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The Finno-Ugrian Hydronymic Stem *Voi-* as a Reflex of the Former Area of Distribution of the Water Chestnut (*Trapa natans*)

In the north-western parts of Eurasia quite a number of hydronyms with the place name stem *Voi-* of Finno-Ugrian origin, together with its variations, are to be found. In most cases, a limnonymical basic element or suffix of different modifications is joined to the adjunct, such as Finnish, Karelian *-järvi* 'lake', Veps *-järv* id., etc., (see SSA 1: 259) or their equivalents of substratum origin such as -(*V*)*xra*, -(*V*)*xro*, quite common in central Russia (see Ahlqvist 2006). In lake names of Finno-Ugrian origin in north-western Russia the basic element is often translated with the Russian *-ozero*, *-ezero* 'lake' (see, e.g. Mullonen 2002: 117–122).

There is a notable number of place names in Finland bearing the stem *Voi-* (see MLKP), among them names of stagnant bodies of water (lakes and ponds) and mires, such as *Voijärvi* (see [№ 1–2]),[1] *Voilampi*/*Voilammi* (< Finnish *lampi*, *lammi* 'small lake, pond' [№ 3–14]), *Voisuo* (*suo* 'mire' [№ 15–18]),[2] *Voikorpi* (*korpi* 'backwoods'), *Voineva* (*neva* 'treeless bog'), etc., (see, e.g. MLKP; NA). Anne Laamo (2003: 242–244; NA: map 2564) has mapped the Finnish place names with the stem *Voi-*. Among these there are plenty of names for bodies of water or places bordered by water.

In Finland and in Karelia, for example, these toponyms have been commonly traced to the word *voi* meaning 'butter' – connecting their semantic contents to summertime animal husbandry, dairy farming, as in the case of *Voikorp* in Antrea (see Nissilä 1971: 321–322; 1975: 79) or

[1] The numbers of objects shown on the map in this article are indicated by the № sign in brackets.

[2] One of these toponyms, *Voisuo*, in Kemiö on the south coast of Finland recurs in its Swedish translation as *Smörkärret* (< *smör* 'butter', *kärr* 'bog') (see MLKP [№ 15]).

presuming them to indicate in a figurative sense the colour of the water as in the pond name *Voilampi* (see Mallat 1996: 112; cf. Laamo 2003: 242, 244, and also SP 513). Helinä Uusitalo (2006) observes that popular name explanations are easily generated, although often such place names are older than the tales themselves. As one example of this kind, she mentiones the former lake *Voijärvi*. A parallel lake name *Võijärv* is also found in Estonia, and a village *Võikülа* with an islet *Võilaid* nearby (see EKI [№ 59]; cf. Kallasmaa 1996: 500–501).

The hydronym element *Voi-* in the former or present-day Finno-Ugrian territories, is to be traced to the Finno-Ugrian root **woje*, meaning 'fat, fatty substance', represented in the Finnish *voi* 'butter', Karelian–Lude *voi* 'butter; oil', Veps *voi* 'butter', Estonian *või* id., Livonian *vui*, *ui* id., Saami (North) *vuoggjâ*: *vuojâ* '(fluid or semi-fluid) fat; butter, margarine; (cod-liver) oil', (Kildin) *vujj*, (Skolt) *vuojj*, (Akkala) *vuj* 'fat, melted fat; oil; train oil', Mordvin (Erzya) *oj*, (Moksha) *vaj* 'fat; butter; oil', Mari (Western) *ü*, (Eastern) *üj* 'oil; butter; fat; melted fat', Udmurt *vẹj, vȯj* 'butter; fat; melted fat; oil', Komi *vi̯j*, *vi* 'butter; (fish) oil'; dialectal '(melted) fat', Mansi (Southern) *wāj*, (Eastern) *vuoj*, (Northern) *wə̄j* 'fat; butter; cream', *woj*: *soj-w*. 'butter', (Western) *wōj*: *saj-w*., Khanty (Eastern) *woj*, (Southern) *uj*, (Northern) *wăj* 'fat; butter; oil; tallow', Hungarian *vaj* 'butter' (see SSA 3: 467; UEW 578–579; FUV 125; KRS 146; SKD 71, 74).

The meaning 'butter, oil' in most of the cognate languages is regarded as secondary, related to factors concerning the history of civilisation (UEW 578). The original meaning of this lexeme is considered to be 'fat' (UEW 578–579; SSA 3: 467). The semantic spectrum of this stem can be seen on the basis of, for example, the Mordvin *oj*, *vaj* which is used to express many different kinds of animal or vegetable oils: compare such compounds as (Erzya) *skal-oj*, (Moksha) *skal-vaj* 'butter' (*skal* 'cow'); (Erzya) *piče-oj*, (Moksha) *peče-vaj* or (Erzya) *kuz-oj*, etc., 'resin' (*piče* 'pine', *kuz* 'spruce') (see MW III: 1430–1433; ERS 434), Mari *nulgo üj* 'fir oil' (*nulgo* 'Siberian fir') (SMJ VIII: 169–170).

This same etymological basis is reflected in calques. The hydronymic stem in the Finno-Ugrian territories of north-western Russia in the forms *Voi-*, *Voj-*, *Vo-*, *Vaj-*, *Va-* and even *Oj-*, *Oi-*, *O-* has in some cases been translated by the Russian noun *ма́сло* 'butter, oil' or its derivatives, the adjectives *ма́сленый*, *ма́сляный* 'buttered; oiled; oily; greasy, etc.',

масляни́стый 'oily; oleaginous; buttery; butyraceous: unctuous, etc.' (see RED 1: 1312–1314).

Thus, A. I. Popov (1949: 51, 54) regards the Russian settlement name *Maslozerskaja* of the former Olonets Province as a loan translation of *Vojjarvi* from the Karelian *voi* [*вой*] 'butter' and *jarvi* [*ярви*] 'lake'.[3] Popov probably means Lake *Voj-Jarvi*, in Russian *Maslozero*/*Masl-ozero* and the parish village *Voijärvi* / *Maslozero*/ *Maslozerskaja* in northern Karelia, even if Max Vasmer hesitates to consider Lake *Voj-Jarvi* near the river Kem' as either *Maslozero*/*Muas-jarvi* or *Maslozero*/*Masl-ozero* (see WRG III: 218; cf. RGN V: 453). According to the catalogue of the settlement places, it would seem clear that the parish village *Voijärvi* is really in question, called in Russian *Maslozero* (SNMK 5). This is the deserted village *Maslozero* on the present map, situated by Lake *Maslozero* (see AKS 134 [№ 19]). In the same village community there is another village, called *Voineme* (cf. Finnish, Karelian *niemi* 'promontory, headland', Veps *ńem* id., etc.) (see SNMK 5). The other lake, *Maslozero*, called also *Muas-jarvi*/*Muas'jarvi* (WRG III: 218 [№ 44]), is located within short water distance of Lake *Vajkul'skoe*/*Vojkul'skoe* (see AKS 84; WRG I: 345). This limnonym must be connected with the Karelian name of a village *Voikula*/*Vojkula* (cf. also SNMK 2). The stem of the Karelian oikonym *Voi-* with the meaning 'butter, oil; buttery, oily' permits the semantic binding of these two toponyms.[4]

Correspondingly, one of the two limnonyms *Masl-ozero*/*Maslozero* in the Vologda Province is regarded as a full translation of the Veps lake name *Vojjaŕ* from the words *voi* 'butter' and *järv* 'lake' (see for details Kuznecov 1995: 47–48; cf. KVO 18 [№ 28]). For the lake name *Vojärv*/*Vojbozero* of the River *Ojat'* basin in the Leningrad Province the Russian variants *Masljanoe ozero*/*Maslenoe* are given; a mire named *Voiso* (< Veps *so* 'mire') is also located here (SGBS 64; KLO 18 [№ 27]). Nearby, there is still a lake named *Masljanoe* (see SGBS 56 [№ 51]), if this, however, is not the same as that mentioned earlier.[5]

[3] In certain cases, where there may be doubt about the validity of the transliteration, the form written in the Cyrillic alphabet is also given.

[4] M. Vasmer presents still one more limnonym and oikonym *Maslozero* nearby the River *Vyg* in the former Kem' County. However, he proposes that this would be identical to one of the toponyms *Maslozero* mentioned above (see WRG III: 218).

[5] In cases 30–31, 37, 51–52, 54 and 57 the location of the objects on the map is not absolutely clear.

Further in the central part of Karelia there is a group of water basins consisting of two lakes named *Vajarvi* and a lake *Maslo* (see AKC 66 [№ 24]). There is no doubt that this is an example of a Russian calque from the Finno-Ugrian limnonym, emphasised by the non-derived form in the nominative case of the common noun *масло* – a phenomenon uncommon to Russian place name formation. There is still a lake, *Vajarvi*, in the southern part of northern Karelia (see AKS 158 [№ 25]) and a lake *Vajärv*/*Vajozero*, with a mire *Vajärvso* in the Veps territory (SGBS 62 [№ 26]).

On the basis of one of the variants of the lake name *Ojajärv* in the Veps territory, namely *Maslovo* that is immediately connected with a mire named *Maslovskoe boloto* (see SGBS 77; KLO 46 [№ 32]), it seems also possible to connect with this limnonymical model a number of lake names in the basin of the River *Ojat'*, such as Lake *Oiozero* / *Ojozero* / *Oja* / *Ojazero* in Karelia (SGBS 7; KLO 8; AKJ 115, 136 [№ 33]), Lake *Ojärv*/*Oezero* with the River *Ojärvoja* (SGBS 52; WRG III: 461; KLO 18–19), Lake *Ojarv*/*Ojozero* with the rivulet *Ojarvoja*/*Ojozerskij ručej* (see SGBS 81; KLO 32–33; KVO 40), two lakes *Ojarv*/*Ojarvozero* and *Puču Ojarvut* (SGBS 56), Lake *Ojarv* / *Ojarv* / *Ojarv* / *Oja* with its rivulet *Ojarvoja* and Lake *Ojozero* / *Ojaozero* / *Ojarozero* in the Leningrad Province, if the two last-mentioned are different objects (cf. SGBS 45, 47; KLO 20; KVO 18 [№ 34–39]). In the borderland area of the Leningrad and Vologda Provinces there is a lake called *Ojozero* and also, in the nearby region, in the Vologda Province, west of Lake Beloe, there are four lakes with the Russian name *Maslozero*, one of which actually comprises of two lakes called in the plural *Maslozera*, and beside one of these *Maslozero* lakes there is a mire, *Masloboloto* (see KVO 18–19, 40–41; KLO 33; cf. WRG III: 218–219 [№ 28, 48–50]), for which reason the arguments for such a nomination seem well founded.[6]

[6] In the property of the adjunct in the case of these limnonyms, the popular determinant of the Veps river names, *oja* 'ditch, rivulet' with its various modifications (see, e.g. Mullonen 2002: 70, 126; SSA 2: 262) does not, generally, seem justified (cf. Mullonen 1994: 26–27; Saarikivi 2006: 70 ff., 249). This term for the terrain could, however, have been influenced by folk etymology in the case of some of the hydronyms in this model. It is possible that this also applies to some of the Finnish lakes named *Ojajärvi*, when compared with other limnonyms, in particular, such as the name of the shallow Lake *Oijärvi* in Ii, northern Ostrobothnia, for example (cf., however, SP 300, 302). Correspondingly, alongside a small lake, *Ojajärvi*, in Alajärvi, southern Ostrobothnia, is a field called *Voisaari* (< Finnish *saari* 'island') (see MLKP).

