The Semantics of *Exāmen*

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Abstract: In the major French and German etymological dictionaries of Latin, there is some puzzlement over the semantics of *exāmen*: how can one word refer to a measurement or examination, but also to a swarm of bees? Walde and Hofmann suggest these two disparate meanings stem from the diverse meanings of the verb *exigō* (<*ex-agō*, 'to drive out'), from which *exāmen* derives. They claim these two senses of *exāmen* become two words in the Latin *Sprachgefühl*. Ernout and Meillet agree: there is more than one *exāmen* in the Latins' *sentiment linguistique*. I, too, agree. But this approach does not tell us *why* these terms derive from *exigō*, nor does it give any hint of an underlying concept which measurements and swarms of bees share, which makes a derivation from *exigō* appropriate to both.

The present paper addresses this puzzle by reducing the two meanings of *exāmen* to one meaning of the parent term *ex-agō*: 'to drive out.' In sum: a swarm of bees is a 'driving out' or outpouring, and a measurement or examination is a 'driving out' or setting out for scrutiny. This interpretation is moreover supported by semantically parallel uses of cognate terms in other Indo-European languages, notably Greek and Old Irish, and by semantic parallels in English and in the Slavic language family. Along the way, I touch upon a philosophical puzzle: at what point do evolving linguistic items with a common source become distinct from one another?

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Here is a Latin lexical mystery: sheep come in a herd (*grex*), birds a flock (*caterva*), but bees come in—of all things—an *exāmen*, a term which means 'swarm', but also 'exam.'[2] How are swarms related to exams?

The 'swarm' meaning of *exāmen* is attested prior to 'examination'—though not in an apicultural sense. In his *Truculentus* (ca. 190 BC), Plautus uses it twice to describe swarms: an *exāmen* of maids, and an *exāmen mali* ('swarm of trouble[s]').[3] Later on, Varro uses it more narrowly as an agricultural technical term for swarms of bees and other insects (*Res Rusticae*, ca. 37 BC); Virgil later does the same (*Georgics*, ca. 29 BC).[4]

Exāmen is also attested early on for weights, measures, and judgments, though it retains its 'swarm' meaning all the while. For weights and measures, it has four uses. The first is 'an amount weighed.' This is first unambiguously attested in Pliny the Elder (*Naturalis Historia*, ca. AD 77), who describes pruning an equal weight (*exāmen*) of shoots from each side of a vine (*in aequali examine undique*).[5]

Second and third, it is used for the instrument or means of weighing, or of displaying weights. In the second sense, we have *e.g.* Jupiter's 'evenly-balanced scale'

[2] *TLL,* vol. 5, part 2, 1162–5.
[3] Plautus, *Truculentus*, 534, 514.
[4] Varro, *Res Rusticae*, 3.6.23; Virgil, *Georgics*, 4.21.
[5] Pliny the Elder, *Naturalis Historia*, 17.184.

(*aequato examine*) in Virgil's *Aeneid*. Commenting on this passage in Virgil, Servius (fl. 4th cent.) claims that an *exāmen* properly speaking is the *needle* of a scale.[6] But this third, more specific use of *exāmen* for a scale's needle is explicitly attested only later, first in Pomponius Porphyrion (fl. 2nd cent.), who refers to the "needle or tongue, which is part of a scale" (*examine vel agina, quae pars trutinae est*).[7]

Fourth, *exāmen* is used for the process or act of weighing, considering, judging and so forth, attested first in Statius' "judgments of a long life" (*longaeque examina vitae*; ca. AD 45–96).[8] This use is where the familiar sense of *exāmen* as 'examination' derives and, apart from the use of *exāmen* to denote needles of scales, is attested latest of all.

