitate the shape of the *N. caerulea* leaf ([37]). However, the raised ridge around the inner circumference probably copies the in-turned edge of the leaf. The ridge may also be a reinforcement of the leaf, without rolling the edge. Nevertheless, the contour shape of the Abydos dish does not allow the identification of the water-lily variety beyond doubt, though it may very well concern *N. caerulea*. The second leaf imitation (Tab. B.1) is a copper mirror from a stairway tomb at Abusir. It is the earliest example of a rare

(30) PETRIE *et al*., *op. cit.,* 24, pls. XLIV, LIV; EL-KHOULI, *op. cit.,* n° 5563; B.G. ASTON, *Ancient Egyptian Stone Vessels. Materials and Forms,* SAGA 5, Heidelberg, 1994, n° 92; H. WHITEHOUSE, *Ancient Egypt and Nubia in the Ashmolean Museum,* Oxford, 2009, no 24.

(31) BRUNTON, *op. cit,* pl. XVIII,4; EL-KHOULI, *op. cit.,* n° 5564; ASTON, *op. cit.,* n° 92.

(32) EL-KHOULI, *op. cit.,* n° 5565.

(33) GRIMM, A. & SCHOSKE, S., *Am Beginn der Zeit. Ägypten in der Vor- und Frühzeit,* Schriften der Ägyptischen Sammlung 9, München, 2000, n° 146; S. SCHOSKE *et al*., *"Anch". Blumen für das Leben. Pflanzen im alten Ägypten*, München, 1992, n° 87 (attributed to 1st dyn.); A. WIESE, *Antikenmuseum Basel und Sammlung Ludwig. Die Ägyptische Abteilung,* Mainz, 2001, n° 9.

(34) PETRIE, *op. cit*., pl. VIII. 137; BUSSMANN, *op. cit*., A6027, Abb. 5.1014.

(35) PETRIE, *op. cit*., pl. VIII. 138; BUSSMANN, *op. cit*., A6028, Abb. 5.1015.

(36) An additional vessel is mentioned by ASTON, *op. cit.,* 125, n° 92 (Cambridge E. GA.4584.1943). The image available for this inventory number through the Fitzwilliam database shows a gold and stone pendant which can hardly date to the Second Dynasty.

(37) This is also the opinion of Barbara ADAMS (in press, n° 48).

type of mirror known from the Old Kingdom ([38]). Unfortunately, additional artifacts from the tomb are unknown. Although one may safely assume the mirror represents a *Nymphaea* leaf, it is not possible to determine the species (*N. lotus* or *N. caerulea*). The smooth edge of the leaf may result from the manner in which copper is worked and not a deliberate imitation of *N. caerulea*. Finally, representations of water-lily leaves can be found on inlay fragments from the tomb of Khasekhemwy at Umm el-Qaab (Tab. B.3, Fig. 14).

Also noteworthy among the Early Dynastic representations of water-lily is a small ivory or bone column in the shape of eight water-lily flowers bound together, found at Helwan (Tab. B.4, Fig. 15). It is considered by the excavator as part of a larger object, possibly a fan or walking stick. confirmation exists for this suggestion, but what may be stressed is that the object is the earliest attestation presently known of a composition of flowers and stems being used as "architectural" element ([39]).

	Site / tomb	**Museum**	**Material / size**
1	Abusir 12 B-4 ([40])	Cairo JdE 87531	copper, 21 cm.
2	Abydos, tomb of Djet ([41])	UC.37063	greywacke / diam. ca. 55 cm.
3	Abydos, Khasekhemwi ([42])	Inv. K 1879, Abydos R 547	bone, 4.6 × 2.2 cm
4	Helwan, 116 H.4 ([43])	Cairo	ivory / bone, 21 cm

Tab. B: Early Dynastic objects in shape of *Nymphaea* leaves and flower bunches ([44])

(38) L. KEIMER, "La signification de l'hiéroglyphe rd, , , etc.," *ASAE* 48 (1948), 97-100.

(39) Water-lily columns are frequently depicted in tomb scenes of the Old Kingdom, cf. the figures in PIEKE, *op. cit*.

(40) H. BONNET, *Ein Frühgeschichtliches Gräberfeld bei Abusir,* Veröffentlichungen der Ernst von Sieglin Expedition in Ägypten 4, Leipzig, 1928, 48, Tf. 32.3.

(41) B. ADAMS, *Fancy Stone Vessels from the Early Dynastic Royal Tombs at Abydos,* SAGA, Heidelberg, in press, n° 48.

(42) U. RUMMEL (ed.), *Meeting the Past. 100 Years in Egypt. German Archaeological Institute Cairo 1907-2007*, Cairo, 2007, n° 64; G. DREYER *et al*., "Umm el-Qaab, Nachuntersuchungen im frühzeitlichen Königsfriedhof 9./10. Vorbericht," *MDAIK* 54 (1998), 166, Tf. 15.a.

(43) Z.Y. SAAD, *The Excavations at Helwan: Art and Civilization in the First and Second Egyptian Dynasties,* Norman, 1969, 43-44, pl. 44.

(44) ADAMS, *op. cit.,* convincingly rejected the identification of MMA 19.2.17 by H.G. FISCHER, "Some emblematic uses of hieroglyphs with particular reference to an Archaic ritual vessel," *Metropolitan Museum Journal* 5 (1972), 15-17, figs. 21-22, as lotus leaf, showing that in reality it concerns a reworked piece, originally most probably a vine leaf.

During our revision of finds from Predynastic and Early Dynastic tombs, we found additional objects representing parts of water-lilies (Tab. C, Figs. 16-22). The first group consists of model flower buds, one of which was identified previously by Dreyer ([45]) as *Lotosknospe* (Tab. C.4, Fig. 19). On this model, from the early shrine at Elephantine, the four sepals are indicated by incised lines. A horizontal line near the base defines the stem node. An almost identical piece (Tab. C.5, Fig. 20) was found among the many objects from the Main Deposit at Hierakonpolis and was considered by Adams as "a possible lotus bud" ([46]). The two examples from room M69 in the early temple at Abydos are badly preserved and for one of them (Tab. C.1, Fig. 16), the stem node may have been located in the part that is now missing. The other examples (Tab. C.2-3, Figs. 17-18) are heavily eroded but does not seem to show the stem node. Nevertheless, both models from Abydos can be accepted as *Nymphaea* buds, due to the four incised lines indicating the petals and their likeness to the mentioned models from Elephantine and Hierakonpolis.