This same waterway, the *Ojat'*, has its source near one of the lakes named *Maslozero* in the Vologda Province, also called *Vojjaŕ* (see KVO 18; KLO 20) mentioned above, while the other local lake *Masl-ozero* mentioned by A. V. Kuznecov (1995: 47–48; cf. KVO 40–41) has an outlet named *Masljanka*. Taking into account the existence of a considerable number of toponyms in the basin of the River *Ojat'*, representing the hydronymic stem in forms such as *Oj-*, *Oi-* or translated by the Russian lexeme *Masl*(*V*)-, it can be affirmed that by its very nature the River *Ojat'* seems to be one of the "oily waters".[7]

Further, in the Veps territory there is a lake named *Vojozero*/*Voezero* with a rivulet *Voezerskoj ručej* (see SGBS 86 [№ 31]). Parallel names for this are found in the Archangel Province: Lake *Voezero* in the Onega basin and Lake *Vojozero* with an outlet *Voja* (see AKJ 74–75; WRG Nachtrag: 106 [№ 29–30]). M. Vasmer gives yet another name, Lake *Voezero* with the River *Voezerka* and oikonym *Voezerskoj* in the Kargopol' County of the former Olonets Province, mentioning also the Finnish name *Voijärvi* (see WRG I: 341). Additionally, Vasmer mentions a lake with the name *Voozero* in Onega County of the former Archangel Province (WRG I: 368), but is it possible that this is unconnected?

Besides the river name *Voja* already mentioned, there are other rivers bearing the name *Voja*/*Vaja* and *Voj*, *Vaj* in the former Archangel, Vjatka, Vologda, Perm', Kostroma and Novgorod Provinces, in particular (see WRG I: 253, 269, 344, 386; Nachtrag: 86, 120, and the river names *Vyja* below), some of which could be regarded as ellipses. Nearby one of the rivers, *Voja*, in the former Vjatka Province, a rivulet and an oikonym *Maslovskij* are mentioned (see WRG III: 218).

The name of the River *Vóexta* and of two villages beside it should be added also, *Boľšája Vóexta* (< Russian *большо́й* 'big') and *Málaja Vóexta* (*ма́лый* 'small'), the latter already deserted, and between these a mire named *Vóexovsko*/*Vóèxotska bolóto* located in the surroundings of the town Rostov Velikij, in the Jaroslavl' Province (see AJO 103). This hydronym bears the river name suffix -(*V*)*xta*, -(*V*)*gda*, which is mostly found in the ancient land of Merya (see, e.g. Ahlqvist 2006: 12 ff.).

[7] In the case of the name of the *Ojat'* River – one of the main waterways in the Veps territory – any connection between the adjunt and the term for terrain *oja* 'ditch, rivulet' must be out of the question, with the exception of a possible folk etymological context (cf. the previous footnote).

In areas surrounding some of the hydronyms with the stem *Voi-*, names referring to some other natural features that belong to the same name cluster can be found. In Finland there are quite a number of (micro)toponyms with the stem *Voi-* (see MLKP; NA). These names with the beginning *Voi-* for natural places other than bodies of water are located in the western part of Finland, mostly in Ostrobothnia and more sparsely in Tavastia, and in eastern Finland, especially in southern and northern Karelia and on the Karelian Isthmus (Laamo 2003: 242–244; NA: map 2564). Thus it seems evident that in north-western Russia they should also exist or have existed. In Karelia this hydronymic stem occurs in the names of places that are connected with stagnant bodies of water such as an island *Vojšari* (cf. Finnish *saari*, Karelian-Olonetsian *soari*, *šoari*, *šuari* 'island', etc.) (see AKC 51 [№ 20]) and two bays in Lake Onega called *Vojguba* (< Russian *губа́* 'bay, inlet'), beside one of which is a headland, *Vojna-volok* (< Russian dialectal *на́волок* 'meadow etc.') (see AKC 117; AKJ 43 [№ 21–22]).

As a whole there is a notable number of parallel names of stagnant bodies of water, or mires and related to them places with the substratum stem *Voi-*, *Voj-* in, for example, central and north-western Russia and in Finland, representing varied phonetic patterns and bearing different toponymical suffixes of mostly Finno-Ugrian origin. Without further details it is difficult to say which of the transformations belong to this model. It has to be emphasised that every concrete case must be treated separately and very carefully. Nevertheless, the river name *Vojažoj* in the Tveŕ Province should be added, for example, if the component *-ž-* and the term for terrain corresponding to the Finnish, Karelian, Veps, etc., *oja* 'ditch; rivulet' are to be distinguished – especially since one of the nearby villages is called *Maslenka* (see ATO 59). The suffixation of the river name *Vozixma* / *Vozexma* / *Vozemxa* in the River Nerl' basin in the Vladimir Province also admits to several interpretations, but as this torrent has a Russian variant, *Maslinskoj* (see GBO 215; WRG I: 343; AVO 20), whether indeed the stem *Vo*(*j*)- did originally come into question or not should be considered.

Besides the above-mentioned calques with the Russian place name stem *Masl*(*V*)- and the four lakes *Maslozero* in the Vologda Province, analogical Russian hydronyms are also respresented in cases such as Lake *Masljanoe* with its rapids the *Masljanyj* in northern Karelia (AKS 37 [№ 45]), a lake and a village *Maslovo* and a lake *Maslovka* in the (former) Tver' Province

(ATO 198; WRG III: 218 [№ 52–53]), Lake *Maslovo* in the former Rjazan' Province (see GBO 130 [№ 57]) and Lake *Maslitino* in the former Vladimir Province (GBO 228 [№ 56]). Moreover, two lakes are mentioned, Lake *Maslovo* and Lake *Maslickoe* in the former Vitebsk Province, and Lake *Maslovo* in the former Vilna Province (see WRG III: 217–218). Among the gelonyms such cases are to be found as the mire *Masljanyj Mox* (< Russian dialectal *мох* 'mire') in the Archangel Province (see AKC 122 [№ 47]), a mire named *Maslenskoe* east of Nižnij Novgorod (see KNNO 31 [№ 58]), the mire *Maslovo boloto* in the Moscow Province (NSE 174–175 [№ 55]), and several other *Maslovo* mires, one of them situated in the Moscow Province (WRG III: 218 [№ 54]).

A considerable number of loan translations or analogical names for neighbourhoods emphasise the semantic content, namely, the idea of 'butter; oil'. Thus, formally there should be no doubt about the validity of the proposed earlier etymology. Despite this, the arguments for such a nomination, that is, primary substance of the place name element *Voi-*, has remained completely unclear. Where has the name of a body of water got as its qualifier 'butter(y)', 'oil(y)' or 'fat(ty)' from?

In this connection, it is of interest to take into account also the argumentation of A. K. Matveev (1980: 68–69) concerning the water names *Výja* in the central Urals (four rivers, one of which has variants of the name **Voja* [the instrumental case: *Воей*] and **Vuja* [*Вуйей*] from the 18th centrury) and *Vyjá* in the Tjumen´ Province (see also WRG I: 402). According to Matveev, these river names have usually been compared to Finno-Ugrian words, namely Mansi *вой*, Komi *вый* with the meaning 'butter; oil', 'fat'. In this case, the Komi adjective *выя* 'buttered; oiled; oily; greasy, etc.' which is derived from this, should also be mentioned (see KRS 151; SKD 74). However, Matveev (1980: 68) believes that the interpretation 'oily (river)' is justified only in such an event that in these rivers, for one reason or other, in reality "oily spots" appear. Of course, in those north-eastern territories, some of the river names of this model could be connected with the presence of underground deposits of oil, but this would appear to be only a very marginal possibility.[8]

[8] A. K. Matveev (1980: 68–69) also proposes another explanation for the water name *Vyja*. Because there is a river named *Výja* in the Archangel Province also, he considers it possible to connect this name with the word *выйэ*, *вуай*, *вуэй*, *вуой*, *ой* 'stream, rivulet' found in Saami languages. However, the nature of the object should be taken into consideration: the afore-mentioned *Vyja* is "one of the significant tributaries of the

It would seem that the names of this model, as well those of Finno-Ugrian origin and Russian examples, are geographically limited, concentrating in certain territories (see the map). The wide distribution of the Finno-Ugrian hydronym stem *Voi-* and some of its phonetic reflections, clearly points to an early origin of this toponymical model.

It is obvious that place-names – no matter whether they are totally transparent and can be interpreted on the basis of some contemporary language or whether they are linguistically obscure and possibly of very ancient substratum origin – have not come into existence arbitrarily. In the remote times of hunting–fishing–gathering communities and even in old agricultural communities it was essential that the meaning of the toponyms was accurate. Such systematics – hunting grounds, fishing waters and berry places, later also patches of arable land and parcels of meadow, etc., with their own, unambiguous names – were of vital importance to these people living entirely according to oral tradition, or at least principally. It seems it was preferred to name places according to those concrete physical features or natural qualities characteristic of these. In the majority of cases the nomination of places must have been based on firm premises, on clear grounds for nomination.

In general, there has to be a property uniting these stagnant bodies of water or mires, if they are to be considered "oily (lakes)". It is a question not only of existing lakes, but also of mires that in some cases have been proved to have been lakes, as with the mire called *Voijärvi* ('butter/y/ lake') in Kuusankoski, southern Finland. This fact is shown not only by the determinant of the name *-järvi* 'lake' and by oral tradition, confirming that *Voijärvi* is a former lake, drained into a mire, being still very soggy (NA; Uusitalo 2006), but also according to geological research at this site, proving again that *Voijärvi* really is an overgrown lake (see Mäkilä & Grundström 1988: 17–18). Finally, even at the turn of the 19th century this same *Voij Iärvi* was cartographied as a body of water (see KK 163, 395).

A group of the three nearby "oily lakes" in central Russia, the lakes *Vóixro*, *Vóxryč* and *Voxro* in the Kljaz'ma floodlands in the Vladimir Province, bearing the limnonym suffix -(*V*)*xra*, -(*V*)*xro* (see Ahlqvist 2006 [№ 40–42]), presented me with concrete evidence concerning the grounds

River Pinega", as stated by Matveev, and thus naming a river of this kind using a word that applies only to waters with a small current would not be credible.

The explanation for the limnonym *Vojjaŕ* coming from the Saami *вуэй* with its Russianised toponymic forms *буй*, *бой* 'stream, rivulet' has also been analysed (see Kuznecov 1995: 48).

for nomination of this limnonymical model. I assume that these water names are connected with the above-mentioned stem *Voi-* of Finno-Ugrian origin but the grounds for nomination are based on extremely ancient, concrete facts. I connect this name root with former occurrences of the aquatic plant, the water chestnut (*Trapa natans*).

Local people in the villages surrounding the lakes *Voixro*, *Voxryč* and *Voxro* assured me that the relict aquatic species, the water chestnut, is still found in that very Lake *Voixro*. As far as the recollection of the informants goes, the water chestnut grows or grew in Lake *Voixro* more abundantly than in the other lakes in the surroundings, in the first instance Lake *Krásnoe* (< Russian *кра́сный* 'red', formerly 'beautiful'). An elderly local resident thinks it possible that the water chestnut might also be found in Lake *Voxryč*.

Lake *Voixro* is nowadays also called *Vójxra*, and officially *Vóexra*. On the contemporary map three former river-bed lakes next to each other bearing the names of the same cluster are shown: the lakes *Vojxra*, *Voxro* and *Voxryč* (see AVO 37–38, 57–58). How these nearby lakes are related is not quite clear, and there could be a cartographical mistake: Lake *Voixro* is shown on the map as *Voxro*. However, these lakes form a network. Lake *Voxryč* has an outlet to Lake *Voixro* (*Voxro*). As far as Lake *Voxryč* is concerned, an outlet from Lake *Svjáto* (< Russian *свято́й* 'holy, saint'),[9] called *Oréxovskaja* (derived from the Russian noun *оре́х* 'nut') empties into it. Geographical unambiguity justifies considering the lake name *Vyxrica*, interpreted possibly also as *Voixrica* by G. P. Smolickaja, to be a historical variant of the limnonym *Voxryč* – nearby, Lake *Orexovskoe* is also mentioned (see GBO 218). It should be stated that across the River Kljaz'ma, on the shore opposite to Lake *Vojxra*, there is a village called *Máslovo* (see AVO 58), the name of which may, however, be based on relatively recent economic activities or on a Russian anthroponym, derived from the noun *масло*. It has to be underlined that grounds for nomination of this kind are common among the numerous Russian settlement names, such as *Maslovo*, *Maslino* etc., widespread in Russia (see RGN V: 448–454; XI: 632). Sometimes such oikonyms are connected even to the

[9] Lake *Svjato*/*Svjatóe* (see AVO 37, 57) is the only small lake in the surrounding area that has not been formed from the old river bed, but is of karst formation. According to a local legend, there was a church at the site of the lake that sank beneath the ground. It is believed that in a violent thunderstorm or strong wind the icons rise to the surface of the lake.

celebration of the feast *ма́сленица* 'Shrovetide', as I was told in the case of the former village *Máslovo* in Pošexon'e County in the Jaroslavl' Province (see AJO 34). Since the village *Maslovo* mentioned above is located near *Vojxra*, the influence of the Finno-Ugrian substratum heritage cannot be offhand excluded – especially since there is also a river called *Vojninga* nearby (see below).