The etymology of *exāmen* is straightforward enough: the suffix *-men* (or *-smen*, per Walde and Hofmann) attaches to nouns derived from verbs, which are used to denote the product or result of the action the corresponding verb describes: hence *certamen* ('combat') from *certo* ('to fight'), *acumen* ('a point') from *acuo* ('to sharpen'), and so forth.[9] *Exāmen* is from *ex-agō* (> *exigō*: 'to drive out', etc.), and so denotes the product or result of an act of driving out. On this basic fact, everyone writing on the subject seems to agree. But the deeper mystery remains: why an *exāmen* of bees? What connects measurements and scales with swarms?

Ernout and Meillet give a brief account of the two meanings of *exāmen* in their *Dictionnaire étymologique de la langue latin* (1959). Their solution turns on the diverse meanings of *exigō* ('to drive out'):

> The diversity of meaning [namely of *exāmen*] is explained by the diversity of meanings that *exigō* has, which has had the effect of separating them in the linguistic feeling [*sentiment linguistique*] of the Latins (205–6).[10]

In their view, the 'swarm' and 'weight' meanings of *exāmen* renders two distinct words in Latin speakers' *sentiment linguistique*, and this duality is a product of the diverse meanings of *exigō*. If true, however, this analysis does not tell us how to trace these diverse meanings back to *exigō*, and in particular what sense(s) of that verb gives rise to the two meanings of *exāmen*—or, perhaps, the two *exāmina*, if there really are two words here.

Now an anonymous reviewer for this journal asks, are there two words here, or is there one word with two meanings? The diversity of meanings here suggests the former, though the shared root might be taken to imply the latter. For my part, I believe semantics should win out, since words are more than their etymologies; what we have here are, I submit, two words. At some point in the history of *exāmen*,

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[6] Virgil, *Aeneid*, 12.725; Servius, *In Vergilii Aeneidem Commentarii*, 12.725.
[7] Pomponius Porphyrion, *Commentarii in Q. Horatium Flaccum*, 2.1.72.
[8] Statius, *Silvae*, 3.3.203.
[9] Palmer, 1954, 237; Perrot, 1961, 249; Haudry, 1981, 4.
[10] "La diversité du sens qui s'explique par la diversité de sens de *exigō*, a eu pour effet de les séparer l'un de l'autre dans le sentiment linguistique des Latins".

these words became distinct. Note, too, that their derivatives meaning 'exam' and 'swarm' in many of the modern Romance languages are indubitably distinct. For instance, we have, respectively: Spanish *examen* and *enjambre*; Portuguese *exame* and *enxame*; Catalan *examen* and *eixam*; Italian *exame* and *sciame*; and French *examen and essaim*. But it seems to me that the problem of determining precisely when and how words become distinct is at bottom a philosophical one.[11]

Turning to Walde and Hofmann, we find a similar but more detailed account than that of Ernout and Meillet. In their *Lateinisches etymologisches Wörterbuch* (1938), they claim that *exāmen* is "originally taken from the establishment of a hive [...] and then later comes to be a group of bees" (424–5).[12] In support of this account, they give Greek ἑσμός (*hesmós*, 'swarm') as a semantic parallel. There are two noteworthy things about the selection of ἑσμός. First, ἑσμός is not cognate with *exāmen*, but comes from a different Proto-Indo-European root, $*(H)ieh_1$- ('to throw').[13] Second, Greek has a cognate with *exigō*, namely ἐξάγω (*exágō*, 'to drive out'), and Aristotle uses derivatives of this term in connection with bees (more on this in a moment). In any case, Walde and Hofmann's notion of a swarm as something thrown or flung out is consistent with the explanation I will provide.

The second meaning of *exāmen* is, per Walde and Hofmann, 'the needle of a weight scale', on which the weight is 'spread out.'[14] Thus the 'driving out' sense of *exāmen* is a driving out or swinging of the needle from the resting position.[15] In support of this etymology of *exāmen*, they cite Vitruvius who, in his *De Architectura* (ca. 15–30 BC), uses the term in a description of what happens when carrying poles are unbalanced. The passage is worth examining in full:

> The mid-points of the carrying-poles (to which the straps of the bearers are attached) are fixed by nails, so that they do not slip. But when the straps slip (*promoventur*) from the middle, they push against the part of the pole to which they are closest, in the same way as a weight (*exāmen*) does when it is moved (*progreditur*) to the end of the balance.[16]

The connection of *exāmen* with a measure(ment) in a balance is clear. But the evidence that *exāmen* is meant to denote the needle of a scale—or even a 'pushing out' of the weight in a balance—is sparse. Instead, Vitruvius uses *promovere* and *progredior* to describe the force of 'pushing out', so to speak, which the weight exerts. And, unlike a scale, there is no needle on a carrying pole.