Besides these models, nine pottery rattles (Tab. C.6-14, Figs. 21-22) may be identified as buds of *N. caerulea*. Although the rattles have not yet been described as such, the identification of *N. caerulea* is clear. For the best made examples of these rattles, four sepals marked with incised points can be recognised easily (Tab. C.6-8). Between the sepals, petals are shown that — in contrast to the sepals — are without incised points and again reflect the stylised way of reproducing what has been observed in nature. Of the three remaining complete rattles, one is carefully made but shows only three sepals (Tab. C.10). The two others are rather roughly made and decorated on one half with incised points, only (Tab. C.9, 11). On three of the rattles (Tab. C.7, 9, 11), the stem node is indicated, with a single line above an undecorated area, similar to the models from Elephantine and Hierakonpolis discussed above. The three other rattles (Tab. C.6, 8, 10) and probably also two of the fragmentary examples (Tab. C.12, 14), show a double horizontal line placed at approximately one fourth of the height of the rattles, indicating, in our opinion, the water surface and the manner in which the flower bud emerges from the water. Indeed, the petals would only be visible for the part of the bud that is already out of the water. A double line indicates the optical effect of the bud being in the water and implies that the artisan focused on a bud on its journey from under the

(45) Dreyer, *op. cit.,* 1986, 121, n° 244.
(46) B. Adams, *Ancient Hierakonpolis,* Warminster, 1974, 29, n° 146.

water to a fully developed flower. The lower part of the latter three rattles is entirely marked with dots, reflecting the closed petals and sepals of the part of the bud still submerged (Fig. 1).

Eight of the rattles under discussion were found at Tell el-Farkha and another one at Hierakonpolis. Five examples from Tell el-Farkha (Tab. C.7-12, Fig. 22) were found together as part of a deposit of votive objects in a shrine, which was part of a much larger administrative–religious building (47). Two more (fragmentary) examples from Tell el-Farkha (Tab. C.13-14) were found in the cemetery: one near a tomb, the other in the top level of the south chamber of another tomb (48). Both rattles are considered related to the funerary rituals rather than being part of the funerary equipment. The association between rattles and funerary rituals complements the fact that all the other examples are from votive deposits in shrines. Unfortunately, the exact provenance of the example from Hierakonpolis is unknown, yet there exists a remarkable similarity between the Hierakonpolis rattle and the examples from Tell el-Farkha.

Rattles similar in shape, but different in decoration, already are known prior to the Early Dynastic period. The earliest examples are two rattles in red polished pottery with black spots found at Merimde (49). At least one of the rattles dates to the *jüngeren Merimdekultur* (50), presumably around 4600-4100 BC. For Predynastic times, their number is limited, but they are attested for Naqada IC and Naqada IIC (51), indicating that rattles were

(47) M. Chłodnicki *et al*., "Polish excavations at Tell el-Farkha (Ghazala) in the Nile Delta. Preliminary report 1998-2001," *Archeologia* 53 (2002), 73-75, fig. 8.B.

(48) Krzysztof Ciałowicz, pers. com.

(49) H. Junker, "Vorbericht über die dritte, von der Akademie der Wissenschaften in Wien in Verbindung mit dem Egyptiska Museet in Stockholm unternommene Grabung auf der neolithischen Siedelung von Merimde-Benisalâme," *AnzAWW* (1932), 70, Tf. V.

(50) J. Eiwanger, *Merimde – Benisalâme III. Die Funde der jüngeren Merimdekultur,* AV 59, Mainz, 1992, 65.

(51) **1**. Abadiya, tomb B111, not dated (Oxford AM E.2879), J.C. Payne, *Catalogue of the Predynastic Egyptian Collection in the Ashmolean Museum,* Oxford, 1993, n° 808. — **2**. Abydos, tomb U-560 (Abydos store room, U. Hartung, "Nile Mud and Clay Objects from the Predynastic Cemetery U at Abydos (Umm el-Qaab)," in R.F. Friedman & P. Fiske, *Egypt at its Origins 3*, Leuven, in press. — **3**. Gerzeh, tomb 27, Naqada IIC (London, UC.10748), W.M.F. Petrie *et al*., *The Labyrinth, Gerzeh and Mazghuneh,* BSAE & ERA 21, London, 1912, 24, pl. VI.11. — **4**. Mahasna, tomb H41, Naqada IC (Brussels E.2964-2967), E.R. Ayrton & W.L.S. Loat, *Pre-dynastic cemetery at El-Mahasna,* EEF 31, London, 1911, pl. XVII.3, M. Eyckerman & S. Hendrickx, "The Naqada I Tombs H17 and H47 at el-Mahasna, a visual Reconstruction," in R.F. Friedman & P. Fiske, *Egypt at its Origins 3*, Leuven, in press. — **5**. Naqada, tomb 1613, Naqada IC (Oxford AM 1895.467), Payne, *op. cit.,* n° 418; G. Graff, *Les peintures sur vases de Nagada I* —

present throughout the Predynastic period, up to Early Dynastic times. However, none of the Predynastic rattles shows details indicating petals or sepals. Several are painted red, among them are the examples from Mahasna tomb H41, preserved in Brussels ([52]). At least two rattles (n.44, nº 1, 7) are decorated with a line pattern imitating most probably melons (*Cucumis melo L.*) ([53]). After ripeness, the melon seeds loose from the inner flesh and therefore the melon and become a natural rattle when shaken. Obviously, this was the model of the earliest rattles, which explains their shape and occasional decoration. A similar explanation for water-lily buds being the inspiration for Early Dynastic rattles is excluded. Water-lily seeds only develop after the bud has flowered and lost its leaves, and will, of course, never rattle. Our experimental drying of water-lily fruits confirmed that even the small dried fruits will not rattle. Change in the decoration of rattles over time is addressed below.

	Site / tomb	Museum	Object type / size
1	Abydos, M69 ([54])	Brussels E.511	faience model, 14.0 cm
2	Abydos, M69 ([55])	Cairo JdE 36094	faience model, 11.2 × 7.5 cm
3	Abydos, M69 ([56])	Boston 03.1731	faience model, 12.9 × 8.0 cm
4	Elephantine, shrine ([57])	Elephantine 6953-81	faience model, 6.1 cm

Nagada II. Nouvelle approche sémiologique de l'iconographie prédynastique, Egyptian Prehistory Monographs 6, Leuven, 2009, n° 139. — **6**. Naqada, tomb 1615, Naqada IC (Oxford AM 1895.790), PAYNE, *op. cit.,* n° 575. — **7**. Sahel el-Baghlieh, not dated (Cairo CG 11504), J.E. QUIBELL, *Catalogue Général des Antiquités Egyptiennes. nos. 11.001-12.000 et 14.001-14.754. Archaic objects,* Cairo, 1905, n° 11504. — **8**. unknown, not dated (London UC.45288), unpublished. The online inventory of the Pitt Rivers Museum at Oxford includes a pottery rattle (inv. 1901.29.93) described as Predynastic, in date, from el-Amrah, tomb B1028. This description is most unlikely, since the tomb number is impossible. The highest tomb number mentioned by the excavators is B236 (D. RANDALL-MCIVER & A.C. MACE, *El Amrah and Abydos. 1899-1901,* EEF 23, London, 1902, 24). More than likely, the rattle is from the Middle Kingdom or SIP found by the same excavators in tombs 79 and 84 at el-Amrah (*Ibidem*, 87-88, pl. LIV.35)

(52) EYCKERMAN & HENDRICKX, *op. cit.*

(53) Cf. L. KEIMER, *Die Gartenpflanzen im alten Ägypten,* Berlin, 1924, 171, n° 20.

