Moreno Mitrović Invited paper

ONOMASTIC STRUCTURES

Abstract

Hydronymic Europe seems structured. I offer a paradigmatic theoretical formalization of hydronymic root distribution across and beyond Europe, yielding an exclusively linguistic description of plausible prehistoric development. The paper is an unconventional integration of formal linguistic theory with philological, etymological and onomastics scholarship. I also provide a critique of some onomastic-etymological approaches to river names, such as the understanding of hydronym *Sava*. With a predominant focus on hydronymy, I compare the river-names on morphemic-phonological and denotational-semantic levels which yield arguments in favour of a relatively linear and layered onomastic image of Europe. Concerning the denotational-semantics of hydronymic *nomina propria*, I propose an analogue for formally inferring the meaning of roots underlying hydronyms.

0. Preliminaries

Given that that a formal approach to onomastics on a non-local model has, to the best of my knowledge, not been practiced yet (as widely), I propose an atypical approach, integrating the results of etymological and onomastics scholarship with modern linguistic theory.

This approach hopes to shed light onto some of the postulates of the Paleolithic Continuity Theory but tries to avoid any theoretical stances. What I propose, therefore, is a consideration of some empirical evidence in terms of rethinking both the place of *nomina propria* within linguistics and philology as well as prehistoric human evolutionary model, as far as language is concerned, and provide arguments that linguistic evidence should be further acknowledged as they are as intrinsic as those put forward by archeologist, geneticists and anthropologists, as it were.

In the river- and water-names, we are able to find the oldest evidence of human linguistic history [1]. With my knowledge of linguistic theory and languages such as Slavic, Sanskrit and Arabic, I hope to be able to find some of that evidence.

Inductively, I formulate a view (of laws) based on limited observations of reoccurring phenomenal patterns, namely, river names. I begin by over-viewing some of the postulates of modern linguistic theory before accounting for the use of language in (river) names. In the last instance, I map the names to geography – or map geography to the names – which yield a structured image of distribution of name roots. The latter distribution of names – that is, intrinsically their roots – appears to involve geographical areas that do not accord with traditional historical postulates. I show that these root-distributional states may be considered either homologically (i.e. having shared ancestry) or homoplastically (i.e. by means of parallel mutation).

In terms of my inductive method, I arbitrarily follow here Chomsky's [2] levels of adequacy for evaluating the onomastic structures. I start by outlining (i) an observationally adequate model by giving a discrete enumeration of the hydronyms in my data. I then try to achieve (ii) descriptive adequacy, specifying some rules accounting for all observed arrangements of the data. In the last instance, I briefly try to introduce an account of (iii) explanatory adequacy of the model by fitting it into some theoretical framework, postponing seeking for historical and inter-disciplinary compatibility of the model, which I address as concluding remarks.

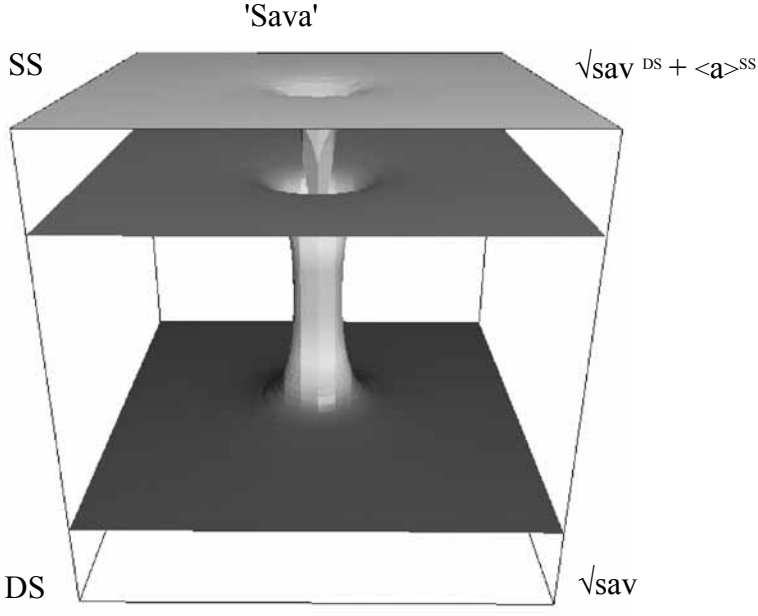
1. Introduction

1.1 Language Design – An Overview

Grammar that may be viewed as the core component of language consists of a lexicon and computational system [3]. Dealing with hydronyms that are lexemes by default, I predominantly focus on the lexicon component. In the later stage, I also try to account for the morpho-syntax of hydronyms which constitute further (syntactic) paradigms. Formally, I am trying to overview the historical aspects of lexical and grammatical patters in onomastics.

I argue that lexical (onomastic) roots carry diachronic evidence that is continuous (under a stochastic assumption) and that they do not get *internally* modified by the syntax (morpho-syntactically overt as affixes in most instances) as far as hydronymy is concerned. In this respect, I view roots to be somehow historically continuous and therefore

(1) *Scheme 1: A graphical analogy of the stipulated DSM approach*



deeply-structured (DS), whereas the affixes that get attached are surface-structured (SS) elements. In a sense, I stipulate that hydronyms (as well as toponyms, oronyms, etc.) carry a deeply-structured element that the language-specific morphosyntax accommodates. Let us dub this *the diachronic-synchronic mapping (DSM)*, whereby a root is synchronically modified by morpho-syntax, without changing its 'lexemic state' (again, under a stochastic assumption). This is a completely arbitrary stipulation that I shall assume for the sake of argument and clarity. I also show that hydronyms are uniform at SS since affixes carry no intrinsic meaning at the macro-level of investigation I am assuming. The scheme in (1) should generally capture the stipulated model.

In a sense, I follow here an 'affixless theory' [4]. The second layer may account for hydronyms such as *Donava*: $\sqrt{don}^{\text{DS}} + \langle av \rangle^{\text{SS-RED}} + \langle a \rangle^{\text{SS-MAX}}$.

1.1.1 Regulating Sound Change: Morphophonemic's

It important to acknowledge phonological variation with regards to semantics: sound may change whereby the meaning (of words) or reference (of names) is retained. Warnow *et al.* [5, 6] acknowledge phonological variation in diachronic material and label this as the phonological linguistic character. The examples a-c in (2) shows this inferred regular sound change.

(2) ⟦a⟧ = ⟦b⟧ = ⟦c⟧ (≈ 'a river in Europe')
Donava
Dunav
Danube

As seen in (2), a name, just as any other lexeme, can assume various phonological and therefore orthographic forms while still retaining its meaning or reference. This leads us to somehow theoretically regularise the sound correspondences such as the vowel and consonantal change in (2), for the sake of pinning down the core lexemic components and somehow ignoring the variation at this stage.

Hoenigswald [7], who formally developed the comparative method in linguistics, formalised the means of three steps by which a given set of languages known to be related may also be proven to be so. This method will also be pivotal to my onomastic analysis.

(3) STEP ONE: Sound correspondences must be observed; that is, one should compare words for the same (or comparable) meanings and observe patterns of; sound correspondences between pairs of languages.

(4) STEP TWO: Regular sound change rules should then be inferred. These rules must explain all the sound correspondences observed in (step one). These rules may be context-free or context-dependent, and are specific to each lineage.

(5) STEP THREE: Cognation judgments should be inferred. Two words *w* and *w'* from two languages *L* and *L'* respectively are said to be cognate if it is possible to infer a word **w* in some common ancestor of *L* and *L'* such that each *w* and *w'*; can be derived from **w* by the sound change rules specific to *L* and *L'*; respectively. [6]

Based on these steps of the comparative method I set the following principles that should regularise and establish the lineage in a respective root-paradigm.

Some of the general principles that will apply in this article are shown in (6).

(6) a. Labial (de)spirantisation: [b] ≷ [β] ≷ [v]
b. General (de)voicing: [d] ≷ [t]
c. Vocal opening (closing): [a] ≷ [i]
d. Vocal fronting (backing): [u] ≷ [i]
e. Vocal (de)centralising: V ≷ [ə]
f. Metathesis: <xy> ≷ <yx>
g. etc.

