

## From inflexion to derivation: The PIE word for ‘salt’

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**Abstract.** The Proto-Indo-European word for ‘salt’ has reflexes in all the main branches of the Indo-European languages with the exception of Anatolian. It can be reconstructed as a neuter *l*-stem: *\*séh₂-l*, *\*sh₂-él-*.

A unique feature of this word is a stem-final element *\*d* in some but not all branches of the family. Evidence for *\*d* is found in Armenian, Germanic, Italic, and Balto-Slavic, with a possible further trace in Indo-Iranian. Since *\*-d-* cannot be explained as an independent innovation that occurred in each branch, this formant was most likely an integral part of the late Proto-Indo-European paradigm of the word for ‘salt’.

In this paper, I propose that Late PIE *\*sh₂éld* continues the Indo-Anatolian instrumental singular form *\*sh₂élt* which came to be used as a subject marker when the protolanguage switched from ergative to nominative alignment. The attested word-final *\*-d* is the result of a phonetic shift *\*-t > \*-d* that happened after the Anatolian languages had split off. The final *\*-d* of *\*sǵald* was lost in Tocharian and Greek, and was reanalyzed as part of the stem in other branches.

**Keywords:** Proto-Indo-European, nominal inflexion, instrumental, grammaticalization, salt.

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## От формообразования к словообразованию: праиндоевропейское слово ‘соль’

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**Аннотация.** Для праиндоевропейского слова со значением ‘соль’, рефлексы которого сохранились во всех основных ветвях индоевропейских языков за исключением анатолийской, можно реконструировать основу среднего рода на *-l*: \**séh₂-l*, \**sh₂-él-*. Уникальной особенностью данной лексемы является то, что в некоторых ветвях, в частности, в армянском, германских, итальянских, балто-славянских языках, а также, по всей видимости, в индоиранских языках, существует вариант этой основы с дополнительным элементом *\*d*. Так как *\*-d-* невозможно объяснить как независимую инновацию, произошедшую в каждой ветви, этот формант, по всей вероятности, был неотъемлемой частью поздней праиндоевропейской парадигмы слова ‘соль’. В ряде языков вариант, оканчивающийся на *-ld*, был утрачен, а в других различие между основами с исходом на *-l* и на *-ld* лексикализовалось, причем второй вариант чаще встречается в основах прилагательных. Позднее праиндоевропейское \**sh₂éld* с формальной точки зрения может восходить к индо-анатолийской форме инструментального падежа единственного числа \**sh₂élt*. Однако на раннем этапе развития праиндоевропейского языка, когда тот был еще эргативным, формант *\*-t-* выступал в том числе как маркер эргатива у неодушевленных имен. После смены строя праязыка с эргативного на номинативный *\*-t-* стал показателем номинатива у местоимений, но не у имен, где он мог быть переосмыслен как часть основы, а мог быть утрачен. После фонетического перехода *\*-t > \*-d*, произошедшего после отделения анатолийских языков, конечное *\*-d* в праграфме \**séh₂ald* было утрачено в тохарских и древнегреческом языках, и переосмыслено как часть основы в других ветвях индоевропейских языков. То, что в ряде языков у этого варианта основы присутствует значение прилагательного, может быть прямым следствием исходного значения инструментального падежа этой формы: ‘с солью’.

**Ключевые слова:** праиндоевропейский, склонение, инструментальный падеж, грамматикализация, соль.

## 1. Introduction

Salt is present in different natural sources, in salt waters, salt soils, salty plants, and as rock salt. In Europe, it has been extracted by humans through various techniques since at least the sixth millennium BC [Nikolov, Bacvarov 2012; Harding 2013; Weller 2015], and material traces of Neolithic salt exploitation suggest that it had become an economic commodity that was traded across long distances to areas where salt was rare. There probably was a rising demand for salt due to the shift from a largely meat-based hunter-gatherer diet to an agricultural way of life, in which humans and their livestock profit greatly from the addition of salt to their menu [Monah 2012; Harding 2013: 16]. A linguistic illustration of this shift is provided by the Proto-Finno-Mordvinian word *\*sōla* (reflected for instance in Finnish *suola* ‘salt’), which was borrowed from Proto-Baltic in the second millennium before the Common Era [Napol'skikh 2015]. Together with other linguistic arguments, this points to “the absence of the use of salt in the dietary and food-preservation tradition among the speakers of Proto-Finno-Ugrian, which relates to hunting and fishing being the base of their economy” [Napol'skikh 2018].