(54) W.M.F. PETRIE, *Abydos. Part II. 1903,* EEF 24, London, 1903, pl. VII.96; BUSSMANN, *op. cit.*, A3164, Abb. 5.840.

(55) PETRIE, *op. cit.*, pl. VII.97; BUSSMANN, *op. cit.*, A3163, Abb. 5.839.

(56) *Ibidem*, A3165, Abb. 5.841.

(57) DREYER, *op. cit.,* 1986, n° 244, Abb. 34, Tf.40.244.

	Site / tomb	Museum	Object type / size
5	Hierakonpolis, Main Deposit ([58])	UC.15005	faience model, 9.5 × 5.2 cm
6	Hierakonpolis ([59])	UC.15008	pottery rattle, 4.6 × 3.3 cm
7	Tell el-Farkha, shrine ([60])	TeF reg. 131, W6-D5	pottery rattle, 11.1 × 7.0 cm
8	Tell el-Farkha, shrine ([61])	TeF reg. 132, W8-D7	pottery rattle, 9.9 × 5.4 cm
9	Tell el-Farkha, shrine ([62])	TeF reg. 133, W11-D10	pottery rattle, 9.1 × 6.2 cm
10	Tell el-Farkha, shrine ([63])	TeF reg. 134	pottery rattle, 7.8 × 5.2 cm
11	Tell el-Farkha, shrine ([64])	TeF reg. 135, W9-D8	pottery rattle, 7.8 × 4.7 cm
12	Tell el-Farkha, shrine ([65])	TeF W01-10-D9	pottery rattle (fr.)
13	Tell el-Farkha, near tomb 2 ([66])	TeF E-02-3	pottery rattle (fr.)
14	Tell el-Farkha, tomb 4 ([67])	TeF E-03-4	pottery rattle (fr.)

Tab. C: Early Dynastic models in shape of *Nymphaea* flower buds

Nymphaea in early writing

Besides the three-dimensional objects, the water-lily appears in hieroglyphic writing from the beginning of the First Dynasty onwards. The sign  (M9) shows the flower of *Nymphaea* and a variant writing of it (M9^{v}) has been proposed by Kahl, occurring already during the reign of Iri-Hor ([68]). The sign occurs for the writing of *nḥb* 'tribute' ([69]), for which the "classical" M9 is used during the Old Kingdom. Thus, M9^{v} and M9

(58) J.E. Quibell, *Hierakonpolis I*, ERA 4, London, 1900, pl. XX.3; Adams, *op. cit.,* n° 146; Bussmann, *op. cit*., A3163, Abb. 5.839.

(59) Adams, *op. cit*., n° 147.

(60) Chłodnicki *et al*., *op. cit.,* pl. IX.4 top left; K.M. Ciałowicz, "Excavations at the Western Kom at Tell el-Farkha 1998-2003 (Nile Delta, Egypt)," *Recherches archéologiques de 1999-2003,* Krakow, 2006, ph. 20. (Fig. 21, centre).

(61) Chłodnicki *et al*., *op. cit.,* pl. IX.4 below right; Ciałowicz, *op. cit*., ph. 21. (Fig. 21, 1st from right).

(62) Unpublished, courtesy Krzysztof Ciałowicz (Fig. 21, 1st from left).

(63) Chłodnicki *et al*., *op. cit.,* pl. IX.4 top right (Fig. 21, 2nd from left).

(64) Chłodnicki *et al*., *op. cit.,* pl. IX.4 below left (Fig. 21, 2nd from right).

(65) Unpublished, courtesy Krzysztof Ciałowicz.

(66) Unpublished, courtesy Krzysztof Ciałowicz.

(67) Unpublished, courtesy Krzysztof Ciałowicz.

(68) J. Kahl, *Das System der ägyptischen Hieroglyphenschrift in der 0.-3. Dynastie*, GOF IV, Reihe Ägypten 29, 101-102; I. Regulski, *A Palaeographic Study of Early Writing in Egypt*, OLA, Leuven, 2010, 138, table M9.

(69) J. Kahl, coll. M. Bretschneider & B. Kneissler, *Frühägyptisches Wörterbuch, Zweite Lieferung m-h,* Wiesbaden, 2003, 243-244.

may be regarded as equal. On the other hand, the actual sign M9 is not attested for the Early Dynastic period, but appears in the pyramid texts as a determinative after the word *nḥb.t*, meaning (white) water-lily ([70]).  (M11) shows the water-lily flower on a long stalk, having been pulled up, and is used as determinative for *wdn*, meaning 'to make a sacrifice' ([71]). However, signs M9 and M11 are not attested during Early Dynastic times ([72]). For the Early Dynastic period, the only water-lily sign attested, aside from M9^{v}, is  (M12), showing the leaf of *Nymphaea* with its stalk and rhizome ([73]).M12 occurs from the very beginning of the First Dynasty (Aha), and is used to indicate the number 1000 (*ḫ3*) ([74]). A 'double' version of M12 (Kahl m3), indicating the number 2000, is present already on the Narmer macehead ([75]).When used in sacrificial texts, the number 1000 often means 'a large quantity,' The choice of the water-lily for expressing the number 1000 may be determined by the observation that the fruit includes an enormous number of seeds (up to 10,000) for reproduction. Conversely, the sign may indicate that the plant was present in huge numbers in swampy areas. Furthermore,  *ḫ3* is also used as a phonogram ([76]), confirming that the plant was a well known visual aspect of the daily environment.

The possible uses of *Nymphaea* in the Early Dynastic period

Scenes of so-called 'daily life' in tombs are not attested before the Third Dynasty. Nevertheless, scenes of 'daily life' are important for our investigation on the origin of the *Nymphaea* motif. The Old Kingdom representations show the plant in different contexts. As part of the landscape, it

(70) Pyr. 520, §1223e.

(71) Pyr. 274, §408b.

(72)  (M10), which shows a closed water-lily flower or bud, currently is not attested before the New Kingdom, cf. Gardiner, EG, 480, M10, and Thesaurus Linguae Aegyptiae: http://aaew.bbaw.de/tla/servlet/s0?f=0&l=0&ff=14&hc=M10&l1=0

(73) See L. Keimer, "La signification de l'hiéroglyphe rd, , , etc.," *ASAE* 48 (1948), 92.

