The Celtic origin of Lat. *rota* and its implications for the prehistory of Europe

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1 Two words for 'wheel' in Indo-European languages: the solid and the spoked wheel

As is known, there are two word families for the 'wheel' in IE languages: the Gr. *kýklos* type and the Lat. *rota* type. The most plausible explanation for this remarkable synonymy was already advanced by Heyne (1901), and later resumed by Weijnen (1974) and by the writer (Alinei 1996ab): the *kýklos* type might designate the more primitive and earlier, disc wheel, and the *rota* type the more advanced and recent, spoked wheel. The two names would thus correspond to two completely different wheel technologies, and to two entirely different periods of prehistory.

Let us first review, and in part elaborate, the main arguments for the interpretation of the *rota* family as the name of the 'spoked wheel', and let us begin by recalling its membership (cf. Pokorny (IEW 866) and Buck (1949 §10.76):

> Lat. *rota* (It. *ruota*, Fr. *roue*, Sp. *rueda*, Rum. *roată* ecc.); Germ. *Rad*, Du. *rad*; Lith. *rãtas* m. 'wheel, circle' (pl. *rãtai* 'carts, vehicle'), Lett. *rats* (Plur. *rati* 'vehicle'), (> Finn. *ratas* 'wheel'); Ir. *roth* (m.), Welsh *rhod* (f.), Bret. *rod*. Gaul. *Roto-magus* (*Rouen*); Skr. *rátha-* (m.) 'chariot', Av. *raθa* 'idem'.

On the semantic level, note that the meaning of the Indo-Iranian word is not 'wheel' but 'chariot', namely a vehicle used by chieftains and their noble entourage of warriors (besides as ritual vehicle). This has two implications, one technological and the other linguistic one: on the one hand the 'chariot' as such necessarily implies a light construction, and thus horse traction and a spoked wheel (Piggott 1992, 56). On the other the change of the word meaning from the original 'wheel' to 'chariot' – while the Indo-Iranian wheel's name remained the original PIE one – points to a loanword, rather than to an inner development (cp. the Baltic development). Note also that the semantic development from OHG *rad* 'wheel' to ON *roðull* 'Strahlenkranz, Sonne' can be understood only if one recalls that the *spoked* wheel was often associated with a solar cult, and that in the Romance area the name of the 'spoke' - which continues Lat. *radius* - is the same as that of the sun-ray (Alinei 1974).

2 The etymological problem of the *rota* family

Pokorny (IEW 867), who overlooked the relevance of the distinction between the ancient solid and the recent spoked wheel for the etymological problem of their name, made consequently two mistakes: he reconstructed PIE ***roto-** 'wheel' from PIE ***ret(h)-** 'run', without realizing that the latter motivation is appropriate only for a fast vehicle, and not for a slow, solid-wheel, ox-trained one. (Recall that the motivation of the solid wheel name – *kyklos* and cognates – is simply 'apt to turn, to rotate'.) Moreover, if the *rota* type would designate the "new invention" of the spoked wheel (Childe 1954, 214), then it would be impossible, even within the framework of the traditional IE Copper Age invasion theory, to consider the *rota* family as belonging to the common IE stock. For the invention of the spoked wheel can be dated "from hardly before the beginning of the second millennium BC in Western Asia or Europe" (Piggott 1983 27, cp. Mallory 1989 127). Consequently, the word would have to be seen as a local innovation, and its areal distribution would be that of a borrowing.

Heine had already proposed a Celtic origin, but on the basis of obsolete arguments, no longer worthy of mention. Weijnen pointed to a Celtic origin only for the southern Germanic form represented by Germ. *Rad* (the northern form being of the *wheel* type), while for the rest of the word family he held to Pokorny's traditional view that the word belongs to the PIE common stock. In my previous article on *rota* (Alinei 1996a) and in the first volume of my *Origini* (Alinei 1996b) I have argued for a Celtic origin of the whole family, on the basis of arguments that I now will repeat and elaborate.