## 2. Proto-Indo-European ‘salt’

The PIE word for ‘salt’ is reflected in all main branches of Indo-European except Anatolian (cf. [IEW: 878–879; NIIL: 586–590]): Skt. *salilá*-noun ‘sea, ocean’, adjective ‘salty’ [EWAia, 2: 712]; Lat. *sāl*, *salis* m.n., but also *sale* n., which is probably more recent (on the model of *mare*, gen. *maris* ‘sea’, [Ernout, Meillet 1979: 589], Umbr. *šalu* acc. sg. ‘salt’ [de Vaan 2008: 535]; OIr. *sál* ‘ocean, seawater’ <*\*sālo-*, OIr. *salann* n. ‘salt’, OCorn. *haloin*, MW *halaen*, MoW *halen* ‘salt’ < PCelt. *\*saleino-* ‘salty’ [Schrijver 1995: 216]; Gk. *háls*, gen. *halós* ‘salt’; Arm. *al* (*i*-stem) ‘salt’, *alt*- pl. ‘salt-mine’, *alt-alt(-in)* ‘salty, salted’ [Martirosyan 2010: 24, 40–41]; OPr. *sal*, Latv. *sāls* ‘salt’ f., Lithuanian Žemaitian dial. *sólymas* m. ‘saltpan’; OCS

*solb*, Ru. *sol'* ‘salt’ f.; Toch. B *salyiye*, Toch. A *sāle* < PToch. \**sali-h̥en-*? [Adams 2013: 742]; Alb. *gjollë* ‘salt lick (for cattle)’ < \**sāl-*, *nгjelmę* ‘salty, tasty’ (with prefix *n-*) < \**sal-* with *i*-mutation [Demiraj 1997: 298–299].

Opinions are divided as to the reconstruction of the syllabic nucleus of the stem. Traditionally, scholars have posited PIE \**a* and \**ā* (e.g., [IEW; Mayrhofer 1986: 170; Sihler 1995: 44; NIIL: 486ff.]), whereas Beekes ([1985] and in [Mallory, Adams 1997: 498]), Matasović [2004: 130], Kortlandt [2014: 221], Lubotsky [1989: 60], Müller ([2007: 288], with hesitation) and Pronk [2019: 145] favour an ablauting *l*-stem \**séh₂-l*, \**sh₂-él*. I adopt the latter reconstruction because it offers a better explanation of the cross-IE vowel variants and the Balto-Slavic accentual phenomena. Kortlandt posits an original neuter *l*-stem, which would imply a nom. acc. sg. \**séh₂-l* > \**séh₂l*, gen. \**sh₂-él-s*. Matasović [2004: 130f.] agrees that ‘salt’ is probably an original neuter, as it belongs to the category of non-count nouns denoting substances, as do, for instance, ‘horn’, ‘excrement’, ‘fat’, ‘wood’, and ‘meat’.

Pinault [2016: 39] objects to the analysis as an *l*-stem that the required PIE root \**séh₂-* is unknown, but that is not a compelling counterargument against the morphological interpretation. Formally, the root \**séh₂-* ‘to stuff, fill’ [LIV<sup>2</sup>: 520–521; Kloekhorst 2008: 691 (for the meaning)] would be a good candidate for a word called ‘additive’ or ‘condiment’, but I will not insist on this possibility. Given the different ways and shapes in which salt was obtained and processed in prehistoric times, there were many potential semantic sources for the creation of a word for ‘salt’.