(74) Kahl, *op. cit*., 560; Regulski, *op. cit.,* table M12.

(75) - Kahl, *op. cit*., 560, Narmer Qu.80, 585-586; Regulski, *op. cit.,* table m3; cf. also L. Keimer, "Bemerkungen zur Schiefertafel von Hierakonpolis (I. Dynastie)," *Aegyptus* 7 (1926), 169-188.

(76) The logogram *ḫ3* with the meaning 'water-lily' is not attested before the Middle Kingdom.

appears in scenes situated in the marshland. Here, the plant is reproduced in a naturalistic way with its flowers, buds, fruits, and leaves in different stages of development, often with a striking differentiation of leaves and flowers for the two *Nymphaea* species (77). The economic value of the water-lilies becomes visible in the harvesting scenes, showing men in a swamp or garden pool pulling up the stalks of water-lilies with flowers (open and closed), fruits, and buds (78). Equally important are the materials on the boats depicted in the marshlands (Fig. 22). The loaded baskets contain different parts of water-lilies. It is apparent that flowers and buds with stalks, and fruits have been transported (79). Some of the boatmen hold water-lily flowers in their hands. Most noticeable are those figures whose heads and necks are adorned with the flowers (80).

Only one of these scenes, in the tomb of Meresankh III (81), bears an inscription. The scene shows a boat loaded with water-lily flowers. One of the boatmen is holding a flower to his nose to inhale the smell. The

(77) Cf. for example the west wall of the entrance hall in the tomb of Kagemni, Saqqara (C.M. FIRTH & B. GUNN, *Teti Pyramid Cemeteries II,* Cairo, 1926, pl. 53); the west wall of room I in the tomb of *ʿnḫ-m-ʿ-Ḥr*, Saqqara (A. BADAWY, *The tomb of Nyhetep-Ptah at Giza and the Tomb of Ankm'ahor at Saqqara,* Berkeley, 1978, fig. 26); the east side of the south wall in the tomb of *Ḏʿw* (N.d.G. DAVIES, *The Rock Tombs of Deir el Gebrâwi II,* ASE 12, London, 1902, pls. V); the right half of the east wall in the chapel of *ȝḫti-ḥtpw*, Saqqara (N.d.G. DAVIES, *The mastaba of Ptahhetep and Akhethetep at Saqqareh II*, ASE 9, London, 1901 = C. ZIEGLER, *Fouilles du Louvre à Saqqara I. Le mastaba d'Akhethetep,* Leuven/ Paris, 2007, fig. 37); cf. also the figures in L. KEIMER, "Nouvelles recherches au sujet du Potamogeton lucens L. dans l'Égypte ancienne et remarques sur l'ornementation des hippopotames en faïence du Moyen Empire," *Revue de l'Égypte Ancienne* 2 (1929), 210-253.

(78) Cf. for example the east wall of the tomb-chapel of *Sḫm-kȝ=i,* Giza (W.K. SIMPSON, *Giza Mastabas, vol. 4: Mastabas of the Western Cemetery I*, Boston, 1980, fig. 4, pl. III a/b); furthermore see the list of representations by M. HERB, *Der Wettkampf in den Marschen, Quellenkritische, naturkundliche und sporthistorische Untersuchung zu einem altägyptischen Szenentyp,* Nikephoros Beihefte 5, Hildesheim, 2001, 337, n. 491. Harvesting the water-lily in a man-made garden pool is illustrated in the tomb of Nianchchnum, Saqqara (MOUSSA & ALTENMÜLLER, *op. cit.,* 76-77 (scene 9.4.2), Tf. 20-21, Abb. 8).

(79) Cf. the figures in HERB, *op. cit.,* 445ff., Dok. 1 (flowers with stalk); 10 (fruits; flowers with stalk); 12 (buds and rhizome [?]); 13 (fruits); 15 (flowers with stalk); 16 (flowers with stalk); 19 (fruits); 22 (flowers with stalk; fruits; rhizomes); 35. HERB, *op. cit.,* 334f. considers the rhizomes coming from papyrus. In older literature, the products on the boats have been considered special kinds of fruits or vegetables, utilized as the meal for the workmen,. For convincing arguments against this, see *Ibidem*, 326-328.

(80) Cf. the figures in HERB, *op. cit.,* 445ff., Dok. 3, 10, 14, 16, 19, 20, 22, 25, 26, 31 (cf. fig. 37).

(81) Tomb of Meresankh III, G7530-7540, Giza, Eastern field (D. DUNHAM & W.K. SIMPSON, *The Mastaba of Queen Mersyankh III, G7530-7540,* Boston, 1974, 10, fig. 4).

inscription reads: *pr.t m šȝ ḫnʿ nḥb.wt ỉn mḥ.tiw=ś ỉn=śn n=ś ỉḫ.t nb.t nfr.t ỉnn.t n špś.t m kȝ.wt śḫ.t* "Her (Meresankh's) marsh-men coming out of the marshland with (white) water-lilies bringing to her every good thing which is generally brought to a noble woman from the works in the fields". The direct relation with the elite living style of women clearly illustrates the high esteem given to the water-lily. This relationship is confirmed by the representation of water-lilies in garden pools ([82]), illustrating the pleasant aspects of life.

There are two terms for 'water-lily', *nḥb.t* and *sššn* / *śššn* > *śšn* / *ššn*. In our opinion, *nḥb.t* is the white (*N. lotus*) and *sšn* the blue species (*N. caerulea*) ([83]). These terms also are used during the Middle and New Kingdoms to denote the water-lily, but are not attested very often. In the Old Kingdom texts *nḥb.t* is mentioned in the scene shown above (Meresankh III), and in pyramid text spell 520 (§1223d/e): "… Pepi will pluck out the 'dancers' (tufts of hair) on your head like a (white) water-lily out of the marshland." (*fdi.kȝ Ppy ỉȝi.w ḥr-ib dp=ṯn mi nḥb.t m ḫnt*(*.i*).*w-šȝ*). In addition, *nḥb.t* and *śšn* are the names of two domains of Kajemnofret ([84]). *sš*(*š*)*n* is attested in pyramid text spell 249 (266a): "Unas appears as Nefertem, as the (blue) water-lily at the nose of Re" (*ḫʿi Wnis m Nfr-tm m sššn r šr.t Rʿ.w*). This idea continues in the Book of the Dead (Tb 81, Tb 174). In summary, it may be said that the textual evidence only allows the following conclusions, 1) *Nymphaea* can be used as a symbol for large quantities and 2) *Nymphaea* may be used to denote a sweet smell.

Because the available documentation does not provide more precise indications for the purposes the water-lily served, we will now analyze the water-lily from a modern perspective to discuss the possible uses of that plant.