3 Lat. *rota* and its cognates as a Celtic loanword for 'spoked wheel'

Following Pokorny's own materials, the motivation 'run' actually appears only in Celtic (OIr. *rethim* 'I run', Ir. *rithîm* 'idem', Welsh *redheg*, Bret. *redek* 'to run' etc.) and in Baltic (Lith. *ritù*, *rìsti* 'roll'). However, Baltic specialists have later excluded the Baltic connection: Fraenkel (1962-1965, s.v.*rãtas* 703), the main authority on Baltic etymology, after having listed the Baltic material, does not hesitate to state that "Die wörter haben nichts mit lit. *riesti* 'aufbiegen, hochwölben, zusammen-, aufrollen', *rìsti* 'rollen, wälzen' zu tun". And more precisely (s.v. *riesti*): "Die Wörter sind wegen des Vokalismus von der Sippe von lit. *rãtas* 'Rad' zu trennen... Sowohl W[alde]-H[offmann] 2 244 [corrige: 444 M.A.]- als auch Pokorny...- ist diese Tatsache entgangen".

As a consequence, the initial motivation 'run' appears exclusively in Celtic, and only in Celtic does the development from 'run' to 'wheel' correspond to regular morphological rules.

Also the principle of ' morphosemantic density' (Alinei (1967, 1971, 1974, 1996a), applied to the *rota* word family, leads one to conclude that the *rota* family may in fact be the result of the spread of a Celtic loanword. For the reader's benefit I shall summarize here the principle of 'morpho-semantic density': consider the two international words *film* and *scanner*, and imagine that their English origin was unknown to us. On the basis of purely linguistic considerations we could nevertheless identify their focus area, by observing that only in the English area does *film* have a more general meaning, that of 'thin layer', which explains that of the international 'film'; and that only in English does the verb *scan* exist, whose general meaning explains the international name of the machine, plus the morpheme *-er*. This kind of observation can be summed up by saying that European *film* and *scanner* come from the English area because in that area they have the highest 'morpho-semantic density'.

As to the *rota* family, not only is Celtic the only language group which shows a morpho-semantic regular relationship between the original verbal motivation 'run' and the noun 'wheel (of a fast vehicle)', but Celtic is also the only group in which the basic verb 'run' shows a very high degree of morpho-semantic density, including developments of suffixes and abstract notions, which point to a greater chronological depth. Here is the basic evidence:

(1) The ecceptional variety of compounds based on the Celtic verb for 'run', as shown by OIr. *reth-* 'run': with *ad-, air-, to-air-, com-, di-, for-di-, to-imb-di-, fo-to-imb-di-, to-etar, com-to-etar, fo-, iarm-fo-, to-iarm-fo-, imb-, ind-, air-ind-, to-air-ind-, to-ind-, di-od-, for-di-od-* (Pedersen 1909-1913 § 797).

(2) The development, from the same verb, of collective and abstract suffixes, as in MWelsh *rhawd* 'Lauf', *gaeaf-rawd* 'Winter', MIrl. *gem-rad* 'idem', MWelsh *bed-rawd*, Welsh *bedd-rod*, MBret. *bez-ret* 'cemetery', Bret. *bered* 'idem' (Welsh *bedd* 'grave'); Welsh *brith-red* 'tangle, confusion' , MIrl. *brecht-rad* 'variety', MIrl. *aig-red* 'ice', etc. (Pedersen 1909-1913 § 396, Pokorny IEW 867).

The Celtic word for 'wheel' (Ir. *roth*, Welsh *rhod*, Bret. *rod*) seems thus to be one of the many developments shown by the highly productive Celtic verb for 'running', while in the other IE languages the *rota* cognate words show no formal and semantic background whatsoever. In fact, the morphosemantic developments shown by some other IE languages clearly show that they took place only   *after* the development of the meaning 'wheel': as in Latin, where *rotundus* 'round' is an evident development from the roundness of the fast *rota* 'wheel', and in Germanic, where there

appear for example Germ *rasch*, *gerade*, from OHG. *rado*, *rato* schnell', from the speed of the new kind of wheel and vehicles, and the already mentioned ON *roðull* 'Strahlenkranz, Sonne', from the association of the sun with the spoked wheel.