### 3. Stem-final \**d*

Indo-European ‘salt’ has the unique feature of displaying a stem-final element \**d* in some but not all branches of the family. Evidence for \**d* is found in Armenian, Germanic, Italic, and Balto-Slavic, with a possible further trace in Indo-Iranian.

In Armenian, the distinction between singular *al* ‘salt’ and plural and adjectival *alt* ‘salt-mines’, ‘salty’ suggests to Martirosyan [2010]

a distinction between sg. \**sal-* and pl. \**sal-d-*, or between nom. sg. \**salds* and obl. sg. \**sald-i-*. In view of the semantics, an alternative solution would be to regard the variant \**sald-* as adjectival ‘salty’ (cf. [Olsen 1999: 86–87, 468]), from which ‘salt-mines’ can easily be derived.

In Germanic, a neuter noun \**salta-* ‘salt’ (Goth. *salt*, OHG *salz*) and a strong verb \**saltan* ‘to salt, pickle’ (Goth. *unsaltans* ‘unsalted’, pret. pl. OHG *sialzun*, [Seebold 1970: 385; Kroonen 2013: 425; Miller 2019: 190] can be reconstructed. Since the verb is not found in any of the other branches of Indo-European, \**saltan* was probably derived from the noun. Its strong inflexion must be secondary, and it seems likely that the participle \**saltana-* ‘salted’ was the pivot which led to its creation. Possibly, \**saltana-* reflects a similar *n*-adjective as some of the other derived *n*-formations in Indo-European, such as Sl. \**solnъ* ‘salted’ [Derksen 2008: 460] and PToch. \**salen-*. In Germanic, it may have secondarily introduced *t* from the noun. The derivative PGmc. \**sultī*, *-jō-* ‘brine’ f. (OS *sulta*, OHG *sulza*, cf. [de Vaan 2017: 278]) is probably based on a secondary zero grade \**sul-* that existed in the nominal paradigm rather than on a zero-grade verb form (as suggested by [Kroonen 2013: 491]), since no zero grade is attested in the strong verb.

In Latin, the verbs *sallere* and *sallīre* ‘to salt’ contain geminate *ll* which must go back to a consonant cluster containing *l*. Since the verbal adjective *salsus* ‘salted, salty’ can reflect \**sald-to-*, a preform \**sald-e-* seems the more likely reconstruction for the present stem. Already Schmidt [1889: 183] regarded the Latin verb as denominal to a stem \**sald-*.

In Celtic, OIr. *sall* f. ‘salted meat, esp. bacon’ may reflect Pre-Celtic \**saln-* or \**sald-* [LEIA: S-14]. According to David Stifter (personal communication), the evidence for a phonetic change PIE \**ld* > Early OIr. *ll* is flimsy, so that a preform \**salnā* is more likely. Still, because of the Late Old Irish/Early Middle Irish assimilation of *ld* to *ll* [Pedersen 1909: 114], a preform \**saldā* cannot be excluded. OIr. *saillid* ‘salts, cures (meat)’ may be derived from *sall* (with a present suffix \**ī*) but probably also from the preform \**saleino-* of OIr. *salann* ‘salt’ (with suffix \**ā* or \**ī*).

Welsh *halla* adj. ‘salt, salty’ would most straightforwardly reflect PCelt. \**sal-to-*, since the outcome *llt* from earlier *ld* is only certainly attested in Latin loanwords where it might be due to sound substitution, e.g.,

in *swllt* ‘shilling’ from \**soldus* from Classical Latin *solidus*, cf. [Jackson 1953: 432; Schrijver 1995: 62].

In Balto-Slavic, a semantic split occurred between the *d*-less variants which continue the meaning ‘salt’ (see above) and the adjective ‘sweet’ which always has suffixal *d*, Lith. *saldūs*, OCS *sladъkъ*, Ru. *solódkij* (dial.) ‘sweet’ < PBSI. \**s<sup>?</sup>al-du-* from PIE \**sh<sub>2</sub>el-d-* [Derksen 2015: 387–388]. The acute intonation of the vowel can be explained from Winter’s Law. The *u*-suffix was apparently taken from PIE \**sueh<sub>2</sub>du-* ‘sweet’, the connection between ‘salt’ and ‘sweet’ being of metonymical character; see [Schmidt 1889: 182] for further semantic parallels.