Among elderly people, hunters and fishers in the River Kljaz'ma basin, the water chestnut, named in Russian *водяно́й оре́х* (*плавающий*) '(floating) water nut', *чили́м*, *чертов орех* 'devils nut', *рогатый орех* 'horned nut' or *рогу́льник*, according to elderly sources also *болотный орех* 'marsh nut' (see, e.g. KKSS 384; KKRF 431; BSE 5: 202; ES 52: 895), is a familiar plant. The local hydronyms, traced back to the Russian nown *оре́х* 'nut', are not at all regarded by these people as in some way connected to the habitats of the hazelnut tree (*Corylus avellana*), but to the habitats of *Trapa natans*, as in the case of the former river-bed lake *Oréxovo*/*Oréxovoe*, located downstream in the River Kljaz'ma flood area, in the Kljaz'ma nature reserve in the Ivanovo Province (see AVO 23–24; GBO 220). It seems that the water chestnut vanished from Lake *Orexovo* about twenty years ago, and nowadays it only grows in one of the former river-bed lakes of the same group, in Lake *Sorókino* (AVO 24), where it has now become a rarity (see also JMR 3).

In the surroundings of Lake *Orexovskoe*/*Orexovo* there is a lake mentioned in historical documents as *Vakra*/*Vatkra* (see GBO 220). If the form *Vakra* has developed from **Vaxra* with the limnonym suffix -(*V*)*xra*, the stem should probably be reconstructed as **Va*(*j*)-. The analogical historical form *Vaxra*, having also a variant *Vixra*, is found in the lower course of the River Oka, in the land of the Muroma, with a lake, *Orexovec*, in the vicinity (see GBO 196). In the Nižnij Novgorod Province, nearby the town of Murom there is Lake *Orexovoe* where the water chestnut grows, and another lake called *Orexovec* in the flood area of the River Oka (see AVO 93). An analogical connection may be reflected in the gelonym *Maslenskoe* and in the settlement name *Orexi* in the same area of the mire east of Nižnij Novgorod (see KNNO 31).

Preliminarily, it would seem that there is one essential, but not absolute difference in geographical distribution of the Russian "oily" hydronyms. In the north-west and north of Russia where the water chestnut obviously did not even exist, when the Slavs settled down there, the original Finno-Ugrian hydronym stem *Voi*- was translated letter by letter being determined

by the semantics of that time as *Masl*(*V*)- 'butter(y); oil(y)', without, and we must imagine that the proposed original connection of the topolexeme with the ancient flora of the region was known. In those places in which *Trapa natans* still existed, as in the Oka (Kljaz'ma) River basin, the substance of the limnonyms with the stem *Voi*- must have been transmitted to the Slavs in a very tangible way, and the concrete meaning of this stem was translated by them as *Orex*(*ovyj*)-, refering thus to the existence of the water chestnut (see the general distribution of the hydronyms with the stem *Orex*- in WRG III: 511–515).

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The water chestnut (*Trapa*), also called in English the water caltrop or water nut, is a free-floating aquatic annual, native to the warmer and tropical regions of Eurasia and Africa, and naturalised in North America and Australia (see, e.g. EB 12: 515; 13: 692; 19: 137; OE; FPW 156; Hummel & Kiviat 2004: 17; FR IX: 484; KKSS 384; FUSSR XV: 477). The European water chestnut, the *Trapa natans* L. (Linnaeus) species, grows in Europe mainly in the southern and central areas and in western Siberia (KM 2058; Hummel & Kiviat 2004: 17–18; FR IX: 489–490; FUSSR XV: 481, 488).

Today, the water chestnut is dispersed over the temperate and warm areas of the Old World, but it does not exist in the arctic regions (FPW 156; KM 2058). There are sporadic occurrences farther north also, for example, in the Baltic countries and in central Russia, at about the 57th parallel (KM 2058). The present northernmost habitats of the water chestnut are considered to be relicts of an era with more advantageous climatic conditions than now (KM 2058). Nowadays, the water chestnut is a protected species in Europe, including Russia (see, e.g. Hummel & Kiviat 2004: 17, 20; Vankina 1970: 134; KKSS 384; KKRF 431–432).

The northernmost limit of the water chestnut in western Eurasia is Latvia, where it can be found in three lakes in the Jekabpils and Balvi regions (Vankina 1970: 134; Nummi 2005: 18–19; Auer 1925: 24). It also survives in Lithuania, Belarus, Ukraine and in Russia from the Smolensk Province to the Pacific Ocean (KKSS 384; KKRF 431; Vuorela & Aalto 1982: 87; Alhonen 1996: 72, 75, see also the map with the present-day northern limit of *Trapa natans* presented according to Linnaeus). In the central belt of the European part of Russia this plant thrives in the river

basins of the Dnepr, Don and Upper Volga, in particular, and also in abundance in the river basins of the Oka and Kljaz'ma, Sura, and in the Volga Delta (KKRF 431–432; cf. FR IX: 486, 490).

The water chestnut is a plant that prospers in stagnant and sluggish fresh waters: shallow lakes, ponds, the reaches of rivers and estuaries sheltered and well-warmed by the sun, preferring nutrient-rich waters with soft, muddy beds (see FUSSR XV: 478; KKRF 431; KKSS 384; KM 2058; FPW 156; PK 2: 144; Vuorela 1981: 10–11; Hummel & Kiviat 2004: 17–18; Nummi 2005: 18; cf. Alhonen 1996: 72–73, 75). In Russia this plant grows in the main in small lakes found in flood lands and former riverbeds in which the water is partially renewed every year, and in the backwaters of rivers, at a depth of 50–250 cm (BSE 5: 202; KKRF 431; KKSS 384; cf. Hummel & Kiviat 2004: 18). According to older sources, marshes are also regarded as habitats of the *Trapa natans* L. (ES 52: 895; cf. also Linnaeus).

There is information according to which *Trapa natans* has been found as subfossils in some of those regions of Russia in which it does not grow now, in the Bologoe County of the present Tver' Province, for example (see Berg 1922). However, recent information confirms that *Trapa natans* L. does grow in the Tver' Province, the northern boundary of its natural habitat (see Gorevoj & Sorokin 2000; cf. KKRF 432). N. N. Tzvelev states that among the areas of distribution of *Trapa natans* L. is the "Ladoga-Il'men' region: southeast along the River Lovat'" (see FR IX: 489–490), but does he mean the growing unit of the water chestnut, which at present exists in the Novgorod Province – as it would seem on the basis of a separate occurence of this plant shown somewhere in the western part of Russia by Linnaeus (map Norra halvklotet) – or is he talking about subfossil evidence? As far as Lake Ladoga is concerned, Tzvelev must have based his evidence on subfossils.

Correspondingly, L. S. Berg (1922) confirms that fruits of the *Trapa natans*, which in his time no longer existed there, have been found in eight peat bogs in the (former) Moscow Province. There is also information that *Trapa natans* has vanished from the local Lake Trostenskoe (see ES 52: 895; AMO 51). According to present data, the water chestnut still grows in the south-eastern corner of the Moscow Province in two lakes beside the River Oka, *Sitnoe* and *Osetrinoe* (see OPMO; AMO 135).

At present, the water chestnut survives in the Vladimir Province and in the southern part of Ivanovo Province (see, e.g. KKRF 432; KKSS 384). It has been claimed that the water chestnut has only disappeared from the

flora of the Jaroslavl' Volga course during the past 50 years (BJO). Furthermore, *Trapa natans* grows in the Meščera lowland, as generally in the Rjazan' Province, likewise in the territory of the Republic of Mordovia (see, e.g. FR IX: 488; KKRF 432; KKSS 384). In Mari El, the water chestnut is still found, although only in one place naturally and in abundance, namely, in the lakes Bol'šoj and Malyj Mar'er, situated in the Volga basin (see PME; AME 21–22; cf. FR IX: 488). At the beginning of the 20th century *Trapa natans* L. was found in a number of former river-bed lakes in the former Kazan Province (Ruzskij 1916: 86, 88). Then again, in the 1940s *Trapa natans* L., was shown to have existed in the surroundings of the city of Glazov, in the north of the Republic of Udmurtia (see KKU 26, 276; cf. ARU 5–6, 10–11). In these regions separate species of the water chestnut, such as *Trapa okensis* in the River Mokša basin in Mordovia, etc., *Trapa wolgensis* in the Volga Valley in Mari El, etc., and a variant of *Trapa natans* L., *T. metschorica*, in the basin of the River Para in Meščera, have been distinguished (see FR IX: 488, 490 and below).

In the warm period following the Ice Age, in the Atlantic and, above all, in the Sub-Boreal chronozones, the European water chestnut had a considerably wider and more northerly distribution than at present, as can be concluded on the basis of the *Trapa natans* subfossils and pollen grains that have been discovered somewhat abundantly in lakes and mires even as far as in central Sweden and in the northern parts of central Finland (see, e.g. BNF III: 256; PK 2: 142, 144; KM 2058; Linnaeus; Erkamo 1960: 35, map 9; Vuorela 1981: 12; Aalto, Siiriäinen & Vuorela 1985: 175; Alhonen 1996: 71, 75; Vasari 2004: 197, 203; Nummi 2005: 18–19). The most northerly site in Fennoscandia at which *Trapa* has been found as a macrofossil is the bog *Valmosa*, in Evijärvi, in Southern Ostrobothnia at 63°38´N, while the northernmost deposit in Sweden lies at 60°30´N (Vuorela 1981: 12; Vuorela & Aalto 1982: 89; Alhonen 1996: 72, 75; Korhola & Tikkanen 1997: 39, 41; Nummi 2005: 18–20; MLKP, and the map). In southern Sweden, the water chestnut was still growing during the historical period in two lakes: in Småland it had become extinct by the end of the 18th century and in Skåne in the 1910s (BNF III: 256; PK 2: 142, 144; KM 2058; Linnaeus; Nummi 2005: 19).

In Finland, the water chestnut occurs from the Preboreal onwards, and especially since the beginning of the warm Atlantic chronozone, also called the "Stone Age Summer", which commenced about 9000 years ago (see,

e.g. Alhonen 1996: 71–72, 75; Korhola & Tikkanen 1997: 39; Huurre 1998: 184–185; Nummi 2005: 19; Valpola & Salonen 2006: 25 ff.; see also Auer 1925: 28; Valovirta 1957: 4). Palaeolimnologist Pentti Alhonen (1996: 72, 74–75) believes that the water chestnut was most abundant during the Holocene Climatic Optimum, 8000–2500 years ago and was an important indicator of this thermal maximum. He considers it certain that an intrusion of the species still further north followed the development of the warm period (cf. also Sauramo 1929: 95). According to palaeobotanists Irmeli Vuorela and Marjatta Aalto, *Trapa natans* can be considered to have achieved its greatest abundance and most northerly expansion in Europe towards the end of the Climatic Optimum, during the Sub-Boreal chronozone, 5000–2500 years ago (Vuorela 1981: 12–13; Vuorela & Aalto 1982: 89, 91; cf. Alhonen 1996: 73). In favourable locations in southern and central Finland the species would seem to have been rather common during the Early and Middle Holocene (see, e.g. PK 2: 144; Korhola & Tikkanen 1997: 39; Huurre 1998: 185; Vasari 2004: 197). Until the 1960s *Trapa* fossil fruits were found at over 70 locations in Finland (see, e.g. Erkamo 1960: map 9; Vuorela 1981: 12; Vuorela & Aalto 1982: 89; Korhola & Tikkanen 1997: 39; Nummi 2005: 19; Valpola & Salonen 2006: 20).