Does the fact that the technological innovation of the spoked wheel might have been originated in Western Asia (Piggott 1983), rather than in Europe, create a problem for our thesis of a Celtic origin of the word? I do not think so. For the solid-wheel technology was already widely diffused in Europe in the III millennium (the earliest European solid wheel, recently discovered near Ljubljana, Slovenia, has been dated to the end of the IV millennium) and if the much faster spoked-wheel vehicles, suitable to warfare, did appear first in Near East at the beginning of the II millennium the new, powerful Celtic elites emerging in Europe certainly would not have wasted time in adopting them for their own war plans and prestige, at the same time giving them a new name. Celtic technological lead could have thus been the result of a later development, just as, for example, the introduction of metallurgy into Western Europe in the III millennium was accomplished by the Bell Beaker culture, although metallurgy as such was introduced from Asia first into Eastern Europe (V millennium), and in Eastern Europe had its earliest and most important manifestation in the Balkan metallurgical complex. Similarly, even in our times the recent Japanese primacy in certain technological fields does not imply that Japan was also the focus area of those technologies.

4 The historical evidence for Celtic primacy in wheel and vehicle technology

However, if the *rota* family has a Celtic origin, and it expanded to parts of Europe and Asia, we should then be able to find evidence for a Celtic primacy in wheel and vehicle technology. This evidence is overwhelming, and comes from both philology and archaeology:

(1) In Latin, the whole cart terminology is Celtic: *benna, cant(h)us, carpentum, carrus, carrago, carracutium, carruca, cisium, colisatum, covinnus, essedum, petorritum, pilentum, ploxenum, raeda*. *Rota* could be easily be added. The Latin record shows thus a *general* lead of the Celts in cartwright technology.

(2) For Latin writers, the most famous *spoke-wheel makers* were the Celts (Jope 1956), and their fame was especially due to their ability in creating *spoked wheels with felloes of one single piece of heat-bent wood* (Childe 1954). As is known, the felloe is the curved piece of wood on which the spokes are fitted, and is thus one of the three main components of the spoked wheel, the other two being the nave and the spoke.

(3) The archaeological record confirms that single-piece felloes, made of heat-bent wood, were characteristic of the Celtic Iron Age (La Tène) (Piggott 1983 27), and that prior to that period the standard form was "a felloe in which the segments [we]re dowelled one to another, each carrying two spokes (ibidem)". Now, the earliest example of this kind comes from a second-millennium German find from Barnstorf (Oldenburg) (Piggott 1983 27, 168). Even in that period, then, we find ourselves in a putatively Celtic area.

(4) Also Latin *cant(h)us* 'felloe, rim of the wheel', is considered to be a Celtic loanword, to be compared to Welsh *cant* 'rim of the wheel, tyre', and Bret. *kant* 'rim of the sieve' (Ernout-Meillet DELL). The Latin form is continued by Fr. *jante* and Gallo-Romance and Occitan dial. variants (contaminated with *jambe*; FEW, without good reasons, posits *cambita* as the original form, contaminated with *canthus*), Sp. (Sanabria) *cantrelas*, Port. dial. *cantella, cantelras, cantelas* 'idem' (FEW), These latter forms can be compared to Welsch *cantel* and *cantell* 'a rim' (Pedersen 1909-1913 § 397), It. *canto* 'rim of the wheel', Northern-It. (Bormio) *kant* 'idem', Southeastern-It. *ianta* 'idem' (< Gallo-Rom.).

(5) The Old Irish hero-tales of the so called Ulster Cycle, which form the earliest stratum of Irish traditional literature, are centered on the epic *Táin Bó Cuailnge*, the 'Cattle-Raid of Cooley', which has been called 'the Celtic *Iliad*' (Harbison 1988 166). In these hero-tales, of course, warfare is the

dominant theme, and one of the most notable features in them is the war-chariot called *carpat*, from Celtic *carpanto- carbanto-*, the word which also lies behind Latin *carpentum* (Piggott 1983 236-237).

In short, everything seems to point to both a Celtic primacy in cartwright technology in general, and to a specific Celtic origin of the new spoked wheel, characterized by bent-wood felloes, and to its diffusion, along with its name, into the Latin and Germanic area and beyond. The spread eastwards of its name, reaching Persia and India, can then be interpreted as an anticipation of the Celtic wave of conquests of proto-historic times, which extended to Anatolia.