1.2 A Semantic Barrier: Names, Denotation & Meaning

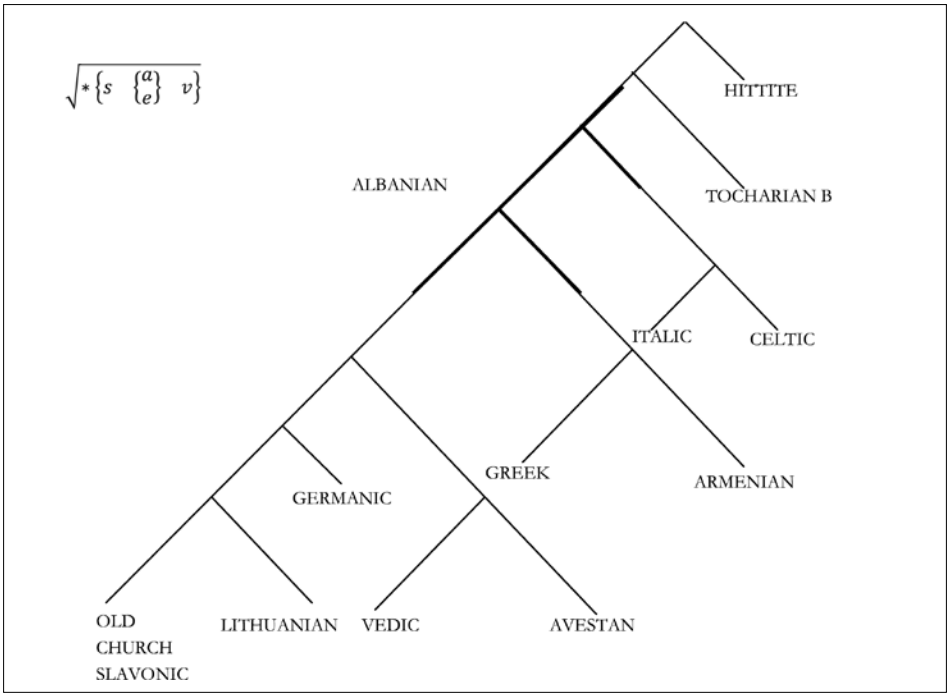
Names as such have no intrinsic meaning. Given that I am dealing with river names, which have roots in words, I try relating the meaning behind those words to hydronyms. As Rudnyckyj [8] noted, the historical comparative method of etymologising names was mechanically transferred from the field of appellatives with the ultimate purpose to deduct *nomina propria* from corresponding *nomina appellativia*. However, in doing so, we need to overcome the matter of denotation, or resolving the semantic barrier of extrapolating meaning from names.

Therefore, I view river names as derivations of words-this view seems pivotal to onomastics science as far as deduction of *nomina propria* from *nomina appellativia* is concerned. Names, hence, are reflexes of lexical denotations. Toponyms and hydronyms are proper names: they are analogous to personal names. However, not all river- and place-names are anthroponyms, derivations of personal proper names. Hydronyms, despite being names, have origin in words which have a denotation. Although a name may not have the ability to denote, its reflexive word-root does. Given this barrier where one is unable to find a hydronymic-or generally, onomastic-denotation, I propose an analogue. Although it may seem unconventional, the proposal succeeds in giving names a bridging ability to denote via words they root in. This becomes relevant in §3. Names are definite and are practical and referential uses of languages. Given that they are rooted in words, they may be seen as diachronically denoting-names.

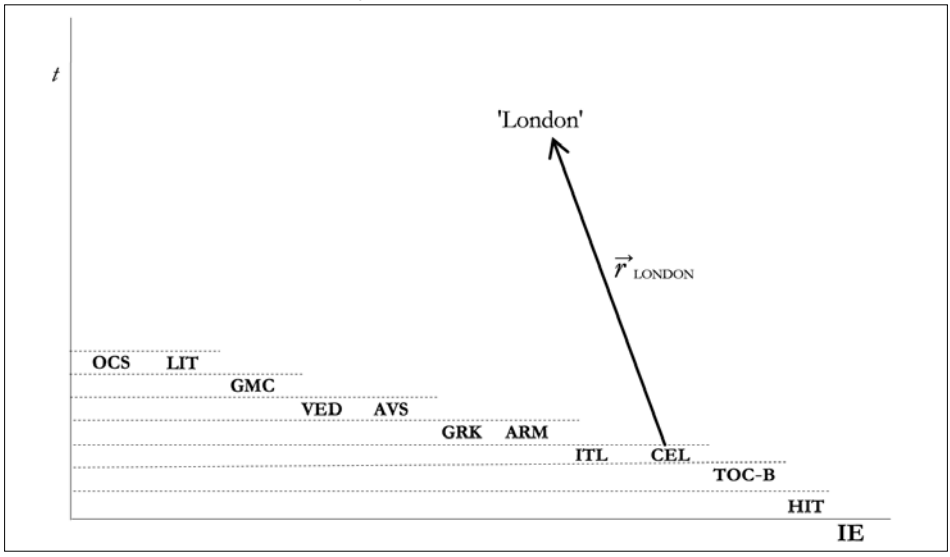
1.2.1 An Analogue

A radius vector in mathematics represents the position of an object-in my instance, a linguistic object-in space, in relation to an arbitrary reference point. Given my object of enquiry is onomastics, let us assume that a (river) name is a reference point within geo-linguistic space and it has relation to a linguistic coordinate system. Let us also assume two axes: on one (x) we can enumerate languages as bases where a name is rooted in, the other (y) may solely be a time-scale, adding the diachronic value to the enumerated languages. This way, a river-name may be seen as a radius vector. This is a completely arbitrary model I stipulate for a sound deduction of *nomina propria* from *nomina appellativia.*

Figure 1: The topology of the rooted evolutionary tree for IE. The tree is not drawn to scale-the only indication of the time that can be inferred is through ancestry. Albanian may be attached to this tree along any thick line. [6]



(7) **Scheme 2**: An appellative analogue for root-denotation



(8) ∵ ⟦'London'⟧ = ∅ (since name have not 'meaning')
∴ $⟦\vec{r}⟧ = ⟦*\text{lond}⟧^{Olr} = ⟦\text{wild}⟧^{Eng.}$

Before I outline this stipulation in more detail, we should have an adequate and accurate model of IE languages. The language groups in my model will be layered according to Warnow's [8] topology of the rooted evolutionary tree for IE, shown in Figure 1.

Despite the unconventional algebraic analogue, I give an example of the toponym *London* in (7) and (8). Double square brackets are a convention of modern semantic theory and signify denotation in terms of meaning. (See appendix for abbreviations used.)

It is in this manner of mapping the root of a name to a root in language that I conduct my analyses of hydronyms.

According to Warnow's [5, 6] work resulting in Figure 1 and the respective layered language model of (7), we can point out a generalization. Since Figure 1 shows a gradual disintegration of IE, we may assume that if a root is attested in the higher nodes of the evolutionary IE tree model, that root may be deemed as an early element of the IE lexicon.

2. Distributed Toponymy

2.1. Res Celtica: A *Fort* Onomastic Account of Europe

Before attempting to account for the European hydronymy, I would like to give some preliminary attention to toponomastics and toponymy.

I particularly focus on – what is assumed to be a Celtic nominal – *dun* and its attested distribution across a Celtic Europe. In both branches of the Celtic languages, it denotes a 'fort(ress)', 'a heap' or (more generally) a fort-like settlement. [9, 10] The distribution of the *dun*-root in toponymic form has been recongised in instances indicated and italicized in (9). Nicolaisen [11], as well as many other Celtic scholars, considers *deen* in (9d) to originate in the hydronym 'Dee', that flows through Aberdeen, and should be etymologized via Celtic *Dēva*, 'godess'. I nonetheless consider it cognate to the derivatives sharing the Celtic *dun*-root.

(9) a. *Dun* Eidean [Basilectal/Celtic name for Edinburgh]
b. *Dun* n'Gael [Basilectal/Celtic name for Donegal, Ireland]
c. Lon*don*
d. Aber*deen*

Given its past Celticism, I assume and further the *fort*-paradigm to continental Europe, indicated below. With regards to (10b), although *-dam* denotes a dam (on the river Amstel), I speculate that dam is historically *fort*-derived.

(10) a. *Dunaj*
b. Amster*dam*
c. Dres*den*

Going back to the 'dun'-root, an associative method of etymology might lead us to consider synonymous or at least similar words to 'fort' and settlement which 'dun' denotes in modern Celtic. I propose a consideration of relating the Celtic 'dun' to Slavic (and Latin) 'dom', denoting 'home'.

3. Distributed Hydronymy

3.1 Reduction to Root-Level and Root-Paradigms

As I noted in §1, I primarily consider the roots as deeply-structured elements of the onomastics. Somehow secondarily follow the surface-structured affixes in §3.3. I postulate a model of most European hydronyms, according to root-paradigms. Based on these root-paradigms, I am able to infer some evolutionary relationship between the respective roots. In this paper, I propose eight initial root-paradigms, that may be collapsed and reduced to a smaller number in the following sections (§3.2).