The time span for the main period of existence of *Trapa natans* according to subfossil finds in Finland can be traced to approximately 8500–2500 BP (Korhola & Tikkanen 1997: 39; M. Moisanen: personal communication, 2008). The *Trapa natans* has been considered evidence of warmer summer conditions, and its overall disappearance from Finland, northern Russia and the eastern Baltic regions is thought to have been caused by the cooling of the climate from late postglacial times, at the beginning of the Sub-Atlantic chronozone, up to the first centuries of the Christian Era (see, e.g. PK 2: 144; Alhonen 1996: 73–75; Vuorela 1981: 12; Aalto, Siiriäinen & Vuorela 1985: 175; Zvelebil 1987: 104, 111; Huurre 1998: 185; Hummel & Kiviat 2004: 24; Nummi 2005: 19; Ruohonen 2007: 18; cf. Korhola & Tikkanen 1997: 39; Vasari 2004: 196–197; Valpola & Salonen 2006: 31, 34, and also Auer 1925: 26, 29; Valovirta 1957; KKRF 431; KKSS 384). In Latvia the water chestnut began to be less abundant around 900 BC (see Vankina 1970: 134), and thus it has also been supposed that *Trapa natans* may have begun to diminish in Finland at the same time, totally disappearing prior to the Christian Era (Nummi 2005: 19).

C. A. M. Lindman has proposed that the primary cause of the extinction of this species in Scandinavia was its inability to stand the present-day climate, especially the low water temperature (see BNF III: 257, and also Nummi 2005: 19). It has been suggested that in the warm period, too, the water chestnut probably needed summers during which the water in the shallow lakes remained warm long enough for the fruits to ripen (PK 2: 144; see also Vuorela & Aalto 1982: 89; Alhonen 1996: 73). Also, the extent of the gathering of the fruits has been supposed to be the ultimate cause for the vanishing of the water chestnut in Sweden, for example (see, e.g. Linnaeus).

Recently, other reasons for the vanishing of the water chestnut have been proposed. In view of the considerable time span of the *Trapa natans* finds in Finland, it has been concluded that the decline of this species in Scandinavia was probably not directly related to the climate or mean temperature, but mainly due to habitat changes in the lake environments themselves, namely infilling of shallow, eutrophied lake basins, and also acidification of the remaining forest lakes (see for further details Korhola & Tikkanen 1997: 39 ff.; cf. Vuorela 1981: 12–14; Vuorela & Aalto 1982: 89–90; Vasari 2004: 196–197; Valpola & Salonen 2006: 34). A convincing argument for this is that those sites at which *Trapa natans* fossil fruits have been found are mainly overgrown lakes (see Korhola & Tikkanen 1997: 39). The situation seems to be similar in the majority of cases both in Finland and Sweden: the maximal occurrence of *Trapa* remains is in limnic sediments just below the peat horizon (Korhola & Tikkanen 1997: 43). Thus the first fruits of *Trapa natans* appeared in the sediments of an ancient lake-basin Pyysuo in south-western Finland 3500 BP, and reached their maximum abundance just before overgrowth turned it into a mire 2500 BP (Korhola & Tikkanen 1997: 39, 41, 43). Furthermore, in the case of Pennala in southern Finland, the decline of the species is considered to have been caused by the filling-in of the lake, while the local pollen curve for *Trapa natans* covers a span of some 2000 years (see Vuorela 1981: 8, 12–14; Vuorela & Aalto 1982: 90, and below). Palaeolimnologists S. E. Valpola and V.-P. Salonen conclude that probably, at least in the small, shallow lakes on the coastal area of Finland, the reason for the disappearance of the water chestnut is a combination of climate, water level fluctuations and infilling of the pools (Valpola & Salonen 2006: 37).

Without the qualifications for evaluating these theories concerning the field of the natural sciences, I would still like to point out that although

places named with the Finno-Ugrian hydronym stem *Voi-* reflect the former area of distribution of the water chestnut, not all of the stagnant bodies of water bearing a name of this model, however, have changed their lacustrine nature and become overgrown into mires in the northern territories. Thus, together with the mires named *Voisuo*, etc., there still exist lakes with names analogical to the Finnish *Voijärvi*. Nevertheless, long ago these northern lakes were not the habitats of *Trapa natans*, either. This could, therefore, indirectly prove that climate cooling, and – as an important consequence of this – a decrease in the water temperature, have been further reasons for the vanishing of this thermophile aquatic plant (cf. Nummi 2005: 19). Today, as far as the influence of the climate is concerned such details as the fact that the water chestnut cultivated in Moscow does not bloom and give fruit every year (see KKSS 384), could be mentioned. Of course, such a supposition is justified only by the fact that some of these lakes or mires, the names of which bear the place name element *Voi-*, could with the aid of palaeolimnological methods be proved to have been habitats of *Trapa natans*.

The characteristics of the bodies of water in question are of vital importance. Thus, the hydronyms and gelonyms in the territory of Finland with the stem *Voi-* seem invariably to be connected directly or indirectly with small shallow waters (see for details the maps in MLKP). The realisation of some other habitat requirements of *Trapa natans*, such as the shelter the basin affords can be observed on the basis of the topographic factors of the surroundings presented in the chartographical materials (see also Vuorela 1981: 13; Alhonen 1996: 75). Thus, the general characteristics of the former Lake *Voijärvi* in southern Finland, for example, seem to have been suitable for *Trapa natans* because of its extra-ordinary shallowness; the most common subsoil type being sand and clay with a thick layer of mud at the bottom (see Mäkilä & Grundström 1988: 19, 45).

The name of the water chestnut is also applied to the edible, nutlike fruit of this plant (EB 12: 515). The fruit of the water chestnut is a large (approx. 2–6 cm in diameter), a tetrahedral, woody, spinose nut with four, more seldom with two, sharp horns (see, e.g. FPW 156; KM 2058; EB 12: 515; OE; FUSSR XV: 479; FR IX: 483–485; KKSS 384; BSE 5: 202; Linnaeus; Hummel & Kiviat 2004: 18; Nummi 2005: 18).

The kernel possesses valuable nutritional properties (KKSS 384; Hummel & Kiviat 2004: 17). It has often been emphasised that the seeds of

Trapa contain abundant amounts of starch and fat (e.g. OE; FPW 156; KM 2058–2059). Compared to the high fat content of real nuts, the water chestnut is, however, much more starchy than fatty. According to one study, it contains 52% starch, up to 20% protein, about 9% tannin, 3% sugar, up to 1% fat and also minerals, etc., (see Vankina 1970: 134; Nummi 2005: 20). However, in the data provided by V. N. Vasiľev the approximate chemical composition of the Russian water chestnut nut was starch 52%, water 22.5%, protein 15%, fat 7.5% and sugar 3% (FUSSR XV: 478; Hummel & Kiviat 2004: 24).

In people's opinion the nuts of *Trapa natans* may seem just "fatty". Those locals from the borderlands of the provinces of Vladimir and Ivanovo who had eaten the water chestnut themselves, described its kernel not only as "like pure protein, like starch", but – especially elderly people that had no, or very little, outside information about the qualities of this plant – more often described it as "starchy, as if it contains some kind of an oil" and even "very oily, greasy".

As far as I know, no popular names for the plant *Trapa natans* have been handed down in contemporary Finno-Ugrian languages. In general, we find only a translation of the official name "water nut" or other widely used terms for this plant (cf. also Nummi 2005: 18), such as the Russian *водяной орех* (*плавающий*), *чертов орех* or *рогатый орех* already mentioned: compare, for example, Mari (Eastern) *вӱдпӱкш*, (Western) *вы́дпӱкш* or *шура́нпӱкш* 'water chestnut' from Mari *вӱд*, *вы́д* 'water', *шура́н* 'horned; (Western) 'devil' and *пӱкш* 'nut',; (see SMJ I: 324; IX: 353–354), Mordvin (Erzya) *veď-pešče*, (Moksha) *veď-päšťä* 'some edible plant that grows in the water' (MW III: 1627; IV: 2590) from Mordvin *ведь* 'water' and *пеште*, *пяште* 'nut' or Udmurt *уясь вупашмульы* 'water nut floating' (cf. Udmurt *ву* 'water', *пушмульы*, *пашпумульы* 'nut') (see EUE; URS 96, 335, 368).

However, even the Moksha limnomym of fairy tales *vaj-äṅkä* has been translated as an 'oily lake' ['масляное озеро', 'Öl-See'] (MW I: 379; III: 1431). This same connection could also provide a reasonable explanation for mire names, such as *Ügup* in Mari El, derived from Mari *ӱ*, *ӱй* 'butter' and *гуп*, *куп* 'mire' (see Voroncova & Galkin 2002: 341). As mentioned above, nowadays only sporadic water chestnut sites can be found in Mari El, in Zvenigov County, adjacent to the Volžkij County with the aforementioned mire *Ügup* (see PME; cf. AME 21–24). The settlement name *Üäjär*, *Üäjär sóla* in the Hill Mari County (see Vasikova 2003: 128, 292),

which bears the limnonymic determinant *järv* 'lake', could also belong here.

The existence of a substratum hydronym stem *Voi-*, especially in such cases as the names of the lakes *Voixro* and *Voxryč* in central Russia with their natural stand of the water chestnut lead us to consider the hypothetical possibility that originally this plant might even have been called *voi* in related Finnish languages. The value of fat and fatty flesh to hunter-gatherers, such as that provided by seals, waterfowl, and some fish, has been underlined (for further references see Zvelebil 1987: 106–107). Hazelnuts, the nuts of water chestnut, cedar nuts, acorns could be added.

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Ever since prehistoric times, the water chestnut has been gathered and consumed as food, on account of its large nutritious seed (see, e.g. KM 2058; PK 2: 144; BNF III: 257; Vuorela 1981: 14; Hummel & Kiviat 2004: 17, 23–24). Even nowadays the fruits of *Trapa* form a staple food in some parts of Asia, where the plant is also commercially cultivated for consumption (OE; FPW 156; EB 13: 693; 19: 137; KM 2058–2059; FUSSR XV: 478; Hummel & Kiviat 2004: 17, 24; Nummi 2005: 20–21). The seeds can be eaten raw or cooked, roasted, or prepared as flour (KM 2058; EB 13: 693; FUSSR XV: 478; Aalto, Siiriäinen & Vuorela 1985: 175; Alhonen 1996: 73, 75; Hummel & Kiviat 2004: 24; Nummi 2005: 20) which is also evidenced by the archaeological data from Latvia (see Vankina 1970: 134; Zvelebil 1987: 104). According to V. N. Vasiľev, in India populations living near water reservoirs containing water chestnut feed on its fruit for about five months of the year (FUSSR XV: 477). In favourable growing conditions the water chestnut yields a good crop; it has been calculated that on average in Russia one hectare produces two tonnes of nuts (KKSS 384; Nummi 2005: 20–21).[10] In some parts of Russia, in the Volga Delta and near the city of Penza, for example, *Trapa natans* formerly grew in abundance and was used as merchandise (see ES 52: 895).

Different views about the age of the water chestnut as a part of the human regimen exist. Generally speaking, it has been concluded that Stone Age man used water chestnuts as food in northern Europe, also (see, e.g.