5 The prehistoric implications of the Celtic origin of the Lat. *rota* family

The implications of this conclusion for the cultural prehistory of Europe and for the Celtic role in it are several and far-reaching.

First of all, it is evident that the Celtic power of the Iron Age and protohistorical times must have rested on developments typical of Bronze Age such as horse-warfare and the cartwright technology associated with it. And this is exactly what the Celtic origin of Lat. *rota* and its cognates seems to confirm. But the awesome problem that troubles both the traditional IE Copper Age invasion theory in and Renfrew's theory of the IE Neolithic dispersal is that in the Bronze Age the 'arrival' of the Celts cannot be detected in any way in the archaeological record: within these two frameworks, the sudden appearance of the Celtic power in Europe remains thus inexplicable.

The Celtic origin of the *rota* family provides us with yet another argument to revise in an essential way traditional thinking about the formation of the Celtic power in Western Europe, as well as the traditional chronology for the differentiation and the spread of IE languages: in short, it provides us with a new confirmation of the Palaeolithic Continuity Theory (for literature see www.continuitas.com).

Let us now examine in detail the main implications of the new etymology of Lat. *rota* and its cognates.

6 In search of the prehistoric origin of the Celtic primacy in spoked-wheel and cartwright technology in the Iron Age

As we have just seen, the fundamental question is: how did the Iron-Age Celtic primacy in spoked-wheel technology come about?

The archaeologist Stuart Piggott, in one of his major surveys of prehistoric wheel vehicles - *The Earliest Wheeled Transport From the Atlantic Coast to the Caspian See* (1983) -, devotes the 6th and last chapter of his book to Early Iron-Age spoked-wheel vehicles by him explicitly defines as 'Celtic': La Tène's. Celtic mastery of spoked wheel technology is in fact unquestionable in La Tène (V-I cent. b.C.), as the superb wheels buried in the so called 'princely graves' abundantly testimony. However, although La Tène wheels and vehicles obviously presuppose a long period of technological growth, Piggott does not address the specific problems of the origin and formation of this Celtic primacy, the purpose of his book being more general.

Since spoked-wheel vehicles are abundantly attested in Hallstatt (cf. Piggott 1983, ch. 5), we could ask ourselves whether the preceding culture of Hallstatt (end VIII cent. − VI) could perhaps be considered as its ultimate origin. For the cultural continuity between Hallstatt and La Tène is unquestionable, and many Celtic specialists now tend to see Hallstatt as a Celtic phenomenon. But on second analysis the answer must be negative. For Hallstatt is synchronic with the cultural developments that in Italy lead to the birth (753 b.C.) and the development of Rome. The word *rota* - and its derivation *rotundus* 'round', which must have been coined after a consistent period of existence of the spoked wheel - belong to the hardcore of Latin lexicon and must have been known to the Latin-speaking founders of Rome. The lead of the Celts in spoked wheel technology must have thus preceded the foundation of Rome and Hallstatt.

What about Bronze Age Europe? In Early Bronze Age, European evidence for spoked-wheel vehicles is scanty, and concentrates in the East (ibidem, ch. 3). This is why, among other things, an Eastern origin of spoked-wheel technology is still considered as the most plausible hypothesis. But this conclusion, however, simply means that in Western Europe there must have been some fertile ground for the new Eastern invention to take root, and to slowly develop into Hallstatt and La Tène. Could we possibly identify this focus area?