3.1.1 $\sqrt{*\left\{\begin{matrix}d\\t\end{matrix}\right\}\left\{\begin{matrix}a\\e\\u\end{matrix}\right\}\left\{\begin{matrix}n\\m\end{matrix}\right\}}$

Let us assume Donava (Danube) as the representative hydronym of this paradigm. This root is not restricted to hydronymy: as we have seen in §2.1, the same root is distributed in toponomastics. Toponymy and Hydronymy sometimes collide as they do in the Slovak Dunaj for the hydronym Danube and Slovene Dunaj for the toponym Wienna. Bezlaj [12, 13, 14, 15] reports several other instances of this phenomenon. In all cases, however, toponyms are derived from hydronyms, and not vice versa. This is also one of the reasons for pivoting the onomastic analyses on hydronymy as opposed to toponymy.

Table 1A: A list of root-paradigms (i)

$\sqrt{*\left\{s\ \ \left\{\begin{matrix}a\\e\end{matrix}\right\}\ \ v\right\}}$	$\sqrt{*\left\{\left\{\begin{matrix}i\\a\end{matrix}\right\}\ \left\{\begin{matrix}v\\b\\p\end{matrix}\right\}\right\}}$	$\sqrt{*\left\{s\ \ \left\{\begin{matrix}a\\e\end{matrix}\right\}\ \ \left\{\begin{matrix}m\\n\end{matrix}\right\}\right\}}$	$\sqrt{*\left\{\left\{\begin{matrix}d\\t\end{matrix}\right\}\ \left\{\begin{matrix}a\\e\\u\end{matrix}\right\}\ \left\{\begin{matrix}n\\m\end{matrix}\right\}\right\}}$
Sava (SI)	Avon (EN)	Shannon IR)	Dvina (RU)
Suir (IR)	Afon … (WL)	San (PL)	Tana (NO)
Swilly (IR)	Avšče (SI)	Sunja (RU)	Dunajec (PL)
Severn (EN)	Avščeк (SI)	Somme (RO)	Donava (AU)
Sevre (FR)	Aveyron (FR)	Somme (FR)	Timis (RO)
Sauldre (FR)	Opava (PL)	Szamos (HN)	Tamar (CW)
Sioule (FR)	Ibar (RO)	Samara (RU)	Dneper (RU)
Sevre (FR)	Piva (RO)	Seman (AL)	Dnester (UR)
Sauer (NL)	Toplic (RO)	Sinni (IT)	Don (RU)
Save (FR)	Ipel (RO)	Saale (GR)	Donec (RU)
Savinja (SI)	Raba (alii)	Sana (BS)	Dives (FR)
Svijaga (RU)	Laba (RU)	Saane (SW)	Dee (SC)
Saus (AF)	Lahn (NL)	Sambre (FR)	Dee (WL)
Sebou (AF)	Ybbs (RO)	Ind < Sindhu (IN)	Eden (EN)
Sawfasin (AF)	Naab (RO)	Siene (FR)	Dender (GR)
Safāqis (AF)	Abens (RO)	Snov (UR)	Thames (EN)
Sevron (FR)	Epte (FR)	Semois (BL)	Tyne (EN)
Seffersbach (GR)	Aube (FR)	Somes (RO)	Tyne (SC)
Saguia (AF)	Avoca (IR)	Somesu (RO)	Don (SC)
Saoura (AF)	Aude (FR)		Tay (SC)
Souf (AF)	Evrotak (GC)		Donge (NL)
Sauro (IT)	Avre (FR)		Doon (SC)
Sosva (RU)	Eure (FR)		Temega (SP)

Table 1B: *A list of root-paradigms (ii)*

$\sqrt{*\left\{\begin{Bmatrix}o\\ou\end{Bmatrix}\ \begin{Bmatrix}s\\ʃ\\tʃ\end{Bmatrix}\right\}}$	$\sqrt{*\left\{\begin{Bmatrix}d\\t\end{Bmatrix}\ \begin{Bmatrix}a\\o\\u\end{Bmatrix}\ r\right\}}$	$\sqrt{*\{g\ \ l\ \ n\}}$	$\sqrt{*\left\{\begin{Bmatrix}i\\u\end{Bmatrix}\ n\right\}}$
Ouse (*twice*) (EN)	Drawa (PL)	Glina (RO)	Indre (FR)
Oust (FR)	Dordogne (FR)	Glama (NO)	Indus (IN)
Avšče (SI)	Dronne (FR)	Glan (SC)	Ina (PL)
Avščeк (SI)	Duero (PT)	Glana (SI)	Una (BS)
Osam (RO)	Odra (PL) †	Glon (GR)	Inn (GR)
Unzha (RU) †	Drina (BS)	Glen (SC)	
Exe (EN)	Drin (AL)	Glen (EN)	
Oise (FR)	Tara(SI)	Glan (SW)	
Aisne (FR)	Drava (SI)		
Secciha (IT)	Drut (BG)		
Soča (SI)	Dart (EN)		
Sesia (GR)	Dramselva (NO)		
Oste (GR)	Durme (GR)		
Oude (NL)	Trent (EN)		
Escaut (BE)	Derventa (BS)		
Usa (RU)	Derwent (EN)		
Oise (FR)	Drinosi (AL)		
Iskar (BG)	Drini (AL)		
Esk (SC)	Deveron (SC)		
Exe (EN/CW)	Thurso (SC)		
Isére (FR)	Vardar (MK)		
Isle (FR)	Daoura (AF)		
	Dråa (AF)		

Each of root-paradigms will be addressed in §3.1.1-8 in terms of their respective etymology, linguistic derivation and geographical distribution.

In English onomastics, √*dan* has been attested in toponyms such as *Doncaster, Donmin*, hydronyms like *Doon, Dun, Don* (multiple hydronyms), *Donn, Douni, Done.* [9] It is believed that all these hydronyms are derived from an old (PIE?) word for 'water, river'.

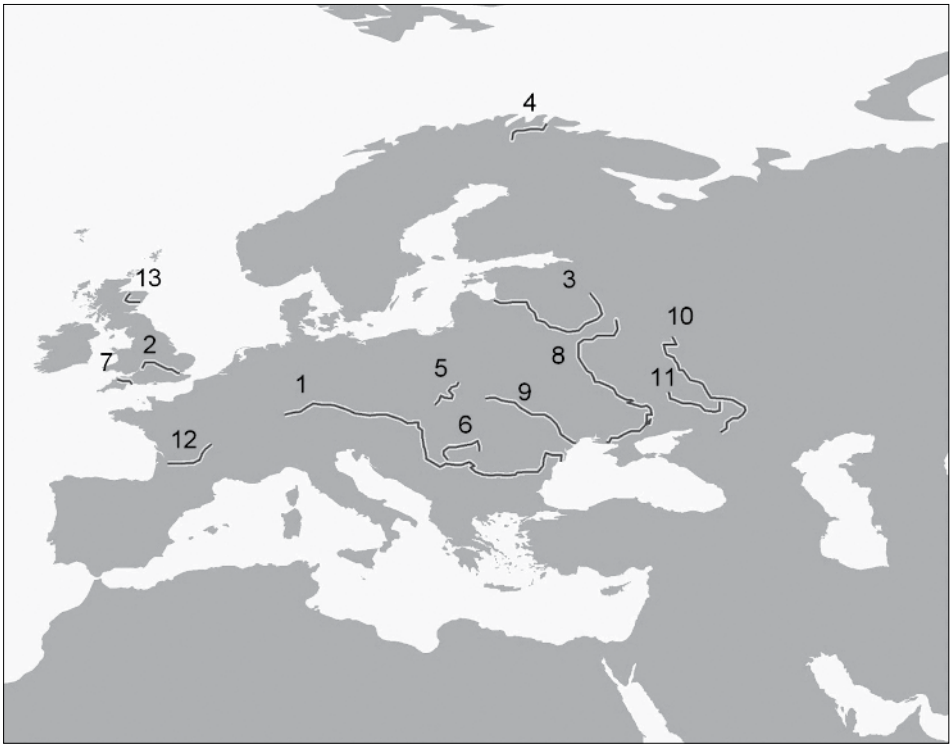
Map 1 shows my analysis of the geographical distribution of this root across Europe.

3.1.2 $\sqrt{*\left\{d\ \begin{Bmatrix}a\\o\\u\end{Bmatrix}\ r\right\}}$

Let us take Drava as a representative hydronym of this root-paradigm. In classic times, the name of Drava was Δράβος, Δάρος, even Δράος [12]. One is also able to make the comparison – as Pokorny did (see Bezlaj [12] for a concise critical history) – between Dravus and द्रवस (Dravas). This would have us conclude that the root is of IE origin; so we are able to reconstruct the base *dreu-, *dru- that is comparable with the Sanskrit verb द्रवति (drāvati), to run [ibid.]. The latter is derived from the verbal paradigm {द्रु}. [16, 17].

However, despite looking at Sanskrit verbal paradigms when trying to account for this hydronymic root, neither Bezlaj nor Pokorny have looked into nominal paradigms.