[10] It has been stated that in 19th century in a lake in the former Orlov Province the annual crop of the water chestnut achieved 160,000 kilos (see Vankina 1970: 134; Nummi 2005: 20). Equally concerning the above-mentioned Lake *Orexovoe* nearby the town of Murom, it has been mentioned that as much as 150 tonnes of water chestnut were gathered every year. Thus, can this be regarded as just a circular legend?

KM 2058; Auer 1925: 25, 29; Sauramo 1929: 97; Valovirta 1957: 4; Vuorela 1981: 14–15; Alhonen 1996: 73, 75; Matiskainen 2002: 124; Lempiäinen 2002: 146; Vasari 2004: 197, 199; Halinen 2007b; Arctinet). Concerning the central and north-western forest zone of eastern Europe, M. G. Žilin (2004: 60) concludes that the gathering of berries and fruits, both forest and water plants, was practised in the Early Mesolithic, and continued into the Neolithic period. It has been proposed that since the Neolithics the water chestnut has been widely gathered (Hummel & Kiviat 2004: 17; cf. also Coles & Coles 1989: 24, 30, 86).

Plant remains which occur at Stone Age sites in the forest zone of eastern Europe include the water chestnut, hazel-nuts, acorns, chestnuts, mushrooms and berries, of which *Trapa natans* seems to have been the most important as a staple plant food (see Zvelebil 1987: 102; Vankina 1970: 133–134; Coles & Coles 1989: 90). It is believed that the waters of Neolithic lakeside settlements in north-western Russia have provided essential stable food supplies, including water chestnuts (see Coles & Coles 1989: 90; Hummel & Kiviat 2004: 23; see also Dolukhanov & Miklyayev 1986). It has also been thought that the water chestnut compensated for flour for people who did not grow cereals and was a supplement for those who did, such as the Neolithic inhabitants of Switzerland and Austria (see Coles & Coles 1989: 86). The water chestnut has been described as "the forager's potato", and its widespread distribution at this time may have been an important factor in the appearance of fairly substantial and permanent settlements (Coles & Coles 1989: 90). It has been concluded that this species – together with the hazelnut – was "the most significant and the most nutritive on the menu of Stone Age man" (Aalto 1983: 90; Aalto, Siiriäinen & Vuorela 1985: 175; Alhonen 1996: 75), who "relished the *Trapa*, considering it a great delicacy" (see for references Matiskainen 2002: 126–127).

Consequently, the special significance of the water chestnut for the ancient peoples of northern Eurasia seems clear. Of special interest are those occurrences of subfossil water chestnuts in close proximity to which signs of the activities of prehistoric man have been found, as has been argued for good reason (Valovirta 1957: 4; Alhonen 1996: 73). In Finland shells of the water chestnut and hazelnut, originating from Stone Age dwelling sites, are regarded as the most reliable of the earliest evidence among those plant remains of a macrofossil character indicating human activity (see Lempiäinen 1999: 152). Layers with cracked *Trapa* fruits

have been found together with archaeological findings at a number of sites in Finland (see for details Aalto 1981: 24; 1983: 90; Vuorela & Aalto 1982: 90; Aalto, Siiriäinen & Vuorela 1985: 175; Nummi 2005: 20).

The analysis of an ancient freshwater lake in the vicinity of one of the Neolithic dwelling sites surrounding the basin at Pennala, in Orimattila, southern Finland, has produced evidence indicating the use of the water chestnut by man (see Valovirta 1957: 5; Aalto 1981: 20, 23; Vuorela & Aalto 1982: 81–82; Matiskainen 2002: 126). The fact that the dwelling site can be dated to the typical Combed Ware period (3300–2800 BC) is based on the typology of a fragmented clay pot found together with an accumulation of *Trapa* "nuts" (see for details Vuorela & Aalto 1982: 81 ff., and also Matiskainen 2002: 126; Nummi 2005: 20). Archaeologist Matti Huurre (1998: 185) has proposed that this large Comb-Ceramic clay pot might have been intended for the gathering and preserving of water chestnuts.

This same study revealed that at a depth of 45–60 cm the predominant species in the relatively shallow water of the lake was the water chestnut (Aalto 1981: 21–22; Vuorela 1981: 4 ff.; Vuorela & Aalto 1982: 82–85, 87; Hummel & Kiviat 2004: 20). The leaf-rosettes of the *Trapa natans* may well have covered the greater part of the water, forming luxuriant aquatic vegetation together with other floating-leaved species, such as *Potamogeton*, *Nymphaea* and *Nuphar* (Aalto 1981: 22; Vuorela 1981: 10–11; Vuorela & Aalto 1982: 85–87, 89; Hummel & Kiviat 2004: 20). Archaeologically the gyttja section covers the period from the Pre-ceramic Stone Age to the typical Combed Ware period, after which the lake basin gradually became overgrown and turned into a mire (Vuorela 1981: 5; Vuorela & Aalto 1982: 83; Alhonen 1996: 74).

The maximal occurrence of *Trapa* at Pennala coincides with the dating of the human settlement, which suggests that the fruits were used during the typical Combed Ware period (see Vuorela 1981: 10; Vuorela & Aalto 1982: 90, and also Siljander 2001). It has been concluded that the endocarp fragments are so abundant at this level that one could speak of a *Trapa*-dominated cultural horizon (see Valovirta 1957: 5; Aalto 1981: 23; 1983: 90; Vuorela & Aalto 1982: 90; Alhonen 1996: 74). All the more so, because all the *Trapa* finds at the site were broken, sharp-edged fragments of hulls, which suggests that the fruits were cracked by Stone Age man (Aalto 1981: 23; Vuorela & Aalto 1982: 81, 87, 90; Alhonen 1996: 74; Hummel & Kiviat 2004: 23).

The lowest water chestnut layer at Arolammi, Riihimäki, southern Finland, proved to be of the same age (calibrated average 4178 BC) as the most ancient Pennala ones (Matiskainen 2002: 124, 126; Lempiäinen 2002: 146, 156). The ceramics found here belong to the younger Early Comb Ceramic culture (Matiskainen 2002: 124, 126). On the whole the archaeological findings of this overgrown lake named Silmäkeneva cover the interval from the Mesolithic period until the end of the Neolithic, and the typical Comb Ceramics is especially well represented here (see for details Ruohonen 2007: 16). Fragments of fruit shells found in mire deposits in front of a dwelling place have been interpreted as remains of meals (Matiskainen 2002: 124, 126; Ruohonen 2007: 18).

The Neolithic dwelling place apparently belonging to the Late Comb Ceramic culture at *Järvensuo* ("lake mire"), Humppila, south-western Finland, was dated at 4200–4800 years old (see Aalto, Siiriäinen & Vuorela 1985: 165; Alhonen 1996: 73; Lempiäinen 2002: 146). Also here, the cultural layer of the bog contained cracked fragments of *Trapa natans* nuts, indicating the use of this plant by Stone Age man (see Aalto 1983: 89–90, 94; Aalto, Siiriäinen & Vuorela 1985: 168, 175; Alhonen 1996: 73–75).

Some of the Finnish *Trapa* finds seem even to have belonged to the Mesolithics (8800–5100 BC)[11] (see, e.g. Nummi 2005b). Further relics of the water chestnut have been found in layers of Late Mesolithic settlements in Latvia and Lithuania (see Žilin 2004: 60). At Sarnate in Latvia and at other Stone Age sites in the eastern Baltic region thick deposits of water chestnut hulls around hearths inside the dwellings, burned remains in ashes, and fragments of sharp spines of water chestnut embedded in working surfaces of mallets have been discovered, suggesting that processing of the water chestnut with specialised tools was a widespread activity (Vankina 1970: 134; Zvelebil 1987: 102–104; Hummel & Kiviat 2004: 23–24; Nummi 2005: 20). In almost every dwelling at Sarnate a wooden beetle or even a few of them made especially for splitting water chestnuts were found (Vankina 1970: 95, 134).

Relics of the water chestnut from the Boreal and the start of the Atlantic chronozone have also been discovered in the Tver' Province, at the settlement of Ozerki – mainly among heaps of bones of mammals, birds

[11] These datings are from Petri Halinen (2007a).

and fish, and tools made of bone and stone, which excludes any possibility that the water chestnuts arrived there by accident (Žilin 2004: 60).

There is some archaeological information about the surroundings of one of the "oily lakes", Lake *Voixra*/*Voxro* in the Vladimir Province, mentioned above. On the shores of this lake a settlement from the Bronze Age has been found, and another, possibly from the Mesolithic period (see AKVO 133–134).

The archaeological context in the case of Lake *Vojmežnoe* in Northern Meščera in the Moscow Province with its multi-layered settlement from the Stone and Bronze Ages (see for details Èngovatova 1997) awakens interest in this limnonym. In spite of the ambiguity of the suffixation and of the morpheme boundary it seems that in this case also the original stem *Voj-* could be distinguished. Lake *Vojmežnoe*, called (without the later Russian suffix) also *Vojmega* / *Vojmiga* / *Voimiga* has an outlet, the River *Vojmega* / *Vojmiga* / *Vojmiž* / *Vajmiž* / *Voimiž* (see AMO 84; GBO 225; WRG Nachtrag: 108; Arumaa 1961: 176, 180 [№ 43]).[12] It is also worth noting a small river and a village nearby, called the *Vojmiga* in the Ivanovo Province (see AVO 16–17; WRG I: 345). According to G. P. Smolickaja, this river name has the historical variants *Voimiga* and *Vojdiga* (see GBO 217; cf. WRG I: 344). A variant *Vojmega* is also given for the name of the River *Vojninga* in the Vladimir Province, and possibly also the name forms *Vojmiga*, *Vajmoga*, and even *Vojmira* may belong here (see GBO 226; cf. WRG I: 253, 345; Nachtrag 108). However, the River *Vojninga* flows into the River Sudogda not far from the settlement of *Maslovo* and the three lakes *Voixro*, *Voxryč* and *Vojxra* on the opposite shore of the River Kljaz'ma (see AVO 57–58, 75–76).[13]

[12] Actually, even two lakes found in the former Moscow Province, *Vojmiga* and *Vojmežnoe* have been distinguished (see Arumaa 1961: 176, 180; WRG I: 345; Nachtrag: 108).

[13] In some of the other cases which appear similar, other semantic connections or totally separate lexical elements may come into question. Thus the numerous river names in the northern territories of Eurasia, especially the Komi land, such as *Vóivož*/*Vójvož* that formally could have belonged to the hydronymic model in question, tend to be explained by the transparent Komi vocabulary elements *вой* 'night; north, northern' and *вож* 'tributary' (see Afanas´ev 1996: 46–47; WRG I: 344), for example. The river names *Vojvož*/*Voj-vož* are still found in the former Vologda Province (see WRG I: 344). It should be mentioned that in the former Perm´ Province there are also two rivers named *Ojvož* (see WRG III: 469).

It might be further noted that there is a small river *Vojmež* in the Kostroma Province with a village beside it called *Moslovo* (see KKO 40–41) which name could, in principle, have some kind of a connection with the Russian lexeme *масло*. N. Kučin

In Karelia, just nearby the *Voi-guba* on the northern shores of Lake Onega (see [№ 21]), there is a place named *Voiniemi*, where a large group of contemporary settlements has been discovered, one of which is dated to the third quarter of the 4th millenium BC (Pankrušev 1994: 105). It seems that this place was very popular in those remote times, although without further investigation it is impossible to say whether the water chestnut indeed grew in this "oily bay", or whether this was one of the main reasons people were tempted here? Generally speaking, it is natural not to nominate a whole larger body of water on the basis of the possible existence of the water chestnut, but only a specific part of it, a bay, strait, or a place restricted by water such as a headland or an island, for example, because this plant only thrives in shallow waters.