Nymphaea as food plant

The nutritional value of *Nymphaea* seeds, fruits, and rhizomes is well known in all parts of the world. For example, *Nymphaea* is one of the

(82) Mehu, Saqqara (H. Altenmüller, *Die Wanddarstellungen im Grab des Mehu in Saqqara,* AV 42, Mainz, 1998, 207, Tf. 102 [5]); Niankh-khnum and Khnumhotep, Saqqara, (A.M. Moussa & H. Altenmüller, Das *Grab des Nianchchnum und Chnumhotep,* Mainz, 1977, 76-77, Tf. 20-1, Abb. 8).

(83) For the terminology of plant names, work is currently in progress by Pommerening.

(84) Mastaba of *Kȝ*(*=j*)*-m-nfr.t*, Gisa, Central Field (PM III, 230-293), vestibule B, east wall, register 1 (domains): *Nḥb.t-Kȝ*(*=j*)*-m-nfr.t*; *sššn-Kȝ*(*=j*)*-m-nfr.t*. (S. Hassan, *Excavations at Gîza 1930-1931*, Cairo, 1936, 122-123, fig. 137, pl. XL-XLII).

most important sources of food for some places in West Africa and in other areas the starchy rhizomes are used to produce a flour for baking bread, especially in times of need ([85]).

The use of the wetland resources in Egypt can be traced back to Late Paleolithic times. Hillman *et al*., using the archaeobotanical evidence in combination with ethnographic observations and experimental data, demonstrated that the rhizomes and tubers from the wetlands were one of the main sources of starch for the early foragers at Wadi Kubbanya ([86]). The study indicates that the consumption of water-lily buds, seeds, and rhizomes is very probable at that site. Evidence for use of *Nymphaea* rhizomes also is available in the archaeobotanical record of Nabta Playa ([87]). Nevertheless, there is no evidence for the consumption of water-lily during Predynastic and Early Dynastic times. Furthermore, there is no textual evidence for the use of *Nymphaea* products as food prior to the Greco-Roman period ([88]). Only the water lily fruits in sacks, depicted on the Old Kingdom reliefs mentioned above, may be indicative of food consumption. By contrast, the consumption of *Nelumbo nucifera* in Egypt is well attested. Herodotus (II, 92) writes about Egyptians uses for the roots and capsules. The lotus was introduced to Egypt from India, but apparently not before the New Kingdom ([89]). During the Greco-Roman period, Greek

(85) F. R. Irvine and R. S. Trickett, "Waterlilies as Food," *Kew Bulletin* 8, n° 3 (1953), 363-370; R. Hegnauer, *Chemotaxonomie der Pflanzen. Ein Übersicht über die Verbreitung und die systematische Bedeutung der Pflanzenstoffe*. Bd. 9: Nachträge zu Band 5 und 6, Basel, 1990, 135f.; H.M. Burkill, *The Useful Plants of West Tropical Africa*. Vol. 4: *Families M-R*, Kew, 1997, 264 ff.; A.A. Elegami *et al*., "Two very unusual Macrocyclic Flavonoids from the Water-lily Nymphaea lotus," *Phytochemistry* 63, 6 (2003), 727-731. For *N. alba L.* and *Nuphar lutea L.,* cf. W. Franke, *Nutzpflanzenkunde*, 7., vollständig überarbeitete und erweiterte Auflage, Stuttgart / New York, 2007, 102.

(86) G.C. Hillman *et al*., "Wild plant foods and diet at Late Paleolithic Wadi Kubbaniya: The Evidence from Charred Remains," in F. Wendorf *et al*. (eds.), *The Prehistory of Wadi Kubbaniya. Volume 2. Stratigraphy, Paleoeconomy and Environment,* Dallas, 1989, 162-242.

(87) J. Hather, "Sites E-75-6 and E-91-1: Identification of Parenchymateous Tissues from Nabta Playa," in F. Wendorf & R. Schild (eds.), *Holocene Settlement of the Egyptian Sahara,* New York, 2002, 603-612.

(88) The two terms attested for the water-lily in the Old Kingdom *nḥb.t* and *sšn* do not appear in the offering formula (cf. W. Barta, *Die altägyptische Opferliste von der Frühzeit bis zur griechisch-römische Epoche,* MÄS 3, Berlin, 1963; R. Hannig, *Ägyptisches Wörterbuch I. Altes Reich und Erste Zwischenzeit*, Hannig-Lexica 4, Mainz, 2003), or in nutritional contexts. On the other hand the whole plant is depicted on offering tables of that time.

(89) Seeds of *Nelumbo* are first attested in Deir el Medineh (Dyn. 18), cf. de Vartavan & Asensi Amoros, *op. cit.,* 180.

and Roman authors describe the nutritional aspects of the seeds and the rhizomes of a water-lily-like plant in Egypt used by both men and animals ([90]). The accuracy of these accounts regarding the plant descriptions allows one to distinguish between the different species *Nelumbo* and *Nymphaea* ([91]). During the Greco-Roman period, as well as in modern Egypt, the use of the *Nymphaea lotus* for nutrition is evident ([92]).

Pharmacological value

The pharmacological value of *Nymphaea* currently awaits further examination. In 1985, Benson Harer Jr. studied the textual evidence ([93]), beginning with the ancient Egyptian medical prescriptions, then extending to the Greek and Roman authors, whose observations lived on in European medicine. Unfortunately, Harer did not make a distinction between the different lotus/water-lily species. Harer suggests that the Egyptian lotuses (= *Nymphaea* spec.) contain potent narcotic alkaloids in both flowers and rhizomes, "a fact generally unknown to Egyptologists and botanists"([94]). Harer's suggestion is based upon the assumption that, "members of the same genus contain similar or identical alkaloids"([95]). However, Harer's assumption is false. In general in a historical view, the genera have been set morphologically, not chemotaxonomically, so that when the phytochemical status of a species is unknown, one has to analyze the individual plants, themselves. It is not possible to research the phytochemical status of *Nymphaea lotus* or of *Nymphaea caerulea* by examining some other *Nymphaea* species or some species of the *Nuphar* or even *Nelumbo,* whose genera were separated chemotaxonomically from the Nymphaea spec. after their differences in alkaloid content had been detected ([96]). Furthermore, chemically similar (but not identical) alkaloids may have completely different effects, which moreover depend on the concentrations present in a plant (cf. poppy).

(90) Cf. W.J. Darby *et al*., *Food: The Gift of Osiris*, Vol. 2, London, 1977, 629-633 (refering to Herdotus, Theophrastus, Diodorus, Pliny)

(91) During the Greco-Roman period the term 'lotus' was used for several different, also non-aquatic, plant species.

(92) Cf. n. 86.

(93) Cf. W. Benson Harer Jr., "Pharmacological and Biological Properties of the Egyptian Lotus," *JARCE* 22 (1985), 49-54.