Map 1: The geographical distribution of the hydronymic root $\sqrt{*\left\{\begin{matrix}d\\t\end{matrix}\right\}\left\{\begin{matrix}a\\e\\u\end{matrix}\right\}\left\{\begin{matrix}n\\m\end{matrix}\right\}}$



1 Danube, 2 Thamez, 3 Dvina, 4 Tana, 5 Dunajec, 6 Timis, 7 Tamar, 8 Dneper, 9 Dnester, 10 Don, 11 Donec, (12 Dordogne), 13 Don (ii)

It is noticeable from both the initial table (1A & 1B) as well as from the map above, that I have already collapsed two sets of roots: √*dan* and √*tan*. The dental stop seems to vary in voicing in onset position. From a phonological perspective, this variation could be language-dependent. Even if we consider √*tan* as a subset or sister root to √*dan*, we are still able to reconstruct √**d/t-an.* With regards to Dordogne (12), it may seem more reasonable to view as belonging to the root-paradigm I address in the next section.

It would seem reasonable to look primarily into nominal paradigms for names that are nominals by default and avoid a theory of verbal derivation. It is therefore much clearer, and more convenient, to compare the hydronym *Drava* to the Sanskrit adjective द्रव (*drava*), 'wet' and 'liquid'. Not only are the nominals semantically compatible, they also share amazing phonological resemblance (homology?) if not complete compatibility. द्रव is also a noun denoting 'liquid'. For this reason, I prefer a "nominal" theory of possible hydronymic derivation to a "verbal" one. In (11), a theoretically plausible hydronymic derivation is shown.

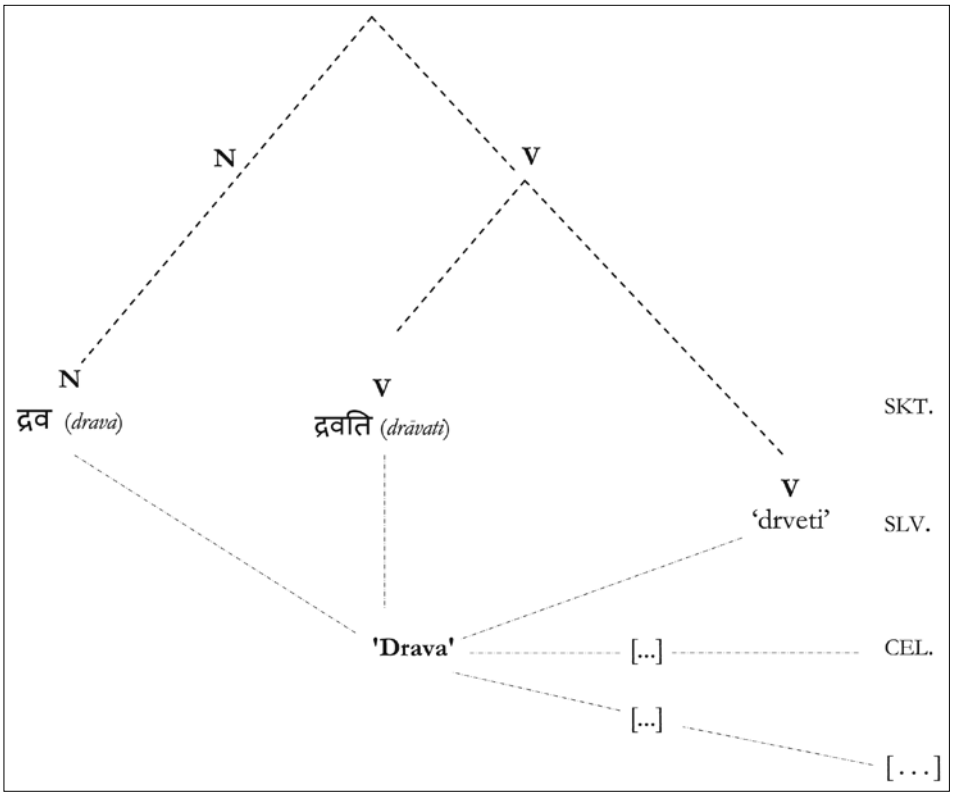
I would like to focus some attention to the analogy between the hydronym *Derwent* in England and toponym *Derventa* in Bosnia. The most elegant explanation for the two would be homoplasy, i.e. parallel evolution [6]. A less elegant and more vexatious attempt would be to relate the two and assume homology.

Ekwall [9] records the form *Derwenta* for the hydronym from the 12th century. He sees a clear etymology: the name is derived from Brittonic **deruu̯ā* 'oak': Wl. *derw*, MBret. *deruenn*, Bret. *derw, derv, derf*, Co. *derow*. Ekwall thus believes *Derwent* – and consequently *Derventa* should we assume homology – means 'an oak river, river where oaks grow abundantly'. He corroborates it by saying that oak is actually grown in the *Derwent* valley.

Compared to Bezlaj's theory [12], an oak-derivation sounds less convincing to a wet- and fluid-etymology, especially with regards to the wide geographical distribution of this root, which the map 2 shows.

What strikes as peculiar, if not shocking, is the realization of this root in northern Africa. Despite a historically much more preferable homoplastic explanation of this

(11) **Theoretically possible hydronymic derivation**



Perhaps another great insight into this hydronymic root-derivation is provided by the Celtic branch of IE. Welsh has preserved an IE relict: *dwˆr,* denoting 'water'.

phenomenon, further distribution of another root will yield worrying motivation of a need for a homological reconsideration.

Map 2: The geographical distribution of the hydronymic root $\sqrt{*\{d\ \{^{a}_{o}_{u}\}\ r\}}$

1 Drava, 2 Derwent, 3 Derventa, 4 Duoro, 5 Drut, 6 Drawa, 7 Dordogne, 8 Dronne, 9 Drinosi, 10 Drini, 11 Drina, 12 Daoura, 13 Dra'a

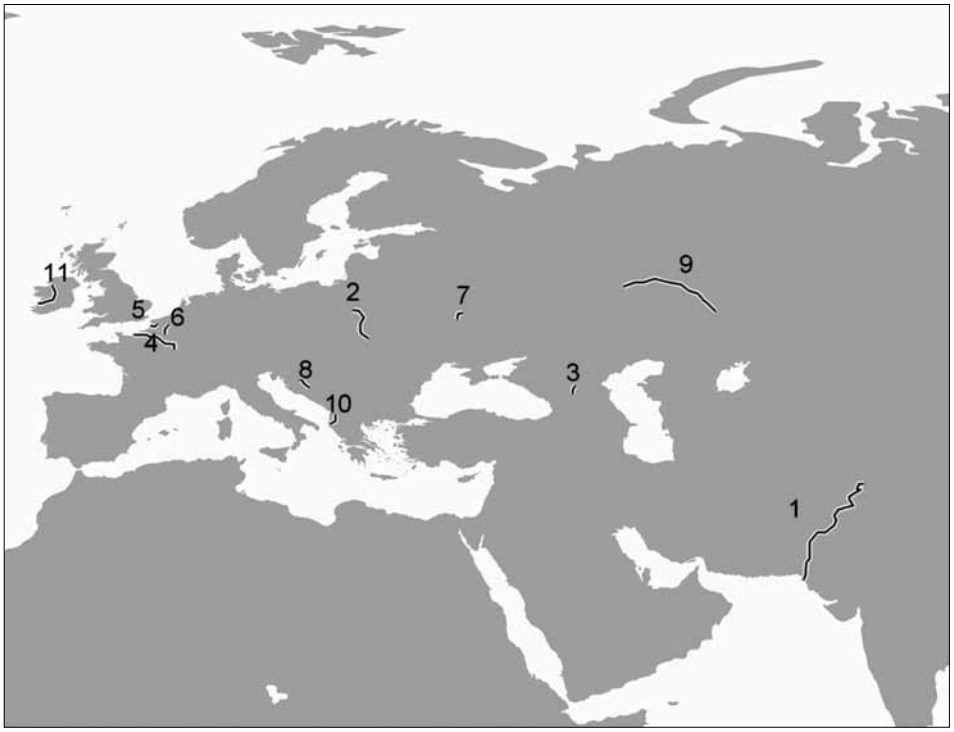
3.1.3 $\sqrt{*\{s\ \{^{a}_{e}\}\ \{^{n}_{m}\}\}}$

As Bezlaj [12] informs us, many philologists have inadequately and incorrectly derived the German hydronym *Sann* and Galician *San* from the root √*sav* (addressed in §3.1.8). Bezlaj [ibid.] is confident in stating that German *Sann* is of Slavic origin. Map 3 shows the dispersion and geographical distribution of this allegedly-Slavic root.

It should be noted that Irish *Shannon* is derived from old Irish *Senou* < *Sinu*. With redards to Indus, the Western linguistic accommodation of this important hydronym is deceptive: the primary name for Indus is सिन्धु *(sindhu)* which in Sanskrit [16, 17] at the same time denotes 'river' or 'water' (see §3.1.4 for a summary of Watkis' [18] skepticism of relating 'river' and 'water'). Given these facts that the same root is present in old Celtic as well as Indo-Aryan, the root should not and can not be taken to be of Slavic

origin [12]. I do, however, agree with Bezlaj that this root should not be collapsed with √*sav* (see §3.1.5).