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[11] For a discussion of related problems, see Gasparri, 2016.

[12] "[U]rsprünglich der zur Gründung eines Stockes ausgeführte [...] dann auch "avium, locustarum"."

[13] Beekes, 2010, 470.

[14] "Zünglein an der Wage (Skala, auf der das Gewicht geschoben wird[...])"

[15] "das Hinaustreiben [aus der Ruhelage], Ausschlag."

[16] "Mediae enim partes phalangarum, quibus lora tetraphororum invehuntur, clavis sunt finitae, nec labuntur in unam partem. Cum enim extra finem centri promoventur, premunt eum locum, ad quem propius accesserunt, quemadmodum in statera pondus, cum examine progreditur ad fines ponderationum" (10.3.7; translation mine).

To support their needle reading, Walde and Hofmann go on to cite a much more convenient—and later—passage from Isidore (ca. AD 560–636), who tells us that an *exāmen* is the needle in the middle (*medium filum*) by which a scale (*trutina*) is balanced.[17] Perhaps Isidore has Servius' comment on Virgil in mind. But as I noted above, this more specific sense of 'needle' is a later development.

On the basis of the latter attestation of *exāmen* as 'needle', Walde and Hofmann claim that the meaning of 'weight' or 'process of weighing' and ultimately 'examination' or 'scrutiny' is derived. For Walde and Hofmann, this latter meaning comes from *examino* ('to examine, judge'—but also 'to swarm'), which derives from *exāmen*. By back formation, *exāmen* then obtains this latter meaning. Nevertheless, Walde and Hofmann conclude that:

> *examination* as a swarm of bees, and the back-formed *exāminō -āre* 'to put to the test' and 'to swarm' are, in native speakers' intuition (*Sprachgefühl*) two different words (425).[18]

In effect, Walde and Hofmann make the same point as Ernout and Meillet, but supply more detail: the two meanings of *exāmen* come from the multiple meanings of **ex-agō*, from which they are derived. But I would like to probe deeper, and to account for earlier attestations than Isidore of Seville, whose needle interpretation seems to hold considerable sway over Walde and Hofmann. *Exāmen* has diverse meanings, but it remains to be seen what unifies them—that is, what aspect of **ex-agō* explains its use for measurements of things as well as for swarms of bees.

My proposal is as follows: in its most straightforward sense, **ex-agō* (comprising *ex*—'out from'—and *agō*—'to drive', etc.) means 'to drive out', 'draw out', etc. Hence the derived *exāmen* retains this meaning of 'a drawing-out' or outpouring. Here, we can see the link between the two *prima facie* disparate things denoted by *exāmen*: the first is *exāmen* as 'examination', in the sense of laying- or pouring-out goods on a scale for weighing (akin to the Modern English noun *lay down*, where cards in a poker game are set out for assessment). Later, this meaning is extended to the exercise whereby something is set out for consideration or judgment, originally in a scale. Then, it is applied to the intellectual exercise of scrutinising or testing a thing, and in particular of investigating or driving out the truth of a matter.[19]

The second, an *exāmen* of bees, is an outpouring or driving-out of the insects from a hive. This is underwritten by the meaning of **ex-agō* as 'to drive out.'[20] The *Thesaurus Linguae Latinae* hints at this, where it notes that in the strict sense *ex-*

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[17] *Etymologies*, 16.25.5.

[18] "*exāmen* „Bienenschwarm" und *-āre* „prüfen" bzw. „schwärmen"; im Sprachgefühl zwei versch. Wörter."