On the whole, the subfossil finds of *Trapa natans* in Finland, in particular, occur in areas where prehistoric findings have been made, namely, from the Stone and the Bronze Ages (see Nummi 2005: 19–20). On the basis of these studies the soundest evidence of a "*Trapa*-culture" seems mainly to be based on evidence from settlements of the Neolithic period, the New Stone Age (5100–1700 BC), representing different stages of the Comb Ceramic culture (see also Nummi 2005: 20). Water chestnut shells have also been found at a Bronze Age (1700–800 BC) settlement in Luhdanjoki, Lahti, dating from the Textile Ceramics period (see Nummi 2005: 20; Siljander 2001). It has been emphasised that the water chestnut has never been found in territories without an ancient settlement (Valovirta 1957: 4). Thus, the former presence of the water chestnut in northern regions seems to be regularly related to the dwelling places or consumption areas of prehistoric populations.

The natural means by which the water chestnut spreads, such as with the current, are very limited (see Vuorela 1981: 10; Huurre 1998: 185; Nummi 2005: 19–20; cf. BNF III: 257; PK 2: 144). It is believed that this plant spreads with the help of the fur of wild animals, certain mammals (boar, beaver), the plumage of water birds (goose, duck), since the barbed spikes of the nuts enable them to cling to moving objects, including human clothing, nets, wooden boats, etc., which means that the most effective form of its dispersal is of human origin (see Hummel & Kiviat 2004: 20; KKSS 384; KKRF 431; BNF III: 257; PK 2: 144; FUSSR XV: 478; cf. Huurre 1998: 185; Nummi 2005: 19–20).

(2000: 199), however, traces the two oikonyms *Moslovo* in the Manturovo County back to the anthroponym *Mosol*, *Moslov*, which formally seems to be the right conclusion.

No explanation has yet been found for the natural spreading of the water chestnut into Finland after the Ice Age (Nummi 2005: 20; see also Huurre 1998: 185) – except the anthropogenic factor. Thus, it has been concluded that as early as the Stone Age it was possible or very likely that human beings helped to distribute and transplant *Trapa natans* into new areas, they "might have facilitated its subsistence", and "cherished" or even "cultivated" it in small lakes by their settlements (see KM 2058; Auer 1925: 29; Sauramo 1929: 97; Valovirta 1957: 4; Vuorela 1981: 14; 1999: 144; Alhonen 1996: 73; Huurre 1998: 185; Lempiäinen 2002: 146; Vasari 2004: 197; Nummi 2005: 20; Valpola & Salonen 2006: 20; Ruohonen 2007: 18; Halinen 2007b; cf. also PK 2: 144; Vankina 1970: 134; Vuorela & Aalto 1982: 90; Matiskainen 2002: 126). According to some researchers, it seems obvious that when Stone Age man moved into new hunting or fishing territories he took with him the nuts of the water chestnut and transplanted them in new lakes (Valovirta 1957: 4; Alhonen 1996: 73, 75).

Concerning the spread of the water chestnut and the origin of the ancient toponymical model proposed to have been connected with the plant, some of the recurrent connections between the prehistoric populations of the former Finno-Ugrian territories during the Neolithics and the Bronze Age, in the first place, should be taken into account. Plausible explanations could be sought through the archaeological evidence. Preliminarily one could point in the direction of the ancient central Russia. The Volga-Oka region was the primary source for several presumed demic movement waves in the north-westerly direction, including the Stone and Bronze Ages, and its significance as a cultural innovator never faded (see Carpelan 2006: 87; 2007a; 2007b).

Of special interest is, firstly, a widespread completeness or network consisting of (Sub-)Neolithic hunting cultures in the northern forest zone that in approximately 6000/5000–2000 BC extended from Finland to the Urals, and within which mutual exchange was practised (C. Carpelan: personal communication, 2008). At its early stage, since 5000 BC, the Pit-Comb or Ljalovo entity spread from the Volga–Oka interfluve as far as Lake Onega (Carpelan 2007a; C. Carpelan personal communication, 2008). The Typical Combed Ware culture based on the Ljalovo, expanded into Finland up to the Gulf of Bothnia and as far as the Arctic Circle in the North, into eastern Karelia, the Leningrad Province, Estonia and Latvian in about 3900–3500 BC; obviously an expanding demic movement (see Carpelan 2006: 85; 2007a; C. Carpelan: personal communication 2008;

Huurre 1998: 52; cf. also Häkkinen 2007) should be taken into account here. Thus in the middle of the Neolithic period, during the typical Comb Ceramic time, in particular, the population of Finland is regarded as having reached its culmination (Halinen 2007a).

Secondly, in about 1900 BC there was a strong wave of influence, probably carried by a demic movement from the Volga-Oka region into eastern Fennoscandia, eastern Karelia, up to the White Sea, and into Finland, up to as far as the northern part of the Gulf of Bothnia, initiated by the population of the Textile Ware culture (see Carpelan 2006: 86; 2007b). The Sejma-Turbino "cross-cultural network" might also have been involved in this wave, which in 1900–1600 BC influenced the zone stretching from the headwaters of River Ob' to the Upper Volga, where bronzes and other valuable goods and cultural elements from East Russia were distributed as far as to Estonia and Finland (Carpelan 2006: 86; 2007b). Afterwards, during the Early Iron Age (800–300 BC) the Anan'ino culture of the lower Kama and central Volga had a significant influence as far west as eastern and northern Fennoscandia, the whole territory of the northern Russia, and in the west up to Lake Onega, although this is regarded as primarily tradinger activity (Carpelan 2006: 87; 2007b).

The "Comb ceramists" were joined to an extensive exchange network, within which such materials of great value as flint, amber, copper and Siberian pine were dispersed in the territory, extending from the Urals as far as Finland (Carpelan 2006: 85; 2007a). In Finland, at typical Comb Ceramic dwelling sites, flint is a normal material discovered in archaeological excavations, while during the Preceramic and Early Comb Ceramic periods flint was used only a very little, and again after the typical Comb Ceramic period flint findings clearly become fewer (see Huurre 1998: 226–227, 239). On the basis of what has so far been stated it could be asked whether the nutritive and high-yielding plant, the water chestnut, might also have been one of the commodities spread by this population?

The Russian calques of the Finno-Ugrian limnonyms treated above give reason for supposing that some of the pure Russian lake or mire names with the element *Masl*(*V*)- could turn out to have been translations of Finno-Ugrian originals into Russian. Without any further information, for instance archival data, this of course cannot be verified. Nevertheless, a dozen dwelling places from the Middle Neolithic period belonging to the Ljalovo culture have been found beside one the most famous of these Russian places, the mire *Maslovo boloto* in the Moscow Province (see NSE

174–175), that once again presents evidence on behalf of a Finno-Ugrian origination. It might also be remarked that the above-mentioned site *Vojmežnoe*, *Vojmežnaja*, belongs to the same neolithical cultural sphere as the *Maslovo boloto* settlements (cf. NSE 166, 174–175).

On the whole it should be observed that in the very expansive regions inhabited by Finno-Ugrian populations in the past and to some extent also at present, a remarkable number of ancient parallel toponyms common to the territories situated at considerable distances from each other can be distinguished. Some of these place names consist of such unique components, that it would seem that their parallel existence can only be explained by assuming that migration took place.

The toponymical model "oily waters" seems to be relatively general in the north-western territories of Eurasia. Among place names of Finno-Ugrian origin even different layers belonging to this category may be distinguished. Some of these have clearly been derived from the Finnic languages, while the others resemble either the Volgaic languages, especially Mordvin, or the Permian languages, particularly Komi, or Saami, and even the Ob-Ugrian languages. Some of these analogical place names seem to have followed the development of the language, whereas others became petrified in the distant past. Nevertheless, the phonetic differences in the individual modifications of the place name element in question could have arisen for various reasons, having been connected not only to the internal development of these languages, but also to the adaptation of these names in languages related to Finno-Ugrian or other origin.

As regards the variation in the Finno-Ugrian toponymical stem *Voi-* treated here, and not only in this particular case, attention should be paid to the linguistic diversity of populations that are supposed to have participated in the proposed migrations. Even if the Volga-Oka region alone appears to be the point of departure for these demic movements, the language forms of Finno-Ugrian origin spoken by these populations could clearly not have been linguistically uniform. This is evident not only from the great chronological differences of even thousands of years, but also because of the constitutive divergences in the very language forms spoken in this region, indicating not only the relative extent of the territory, but, above all, the heterogeneousness of the local language material, the spectrum of linguistic conditions that even today can well be seen here on the basis of the many layers of place names of Finno-Ugrian substratum origin.

Concerning the central territories of Russia, language elements similar to Volgaic would be natural, as shown by the subsequent history of this region. It should also be observed that in central Russia a strong toponymical layer with a remarkable number of elements clearly similar to the contemporary Permian languages still exists, that in any case must have originated in the period(s) preceding the last substratum layer – remains from the cultural phases of the Merya and Muroma. Thus, the migration waves presumed by achaeologists might be responsible for a partial dispersal of language material towards the north-west, which seem to be represented in petrified place name elements quite reminiscent of the Volgaic and Permian languages, for example.[14] There are still many questions related to this complex of problems.

[14] Related to this, one possibility at least worth considerating is presented by the connection between subfossil *Trapa* finds and a place name element with a feasible modification of the Finno-Ugrian stem *Voi-* that might be perceived in the case of the parish name *Viiala* (with the suffix *-la*, *-lä*, *-l*, widely used in forming settlement names in the Finnic languages), in Tavastia, Finland. On the transgression shore of Lake Vanajavesi near *Viiala*, at a proposed Stone Age camp-fire site, a cultural stratum with an abundance of *Trapa natans* nuts that were all broken has been discovered. These have been interpreted as the remains of food used by man (see Auer 1925: 25; Valovirta 1957; Alhonen 1996: 73–74; Huurre 1998: 185; Aalto 1981: 24; Vuorela & Aalto 1982: 90). *Trapa natans* has been discovered at *Viiala* at depths of 2.00m, 1.40m, 1.10m and 1.00m (see Auer 1925: 42–46) and this could even provide some evidence of the age of this toponym – if the proposed connection were to be accepted.

The oikonym *Viiala* mentioned in 1455 in the form *Wiala* is not an isolated case in Finnish toponymics (see, e.g. MLKP; SP 504), and all of these should be studied separately. A considerable number of these toponyms are settlement names, so that the possibility that they are of an entirely different origin, grows. No clear explanation has been given for the oikonym *Viiala*: it has been proposed that *Viia* or *Viija* could have been an ancient Finnish name for a male or that names with the stem *Viia-* could be based on the ethnonym *svea*, *svia* 'Swede', for example (see for further details SP 504). Nevertheless, the existence of mire or pond names with the stem *Viia-*, such as *Viiansuo* or *Viialampi* in Finland coincides with the point of departure presented here. Thus, the farm *Viiala* in Luumäki, south-eastern Finland, is located near to a mire *Viiansuo* (MLKP). One of the farms named *Viiala*, in Juva, eastern Finland, is located on the shores of Lake *Viiainen*, while one of the places nearby is called *Rasvalahti* "greasy bay" (< Finnish *lahti* 'bay, cove') (see MLKP; cf. also SP 504). As regards place names, mostly hydronyms with the lexeme *rasva* 'fat, grease', such as *Rasvasuo* or *Rasvalampi*, *Rasvalammi* in eastern Finland in particular, have been explained either on the basis of a type of rock, steatite, a soapstone that seems 'greasy', or on the basis of a membrane found on the surface of bog water, for example (see SP 372).

There are place names such as the River *Vija* with the mire *Vijamox* in Karelia (see AKC 138–139; cf. also the hydronyms *Vyja* discussed above). Such toponyms in the Veps territory, in the basin of the River *Ojat'*, as *Viozero*, or even two such names (cf. SGBS 29; KLO 18), further *Vijso* / *Vijanso* / *Vijboloto* / *Viiboloto* (< Russian *болото* 'mire'), etc., (see Mullonen 2002: 107; SGBS 40; KLO 19) should represent a parallel

The boundary between the gatherer culture and the cultivation culture is regarded to have been sliding (Vuorela 2007). Quite early on that it was realised that natural plants would give a good crop in their natural habitat, and these were carefully handled and protected (see Vuorela 2007). Insofar as the water chestnut and hazelnut have been intentionally planted in new places, this can be regarded as a pre-stage of cultivation in Finland (Huurre 1998: 188). It also has been stated that the water chestnut is a primeval cultigen that humans have used for nutriment since the Early Stone Age (Valovirta 1957; Alhonen 1996: 73). The culture-centric dating of the maximum occurrence of *Trapa natans* at Pennala, Orimattila may even point to the intentional cultivation of the species during the typical Combed Ware time (Vuorela 1981: 14).

