

## WHAT CAN THE ṚGVEDA TELL US ON AGRICULTURE?

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The study fills the gaps in the lingustical database bearing on agriculture in the age of the Ṛgveda. Several corrections of existing standpoints have been made concerning purely philological issues as well as the semantical field of certain agricultural terms. The unbiased reassessment of etymology of some terms reveals that beside the terms of Indo-European origin there are terms from extinct languages while the number of items of Dravidian origin is meagre and the Austro-Asiatic influence can be excluded. Language contacts with the Bactria-Margiana Complex (BMAC) must be taken into consideration. The all-around analysis of linguistic data and archaeological evidence together with the observations of historical ethnography allows us to form a more balanced view of economic conditions: although pastoralism played a dominant part in the life of Indo-Aryan speakers in the Panjab in the second half of the second millennium B.C., agriculture including wheat production gained also an established position in the region. Both the negligence and the overestimation of agriculture in this system are erroneous viewpoints.

*Key words:* Ṛgveda, agriculture, Aryan, non-Aryan, Panjab, BMAC.

It is almost a *communis opinio* of Indologists that there was a mixed economy in the so-called Vedic age and that pastoralism played a greater role than agriculture in that period (Kosambi 1975, pp. 80 ff.; Gopal 1984, p. 89; Sharma 1999, p. 41; Witzel 1997, p. 267; Rau 1997, p. 205; Oberlies 1999, pp. 115–118). Nevertheless, it would be important to form a true notion of the stand of agriculture within this system. It is a pity, that this task has not been carried out yet and the new results of Vedic philology find their way unusually slowly to the historians and those who form common ideas about Indian history and society.

The basic source material still comes from the Vedic texts that contain “snapshots of the cultural situation of the particular period” (Witzel 1995, p. 91). The great majority of this material has already been collected by Zimmer (1879) and Macdonell – Keith (1912). Aiyer’s work (1949) though it does not surpass the two former ones served as source-book for the relevant chapters both in Acchelāl’s

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(1980, pp. 31–60) and Randhawa's (1980, pp. 290–322) histories of agriculture. The former work is a careful stock-taking of the linguistic data, the latter one is an imposing handbook. Being a practising scholar of agriculture and allied sciences Randhawa fully utilised his experimental knowledge, the philological material borrowed from Sanskritists and the available archaeological evidence and so he succeeded in drawing a living picture of Vedic agriculture. He does not touch upon the proportions of pastoralism and agriculture in the Vedic period. Thakur's (1994) study does not bring any hitherto unknown philological data or fresh archaeological evidence. Rather he attacks sharply those scholars who maintain a balanced view on the relation between pastoralism and agriculture, however, his argumentation is unconvincing and strongly biased against the traditional views. In spite of its title Kansara's (1995) monograph is a medley of informations taken from different sources and ages. As he himself puts it *Veda* means 'wisdom' not only the Vedic *Samhitās*. The Hindi booklet on the subject written by a serious Vedic scholar (Sātvalekar 1951) and some shorter papers (Gopalaswamy Aiyangar 1967; Bhattacharjee 1978) were not available to me.

Strictly speaking, the only significant study on the linguistic data is that of Schetelich (1977). However, due to language barriers and perhaps the place of publication her ingenious paper did not exercise much influence on matters in Anglophone Indology. It is regrettable, because the author applied a complex method in research happily combining the results of Vedic philology with Kuiper's (1955) results in tracing non-Aryan elements in Vedic vocabulary and the available scanty archaeological evidence (cf. Agrawal – Kusumnagar 1974). I can only subscribe to Schetelich's decision to restrict the investigation to the RV instead of the vague Vedic age and to those hymns that refer to the most important agricultural activity namely ploughing and its implement the plough. She assumes that, although the Aryan speakers had their own plough when they arrived in India, the pre-Aryan population did the same. Accordingly she speaks of two lines of tradition of terminology on the one hand represented by the Indo-Iranian one and the other hand by the mixed Aryan–non-Aryan one (Schetelich 1977, p. 214). She is very much critical in her approach and does not make haphazard conclusions. Rather she underlines the dangers of ascribing linguistic entities to ethnic ones and justly refers to the inadequate contribution of archaeology to fill the enormous gaps in our knowledge (Schetelich 1977, p. 216).