[19] *Thesaurus Linguae Latinae*, V 1, 1163–5.

[20] Convenient to my thesis is the fact that *exigō* is elsewhere used specifically for driving animals, e.g. *Aeneis* 2.357: 'elephantos igni e castris exactos.'

āmen is applied to "the offspring of bees *driven out from* or leaving the hive" (V 1, 1162, 78).[21] A swarm is, in this sense, an outpouring of bees in a fluid-like mass.

There is corroborating evidence in other Indo-European languages for this 'pouring out' meaning of the Latin *exāmen*, especially with bees and other insects. This evidence comes in two types: semantic parallels, and parallels which are both semantic and cognate. For the latter: Latin *ex*, Greek ἐκ, and Old Irish *ess-*, all of which mean 'out (from)', derive from the Proto-Indo-European *h_1eǵh*, *h_1éǵhs*, 'out from, away.'[22] PIE *h_2eǵ-e/o-*, 'to drive' becomes Latin *agō*, Greek ἄγω (*ágō*), and Old Irish *aigid*, 'to drive.'[23] From these we get Greek ἐξάγω (*exágō*) 'to drive out' > ἐξαγωγή (*exagōgê*), 'a leading out' of soldiers, as well as ἐξαγωγεύς (*exagōgeús*), 'one who leads out soldiers'—which, conveniently, is Aristotle's term for the 'king' bee, who leads the swarm out from the hive.[24] Whence, too, the Old Irish legal term *esáin*, 'a driving out' or 'expulsion' of a person in desperate need of food or shelter[25]. Thus these Greek and Old Irish terms are cognate with the Latin *exāmen*, and denote a 'driving out' which, in the case of the former, specifically applies to bees.

There are two further semantic (but non-cognate) parallels from other Indo-European languages, in addition to the English *lay down* mentioned above. The first pertains to measurements: it is the English noun *pour*, used in construction, the culinary arts, and similar contexts. A recipe for rum punch calls for equal *pours* cranberry, orange, and pineapple juice; and concrete *pours* can be large or small. Just as with *exāmen*, a verb used to describe removal from an enclosed space (the Latin verb *ex-agō*, the English verb *pour*), gives a noun for the product of that action (the nouns *exāmen* and *pour*), which is then applied to measurement as an outcome of the process. Note, too, that the measurements here are vague: pours are not a specific amounts, like pints or barrels; but they can be compared against each other in ratios, much like the equal *exāmina* in Pliny the Elder discussed above.

The second semantic parallel pertains to bees. The Slavic languages are apparently unanimous in denoting swarms of bees with a cognate of Latin *rivus* ('stream, river'). The PIE term these words all derive from denotes a churning out or flow (ultimately from the PIE stem *$h_3$reyH-*, 'to churn, boil'), though in the Slavic languages the connection with water, inseparable from the Latin *rivus*, is lost. Thus Proto-Slavic *ròjь* (*ròjĭ*) > Polish *rój*, Russian роӥ (*roj*), Serbo-Croatian *pôj* (*roj*)/*rôj*, and Macedonian *poj* (*roj*), all meaning 'swarm.' Etymologically speaking, then, bees flow in the Slavic languages, as they pour out in Latin.

Thus the two definitions of *exāmen* can be resolved into one basic meaning, on the basis of *ex-agō* as 'to drive out.' This accounts for their origin, whether or not they are regarded as two words in the *sentiment linguistique* or *Sprachgefühl*. The

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[21] "de apium subole ex alveario expulsa atque egressa." Emphasis mine.
[22] de Vaan 2008, 195–6; Dunkel, 2014, 204–7. The latter gives *éǵh-s*.
[23] de Vaan, 2008, 30–1.
[24] *History of Animals* IX.40.25, 625a23.
[25] Kelly, 1988, 139–40.

approach set out here accordingly supplements that of Walde and Hofmann, Ernout and Meillet, and economically accounts for the two apparently quite disparate uses of *exāmen*.[26]

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