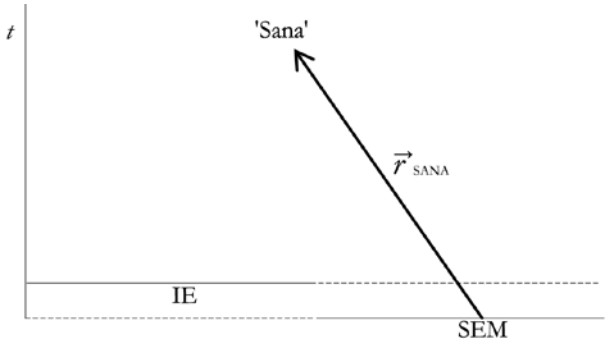
Map 3: The geographical distribution of the hydronymic root $\sqrt{*\{s\ \{a\ e\}\ \{n\ m\}\}}$



1 Indus < Sindhu, 2 San, 3 Sunzha, 4 Siene, 5 Sambre, 6 Somme, 7 Snov, 8 Sana, 9 Samara, 10 Seman, 11 Shannon

Given its broad distribution, I propose another, wider consideration. What if the root is pre-PIE origin? In Arabic, سانل *(sānel)* means 'liquid', 'running', 'streaming' as an adjective or 'fluid', '(a) pouring' as a noun. In this respect, both hydronymic roots √*san* and √*der* have a very similar semantic form in Celtic, Sanskrit (IE) and Arabic (Sem). I show my theoretical analogue of 'name-bridging denotation' of √*san*, as it were, in (12).

(12)



(13) $[\![\text{r}^{\text{}}_{\text{SANA}}]\!] \approx [\![\text{سانل}]\!]$

Not only does this disprove √*san* as a Slavic root [12], the semantic and phonological form of the Arabic سانل *(sānel)* makes us reconsider if not even abandon a postulate where √*san* is an IE (or even PIE?) root. Further onomastics structures will be just as anxiously demanding.

3.1.4 $\sqrt{*\left\{\begin{matrix}\{i\\a\end{matrix}\right.\ \left.\begin{matrix}\{v\\b\\p\end{matrix}\right\}}$

Irish *aub* is derived from **ab-ō.* Watkins [18] suggests that the Greek ήδοή has the same derivation. The thematic stem **abo-* underlying **abonā* is attested for early Insular Celtic: the estuary of the Humber river in Ptolemy's Geography (2nd century AD) appears as 'Αβον …'. [ibid.]

Pokorny [19] reconstructs an Indo-Germanic **ab as* attested in the West Germanic river-names. Watkins, however, does not find it convincing or even feasible to relate **ap-* 'water' (Indo-Iranian *ăp-*) and **ab(h)-* 'river'. Another testimony of this root's antiquity is provided by Hittite: *(-) ḫa-pa-aš, ḫapa,* 'river'. Pokorny's Hittite translation of 'water' is **u̯ep-, *u̯op-, *up* [19]. I find no problem, unlike Watkins [18], relating 'water' and 'river'

Map 4: *The geographical distribution of the hydronymic root* $\sqrt{*\left\{\begin{matrix}\{o\\ou\end{matrix}\right.\ \left.\begin{matrix}\{s\\ʃ\\tʃ\end{matrix}\right\}}$

1 Avon, 2 Avče/Avščck, 3 Ibar, 4 Ebro, 5 Huebra, 6 Sabor (?), 7 Lapos, 8 Ipel, 9 Ybbs, 10 Abens, 11 Avre, 12 Eure, 13 Epte, 14 Avoca, 15 Happi

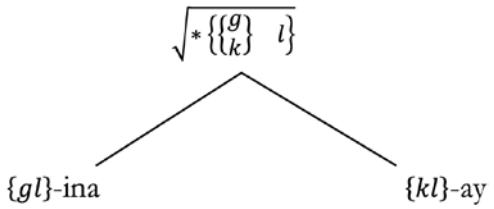
with regards to the proto-lexeme **ap.* Even the (non-IE) Ugro-Finnish 'river' is *Abona*. Below is the mapped distribution of this root in few instances, which includes *Happi* (Nile) which I consider homological to this hydronymic root and may thus reconfirm the proto-status of this root.

3.1.5 $\sqrt{*\{g \quad l \quad n\}}$

Hydronym Glan is taken as representative of this paradigm. Bezlaj [12] mentions several rivers related by this root: *acqua Glanna, Glane, die Glon, Clain, Glanis* (mentioned in 667 AD), etc. We know of a hydronym Κλάνιζ from the Noric kingdom and should be included here.

The traditional notion of this paradigm was to postulate a Celtic origin: old Irish **glan* via old Celtic **glano-s.* Schnetz [ibid.] stipulated an IE base **klūros* (Cel. *clir*). Another theory would be to relate this hydronymic (and toponymic) root with Slavic 'clay' which has partly also been preserved in English, as shown in (14).

(14)



The Map 5 shows the distribution of some of hydronyms (I consider) derived from this root.

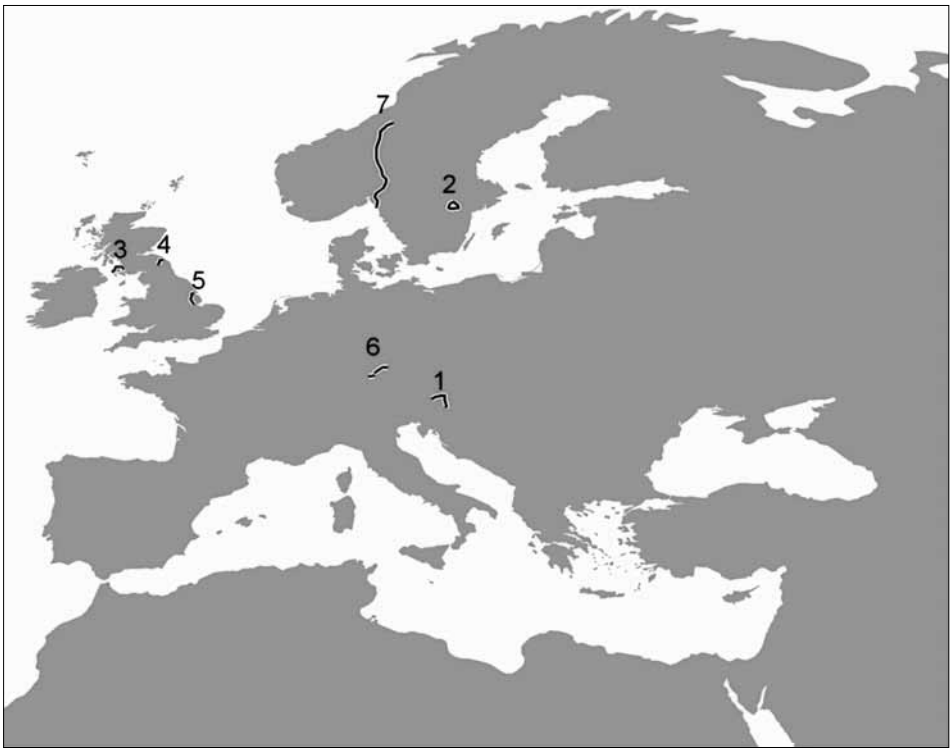
3.1.6 $\sqrt{*\left\{\left\{\substack{o\\ou}\right\} \quad \left\{\substack{s\\ʃ\\tʃ}\right\}\right\}}$

Some philologists [9, 10, 11, 12, 13] claim **isa* to have been preserved in Celtic alone. Welsh hydronym *Wysg* was written Uisc or Uisc in Old Welsh and was applied to other hydronyms like *Usk, Escan(castere), Exe* (and therefore *Exeter*), etc. Ekwall [9, 10] identified *Isca* with OIr. *esc,* Ir. *easca* 'water'. The same *Isca* has been refracted in the continental Europe as *Isch*, a tributary of the *Saar* [13]. I have identified several more in continental Europe, shown in Map 6.

The reason for inclusion of *Soča* (and consequentially *Secchia*) is its diachronic name *Isontius* [11] which via metathesis resulted in MSlo. *Soča.* It is also believed [ibid.] that the alternative name for *Soča* was *Istris.* Whatever the older variety, it seems to bear the allegedly-Celtic [10, 11, 12, 13] root √**isa*.

Given that the reconstructed root in hydronymic form *Ouse* (EN) is realized as √*uzə̑,* I propose a consideration of an analogy with Slo. 'l-uža'.