Some researchers believe that the water chestnut was such an important food source for prehistoric peoples of north-western Russia that the disappearance of the plant contributed to the shift from hunting and gathering to agriculture (see Hummel & Kiviat 2004: 24) or, to put it more exactly, that the delay in the adoption of cereal farming was caused by the effective exploitation of local plants which assumed the role of staple foods (Zvelebil 1987: 102, 116). On the other hand, it has been expressed that the extinction of the water chestnut in Finland was precipitated by the changeover to the grain growing period, after which the importance of *Trapa natans* as a plant of nourishment distinctly diminished (see Alhonen 1996: 74; cf. Valovirta 1957: 5). However, the water chestnut began to vanish in Finland at about the same time as more extensive cereal cultivation commenced (see for further references Aalto, Siiriäinen & Vuorela 1985: 175), that is in the Late Neolithic Stone Age over 4000 years ago (see e.g. Vuorela 1999: 143, 146–147; 2007).

The northerly hydronyms with the Finno-Ugrian stem *Voi-* in Finland and northern Russia occasionally extend beyond the northernmost locations of *Trapa natans* subfossils finds (see the map). Compared with the extent of the settlements of the Comb Ceramic culture in the northern dimension

toponymical layer. Insofar as these cases belong to this model, a wovel change in the first syllable that does not historically correspond to the Finnic languages must be assumed (T. Salminen: personal communication, 2008).

Nevertheless, this association raises the hypothetical question: should place names of this kind be regarded as an evidence in favour of the human introduction of the plant *Trapa natans* by a population speaking a language quite similar to the present Volgaic, for example, especially the Mordvin languages as suggested by the case of the stem in the form *Oj-*, *Va*(*j*)- etc., or a language reminscent of a form related to Permian as supported by the case of the stem *Viia-*, etc., into the territory of Karelia and Finland?

in Finland there seems to be no incompatibility (cf. the map and NBAK). Should these only be regarded as names of familiar places transfered to new dwelling environs or did pre-historic man also transfer the corresponding concept, the seeds of the water chestnut for cultivation, to some areas further north? Neither should the possibility that the name for a lake could have been taken from attempts to grow the plant be excluded – the creation of the name could have been a logical result, even if they had had no success worth mentioning. In the Ivanovo Province I was told about a corresponding modern day unsuccessful attempt to transplant the water chestnut into Lake *Váskara* (shown on the map as *Vaskerovo*, see AVO 23), before it became evident that the sandy bottom of the lake was not suited to this plant.

Related to this, the name of a lake and its outlet, *Vojdoma*, in Karelia (see WRG Nachtrag: 108; AKC 79–80 [№ 23]) is of special interest because of its suffixation. It seems plausible to distinguish here the Finno-Ugrian caritive suffix in the form *-toma*, *-doma* (cf. Finnish *-ton*, *-tön*: *-ttoma-*, *-ttömä-*) expressing the lack or absence of something. Consequently, it has to be concluded that this same body of water was "unoily", "a lake without water chestnuts". Implicitly this might mean that at the time of the nomination similar lakes in the vicinity of the *Vojdoma* did contain *Trapa natans*, even though this plant was missing from this lake, or that attempts to make the plant grow here had failed. Thus, the hydronym *Vojdoma* would belong to a certain caritive category with such a widespread lake name model as *Kalaton* meaning 'without fish' (< Finnish etc., *kala* 'fish') (see MLKP). The frequency of the limnonyms of the type *Kalaton* in the (former) Finno-Ugrian territories is an implicit indication of the great importance of the fish in the regimen of the ancient occupants of the northern territories and, correspondingly, implies the "worthlessness" of lakes that were fishless, 'without fish' or 'scarce in fish'. Similarly, the hydronym *Vojdoma* being 'unoily' could be an indirect indication of the significance of the aquatic plant *Trapa natans*. There really are lakes in the surrounding area with the names of opposing characteristics, that is, 'oily', the closest of which are two above-mentioned lakes named *Vajarvi*, directly connected to Lake *Maslo*, and the fairly large Lake *Maslozero* also called *Masl-ozero* / *Maselozero* / *Masljanoe* (see AKC 68; WRG III: 218–219 [№ 46]).

When considering those sporadic cases in which the hydronym stem *Voi-* occurs in the far north, it is of interest to observe that parallel to this

the subfossil hazel has been discovered much further north than is its present distribution. In the Stone Age the hazelnut was found as far north as Rovaniemi – at the edge of the Arctic Circle (see Huurre 1998: 185). On the coast of the White Sea (Dvina Sea) and at Kuusamo, Finland, at about 66°30´N suprisingly large quantities of *Corylus avellana* pollen have been found (Vasari 2004: 196).

The kernels of the hazel nut are considered to have been an important nutriment for gatherers of food, just as the water chestnut was (Vasari 2004: 199; see also Arctinet). In this connection the observation that at Arolammi, Riihimäki, among the water chestnut material large quantities of hazelnuts and their shells have been found, should be mentioned (see Lempiäinen 2002: 146; Matiskainen 2002: 127). Shell fragments of both the water chestnut and hazelnut are thought to have been the remains of meals (Matiskainen 2002: 124, 126–127; Ruohonen 2007: 18). At Arolammi, the nut *Corylus avellana* L. has been related to layers including findings from the Mesolithic period, as well as from the Neolithic (Matiskainen 2002: 127; J. Ruohonen: personal communication, 2007). There are numerous similar cases of the parallel occurrence of both *Trapa natans* and *Corylus avellana* with finds of cracked nuts found in excavations (see, e.g. Aalto 1983: 89–90, 94; Aalto, Siiriäinen & Vuorela 1985: 175; Riehl 1999; Nummi 2005: 20; cf. also Auer 1925: 19–20; Dolukhanov & Miklyayev 1986; Zvelebil 1987: 97–98, 102). Parallel to this, it has been supposed that the hazel shrub was favoured by and spread by man (for further references see Aalto, Siiriäinen & Vuorela 1985: 175; Huurre 1998: 185; cf. Vuorela 1999: 144).

The water chestnut characterised the vegetation during the warm period in the continental regions of the north, but its fruits have not been discovered in the maritime regions of this area (PK 2: 144; see also Vuorela 1981: 12; Vuorela & Aalto 1982: 89). This species is restricted to freshwater basins, which is explained by the failure of its seeds to germinate at NaCl concentrations of 0.1–2% (Vuorela 1981: 12; Vuorela & Aalto 1982: 89; Hummel & Kiviat 2004: 19). Because of this fact, those few toponyms that are connected with salty places or brackish water are problematic. One example of these is the name of an island, *Vojluda* in the Onega Bay in the White Sea (< Russian dialectal *лу́да*, *луда́* ‘rocky islet, etc.’, from Finnic languages: cf. Finnish, Karelian *luoto* id., Lude *luod*(*o*) id., etc.) (see AKS 151; ESRJ II: 528; SSA 2: 111; cf. also SP 513). Could these place names be regarded as evidence of the failure of ancient people

to succeed in cultivating *Trapa natans*, and not only in lakes, but in some cases also in sea water with a low content of salt? It might be added that in the United States the water chestnut also grows in slightly brackish reaches of estuaries (see Hummel & Kiviat 2004: 18–19; cf. Vuorela & Aalto 1982: 89).

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This is where the options, as far as onomastics are concerned ends. Only in collaboration with the natural sciences, particularly palaeolimnology, palaeobotany, and archaeobotany, the study of plant remains at archaeological sites, would it be possible to further resolve the problematics encountered here. It has been emphasised that despite the significance of *Trapa natans* as one of the key indicators regarding the palaeoclimatic interpretation in Scandinavia, very few detailed investigations have been carried out on sites containing *Trapa* remains (Korhola & Tikkanen 1997: 39–40). This research has emphasised that little is known of the exact timing of the spread and extinction of this species. In the case in point it could prove useful to combine the knowledge of several disciplines. Could the results of plant macrofossil analyses or the pollen data of lacustrine sediments confirm that at least some of these lakes or mires with the hydronym stem *Voi-* of Finno-Ugrian origin have been named according to the "oily" remains of the water chestnut? If so, it would be very advantageous to determine the age and time span of possible *Trapa natans* relicts in the places in question.

As for the proposed human part played in preserving this food plant, the supposition presented here could open up some new vistas for archaeology, which could lead not only to unearthing new settlements from the Neolithic period perhaps, and possibly of other eras too, but also to obtaining additional information about those populations that are supposed to have been involved in spreading the water chestnut. This problem is actually related to a complex of unsolved questions concerning the development of the Finno-Ugrian peoples and languages in their early stages, and this includes also the settlement of Finland.

In this connection it should be remembered that populations of the water chestnut growing in the same lake or waterway are often very uniform (see KM 2058), and that the species *Trapa natans* is very polymorphic as regards its fruit form (Vuorela & Aalto 1982: 85; Linnaeus). Ocularly,

some of the subspecies seem to differ from each other considerably (see, e.g. FUSSR XV: 483, 491; cf. Auer 1925: 27; Valovirta 1957: 4). Central and northern European authors consider that most of the taxa belong to one species, *Trapa natans* L., or regard them as varieties or forms of a limited number of species, while many eastern European researchers have treated the different forms as separate species (Vuorela & Aalto 1982: 85). Thus, V. N. Vasil'ev has listed no less than 25 distinct species in the U.S.S.R. alone (see FUSSR XV: 478 ff., 732–733; Hummel & Kiviat 2004: 17; cf. BSE 5: 202; KKRF 431–432). N. N. Tzvelev distinguishes a total of approximately 50 species of *Trapa natans* L. (FR IX: 484 ff.).

Both *coronata* and *conocarpa* have been found, for example, among the Swedish subfossil fruits of the *Trapa* (BNF III: 256; II: 337; FUSSR XV: 485–488, cf. PK 2: 144). *Trapa conocarpa* has a general distribution in Scandinavia (fossils in southern Sweden), and additionally in central Europe (France, Germany, Hungary), in the Baltic Countries (Latvia) and in Russia – in the Smolensk, Nižnij Novgorod and Vladimir Provinces, where this is one of the species that grows in the Oka and Sura basins (see for details FR IX: 485–487; cf. FUSSR XV: 485–486). *T. natans* f. *suecica* ("Swedish") is regarded as a variant of either *T. conocarpa* (FR IX: 487) or *T. septentrionalis* ("Northern") (FUSSR XV: 486–487). *Trapa natans* L. also has several variants, among them *T. natans* f. *coronata* (see FR IX: 489; FUSSR XV: 488). Furthermore, in Pennala, southern Finland, all the recognisable remains of this aquatic plant could be referred to as *Trapa natans* var. *coronata*, the most common northern European form (Aalto 1981: 22; Vuorela & Aalto 1982: 85; see also Auer 1925: 28).

On the basis of the afore-mentioned, yet another hypothetical question could be proposed: if this plant was brought to the north through human interaction, would it be theoretically possible on grounds of the subfossil finds to define the subspecies of the water chestnut and in this way to determine the direction(s) from which *Trapa natans* has been brought to the Finnish or Karelian lakes, for example?[15] It seems plausible that the "*Trapa*-people" brought the water chestnut seeds from their (former) dwelling places or from some known water chestnut basin en route to Finland, for instance.

[15] It should be added that equally analyses of flint brought to Finland during the Stone Age have been made, and these show that for the most part this rock has come from the Valdai region (see Huurre 1998: 226, 241).