I think time has come for a reappraisal of the linguistic material of the RV in the light of the recent results of Vedic philology, historical linguistics, history, archaeology as well as historical ethnography. Instead of 'Vedic agriculture' it is much more meaningful to speak of agriculture as depicted in the different layers of the Vedic corpus. My recent paper is an attempt to draw a picture mainly based on the linguistic material of the RV. Doing so I constantly kept in mind that the RV is ultimately poetry where there is wide room for poetical licence. Consequently the results to be achieved are simply indicators of phenomena that appear in certain areas in certain intervals of the time of the redaction of the RV in its present form.

I must begin with a definition. I use the word agriculture in the narrower sense of the term distinct from animal husbandry, horticulture and plant-gathering. For my purpose agricultural vocabulary means the names of implements, operations and

cultivated plants and animals involved. Before starting to deal with these problems I think that a brief survey of the utilisable results of research in philology, historical linguistics, historical ethnography and archeology is in order.

Vedic philology made great progress in various directions in the last two decades. For the present problems I consider specially significant the results concerning the localisation of Vedic texts and the chronology of their redaction and at least the tentative correlation between them and various smaller cultures (Grey Ware, Gandhāra grave culture etc.) (Witzel 1989, pp. 248–249). The proposal of closer comparative studies of the RV and the Old Avesta (Witzel 1989, p. 124) is methodologically right. However, in the case of agricultural terminology it has not yet brought much help: such basic terms as *urvarā*, *karṣati* or *dhānya* occur only in the Young Avesta (cf. AiW, pp. 402, 457–458 and 734). The structural analysis of terms and the things denoted by them is of immense help to decide whether a word is used as a real *terminus technicus* or not (cf. Elizarenkova 1999, pp. 111–150).

The conference on the history and mechanisms of the convergence of ancient Aryan and non-Aryan cultures held at the University of Michigan, Ann Arbor in 1976 was a milestone in the research of Sanskrit, Dravidian and Austro-Asiatic agricultural terminology as well as of their correlation, too.

Masica in a paper presented there regards the words for plough (*lāṅgala*, *sīra*), winnowing basket (*titaṭi*), threshing floor (*khala*), seed (*bīja*), furrow (*sītā*) as non-Aryan, as he says they are ‘specifically Dravidian’ and admits that the names of implements for reaping are Aryan (Masica 1979, p. 127). Southworth who otherwise strongly advocates for Dravidian etymologies lists *khala*, *lāṅgala*, *sīra* in the category of terms shared by Dravidian and Indo-Aryan (Southworth 1979, pp. 216–217). He assumes that Dravidian–Indo-Aryan contacts can be dated back to the time before the composition of the RV and the contact did not disappear with the Old-Indo-Aryan speakers in the Panjab (Southworth 1979, p. 203). The short characterisation of Ṛgvedic agriculture offered by him begs for corrections. He speaks of a pre-urban society with copper and possibly iron technology and producing bean beside barley in the early period (Southworth 1979, p. 263). In the light of the archaeological evidence at our disposal the supposition of the presence of iron implements is unfounded: not any name for ‘bean’ can be attested in the RV.

Gamkrelidze and Ivanov reconstruct an IE *\*seH/i-* ‘to sow’ from which they derive Hittite *šai/-šiia-* ‘to sow’. They postulate this meaning in the period of the so-called Indo-European community (Gamkrelidze – Ivanov 1984, II, pp. 688–689). In my paper on the Sanskrit terms of ploughing and the plough I maintain that *sīra* might have denoted drill plough and it is not quite impossible that proto-Indic speakers brought the know-how of drills from Mesopotamia. Concerning *lāṅgala* I regarded this word of uncertain origin, not excluding a slight possibility of a proto-Munda derivation, however, the question of when and where borrowing took place is still open (Wojtilla 1986, p. 31). I tried to demonstrate that words for ploughing are generally more archaic than those for the plough: there is no common name for the plough in Indic and Iranian (Wojtilla 1986, p. 33); Vedic *kārṣati* has its Young Avestan parallel *karṣa’ti* and both may go back to an IE *\*k<sup>w</sup>els-* to draw a line (Wojtilla 1986, p. 30).