(94) *Ibidem*, 49.

(95) *Ibidem*, 51.

(96) Cf. R. Hegnauer, *Chemotaxonomie der Pflanzen. Ein Übersicht über die Verbreitung und die systematische Bedeutung der Pflanzenstoffe*. Bd. 9: Nachträge zu Band 5 und 6, Basel, 1990, 135f.

For the Egyptian *Nymphaea* species, the available phytochemical knowledge is very limited ([97]). The metabolits isolated from *Nymphaea lotus* and *Nymphaea caerulea* are alkaloids (Armepavin), flavonoids, anthocyanins and tannins, all of which do not cause any striking effect *in vivo*.

Today, *Nymphaea* species are used in folk medicine all over the world for different purposes. The plant is reported to have tranquilizing effects, astringent and diuretic properties, and to be an aphrodisiac. Traditional Sudanese medicine views *Nymphaea lotus* as a remedy for dysentery, to treat tumours, and as an antibacterial ([98]). Presently, it is not possible to associate these effects to the phytochemicals which have been found in N. *lotus* / *caerulea* ([99]).

Perfumed oils

The day-flowering *N. caerulaea* emits a sweet smelling odour, whereas the flowers of *N. lotus*, which open during the night, have a strong, pungent floral scent. This characterization of the scents is due to Savigny, who provided the first description of *N. caerulaea* and determined its name, during Bonaparte's Egyptian campaign. Savigny observes that "the whole surface of the canals, the rivers and almost all the inundated land is enamelled with flowers, whose magnificent blossoms of white and blue charm the eye with their splendor, and fill the air with an agreeable perfume" ([100]). There is no doubt that the ancient Egyptians had the ability to

(97) Thirty years ago, W.A. Emboden ["The Sacred Narcotic Lily of the Nile: Nymphaea caerulea," *Economic Botany* 32 (1978), 395-407; "Transcultural Use of Narcotic Water Lilies in Ancient Egyptian and Maya Drug Ritual," *Journal of Ethnopharmacology* 3 (1981), 39-83] launched the idea that the blossoms of *Nymphaea caerulea* may have been used in rituals, because of the included aporphin alkaloids (i.e. apomorphin) having narcotic effects. It should be emphazised that those alkaloids have not been detected in the Egyptian *Nymphaea* species and therefore, Embodens and Harers implementations must be questioned, cf. Hegnauer, *op. cit.*, 136. Cf. also D.J. Counsell, "Intoxicants in Ancient Egypt? Opium, Nymphaea, Coca and Tobacco," in R. David (ed.), *Egyptian Mummies and Modern Science,* Cambridge, 2008, 206-208.

(98) A.A. Elegami *et al.*, *op. cit.*; V.K. Agnihotri *et al.*, "Antioxidant Constituents of Nymphaea caerulea Flowers," *Phytochemistry* 69 (2008), 2061-2066.

(99) Some articles still claim similar alkaloid contents in different Nymphaea species and construct their arguments on this claim. For example E. Bertol *et al.*, "Nymphaea cults in ancient Egypt and the New World: a lesson in empirical pharmacology," *Journal of the royal society of medicine* 97 (2004), 84f. Research on the alkaloids of *Nymphaea caerulea* and *lotus* are absolutely essential to give those works a fundamental basis.

(100) J.-C. Savigny, Description of a new species of Nymphaea, in *Memoirs relative to Egypt: Written in that Country during the Campaigns of General Bonaparte*, London, 1800, 122-129, here 123 and 128. The chemical composition of the floral scent was

conserve such a scent by pressing the flower and binding the product in fats or oils, at least by the Old Kingdom ([101]). The number of different terms for oils already attested for the Early Dynastic period demonstrates that the production of perfumed oils began prior to the Old Kingdom, but when exactly this production first occurred is less easily defined. The development of stone vessels provides the most relevant source of information. Stone vessels are ideal containers for the storage of fats and oils. Smaller vessels generally are accepted as having served this purpose ([102]). In general, the rims of these jars are pronounced, allowing them to be closed by a piece of cloth or leather, bound below the rim with a rope, illustrated by the imitations of gold foil from the tomb of Khasekhemwy ([103]). Even though stone vessels are known from the Badarian period, the number increases spectacularly from the Naqada IIIA2 period onwards ([104]), becoming a characteristic element of Early Dynastic burials. However, even during the Early Dynastic period, small stone vessels are by far not present in all tombs and remain an elite item. Tens of thousands of stone vessels were produced for the royal tombs at Abydos ([105]), as well as the elite mastabas at Saqqara. The increase in stone vessels and the importance given to them in elite contexts is at least partially explained by their use as cosmetic vessels, hinting at the important developments in the cosmetic technology during the early Naqada III period. Given the absence of water-lily in Predynastic iconography, it seems reasonable that the use of the water-lily, especially *N. caerulea*, was the driving force behind this development. Unfortunately, this cannot be confirmed by hard facts, since little content analysis is available for Early Dynastic stone vessels.

examined by F. Ervik & J.T. Knudsen, "Water lilies and Scarabs: Faithful Partners for 100 Million Years?" *Biological Journal of the Linnean Society* 80 (2003), 539-543.

(101) For scenes of oil pressing and filling of oil jars see the tomb of Nebemakhet, Giza (LD, II. 13; S. Hassan, *Excavations at Giza*, vol 4, Cairo, 1943, 140, 142, fig. 81); the tomb of Iymery, Giza, west field, G 6020 (LD, II. 49 [b]; K. Weeks, *Giza Mastabas*. Vol. 5: *Mastabas of Cemetery G 6000*, Boston, 1994, 36, fig. 30, pl. 14 [a]).

(102) H. Balcz, "Die Gefässdarstellungen des Alten Reiches," *MDAIK* 3 (1932), 76-94; S. Hendrickx, *Elkab V. The Naqada III Cemetery,* Brussels, 1994, 124-127.

(103) London, British Museum, EA 33567-33568, A.J. Spencer, *Early Egypt. The Rise of Civilisation in the Nile Valley,* London, 1993, 86, fig. 65.

(104) S. Hendrickx, "Predynastic – Early Dynastic chronology," in E. Hornung *et al.* (eds.), *Ancient Egyptian Chronology,* Handbook of Oriental Studies, Section One, The Near and Middle East 83, Leiden / Boston, 2006, 72-73; P. Kopp, "Prä- und frühdynastische Steingefässe — Chronologie und soziale Divergenz," *MDAIK* 63 (2007), 193-210.

(105) S. Hendrickx *et al*., "Excavating in the Museum: The Stone Vessel Fragments from the Royal Tombs at Umm el-Qaab in the Egyptian Collection of the Royal Museums for Art and History at Brussels," *MDAIK* 57 (2001), 73-108.