A clue to the answer emerges in Late Bronze Age Europe, when spoked wheels appear to be widely attested, as shown by Piggott in the 4th chapter of his book, and in the map reproduced here (figure 1).
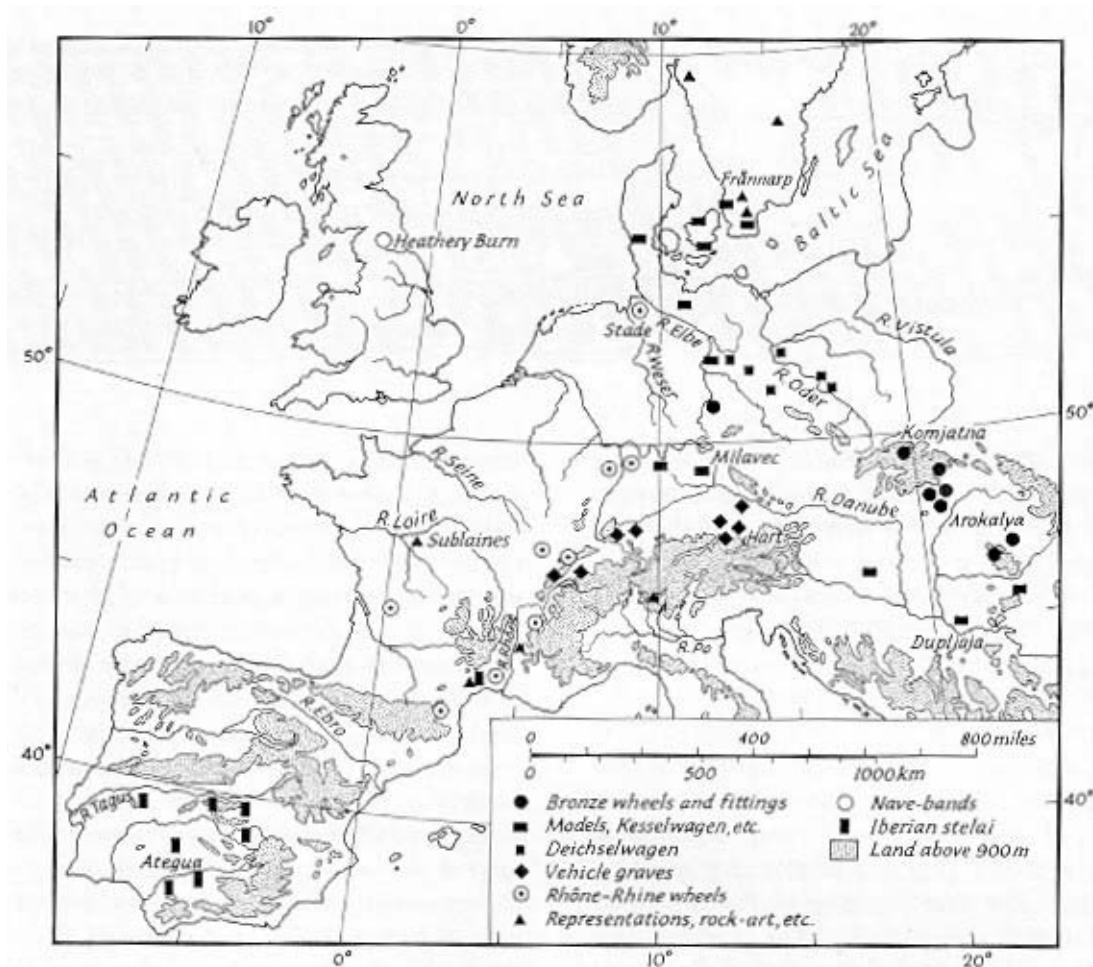

Fig. 1: Map of Later Bronze Age vehicle remains (after Piggott 1983)

Surveying the map and the data, the Bronze culture which might be a suitable predecessor of Halsstatt and a La Tène cartwright technology is the so called Rhône culture, diffused in the Swiss Valais and in the French Jura, Bourgogne and Midi regions. This culture has revealed remains of large cult, ritual or processional chariots, with spoked bronze-sheathed wheels characterized by an "exceptionally accomplished technology" (Piggott idem 124-125). And the archaeologist who has studied the origin and the formation of this culture, A. Gallay (1976), has concluded that its origin must be sough in the III-millennium Bell Beaker culture: the culture, incidentally, which in the second volume of my book on the origins of European languages (Alinei 2000) I have attributed to the Celts on the basis of independent arguments.

The question can then be so reworded: Could La Tène spoked-wheel technology, via the Rhône culture, ultimately derive from the Bell Beaker culture?

Let us first recall the prerequisites, as well as the main functions, of spoked-wheels chariots, as have been lucidly illustrated by Piggott and other scholars. Piggott defines the innovation as "a

complete technological revolution [...] introduced by the development of the domesticated horse as a traction animal in association with a light, fast, vehicle with a pair of spoked wheels", and "in [the] form of a chariot for warfare, hunting, prestige and display" (ibidem 66).