As to proto-Munda influence it must be remembered that the Zides think of the character of proto-Munda agricultural vocabulary as a whole. As they see it proto-Munda speakers knew rice, two or three kinds of millet, at least three species of legumes but it is not sure whether these were domesticated plants (Zide – Zide 1974, p. 1324). Among of the tools of husking, pestle and mortar, were in use while they might have used only a “pre-plough instrument” \**sn̥ɣ* for cultivation (Zide – Zide 1974, p. 1330, fn. 5).

It was once again Kuiper who generated a very fruitful discussion on the genesis of the Ṛgvedic vocabulary with his book in 1991. His aims are clear: it was not his object to give etymological explanations of foreign words but rather ‘some criteria for distinguishing non-Aryan words’ and their frequency in the RV (Kuiper 1991, p. 5). As to the preliminary list of foreign elements, in the RV Kuiper’s wording is quite sober: he speaks of words that ‘have little or no chance of being of Indo-European origin’ and of a ‘grey zone’ between Indo-Aryan and non-Aryan words, too (Kuiper 1991, p. 90). As to the basic items of agricultural terminology he takes the same position as he did in 1955 (Kuiper 1991, p. 14).

Oberlies in his substantial review on Kuiper’s book made a fine critical remark with regard to the terms for plough: Kuiper does not give any information about a crucial question whether the speakers (Austro-Asiatics or Dravidians?) from whose language these loanwords come were agriculturists or not (Oberlies 1994, p. 347). According to McAlpin the Dravidians, while entering the Indian Subcontinent about the same time the Aryans were moving into the Panjab, ‘were certainly transhumants practising both herding and agriculture’ and like Gurukkal sees what we know positively about agricultural knowledge of Dravidian speakers as belonging to the iron age Tamil culture only (McAlpin 1979, p. 182; Gurukkal 1989, p. 166).

The recent attempts at reconstructing the Bactria-Margiana Complex (BMAC) language pave the way for a safer interpretation of Ṛgvedic agriculture. There are agricultural terms that are derivable with great probability from this area: *godhūma* ‘wheat’ from a BMAC \**gant-um*, *yavyā* ‘streamlet, channel’ from a BMAC \**ya(u)vi-yā*, and such words as *parṣa* ‘sheaf (of corn)’ and *bīja* ‘seed, semen’ with their Iranian cognates refer to BMAC agriculture (Witzel 2002). It must be noted that the word *godhūma* cannot be attested in the RV and first occurs only in the AV (P) IX, 11–12. This circumstance may have various reasons: wheat cultivation was not possible in those unirrigated areas of Panjab where the genesis of the RV took place; changing food habits; the AV contains some quite old material not extant in the RV (Wojtilla 1999, pp. 227–229). Eventually, the absence of the word from the RV may be simply due to the poetical licence of the poets/editors of the RV. We must keep in mind that what we have is only one recension of the RV. According to Witzel the Vedic *go-dhūma* must be due to local influence by the Southern (Meluhhan) \**godi* on a northern \**gantum/gandum*. He thinks that this happened in the Panjab in the Middle/Late Ṛgvedic period (Witzel 2002, n. 125). For the time being I do not see any reason to drop any of these raised ideas, however, all are working hypotheses. The attestation of the debated terms *dhānā* ‘grains, perhaps wheat?’ and *purīṣin* ‘possessing fertile soil’ and *yavyā* ‘stream, channel’ may contradict the first assumption,

however, we must not forget that we do not possess an exhaustive and quite unequivocal explanation of these terms (details see under the proper items). Witzel's concept is based on a series of preconceptions to be ascertained by future research.

Historical ethnography is of great help in numerous cases. Steensberg dates the earliest case of the employment of the drill plough from the age of Kalibangan phase II 2300–1700 B.C. and describes the long Indian tradition of using this type of instrument in a very impressive study (Steensberg 1971, p. 241). Icke-Schwalbe after having carried out successful field work in Chota Nagpur opines that the ard plough without prop (*Griessäule*) is exclusively used by Munda speakers but not by the Dravidians. It is a question whether they had known this plough before they moved to the hills or they developed it later in their present home. The type of plough used in the core of their habitat resembles the plough represented in the relief from Bodhi-Gaya from the 3rd c. B.C. The name of this plough is *har* or *harā* (Icke-Schwalbe 1986, pp. 47–50). It is obviously an Indo-Aryan loanword that goes back to Sanskrit *hala* a term that cannot be attested in the RV because it is a later development in Old-Indo-Aryan (Wojtilla 1988, p. 326).