CONCLUSIONS

The wide ethnographic observations on water-lily uses in Africa, as well as data from the Palaeolithic period at Wadi Kubbania and Nabta Playa indicate the potential use of the water-lily as a food source. However, the archaeobotanical evidence currently available for Predynastic and Early Dynastic sites does not provide any definitive insights pertaining to exploitation of the water-lily as a food source or for some other purpose. Conversely, the Old Kingdom representations strongly indicate the use of the water-lily as food and other purposes, evidenced by the frequent harvest depictions of the water-lily (flower, bud, and fruit).

At least one of the possible uses of the water-lily may be illuminated by the stone vessels from the Early Dynastic period in the shape of water-lilies, which most probably served cosmetic purposes in an elite context. The very small aperture of these vessels makes them suitable only for containing liquids or viscous substances, to which perfumed oils correspond perfectly. Imitating the water-lily would refer to its odorous qualities, directly confirming its function as cosmetic vessel.

Figurative stone vessels inspired by floral motives, especially in the shape of leaves, are a remarkable aspect of the Early Dynastic elite culture. The examples known are primarily from the royal tombs at Abydos ([106]) with a few examples from the elite mastabas at Saqqara. Although it concerns mainly plates and dishes, the water-lily vessels are part of the same tradition. The faience water-lily vessels from the temple deposits differ from the stone vessels only through the material used. Because faience is a much preferred material for models in temple deposits, the faience vessels are most probably imitations of the stone prototypes. Indeed, the models of water-lily buds, also from temple deposits, are made of faience. Both the models and faience vessels should be considered within the general idea of temple deposits, in which a large variety of votive objects occurs, representing humans, animals and other objects ([107]). The meaning of the votive objects refers, in many cases, directly to the person(s) making the offering. Therefore, floral models, such as the water-lily buds discussed here, may be replacements for the actual items as offering gifts. However, because votive objects also referred to wishes for fortune and protection in both life and afterlife, a symbolic meaning can

(106) B. ADAMS, *Fancy Stone Vessels from the Early Dynastic Royal Tombs at Abydos,* SAGA, Heidelberg, in press.

(107) Cf. DREYER, *op. cit.*

not be excluded. In that case, the water-lily may refer to flowering and prosperity / beauty in an undefined future. Such interpretation, however, remains entirely unsupported by direct or written evidence.

The rattles are a most intriguing artefact group. As object type, they exist from Naqada I onwards, but they received a new kind of decoration during Early Dynastic times, turning them into water-lily buds. The reason for this may be sought in the plants relation with beauty and by extension with music. This is probably also why during dynastic times water-lilies can often be seen decorating music instruments or being held by singers and dancers. Furthermore, the direct relation with beauty is confirmed by the mirror in the shape of a water-lily leaf from Abusir.

The sudden appearance of water-lilies in Early Dynastic iconography is to be seen in the context of the development of the dynastic visual language. Although many of its aspects can be traced back to Predynastic times ([108]), this seems not to be the case for the water-lily. Accepting the formalization of the Early Dynastic iconography and visual language as a fundamental element of state formation and the possibility for self-identification of court circles, the water-lily is to be accepted as an element of elite behaviour. Perfumed oils are a logical and well noticeable expression of this statement. The exquisite stone water-lily vessels found in elite tombs are a perfect visual component, as are stone vessels in general, be it in a less explicit manner. The association of *Nymphaea* with music, shown by rattles imitating water-lily buds, equally points to the more pleasant side of elite life. On the other hand, most of the rattles have been found in temple deposits, as is the case for the faience imitations of stone water-lily vessels. Although the elite context is less obvious for the temple deposits, one cannot doubt that the temples themselves were controlled by the elite. It is probably only after the Old Kingdom that the *Nymphaea* motif looses its explicit elite connotation. From the Middle Kingdom onwards, a more widespread, and to some extent vulgarised, use of water-lily as equivalent for beauty and pleasure develops into the numerous and extremely diversified attestations of the plant, including its important religious significance ([109]).

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(108) Cf. S. HENDRICKX & F. FÖRSTER, "Early Dynastic Art and Iconography," in A.B. LLOYD (ed.), *Companion to Ancient Egypt*, Cambridge, 2009, 826-852; S. HENDRICKX & M. EYCKERMAN, "Continuity and Change in the Visual Representations of Predynastic Egypt," in I. INCORDINO *et al*. (eds.), *ANSE Conference*, Wiesbaden, in press.

(109) Acknowledgments. — We like to thank Krzysztof CIAŁOWICZ for generously sharing unpublished information on the rattles found at Tell el-Farkha and Ulrich HARTUNG

SOURCES OF THE ILLUSTRATIONS. — Fig. 1. Drawing Merel EYCKERMAN. — Fig. 2. W.M.F. PETRIE, *Abydos. Part II. 1903,* London, 1903, pl. I.7. — Fig. 3. W.M.F. PETRIE, *Abydos. Part II. 1903,* London, 1903, pl. VII.93. — Fig. 4. W.M.F. PETRIE, *Abydos. Part II. 1903,* London, 1903, pl. VII.95. — Fig. 5. H.W. MÜLLER, *Ägyptische Kunstwerke, Kleinfunde und Glas in der Sammlung E. und M. Kofler-Truniger, Luzern,* München, 1964, A 70. — Fig. 6. G. DREYER, *Elephantine VIII. Der Tempel der Satet. Die Funde der Frühzeit und des Alten Reiches,* Mainz, 1986, Tf. 60.e. — Fig. 7. B. ADAMS, *Ancient Hierakonpolis,* Warminster, 1974, pl. 31.151. — Fig. 8. H. WHITEHOUSE, *Ancient Egypt and Nubia in the Ashmolean Museum,* Oxford, 2009, 45. — Fig. 9. Manchester University Museum internet database. — Fig. 10. A. EL-KHOULI, *Egyptian Stone Vessels. Predynastic Period to Dynasty III. Typology and Analysis,* Mainz, 1978: n° 5565. — Fig. 11. A. WIESE, *Antikenmuseum Basel und Sammlung Ludwig. Die Ägyptische Abteilung,* Mainz, 2001, n° 9. — Fig. 12. H. BONNET, *Ein Frühgeschichtliches Gräberfeld bei Abusir,* Leipzig, 1928, Tf. 32.3. — Fig. 13. B. ADAMS, *Fancy Stone Vessels from the Early Dynastic Royal Tombs at Abydos,* Heidelberg, in press, n° 48. — Fig. 14. U. RUMMEL (ed.), *Meeting the Past. 100 Years in Egypt. German Archaeological Institute Cairo 1907-2007*, Cairo, 2007, n° 64. — Fig. 15. Z.Y. SAAD, *The Excavations at Helwan: Art and Civilization in the First and Second Egyptian Dynasties,* Norman, 1969, pl. 44. — Fig. 16. W.M.F. PETRIE, *Abydos. Part II. 1903,* London, 1903, pl. VII.96. — Fig. 17. W.M.F. PETRIE, *Abydos. Part II. 1903,* London, 1903, pl. VII.97. — Fig. 18. http://www.mfa.org/collections. — Fig. 19. G. DREYER, *Elephantine VIII. Der Tempel der Satet. Die Funde der Frühzeit und des Alten Reiches,* Mainz, 1986, Tf. 40.244. — Fig. 20. B. ADAMS, *Ancient Hierakonpolis,* Warminster, 1974, pl. 22.146. — Fig. 21. B. ADAMS, *Ancient Hierakonpolis,* Warminster, 1974, pl. 22.147. — Fig. 22. Courtesy Krzysztof CIAŁOWICZ. — Fig. 23. C. ZIEGLER, *Fouilles du Louvre à Saqqara I. Le mastaba d'Akhethetep,* Leuven/Paris, 2007, fig. 37, det.