Map 5: *The geographical distribution of the hydronymic root* $\sqrt{*\{g \quad l \quad n\}}$



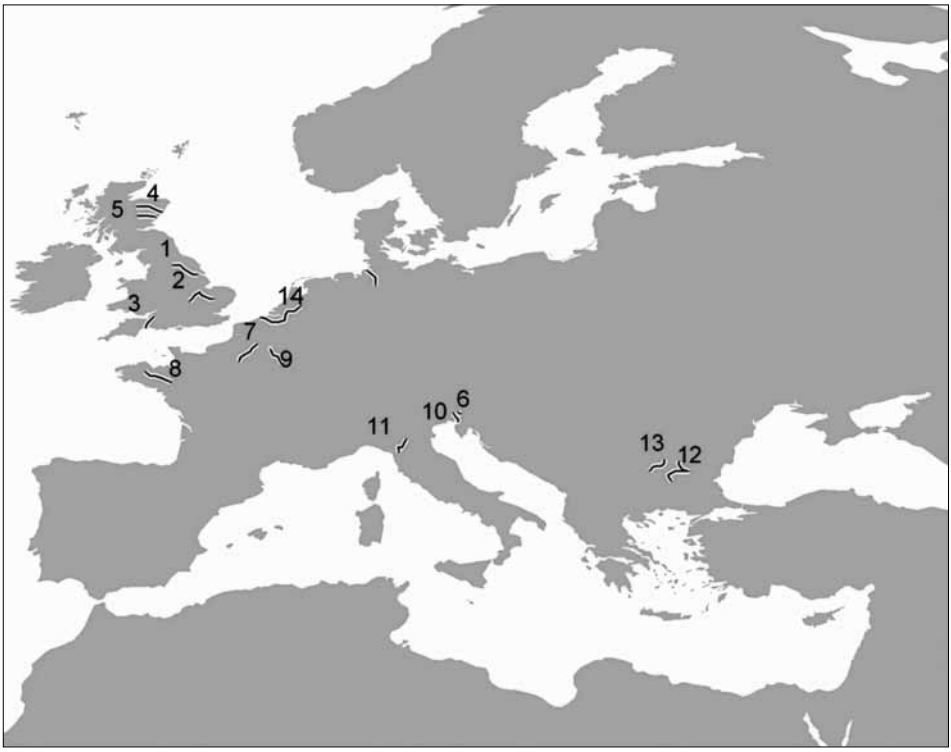
1 Glan (Sl. Glina), 2 Glan (lake), 3.Glen, 4. Glen, 5. Glen (lake), 6. Glon, 7. Glama

3.1.7 $\sqrt{*\{\{\binom{i}{u} \quad n\}}$

I can account for this root solely by seeing it as a subset of √*san.* The name-initial coronal fricative seems to have somehow been elided with regards to this root. Further attention to the plausible relationship between the roots will be given in §3.2 so let us see the map in Map 7 showing the distribution of √*in.*

Another argument in favor of relating √*san* and √*in* is in geography: rivers *Sana* and *Una* in Bosnia seem relatively close to one another. Even if the roots are related, it is hard to account for the deletion of the word-initial alveolar fricative.

Мар 6: The geographical distribution of the hydronymic root″ $\sqrt{*\left\{\begin{pmatrix}o\\ou\end{pmatrix}\ \begin{Bmatrix}s\\ʃ\\tʃ\end{Bmatrix}\right\}}$



1 Ouse, 2 Ouse (ii), 3 Exe, 4 North Esk, 5 South Esk, 6 Avče/Avščak, 7 Oise, 8 Oust (Brt. Oud), 9 Oiste, 10 Soča, 11 Seccia, 12 Osam, 13 Iskar

3.1.8 $\sqrt{*\left\{s\ \ \begin{pmatrix}a\\e\end{pmatrix}\ \ v\right\}}$

This paradigm will prove to be both problematic and controversial. As a root-representative, let us take the hydronym *Sava*. A classic parallel to it was Σάοζ, … Σάβου (Σάου) [13]. Bezlaj believes the hydronym is definitely pre-Slavic. An IE base **seu̯-, *sou̯u̯-* was assumed as in German 'Saft'; Pokorny [19] also seriously considered a Ligurian onomastic layer.

There is also a high level of onomastic ignorance: *Oxford Dictionary of World-Place Names* [20] states that Sava got its name after St. Sava (1173-1236) and therefore assumes an anthroponomical derivation. That is completely invalid, to which most onomastic scholars would concur.

Despite their might having a common ancestral root √*sav,* its etymology is far too complex and puzzling to be simply accounted for with anthroponomical derivation. One

Map 7: The geographical distribution of the hydronymic root $\sqrt{*\left\{\left\{\begin{matrix} i \\ u \end{matrix}\right\} \quad n\right\}}$

1 Ind(us), 2 Indre, 3 Una, 4 Ina, 5 Inn

of the reasons for the failing of etymological theories above is not only an extremely wide geographical distribution across Europe but its firm onomastic status in the areas of northern Africa.

Bezlaj [13] mentions a dubious stance towards a theory of IE etymology of this root: as Shulten had pointed out in 1914, some of the ligurian names have strong parallels in northern Africa. Pokorny [19] responded to this by giving an elegant—but not too convincing—counter-argument that the African names may be accounted for with the Berber *šuf, šaf* 'valley'. No further debate proceeded. Let us now see the actual geographical filtering of this peculiar root. For my earlier hydronomastic analysis of *Sava*, see [21].

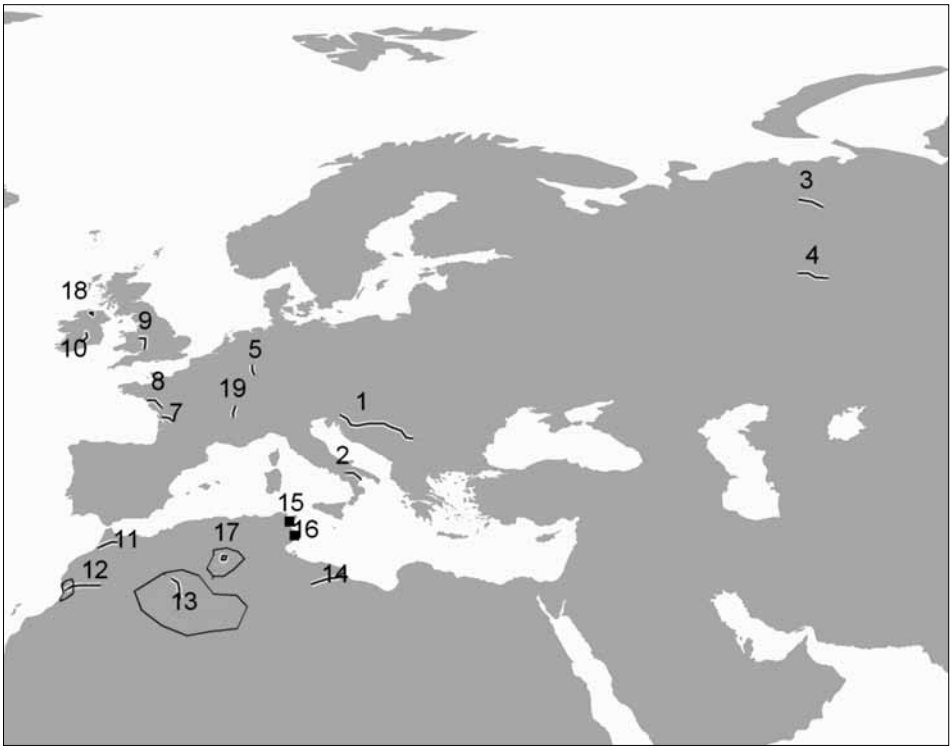
It is interesting to notice in Africa that just as √*der*, this root also is distributed solely across the north-west African area.

3.2 A Stochastic Model of Hydronymic Evolution

I outline a possible theoretical evolution of the hydronymic roots overviewed in §3.1. Given that √*sav* (§3.1.8) and √*der* (§3.1.2) roots seem distributed beyond the borders of Europe, I consider them as older, that is to say, I believe they had split from IE or (pre-) PIE at an early stage, analogous to Figure 1. I propose the following stochastic model of hydronymic evolution, shown in Figure 2.

The root-nodes closer to the root of the hypothetical evolutionary tree show an early stage of onomastic evolution.