Archaeological evidence is still sporadic, however, since the turning up of the clay model of an ard plough a few broken pieces of plough were collected from Banawali (Haryana) from the period of the Indus culture. Curiously, one representation of a spoked wheel unearthed from Banawali reminds the excavators of the wheel described in Vedic literature (Wojtilla 1989, p. 96).

According to Meadow's 1993 report only limited bioarchaeological research was carried out in South Asia by this time and "what has been done is of uneven quality" and the summaries of them must be treated with "considerable circumspection" (Meadow 1996, p. 391). In spite of this uncertainty now we can safely say that the cultivation of barley (*hordeum vulgare*) was widespread in the Greater Indus Valley from the sixth millennium B.C. (Meadow 1993, p. 63). Carbonised barley seeds were found from the mature Harappan period c. 2000–1700 B.C. (Singh 1990, p. 70). Barley always occurs together with wheat at these sites.

I think that an up-to-date survey of the terminology together with the necessary comments based on the results of the above-mentioned disciplines may serve as the only solid basis for further research. The consolidated list of terms is as follows.

AKṚṢĪVALA mfn. 'without (the activity of) a ploughman: X, 146, 6, cf. KĀRṢATI  
APNĀSVAT mfn. 'productive' I, 127, 6.

AṢṬRĀ f. 'plougher's goad' IV, 57, 4. It is the badge of agriculture KauśiSū 80.

Otherwise the word means 'rod to drive herds' VI, 53, 9 and VI, 58, 2 (cf. Wojtilla 2002, pp. 585–586).

ĀRTANA mfn. 'waste' (field) I, 127, 6.

URVĀRĀ f. 'cultivated land' I, 127, 6 – IV, 41, 6 – VI, 25, 4 – VIII, 91, 6 – VIII, 91, 5 – X, 142, 3.

URVĀRUKĀ n. 'cucumber' VII, 59, 12. It is a native Indian word (Kuiper 1991, p. 90).

- \*ULŪKHALA n. 'mortar' I, 28, 6. It does not denote here an agricultural implement because the text deals with the pressing of *soma*. The first *locus* where it occurs as a real agricultural term is AV X, 9, 26 where it is used for husking paddy. As to its etymology I rather subscribe to Oberlies who holds an Indo-European explanation more plausible (EWA I, p. 231; Kuiper 1991, p. 14; Oberlies 1994, p. 335).
- ŪRDARA m. 'granary' or 'a measure for holding grain' II, 14, 11. Its etymology is not clear (EWA I, p. 244). Kuiper regards it a foreign word in the RV but does not refer to its source (Kuiper 1991, p. 14).
- KĀRṢATI 'ploughs' I, 23, 15 – VIII, 22, 6 – *vikārṣati* 'ploughs' IV, 57, 8 – *carkṛṣat* participle intensive. I, 23, 15 – I, 176, 2.
- KĪNĀRA m. 'ploughman': X, 106, 10. Its etymology is not clear, it is probably a non-Aryan word (Kuiper 1991, p. 26).
- KĪNĀŚA m. 'ploughman': IV, 57, 8. Its etymology is not clear, it is probably a non-Aryan word (Kuiper 1991, p. 26).
- KṚṢI f. 'ploughland' X, 34, 13.
- KṢETRA n. 'soil': V, 62, 7. According to Elizarenkova it is an abstract term that denotes not only "field", but also "land, region" and "ownership of a piece of land". She says that on account of the attestation of the term KṚṢI in the chronologically late book of the RV the term has nothing to do with the cultivation of land and this assumption can be maintained in spite of references to cultivation of land in the RV IV, 57 (Elizarenkova 1999, p. 150). For the time being I am inclined to accept her view especially in the light of Oldenberg's hint that only the verses 1–3 of this hymn may belong to the original collection (Oldenberg 1909, p. 309). The references to cultivation of land occur in the additional part.
- \*KHĀNATI 'digs out' (a medical plant): X, 97, 20: *khanitraiḥ khānamānaḥ* 'digging with spade': I, 179, 6. According to Geldner it is 'ein neues Bild für den Liebesgenuss' (Geldner 1951, I, p. 258). At any rate both contexts do not deal with spade cultivation.
- \*KHANITRA n. 'spade': I, 179, 6. The context does not deal with spade cultivation.
- KHANITRIMA mfn. 'produced by digging' (Puri 1968, p. 383) VII, 49, 2. As an epithet of *āpaḥ* 'waters' it clearly refers to artificial water channels. Unfortunately archaeological evidence to corroborate this assumption is lacking. At the same time the Panjab and the adjacent areas have had the most developed canal system in the world in the modern age the antecedents of which nobody investigated thoroughly so far.
- KHĀLA m. 'threshing-floor': X, 48, 7. Burrow – Emenau and Gurov derive it from the Dravidian, Kuiper also admits it and at the same time convincingly explains the interchange k-/kh-, cf. Tamil *kaḷam* etc. Mayrhofer expresses his doubts about this etymology but he does not go into details (DED 1376; Gurov 1987, p. 27; Kuiper 1991, p. 49; EWA I, p. 449).