Skt. *salilá-*, Kath.+ *sarirá-* noun ‘sea, ocean’, adjective ‘salty’ is usually derived from PIE ‘salt’. The noun is one of the Sanskrit formations in *-ira/-ila-* which is not built on an old *i*-stem (cf. [Beekes 1987: 50]), which renders the suffix unexplained. We may consider the possibility that its *i* reflects PIE \**d*. It is known that PIE \**d* was sometimes lenited to a glottal stop \*<sup>?</sup>*d* next to obstruents and in word-final position in Late Indo-European [Lubotsky 2012: 162–163; Garnier 2014], and that \*<sup>?</sup>*d* may be vocalized to *i* in Sanskrit. Hence, if pre-IIR. \**s<sup>?</sup>ald*<sup>1</sup> became \**s<sup>?</sup>al?* ‘salt’, or if a putative adjective \**s<sup>?</sup>ald-ra-* ‘salty’ yielded \**s<sup>?</sup>al?ra-*, the vocalization to \**salira-* would be regular.

## 4. Previous explanations

The explanation of stem-final *-d* is disputed. Schmidt [1889: 182–83, 253] reconstructs a paradigm with nom. \**sāl-d*, gen. \**sal-n-és*, whereas Brugmann [1906: 138] posits a nominative *sāl* which might reflect \**sāld*. Seebold [1984: 123–27] has proposed that \**d* represents the PIE root \**dh<sub>3</sub>-* ‘to give’ in the zero grade, firstly in \**sweh<sub>2</sub>du-* ‘sweet’, which Seebold explains as \*‘giving sweetness’, and then analogically in BSI. \**saldū-* ‘giving malt-flavour, sweet’. Gmc. \**saltan* would then represent

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<sup>1</sup> In which the voiced pharyngeal fricative *ʃ* represents the phonemic reflex of PIE \**h<sub>2</sub>*. It is likely that, after a voiceless obstruent such as *s*, this was realized as voiceless [h].

\**sal-d-* ‘to give salt = to salt’, according to Seebold, and Lat. *sallere* might reflect the same formation. This proposal was embraced by Heidermanns [1993: 466], Casaretto [2004: 77], and in [NIIL], but to my mind this is an unlikely option. There is no trace in the morphology of the *d*-forms, including Gmc. \**saltan*, of the verb \**deh<sub>3</sub>*- ‘to give’, and in order to arrive at a meaning ‘salty’ one would rather expect a combination of ‘salt’ with PIE \**d<sup>h</sup>eh<sub>1</sub>-* ‘to put’ than with ‘to give’.

## 5. Indo-Anatolian instr. sg. \*-t

Since \*-d cannot be explained as an independent innovation of each branch in which we find it, it seems more likely that a variant in \*-ld formed an integral part of the Late PIE paradigm of ‘salt’. In some languages, this variant was lost, whereas in others, the distinction between -l and -ld was lexicalized with a specific semantic distribution.

The only *d*-final case form of Late PIE that fits the bill is the Late PIE ablative in \*-d which goes back to the Indo-Anatolian instrumental in \*-t [Kortlandt 2010: 40]. I therefore propose that Late PIE \**sh<sub>2</sub>éld* continues the Indo-Anatolian instrumental singular \**sh<sub>2</sub>él-t*. In part of the languages, the resulting form \**sh<sub>2</sub>éld* was promoted to the nominal stem for ‘salt’, possibly first in the adjectival meaning ‘salty’.