Map 8: The geographical distribution of the hydronymic root $\sqrt{*\{s \ \{^{a}_{e}\} \ v\}}$

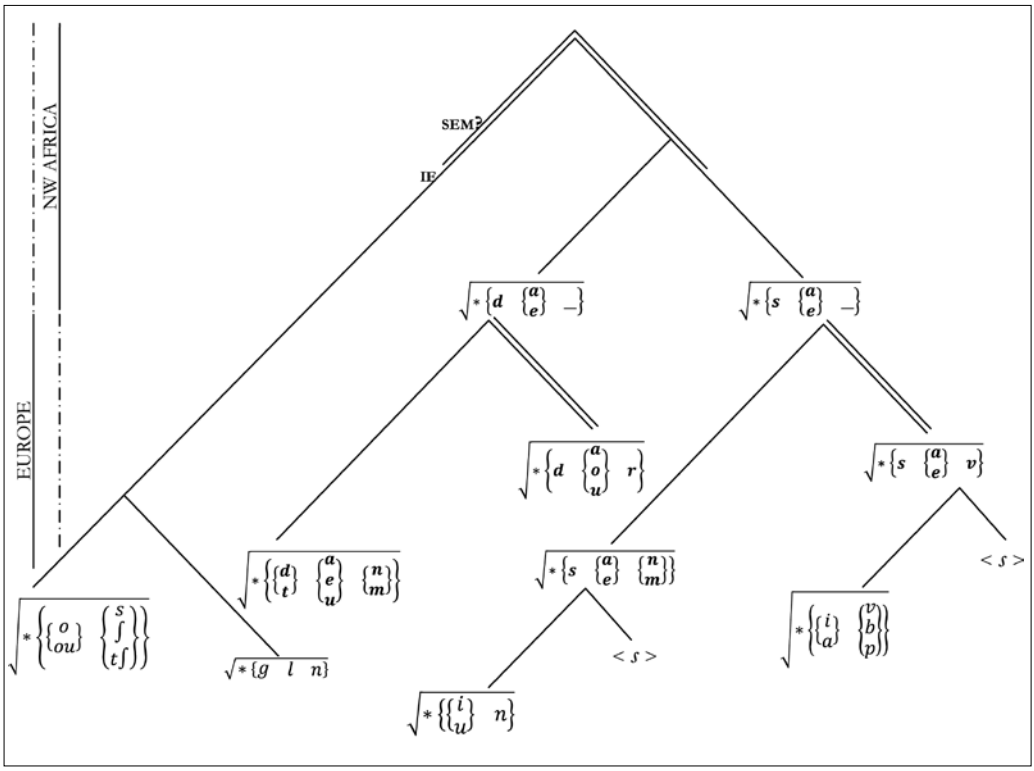


1 Sava, 2 Suero, 3 Sob, 4 Sosva, 5 Seffersbach, 6 Sevron, 7 Seudre, 8 Sevre, 9 Severn, 10 Suir, 11 Sebou, 12 Sous (hydronym and valley name!), 13 Saoura (hydronym and name of the part of desert!), 14 Sawfajin, 15 Susah, 16 Safaqis, 17 Souf, 18 Swilly, 19 Sevron

3.2.1 Onset Erosion

As seen in §3.1.7 and the model above, roots √*san* and √*in* may be related if we postulate a 'name-initial' deletion (of the voiceless coronal fricative [s]). However, we cannot help postulating so and even extrapolating it to right-most branch of the model above: √*sav* ~ √*av*. Additional evidence [22, 23] is provided by old Celtic hydronymy, shown in (15).

Figure 2: A hypothetical stochastic model of hydronymic evolution



(15) OIr. [*S*]$^{\emptyset}$*aborna* > MIr. *Sabrann*

Even further evidence is provided from the East: western IE languages know सिन्धु *(Sindhu)* as *Indus*, despite a diachronically primary word-initial [s] (i.e. in onset position), as (16) shows.

(16) a. Skt. सिन्धु *(Sindhu)*> इन्द् *(ind)*
b. Skt. *S-ind-hu* > Eng. *Ind-us*
c. Skt. *S-ind-hu* > Slo. *Ind*

3.3 Root Accommodation and Surface-Structured Morpho-Syntax

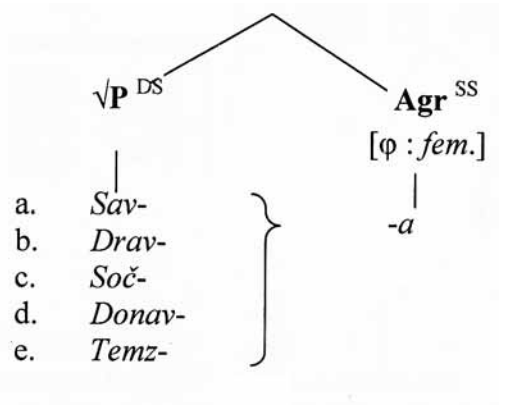
Despite following an affix less theory [4] of some sort, hydronymic affixes are also taken within the scope of this paper. As shown in (1), I view affixes as periphery in macro-onomastics—at least in an initial study of such scope going linguistically beyond IE and geographically beyond European area.

3.3.1 Hydronymic φ-continuity

There is a φ-feature that seems interesting with most rivers. As φ-features comprise of gender, number and person, we can safely generalize that most, if not all, rivers will agree in singular number and 3rd person. I see an important and interesting φ-feature in gender. Most rivers seem to be of feminine gender.

The vast majority of Slovene rivers, if not all completely, are feminine, which is also morpho-syntactically realized as an overt affix *–a*. Even when a non-domestic hydronym is accommodated as Slovene, for instance, simply applies the borrowed hydronym to the same φ-paradigm (as shown in 17d-e).

(17) DP



This hydronymic gender-agreement is not restricted to Slavic alone: OIr. had the same overtly expressed affix as modern Slavic has preserved (as shown in 17). The φ-agreement need not be expressed overly: Welsh has a non-overt feminine inflection in *afon* 'river'.

However, the *a*-feminine stem is and was not present in Germanic. According to Jasanoff [24], Germanic feminine nouns and weak adjectives have an ending reconstructible as **-ô, -ō or ōôn*. From this perspective it seems that Slavic and Old Celtic shared greater gender-agreement affinities.

3.3.2 Hydronymic case-continuity: The n-stem Suffix

The *n*-stem is usually taken to be genitive-denoting, as in PIE 'water' [18]: nom. **u̯ód-r̥, *u̯éd-n̥-s*. This reconstructed PIE lexeme got passed on to Slavic nom. *voda*, adjective (i.e. adjectival gen.) *vode-n* (Slo.). Slovene has, however, not preserved the PIE *–r*. On the other hand, the PIE root got passed down the Celtic branch as well, resulting in MWl. *dwr* [du:r], retaining the allegedly-initial *r*-stem from PIE.

The *n*-stem could be an explanation for a theoretical collapsing of the √*sav* and √*san* root-paradigms in a way shown in (18). Given that there is no absolute certainty that *-n*-signified genitive case in Slavic, I mark it below solely as non-nominative.

(18) √*sav* [+NOM] ~ √*sav-n* [–NOM] ~ √*san* [–NOM]

Although the theory shown in (18) has philologically been assumed by some philologists, the practical onomastic distribution clearly shows that north African

hydronyms, oronyms and toponyms do not belong to the *n*-stem paradigm (see §3.1.8). Naturally, all this is conditioned by the assumption of homology between European and north African onomastics.

4. Onomatic Layering – In Lieu of Conclusion

Although this paper offers a relatively abstract notion and observation of the onomastic root distribution, the patterns that certain roots form – given that we rationally and axiomatically assume homoplasy – seem very coinciding.

Should we allow for homology to have occurred, that is find characteristics that are due to shared ancestry, the traditional and axiomatic model of evolutionary linguistic history should be reconsidered or at least augmented. The traditional doctrine of IE origin is weakening and an increasing number of academics see it as 'a myth'. [25] The Paleolithic Continuity Theory articulated three main working hypotheses, the first of three for now remains pivotal to this paper:

(19) HYPOTHESIS

The easiest working hypothesis for the question of European origin is the continuity model, and no other alternative.

Onomastic structures, despite their only being initial structures and observations, reaffirm the postulates of the PCT in a relatively principled way: certain roots—i.e. elements of *PIE—have been fossilized in onomastics, which is increasingly crystallizing as linguistic archaeology, and as such offers an insight into evolutionary modeling of both the development as well the origin of PIE.

Should the approach if this paper be accepted as a (relatively) valid one, the hydronymic model (Figure 2) should be tested against genetic evolutionary models, yielding together an onomastic-phylogenetic depiction of IE, but such endeavors should be postponed until partial validity of this proposed model is confirmed and any possible objections are dealt with.

I believe Alinei [25] is right in saying that conservation is the law of language while change is an exception, being caused not by an alleged 'biological law of language', but by major external (ethnic or social) factors, that is by language contacts and hybridization, in concomitance with the major ecological, socio-economic and cultural events that have shaped each area of the globe.

This paper is a formalization attempt, based on previous experimental formal approaches to etymology [8, 26]. The pivotal question, therefore, is whether this approach is able to shed more light onto the onomastic layering [23, 27, 28, 29] with respect to language [17, 19, 30]. Provided we allow for the possibility of homology between the hydronyms I offer here – and I believe we should given the structured distribution of the roots – further work should follow, extrapolating the validity of the hydronymic patterns or simply finding adequate and firm arguments for a homoplastic explanation, resolving this paper's initial findings simply as coincidental.