- KHILYÁ m. 'fallow land': VI, 28, 2 – and especially X, 142, 3. where it is opposed to URVARĀ. Its etymology is not satisfactorily cleared up (EWA I, p. 453; Kuiper 1991, p. 50).
- GO f. 'ox used for ploughing': I, 23, 15.
- TITĀŪ n (?) 'sieve': X, 71, 2. Mayrhofer calls it enigmatic (EWA I, p. 645).
- TILVILA mfn. 'fertile' (said of soil): V, 62, 7. From the context it is not clear whether it refers to actual cultivation. Kuiper lists the term among non-Aryan words without allotting it to any group of languages. Mayrhofer expresses his doubt about the existing explanations (EWA I, p. 649; Kuiper 1991, p. 14; Oberlies 1994, p. 335).
- DĀTI 'mows': X, 131, 2.
- DĀTRA n. 'sickle': VIII, 78, 10.
- DHĀNĀ f. plural 'grains of corn': I, 16, 2 – III, 35, 3 – III, 52, 5 – VI, 29, 4. It is not specified what kind of corn is meant here.
- DHĀNYĀKR̥T m. 'corn-producing': X, 94, 13.
- PARŚĀ m. 'sheaf': X, 48, 7.
- PUNĀTI 'sifts' (coarsely ground meal): X, 71, 2. This meaning against 'purifies grain' can be inferred from the interpretation of TITĀŪ and from the object of the operation namely ŚĀKTU.
- PŪRĪṢIN mfn. 'possessing fertile soil' X, 55, 5. It goes back to PURĪṢA n. 'ground, soil' (Gonda 1987, pp. 1 ff.), however the noun cannot be attested in this meaning in the RV. From the context it is not clear whether it refers to actual cultivation or simply denotes a natural phenomenon.
- PRĀTIHANTI 'threshes': X, 48, 7.
- PHĀRVARA m. 'sower', 'filler' (?) X, 106, 2. This meaning is uncertain (cf. WRV, p. 896) and on the contrary: 'an die Joche?' (Geldner 1951, III, p. 325). Kuiper considers the word structure non-Aryan (Kuiper 1991, pp. 23–24 and 42–43).
- PHĀLA m. 'plough share': IV, 57, 8 – X, 117, 7. According to Turner it is 'influenced by Munda or Dravidian to account for early ph- (CDIAL 9072). Kuiper puts it on the list of foreign words on account of the initial -ph- (Kuiper 1991, p. 14 and pp. 49–50). However, it cannot be separated from Iranian cognates (EWA II, p. 203).
- BĪJA n. 'seed for sowing': V, 53, 13 (seed of cereals). – X, 94, 13 – X, 101, 3. Southworth tried to connect it with pro-Munda \**vid-* 'sowing seed' and Dravidian \**vit(t)*. It is not at all sure because the cognates of the word can be attested in Iranian languages (Southworth 1979, p. 200; EWA II, p. 227).
- BHŪMI f. 'plough-land': IV, 57, 8.
- YĀVA m. 'barley' less probably 'corn': I, 23, 15 – I, 66, 3 – I, 117, 21 – I, 135, 8 – II, 5, 6 – II, 14, 11 – V, 85, 3 – VII, 3, 4 – VIII, 2, 3 – VIII, 22, 6 – VIII, 63, 9 – VIII, 78, 10 etc. The IE cognates in Iranian and even in Hittite make it plausible to take it as 'barley' and the physical nature of this plant is well adjustable in the changing environment of Indo-European speaking peoples in move from the Near East to India (EWA II, pp. 404–405). The Indo-Iranian