As argued by Kloekhorst [2018: 195], the instrumental ending -t behaves peculiarly in Anatolian, in that it must be reconstructed with a full grade suffix and a zero grade ending \*-t in all mobile nouns of Indo-Anatolian, regardless of whether they were animate or inanimate. Concrete examples in Hittite are *iš-ha-an-da* ‘blood’, [g]e-nu-t= ‘knee’, *ki-iš-šar-at*, *ki-iš-šar-ta* ‘hand’ /kis:árt/ (\**g<sup>h</sup>s-ér-t*), spelled -it or -et with anaptyctic vowel /i/ after obstruents according to Kloekhorst (see also [Pedersen 1938: 22f.; Neu 1979: 190–191; Čop 1975: 52; 1987: 149–150; Kloekhorst 2008: 799; 2014]). In other words, there was no distinction between protero- and hysterodynamic inflection for this case form, and a preform \**sh<sub>2</sub>él-t* ‘with salt’ would exactly fit the postulated ablaut type *CC-éR-t* for this ending.

As to the phonetics, Kortlandt [2010: 40–41, 44] posits a change of Indo-Anatolian word-final *\*-t* to Late PIE *\*-d*, as witnessed, for instance, by Hitt. *kuit* vs. Lat. *quod*, and by the correspondence between the Hittite instrumental ending in *\*-t* and Late PIE abl. sg. *\*-d*. The phonetic change led to a phonotactic alternation between word-final *-d* and word-internal *-t*, of which either *t* (in most cases) or *d* (more rarely) could be generalized in the morphology of the individual languages [de Vaan 2019]. For instance, the 3sg. athematic indicative ending *\*-ti* came to contrast with *\*-t > \*-[d]* (Old Latin SIED, FECED), which could be restored to *\*-t*. In the *t*-stem nouns, the nom. sg. ending *\*-d* would contrast with gen. sg. *\*-tos*, loc. sg. *\*-ti*, and in most cases (but not always), word-final *\*-t* was restored in the nominative.

Another example is the correspondence between Skt. *daśát-* f. ‘10, group of ten’, BSl. *\*desimti-*, and Gk. *dekás*, *-ádos* ‘decade’. It is often assumed (e.g., [Rau 2009: 13, fn. 2]) that Greek *-d*- is due to contamination with the *ád*-stem abstracts, but already Brugmann [1906: 466] considered the possibility that Gk. *dekád-* had sprung from *\*dekát-*, although the mechanism was unclear to him. We can now infer that Indo-Anatolian *\*dekmít* ‘decad’, gen. sg. *\*dekmítós* would have given Late PIE *\*dekmíd*, genitive *\*dekmítós*, whence PGk. *\*dekád* with subsequent generalization of *d* and, later, the addition of nom. sg. *-s*.

## 6. Syntactic background

Most of the PIE *t*- and *d*-stems make deverbal agentives, often feminines, derived from verbal roots that function as verbal abstracts [Vijūnas 2009; Pinault 2017; 2018]. Suffixal *t* and *d* are furthermore added to neuter non-count nouns, such as abstracts in *\*-h₂* (the Greek type in *-ad-*), abstracts in *\*-teh₂-* and *\*-tuH-*, mass nouns such as *\*melit* ‘honey’, and colour terms (*t*-stems in Indo-Iranian, *d*-stems in Germanic). This matches the theory first put forward by Pedersen [1907: 152] and confirmed by Kortlandt’s findings, that the Indo-Anatolian instrumental *\*-t > Late Indo-European *\*-d** was originally used as a subject marker for neutrals, such as in the neuter pronouns *\*kʷod*, *\*kʷid*, the *-d* of which is otherwise unexplained.

Since ‘salt’ is a mass noun which we have reconstructed as an original neuter, it fits in with the other IE nominals with a *t*- or *d*-suffix.