5. Appendix: List of Abbreviations & Symbols Used

†	May be accounted for with metathesis.	φ	Phi-feature(s) (*in syntax*), comprising of (i) gender, (ii) number and (ii) person.
*	Reconstructed; PIE reconstruction	$[\![x]\!]$	The denotation of x, i.e. its meaning (*in semantic theory*)
AF	Africa	EN	England
IR	Ireland	HN	Hungary
FR	France	PL	Poland
NO	Norway	CW	Cornwall
RU	Russia	SC	Scotland
GR	German	IT	Italy
GC	Greece	SI	Slovenia
UR	Ukraine	BG	Bulgaria
PCT	Paleolithic Continuity Theory [23]	RO	Romania
BS	Bosnia	BE	Belgium
AL	Albania	MK	Macedonia
SW	Sweden	IE	Indo-European
Slv.	Slavonic/Slavic	PIE	Proto-IE
Gmc.	Germanic	Arb.	Arabic
Brt.	Breton	Cel.	Celtic
OIr.	Old Irish	OWl.	Old Welsh
MSlo.	Modern Slovene	OCS	Old Church Slavonic
LIT	Lithuanian	GMC	Germanic
VED	Vedic	AVS	Avestan
GRK	Greek	ARM	Armenian
ITL	Italic	CEL	Celtic
TOC-B	Tocharian B	HIT	Hittite
MBrt.	Middle Breton	Wl.	Welsh
CO.	Cornish	SEM	Semitic
DP	determiner projection (phrase)	√P	Root projection (phrase)
Agr.	Agreement	DS	deep structure (of a lexeme)
		SS	surface structure (of a lexeme)

Bibliography

1. Rohlfs, Gerhard. 1958. 'Europäische Flußnamen und ihre historischen Probleme.' *VIth International Congress of Onomastic Sciences [VI. Internationaler Kongress für Namenforschung.]*. Vols. 1-2. pp. 1-28.
2. Chomsky, Noam. 1964. *Aspects of the Theory of Syntax.* Cambridge, MA: Massachusetts Institute of Technology Press.
3. Chomsky, Noam. 1995. *The Minimalist Program.* Cambridge, MA: Massachusetts Institute of Technology Press.
4. Halle, Morris & Marantz, alec. 1993. 'Distributed morphology and the pieces of inflection.' in Hale, Ken & S. J. Keysner (eds.) *The View from Building.* pp. 111-76. Cambridge, MA: Massachusetts Institute of Technology Press.
5. Warnow, Tandy. 1997. 'Mathematical approaches to comparative linguistics.' in *The Proceedings of The National Academy of Sciences.* Irvine, CA: The National Academy of Sciences of USA.

6. Warnow, Tandy. Evans, Stephen N. Ringe, Donald. Nakhleh, Luay. 2004. 'A Stochastic model of language evolution that incorporates homoplasy and borrowing.' in *The Technical Report.* Berkley, CA: Department of Statistics, The Univesity of California at Berkley. <http://www.cs.rice.edu/~nakhleh/Papers/WarnowRevComplete.pdf>
7. Hoenigswald, Henry. 1960. *Language Change and Linguistic Reconstruction.* Chicago: University of Chicago Press.
8. Rudnyckyj, Jaroslav B. 1966. 'Etymological formula in onomastics.' in *Cahiers de géographie du Québec.* Vol. 10. No. 20. pp. 213-8. Montreal: Université du Québec a Montreal.
9. Ekwall, Eilert. 1968. [1928.] *English River-Names.* Oxford: Claredon Press.
10. Ekwall, Eilert. 1935. *The Concise Oxford Dictionary of English Place-Names.* (4th ed.) Oxford: Claredon Press.
11. Nicolaisen, W. F. H. 2008. 'On river-names in the Scottish Landscape.' in Padel, O. J. & Parsons, David N. (eds.). *A Commodity of Good Names: Essays in Honour of Margaret Gelling.* Donington: Shaun Tyas. pp. 233-8.
12. Bezlaj, France. 1956. *Slovenska vodna imena: I. del (A—L).* Ljubljana: Slovenian Academy of Sciences and Arts.
13. Bezlaj, France. 1961. *Slovenska vodna imena: II. del (M—Z).* Ljubljana: Slovenian Academy of Sciences and Arts, Fran Ramovš Institute of Slovene language.
14. Bezlaj, France. 1965. 'Slovenski imenotvorni proces.' in *Slavistična revija.* Vol. X. No. 4-5. pp. 113-8. Ljubljana: Slavistic Society.
15. Bezlaj, France. 2003. *Zbrani jezikoslovni spisi.* Furlan, Metka. (ed.) Ljubljana: Slovenian Academy of Sciences and Arts.
16. Apte, Vaman S. 2006. *English-Sanskrit Dictionary.* Jawahar Nagar, Delhi: Nag Publishers.
17. Monier-Williams, Monier. 2005. [1899.] *A Sanskrit-English Dictionary, etymologically and philologically arranged with special reference to cognate Indo-European Languages.* [Oxford: Claredon Press.] New Delhi: Asian Educational Service Press.
18. Watkins, Calvert. 1973. "River' in Celtic and Indo-European.' in *Ériu.* Vol. 24. pp. 80-9. Dublin: Royal Irish Academy.
19. Lubotsky, Aleksander. Beekes, Robert. 2005. *Indo-European Etymological Dictionay.* Leiden: Leiden University, Department of Comparative Indo-European Linguistics.< http://www.indo-european.nl/ >
20. »Sava«, *Concise Dictionary of World Place-Names*. John Everett-Heath. Oxford University Press 2005. Oxford Reference Online. OUP, University of York, 9 February 2009, <http://www.oxfordreference.com/views/ENTRY.html?subview=Main&entry=t209.e6665>
21. Mitrovic, Moreno. 2005. *Hypothetical Analogy of Slovene and Celtic.* Ms.
22. Koch, John T. 2007. *An Atlas for Celtic Studies.* Oxford: Oxbow Books.
23. Williams, J. E. Caerwyn. 1990. 'Wysg (river name), Wysg, Hwysgynt, Rhwysg.' in *Celtica.* Vol. 21. pp. 670-8. Dublin: Dublin Institute for Advanced Studies.
24. jasanoff, Jay. 2002. 'The nom. sg. of Germanic *n*-stems.' In Wedel, Alfred & Busch, hans-Jörg (eds.). *Verba et Litterae: Explorations in Germanic Languages and German Literature: Essays in Honor of Albert L. Lloyd.* pp. 31-46. Newark: Linguatext.
25. Alinei, Mario. 2004. 'Paleolithic Continuity Theory: An Introduction.' Ms.<http://www.continuitas.com/intro.pdf >
26. Crist, Sean. 2005. 'Toward a formal markup standard for etymological data.' LSA Annual Meeting. Linguistic Society of America.
27. De Bernardo Stempel, Patrizia. 2007. 'Pre-Celtic, Old Celtic layers, Brittonic and Goidelic in ancient Ireland.' in Cavill, Paul & Broderick, George (eds.). *Language Contact in the Place-Names of Britain and Ireland.* Nottingham: English Place-Name Society.
28. Mawer, Allen. 1924. *The Chief Elements Used in English Place-Names.* Cambridge: Cambridge University Press.

29. Rumble, Alexander R. & Mills, A. D. (eds.) 1977. *Names, Places and People: An Onomastic Miscellany in Memory of John McNeal Dodgson.* Stamford: Paul Watkins.
30. MacBain, Alexander. 1982. *An Etymological Dictionary of the Gaelic Language.* Glasgow: Gairm Press.

Povzetek

Imenoslovne strukture

Rečno-imenoslovna Evropa se zdi strukturirana. V prispevku ponujam paradigmatično in teoretično formalizacijo porazdelitve rečno-imenoslovnih korenov znotraj in izven evropskih meja, kar se izkaže za izključno jezikosloven opis možnega starozgodovinskega razvoja. Članek orisuje atipičen pristop k integraciji formalne jezikoslovne teorije in filologije z etimološkimi ter onomastičnimi dognanji. Prav tako je predstavljena kritika nekaterih onomastično-etimoloških pristopov k razumevanju rečnih imen, še zlasti k umevanju rečnega imena Sava. S pretežnim osredotočenjem na hidronomiji, primerjam rečna imena na morfemično-glasoslovni in denotacijsko-pomenoslovni ravni, kar se izkaže v prid argumentu o imenoslovno slojeviti sliki Evrope. Glede denotacijsko-pomenoslovja pa predstavljam analogičen, pa četudi nenavaden, pristop k formalnemu umevanju pomena korenov, v katerih so hidronimi zasnovani.