- word entered Finno-Ugrian very early perhaps before the splintering of Finno-Ugrian and Samoyedic (Wojtilla 1977, p. 118).
- YAVYĀ ‘stream, channel’ I, 167, 4 – I, 173, 12 – VIII, 98, 8. Witzel takes it as a loanword from the Oxus/BMAC language (Witzel 2002). The meaning ‘stream’ can be taken as granted in VIII, 98, 8, while Geldner finds problematic the rendering of the word attested in I, 167, 4 and I, 173, 12 (Geldner 1951, I, pp. 248 and 251). Similarly Renou also struggles with the word and with own rendering “juvénile” he himself is not satisfied (Renou X, pp. 23 and 72 and XVII, p. 51). Witzel’s view is strongly backed by the archaeological evidence. The actual situation in Panjab is rather complicated. Certain areas might have been under artificial irrigation including channels. At the same time this region is rich in rivers. Nevertheless there are arid areas where wheat cultivation was problematic (see *godhūma*). At any rate it is a desideratum to have more archaeological material that may be correlated with the philological data gained from the more precisely located books of the RV.
- YUGA n. ‘yoke for ploughing animal’ X, 101, 3. Dange argues that its occurrence with the verb *tanoti* indicates a yoke consisting of two parts, i.e. a double yoke mostly used at ploughing (Dange 1969, p. 174, fn. 6).
- YONI m. ‘womb’ X, 101, 3. It is figuratively used in the sense of ‘furrow’.
- LĀṄGALA n. ‘plough’ IV, 57, 4. It is likely a non-Aryan word (Wojtilla 1988, p. 328; Kuiper 1991, p. 14; EWA II, p. 477). It is, however, noteworthy that the plough bearing this name attested in AV II, 8, 4 and III, 17, 3 is a plough with a lance-shaped ploughshare (*lāṅgalaṁ pavīravat*), i.e. a relatively sophisticated instrument and not identical with ‘the curved branch of tree’ (*vaktram dāru*) of JB II, 84.
- VĀPATI ‘sows’ VIII, 7, 4 – X, 94, 3 (*vapantas*) – X, 101, 3.
- VARATRĀ f. ‘a strap of the yoke’: IV, 57, 4.
- VĀHA m. ‘ox drawing the plough’: IV, 57, 4 and 8.
- \*VR̥KA m. lit. ‘wolf’ I, 117, 21 – VIII, 22, 6. Formerly it was taken as a primitive wooden plough with a forepart resembling a wolf’s snout (Wojtilla 1988, p. 328). However, this view is no more tenable after Dunkel’s instructive interpretation of the formula *yávam vr̥kena* ‘grain by means of the wolf’ as metaphor. He is right saying that Yāska’s translation ‘plough’ misses the entire point (Dunkel’s manuscript, p. 7, cf. Oberlies 1999, p. 116, fn. 468).
- VR̥ṢA m. ‘bull for ploughing’ I, 176, 2.
- SĀKTU m. ‘coarsely ground meal’: X, 71, 2.
- SAMBHĀRATI ‘draws together’ (barley): VIII, 78, 10 (*sambhṛtasya yávasya*).
- SĪTĀ f. ‘furrow’: IV, 57, 6 and 7 – I, 140, 4: *kṛṣṇasītā* ‘back furrow’. Mayrhofer finds it problematic (EWA II, p. 532). It is to be judged together with SĪRA.
- SĪRA n. ‘(drill) plough’: IV, 57, 8 – X, 101, 3 and 4. Following Thieme (1954, pp. 559–560) I vote for an Indo-European etymology of the word. Gurov derives it from proto-Dravidian *\*cer* while Kuiper puts it on the list of foreign words in the RV (Wojtilla 1988, pp. 327–328; Gurov 1987, p. 27; Kuiper 1991, p. 14; EWA II, p. 733).

SRṆĪ f. 'sickle' I, 58, 4 – X, 101, 3 – X, 106, 6.

STHIVI m. 'Sack' (Geldner), or 'bushel' or at least 'le nom d'un récipient où l'on puise pour "semer" les grains' (Renou): X, 68, 3 (Geldner 1951, III, p. 264; Renou XV, p. 73).