The syntactic shift from instrumental to nominative function makes sense against the backdrop of the theory that posits a change in the alignment character that took place in Indo-Anatolian, from ergative to nominative alignment [Vaillant 1936; Kortlandt 2010: 91–103; Willi 2018: 504–515]. The marker *\*-t*, which was suffixed to inanimate nouns in the ergative function when they took on an agentive role, became their nominative ending once the ergative alignment was lost. But since *\*-t* still functioned as an ablative/instrumental for animate nouns, it was not grammaticalized as a nominative case marker of neuters throughout the Indo-Anatolian system, except in the pronouns. Rather, it was often reinterpreted as a stem-forming suffix which became obligatory in the whole paradigm (e.g., *\*-gʷm-t-* ‘coming’), which was restricted to the nom. acc. sg. of neuters (the type Skt. *yakít* ‘liver’), or which was facultative (*\*-teh₂-* next to *\*-teh₂t-*). This was the main source of the traditional PIE *t*-stems, as well as of a number of *d*-stems, which arose by the post-Anatolian, word-final lenition discussed above.

The reinterpretation of *\*-d* as an ablative ending in post-Anatolian Indo-European, respectively its further lenition to the instrumental ending *\*-?* [Kortlandt 2010: 41], led to the complete loss of the preform *\*sǵald* in part of Indo-European, such as Tocharian and Greek, and to its reinterpretation in Armenian, Balto-Slavic, Italic, Germanic, and maybe also Indo-Aryan. The adjectival meaning ‘salty’ of *\*sǵald* in Armenian and Balto-Slavic, and possibly also in Italic and Indo-Aryan, may be a direct trace of the instrumental meaning ‘(provided) with salt’, whereas Pre-Germanic *\*sǵald-(o-)* ‘salt’, beside which no traces of *d*-less *\*sǵal-* are left in Germanic, shows the reinterpretation of *\*sǵald-* as the invariant stem form.

## 7. Conclusion

We have arrived at the reconstruction of a PIE neuter paradigm with nom. acc. sg. *\*séh₂-l*, gen. *\*sh₂-él-s*, and instr. *\*sh₂-él-t*. The latter form was first used as an agentive case form for inanimate nouns in an ergative

alignment. After the switch to a nominative alignment system, it was often grammaticalized as a stem-forming marker. The preform *\*sh₂élt* became *\*s₂alд* in post-Anatolian Indo-European, where it was either generalized as the main variant for ‘salty’ and ‘salt’, or experienced semantic specialization next to *d*-less variants of the stem *\*sh₂-el-*.

The word for ‘salt’ fits in well semantically with the other evidence for *t*-instrumentals being grammaticalized as *t*- or *d*-stems, such as verbal abstracts, mass nouns and colour terms: ‘salt’ is a mass noun, which usually has neuter or feminine gender and is suspected to be an old neuter.

It may be asked why we cannot reconstruct any other nouns with an irregular *d*-extension to their stem. To a certain extent, such relic forms are always the result of a coincidence, but some indications may nevertheless be given. ‘Salt’ was a high-frequency word, which is conducive to the preservation of morphological oddities. Furthermore, the *t*-instrumental had more or less the same meaning as the adjective ‘salty’, which is also a frequent semantic concept.

## Abbreviations

1, 2, 3 — 1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup> person; abl. — ablative; acc. — accusative; gen. — genitive; f. — feminine; loc. — locative; m. — masculine; n. — neuter; nom. — nominative; obl. — oblique; pl. — plural; pret. — preterit; sg. — singular.

Alb. — Albanian; Arm. — Armenian; BSl. — Balto-Slavic; Gk. — Greek; Gmc. — Germanic; Goth. — Gothic; Hitt. — Hittite; IE — Indo-European; IIr. — Indo-Iranian; Lat. — Latin; Latv. — Latvian; Lith. — Lithuanian; MW — Middle Welsh; MoW — Modern Welsh; OCorn. — Old Cornish; OCS — Old Church Slavonic; OHG — Old High German; OIr. — Old Irish; OPr. — Old Prussian; OS — Old Saxon; PBSl. — Proto-Balto-Slavic; PCelt. — Proto-Celtic; PGk. — Proto-Greek; PGmc. — Proto-Germanic; PIE — Proto-Indo-European; PToch. — Proto-Tocharian; Ru. — Russian; Sl. — Slavic; Skt. — Sanskrit; Toch. — Tocharian.

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