for allowing access to an article in press. Ilona REGULSKI kindly discussed the palaeographic aspects of Early Dynastic water-lily hieroglyphs. Special thanks are due to Rolf OMLOR, *Botanischer Garten der Universität Mainz*, for competent assistance and making plant material available. We gratefully acknowledge the artistic work of Merel EYCKERMAN for drawing figure 1. Finally, we are most grateful to Lauren LIPPIELLO for correcting and improving the English of this article.



Fig. 1. White water-lily (*Nymphaea lotus L.)* [left] and
blue water-lily (*Nymphaea caerulea Sav.)* [right]. 1. Fruit, 2. Leaf and flower,
3. Plant with rhizome.



Fig. 2. A1. Abydos, M69.

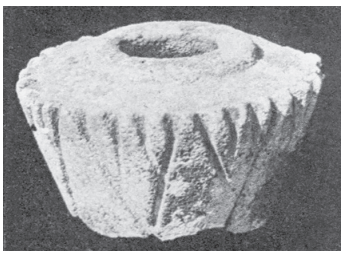

Fig. 3. A2. Abydos, M69.

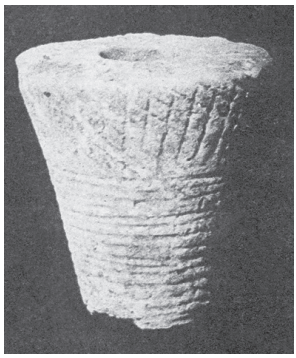

Fig. 4. A3. Abydos, M69.

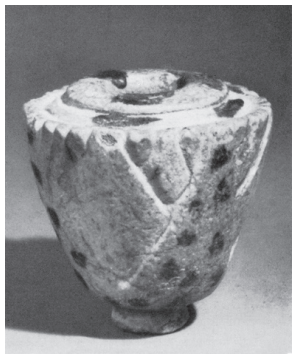

Fig. 5. A4. Abydos (?).



Fig. 6. A5. Abydos (?).



Fig. 7. A6. Hierakonpolis, Main Deposit.

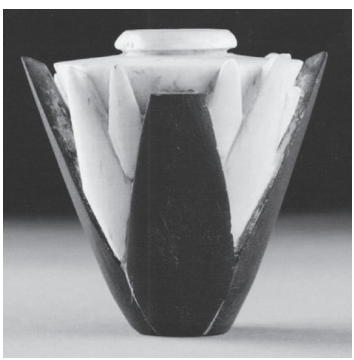

Fig. 8. A7. Lahun, Bashkatib tomb 743.

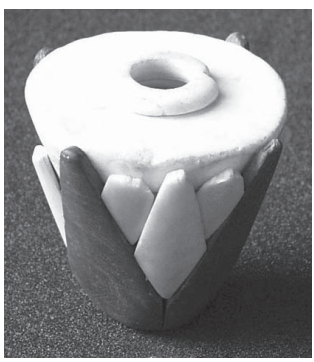

Fig. 9. A8. Qaw, tomb 429.



Fig. 10. A9. Saqqara.



Fig. 11. A10. Provenance unknown.



Fig. 13. B2. Abydos, tomb of Djet.



Fig. 12. B1. Abusir, tomb 12 B-4.



Fig. 14. B3. Abydos, tomb of Khasekhemwy.



Fig. 15. Helwan, tomb 116H.4.

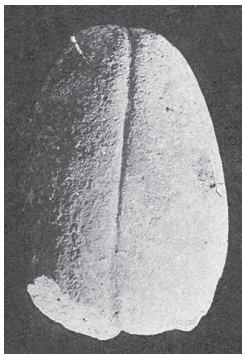

Fig. 16. C1. Abydos, M69.

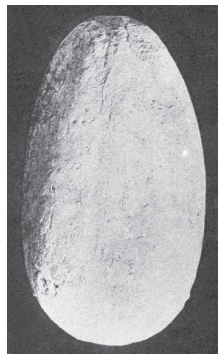

Fig. 17. C2. Abydos, M69.

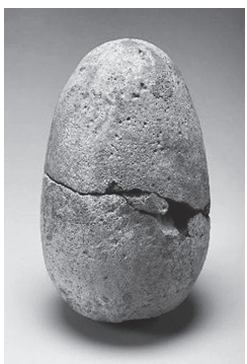

Fig. 18. C3. Abydos, M69.



Fig. 19. C3. Elephantine.

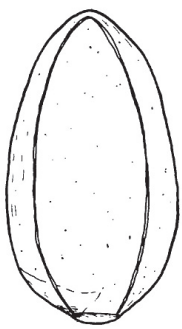

Fig. 20. C4. Hierakonpolis, Main Deposit.

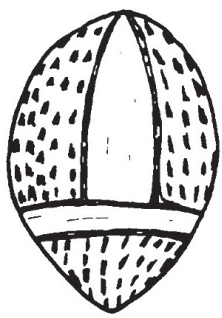

Fig. 21. C5. Hierakonpolis.



Fig. 22. C6-10. Tell el-Farkha.

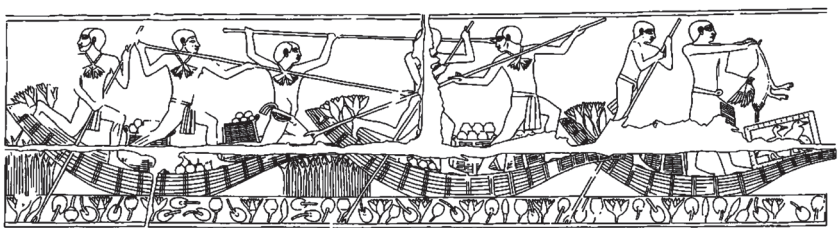

Fig. 23. Mastaba of Akhethetep.