Altogether the agricultural vocabulary of the RV is meagre. Among the forty-nine items there are three that are semantically problematic (*ūrdara*, *phārvara*, *sthivi*), three terms do not refer to the actual agricultural process here (*ulūkhala*, *khānati*, *khanitra*), the real meaning of one term (*yavyā*) in the RV period requires further research using archaeology and historical geography of the Panjab, three are not real terms but metaphorically used vocables (*khānati*, *yoni*, *vṛka*), while *kināra/kināśa* are simply variant forms. Three terms equally belong to the vocabulary of pastoralism (*aṣṭrā*, *go*, *vṛṣa*). The distribution of the number of attestations is significant: *yava* is attested more than one dozen times, *urvarā* six times, *aṣṭrā*, *karṣati*, *bīja*, *yavyā*, *vapati*, *sīra* and *ṣṇī* three times, *khilya*, *phāla*, *vāhā*, *vṛka* and *sītā* two times, while the remaining thirty-four only once. It has been agreed upon by the majority of specialists that books II–VII compose the older part of the RV, while books I and X are young and book X is generally regarded as the book of additions (Witzel 1995, pp. 309–310; Witzel 1997, p. 264). Book IV is very old (Gonda 1975, p. 27) and records eleven terms. Book VIII is regarded as very controversial, its area of genesis covers the western territories and likely shows Munda contacts (Gonda 1975, p. 27; cf. Witzel 1995, pp. 309–310). Book IX can be the oldest among all (Gonda 1975, p. 27). There is a good reason to locate the genesis of books II and IV in the western areas of the Indian subcontinent comprising parts of the present Afghanistan (Witzel 1995, p. 317). The distribution of the terms in the books reveals some peculiarities. Book IX records only two terms: *kṣetra* and *yavamat*, nevertheless they bear the testimony of barley (corn?) production. Book IV lists *aṣṭrā*, *vikarṣati*, *kināśa*, *phāla*, *bhūmi*, *lāṅgala*, *varatrā*, *vāha*, *sītā*, *sīra*, i.e. all requisites of ploughing agriculture with a relatively sophisticated plough without specifying the staple crop. With regard to the geographical site of the genesis of the RV and the supposed language boundary between Indo-Aryan and Munda it is advisable to consider *kināśa* and *lāṅgala* as words of unknown origin or loanwords from extinct languages. For the time being these linguistic evidences cannot be associated with any ethnic group. What we can say is that a strong process of cultural amalgamation was at work in the time of the composition of this book. Book VIII gives also some hints to us to tackle the Indo-Aryan Munda contacts more critically: there is not any reference here to rice and buffalo commonly associated with Austro-Asiatics or Mundas (Ruben 1978, p. 37). Of course words for rice cannot be attested in the whole RV. All this is well in line with the above treated assumptions of historical ethnography. In short, the hypothesis of Austro-Asiatic or specifically Munda presence in the agriculture of North-West India depicted in the RV stands on very shaky grounds. Moreover, as we have seen the reconstructed proto-Munda agricultural vocabulary has nothing to do with wheat cultivation carried out by plough. In the case of the terms *phāla*, *sītā* and *sīra* I do not see any reason why we should prefer Dravidian or any other etymology to the IE one.