Of course, it must be borne in mind that these place names have survived much longer than the phenomenon that is supposed to give grounds for their nomination. From this viewpoint the determination of the time of the first appearance of the water chestnut in those bodies of water discussed above is of even more importance than the data concerning the time it vanished, because in some cases, at least, if enough compatible results can be obtained, this would probably reveal the time of the nomination – at least in those cases in which parallel archaeological evidence, namely, signs of human agency would be obtained.[16] In terms of this, the continuity of the water chestnut stand, as well as the permanence of the settlement connected, or alternatively their rupture, has to be taken into account. Furthermore, one must also remember that some water chestnut lakes could have been located in waste lands where signs of human activity would be more haphazard and less obvious compared to those in permanent dwelling places.

It is believed that some of the place names may be as old as the uninterrupted hunter-gatherer economy or the settling of a certain territory, and in principle can be dated to the Stone Age (see, e.g. Mallat 1996: 109). Concerning place names in Finland, the onomastician Eero Kiviniemi (1984) has stated that many of these can surely be regarded as having originated as early as prehistoric times, but would seem to require a novel theory of linguistic history to discover place names transmitted from the Stone Age population. Kiviniemi stresses that the linguistic origin of place names is the most primary of the toponymical criteria for determining the prehistoric settlement. For example, if on the basis of geological phenomena that have changed the essence of a place, some of the semantically undisputed place names based on a Finno-Ugrian language could be shown to be at least five millennia old, this would be a proof of a Finno-Ugrian population of the same age (see closer Kiviniemi 1984). However, Kiviniemi emphasises that the already familiar nomenclature models have always influenced nomination.

[16] The postglacial land uplift and shore displacement in Fennoscandia could provide some indication of the earliest possible moment for the proposed existence of *Trapa natans* in those lake basins that are located in the south-western coastal area of Finland, for example (see № 11, 12, and 15 on the map), and consequently, of their nomination when compared with data concerning the time when the topographical isolation from the Litorina Sea, that is, the time of the formation of these places, occured (also M. Moisanen: personal comment, 2008).

Insofar as the common view of the human factor connected to the transplanting of *Trapa natans* corresponds to reality, the plant in its northern "subfossil habitats" should be regarded as a very ancient culturally introduced plant (see, e.g. Valovirta 1957; Alhonen 1996: 73) or cultural indicator (Aalto 1983: 89–90), as has been proposed. The water chestnut has been listed in a group of archaeophyts in Finland, together with mullein (*Verbascum thapsus*) and dark mullein (*Verbascum nigrum*), for example, which, and especially the latter, are regarded as a clear indicator of Iron Age settlement and hill forts (see Nummi 2000; 2005). Should *Trapa natans* correspondingly be regarded as an indicator of the Stone Age (cf. Valovirta 1957), and especially of Neolithic period settlement?

Moreover, it seems evident that this plant was named by those people who brought it to the western boundary of the distribution of the Comb Ceramic culture. The hydronym stem *Voi-*, closely associated with those waters that were favourable environments for cultivating *Trapa natans*, is indisputably of Finno-Ugrian origin. The various modifications of this topolexeme, especially in Finland and north-western Russia, might be an indication of the complexities involved in the migration of related ethnical groups in several waves at different prehistoric times, of their separate geographical origin and of the differences in the language forms used by them in the expansive territories of the northern areas of Eurasia.

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Arctinet = *Arctinet-projekti*. 1. *Elävä kivikausi*. Pyyntielinkeinot. Keräily. Keräilyn kohteet. Käsikirjoitus J. Grönhagen & E. Muurimäki. 2001. Päivitetty 12.12.2006. [In: https://extras.csc.fi/arctinet/kivikaus/m4/4_6_1.htm.]

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ATO = *Атлас Тверской области.* Масштаб 1: 100 000. Москва 2003.

Auer 1925 = V. Auer: *Investigations of the ancient flora of Häme* (*Tavastland*). (= Metsätieteellisen koelaitoksen julkaisuista 9). Helsinki.

AVO = *Атлас Владимирской области.* Масштаб 1: 100 000. Москва 2003.

Berg 1922 = Л. С. Берг: *Климат и жизнь*. Глава VI: О пустынно-степной послеледниковой эпохе. Москва. [In: http://www.abratsev.narod.ru/biblio/berg/c6.html.]

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BNF = *Bilder ur Nordens Flora*: *på grundvalen af Palmstruchs "Svensk Botanik"* af C. A. M. Lindman. II: Taflorna 269–519, III: Text. Stockholm 1905.

BSE = *Большая советская энциклопедия*, гл. ред. А. М. Прохоров. Третье издание. Т. 5. Москва 1971.

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ERS = *Эрзянь-рузонь валкс.*/ *Эрзянско-русский словарь*, ред. Б. А. Серебренников et al.. Москва 1993.

ES = *Энциклопедический словарь*. Репринтное воспроизведение издания Ф. А. Брокгауз & И. А. Ефрон 1890 г. Том 52. Ярославль 1992.

ESRJ = М. Фасмер: *Этимологический словарь русского языка*. Перевод с немецкого и дополнения О. Н. Трубачева. Том I–IV. Москва 1964–1973.

EUE = *Энциклопедия* "*Удмурт элькун*". Шер пумиськись но бырыны кутскись будосъёс. (Редкие и исчезающие растения.) [In: http://www.suri.ee/entsik/s/sher%20pumiskis%20no%20byryny%20kutskis%20budosjes.htm.]

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FR = *Flora of Russia. The European Part and Bordering Regions*. Volume IX: Magnoliophyta (= Angiospermae), Magnoliopsida (= Dicotyledones), ed. N. N. Tzvelev. [Translator & General Editor: V. S. Kothekar.] Chapter: Family 98. Trapaceae Dumort. Treatment by N. N. Tzvelev. Leiden 2006, pp. 483–493.

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FUV = B. Collinder: *Fenno-Ugric Vocabulary. An Etymological Dictionary of the Uralic Languages*. Uppsala 1955.

GBO = Г. П. Смолицкая: *Гидронимия бассейна Оки*. (*Список рек и озер.*) Москва 1976.

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JMR = *Южский муниципальный район Ивановской области*. Официальный сайт. Среднерусская Карелия. [In: http://yuzha.ru/index.php?module=content&page=karel.]

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KKO = *Топографическая карта*: *Костромская область*. Масштаб 1: 200 000. Москва 1997.

KKRF = *Красная книга РСФСР. Растения*, ред. А. Л. Тахтаджян. Москва 1988.

KKSS = *Красная книга СССР. Редкие и находящиеся под угрозой исчезновения виды животных и растений*, ред. А. М. Бородин. Издание второе, переработанное и дополненное. Т. 2. Москва 1985.

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KLO = *Ленинградская область*: *Топографическая карта*. Масштаб 1: 200 000. Санкт-Петербург 1996/1997.

KM = *Kasvien maailma*. *Otavan iso kasvitietosanakirja*. 5. Sienet–Öljypuukasvit, ed. P. Kallio & A. Rousi. Helsinki 1981.

KNAB = *Place Names Database KNAB*. *Place names of Estonia*. *Institute of the Estonian Language*. 16.8.2007. [In: http://www.eki.ee/knab/knab.htm.]

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KVO = *Вологодская область*: *Топографическая карта*. Масштаб 1: 200 000. Москва 1998.

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MW = *H. Paasonens Mordwinisches Wörterbuch.* Zusammengestellt von Kaino Heikkilä./ *Мордовский словарь Х. Паасонена*. Составитель Кайно Хейккиля. Band I–IV. Bearbeitet und herausgegeben von Martti Kahla. / (= Lexica Societatis Fenno-Ugricae XXIII, 1–4). Helsinki 1990–1996.

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NA = Names Archive. Research Institute for the Languages of Finland, Helsinki.

NBAK = *Kartat. Suomen asutus kivikaudella: Kampakeraaminen kulttuurivaihe*. Esihistorian opetuspaketti. Museovirasto, Helsinki 2006. [In: http://www.nba.fi/fi/skm_opetus_esihist_kartat_2#kampakeraaminen.]

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NSE = *Археология. Неолит Северной Евразии*, ред. С. В. Ошибкина. Москва 1996.

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PK = *Pohjolan kasvit 2*. 2. painos, ed. J. Taarna. Helsinki 1995.

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Siljander 2001 = E. Siljander: *Päijät-Hämeen arkeologisia tutkimuksia kesällä 2001*. [In: http://www.arkeo.net/seurat/ph2001.htm.]

SKD = *Сравнительный словарь коми-зырянских диалектов*, ред. В. А. Сорвачева. Сыктывкар 1961.

SMJ = *Словарь марийского языка./ Марий мутер*, гл. ред. И. С. Галкин. I–X. Йошкар-Ола 1990–2005.

SNMK = Список населенных мест Карельской АССР. (По материалам Переписи 1926 года.)/ Karjalan A.S.N.T:n asuttujen paikkojen luettelo. (Vuoden 1926 väenlaskun ainehiston mukaan.) Составлен Статистическим Управлением АКССР./ K.A.S.N.T:n Tilastohallinnon laatima. [In: http://www.genealogia.fi/hakem/asnt1926.pdf.]

SP = *Suomalainen paikannimikirja*, ed. S. Paikkala. (= Kotimaisten kielten tutkimuskeskuksen julkaisuja 146). Jyväskylä 2007.

SSA = *Suomen sanojen alkuperä. Etymologinen sanakirja*, eds. E. Itkonen & U.-M. Kulonen. 1–3. Helsinki 1992–2000.

UEW = K. Rédei: *Uralisches Etymologisches Wörterbuch* I–II. (III: Register. Zusammengestellt von A. Dobó & É. Francsaly). Budapest 1986–1991.

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Area of distribution of the water chestnut (Trapa natans) and its toponymical reflexes in the north-western parts of Eurasia

- - - - - - - The present-day northern limit of *Trapa natans*
× × The northernmost subfossil finds of *Trapa natans* in Finland and Sweden
● A stagnant body of water (lake, pond)
○ A mire
□ A stagnant body of water with a mire or with a flowing body of water bearing a name of the same origin
▲ A place related to a stagnant body of water (bay, promontory or island)
△ A field or a meadow
◇ Lake names with calques

The names of stagnant bodies of water, mires and some nearby locations with the Finno-Ugrian stem Voi-/ Russian Masl(V)- :
1–2. Voijärvi, 3–14. Voilampi, Voilammi, 15–18. Voisuo, 19. Voj-Jarvi = Maslozero/ Masl-ozero — a lake beside the parish village Voijärvi = Maslozero/ Maslozerskaja, 20–22. Vojšari, Vojguba and Vojnavolok, 23. Vojdoma, 24. Vajarvi — two lakes directly connected to Lake Maslo, 25–26. Vajarvi, Vajärv/ Vajozero, 27. Vojärv/ Vojbozero = Masljanoe ozero/ Maslenoe — a lake with a mire Voiso, 28. Vojjaŕ = Masl-ozero/ Maslozero, 29–31. Vojozero, Voezero, etc., 32. Ojajärv = Maslovo — a lake with a mire Maslovskoe, 33–39. Ojärv/ Oezero, Ojarv/ Ojozero, Oiozero/ Ojozero/ Ojazero, etc., 40–42. Voixro/ Vojxra/ Voexra, Voxryč and Voxro — a group of three lakes, 43. Vojmežnoe/ Vojmega — a lake connected to the Vojmega/ Vojmiga River, 44–58. Maslozero/ Masl-ozero, Maslozera, Masljanoe, Maslovo (boloto), etc., 59. Võijärv.

Source: Linnaeus, MLKP, NALK, WRG, AKS, SNMK, AKC, AKJ, SGBS, KLO, KVO, AVO, ATO, GBO, KNNO, NSE and Kuznecov 1995.

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[17] All internet sources are used in the form in which they appeared on November 1st, 2007.