Translated in etiological terms, this definition means that the new technology of the spoked wheel could be developed only where horse-riding, warfare (and thus metal weaponry), hunting, prestige and display were not only present and customary, but also had a central role in the community's way of life.

And the Bell Beaker (BB) culture, which in the III millennium carried its aggressive ideology from the Atlantic coasts of Western Europe to new parts of Europe, is the only culture in which these components form its very essence. Already Gordon Childe had seen the BB as "the inevitable drinking-cup [that] symbolizes beer as one source of their influence, as vodka flask or a gin bottle would disclose an instrument of European domination in Siberia and Africa respectively" (Childe 1957, 223). Sherratt, in his more recent synthesis, states: "the decorated handleless drinking-cups known as Bell-Beakers stand *pars pro toto* for a whole new way of life in the areas where they appeared, from Scotland to Sicily" (Sherratt 1994b, 250). And the features of this new way of life, which in Sherratt's synthesis came to form their "martial image", was characterized, among other things, by horse-raising and riding, by warfare and hunting (daggers and archer's kit), by metallurgical skills (metal daggers), by individualism (individual burials), and by a "deliberately ostentatious personal life style" (extended burial, colourful garments, gold ornaments) (ibidem 250-255). Moreover, not only did the 'BB Folk' practiced metallurgy, but in certain European areas it was they who introduced metallurgy (De Laet 1979, 356). And not only did they practice horse-raising and horse-riding, but in most areas where they spread (Ireland, Spain, France, Hungary and Holland), theirs are the first attestations of horse domestication (De Laet 1979, 358). They were also active and able traders, as shown by the rapid diffusion of the BB itself along the coasts, by the existence of BB trade posts along the main rivers, by the diffusion, within their area of influence, of innumerable copper, gold and amber objects (idem, 356). Finally, their elite character, which could be seen as anticipating the princely leadership of La Tène, is also demonstrated by the high value that their copper or bronze dagger certainly had in the III millennium (Strahm 1994, 314).

There is then no question, in my opinion, that the BB culture of Western Europe could form an ideal context for the adoption and the independent development of the new wheel and vehicle technology, so closely associated to warfare, domination, wealth, prestige and display.

Compared to their slightly older cousins of the (stone!) Battle Axe and Corded Ware (drinking vessels as well!) of III-millennium Eastern Europe, the BB people of Western Europe had, besides the features of pastoralism, warfare, male ideology, individualism and elitism that they shared with their cousins, also some additional elements, such as technology, enterprise, trade, and the 'finesse' underlined by Sherratt (1994b, 254), which were destined to change Europe in a permanent way and to bring it to its protohistorical and historical stage.

In my major work (Alinei 1996, 2000) I have illustrated the arguments by which the BB people ought to be seen as the second manifestation, after megalithism, of a Celtic thrust to central Europe. Here, I have confined myself to underline that also if one concentrates on one of the basic factors of Celtic power in protohistory, namely spoked-wheel and cartwright technology, it is again the BB that comes out as its only possibile antecedent. The Celtic presence in Western Europe, in the form of the BB culture, and thus already in the III millennium, is the only satisfactory explanation of the formation and the growth of a Celtic primacy in Iron-Age cartwright and spoked-wheel technology. And this scenario is possible only within the framework of the Palaeolithic Continuity Theory.

Only by assuming that it was the Atlantic Celts of prehistorical times who introduced important technological innovations such as metallurgy, horse domestication and horse-riding, a new type of wheel and of vehicle, as well as trade and exploitation of natural sources into Western and Central Europe, it becomes possible to understand why the Celts of Hallstatt and La Tène appear as the first 'colonial power' of Europe (cf. e.g. Powell 1980, 42, 44-5, 48-49).

In the traditional view, the Celts are the first colonial power of Iron Age Europe, but no explanation is given for such a formidable development. Within the framework of the PCT, the Celts - already present in Western Europe since Palaeolithic times - become the leading force of Western Europe beginning with the expansion of Megalithism and that of the BB elite. The adoption – in the Early Bronze Age - of the spoke wheel and the development of new vehicles suitable for warfare, ritual and display belong to this coherent line of development and forms, in my view, one of the main stages of the formation of Celtic Iron Age colonialism.

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