Since the terms *urvarā* and *phāla* have Iranian cognate forms the agricultural vocabulary of the RV gains wider perspectives. Books II–VII make the picture emerging from book IV even more detailed but basically do not change it. Here the appearance of two plant names is of some importance: *urvārukā* and *dhānā*. The first one is of uncertain origin and does not play any significant role in agriculture while the second one has a too broad semantical field. In VI, 13, 4 the interpretation of *dhānīyam* is highly questionable: Geldner understands it as ‘Getreide’ while Oldenberg rejects this meaning and thinks of ‘Brotende’, ‘Schnittbrot’ and Renou translates it as ‘richesse’ (Geldner 1951, II, p. 105; Oldenberg 1909, p. 375; Renou XIII, p. 45). Since in these books there is *yava* and also *dhānā* the second one must be distinguished from ‘barley’. The possible candidates are ‘wheat’ and ‘rice’. To take any of them is not without problems. As present day figures show, both of them are principal crops of the Panjab. Nevertheless we are more inclined to think of wheat. Looking back to prehistoric times antecedent to the age of the RV North-West India including Kashmir formed a zone associated with wheat-barley culture (Gopal 1984, p. 91). What makes us slightly hesitate to equate ‘wheat’ *dhānā* is the circumstance that there is a proper word for ‘wheat’ namely *godhūma* the cognates of which are known from Greece via Anatolia to India elsewhere but it cannot be attested in the RV and at the present stage of research we have only working hypotheses (see above). The occurrence of the terms *urvārā* and *khilyā* witness the prevalent practice of cultivation in many parts of the Panjab: the crop does best when it comes after a fallow (Randhawa – Prem Nath 1959, p. 38; cf. Elizarenkova 1999, pp. 132 and 135). Book VIII contains terms *karṣati*, *dātra*, *yava*, *yavyā*, *vapati* and *saṁbharati* without mentioning the most important tool namely the plough: *vṛka* is used here metaphorically. None of these words has any relation with Austro-Asiatic (Munda). The vocabulary of books I and especially X are considerably richer (sixteen terms). Book I includes the tool of digging (*khanitra*) and another word for sickle (*ṣṇi*), both of undisputed Indo-European origin, and specifies the animal drawing the plough: instead of the general *vāhā* it gives *vṛṣa* ‘bull’. The term *yavyā* can provisionally be taken for ‘channel’, and if so, it has a tremendous importance. It may indicate the existence of artificial irrigation that offers the proper conditions for the effective production of wheat. Book X has the richest vocabulary with its twenty-three terms. There are three terms which deserve more interest: *khala*, *titaū* and *phārvara*. As to the first a Dravidian etymology is likely. The form *titaū* still resists a meaningful explanation while *phārvara* appears to be a non-Aryan word. The terminology of this book reflects a full-scale corn production as far as, in addition to the basic terms, it provides us with a full-fledged vocabulary of threshing, cleaning and storing grain as well as the ultimate product the meal: *khala*, *titaū*, *parṣu*, *punāti*, *pratihanti*, *śaktu* and *sthivi*.

The agricultural terminology of the RV is sufficient to postulate an established position of agriculture mostly based on grain producing in contemporary economic life. The critical reexamination of old etymologies shows that these terminologies have strong connections with the respective terms beyond the Indian linguistic area. Looking at the distribution of terms in the single books that can be tentatively lo-

cated in North-West India and neighbouring territories, a kind of cultural and linguistic continuity can be traced.

The discovery of possible ties between the RV culture with BMAC (cf. Parpola 1995, pp. 367–370; Witzel 2002) can open new vistas in research. If the BMAC area with its developed agriculture and cities was the home of the Indo-Aryans before their arrival in Greater India they could not have been nomads with a pure pastoral economy. The war chariots used by them are also not the vehicles of nomads (Renfrew 1989, p.182). It is likely that they did not forget their agricultural knowledge under the changing conditions when pastoralism was easier to practice than cultivation of land. In the light of linguistic data Thakur's standpoint should definitely be rejected and the prevailing ideas on the proportion of pastoralism and agriculture even in the earlier period of the RV age can be slightly modified: agriculture was of less importance than pastoralism, nevertheless it was not negligible. In this sense RV economy was a mixed economy with the predominance of pastoralism. The sporadic archaeological material may reinforce this assumption. On their way to the Panjab they subjugated different settled peoples who practiced agriculture at various levels. This appears in the agricultural vocabulary even of the older part of the RV namely in books II–VII, especially in the old book IV, where beside the terms of Indo-European origin there are terms the derivation of which cannot satisfactorily be explained. The richer terminology of books I and especially X are simply due to the new situation: either the RV speakers lived in those territories where cultivation of land was profitable for them or they became more interested in the production of local people. Among the non-Aryan elements of the agricultural vocabulary the Austro-Asiatic or in stricter sense Munda influence can be excluded while the weight of Dravidian loans is at a minimum. Altogether the assumption of strong Dravidian presence in the area of the genesis of the RV made by some scholars rests on slender foundations (Wojtilla 1999, p. 226). At the present stage of research it is more advisable to speak of extinct substrate languages than to make haphazard identification with any member of the known major language groups of India or all the more with any ethnic group. Altogether we must proceed with utmost care combining Vedic philology and historical linguistics, archaeological evidence and the methods of historical ethnography.

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