

## **ORIGINS OF ISLAM: POLITICAL-ANTHROPOLOGICAL AND ENVIRONMENTAL CONTEXT**

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The authors suggest to view the origins of Islam against the background of the 6<sup>th</sup> century AD Arabian socio-ecological crisis whose model is specified in the paper through the study of climatological, seismological, volcanological and epidemiological history of the period. Most socio-political systems of the Arabs reacted to the socio-ecological crisis by getting rid of the rigid supra-tribal political structures (kingdoms and chiefdoms) which started posing a real threat to their very survival. The decades of fighting which led to the destruction of the most of the Arabian kingdoms and chiefdoms (reflected in *Ayyām al-'Arab* tradition) led to the elaboration of some definite "anti-royal" freedom-loving tribal ethos. At the beginning of the 7<sup>th</sup> century a tribe which would recognize themselves as subjects of some terrestrial super-tribal political authority, a "king", risked to lose its honour. However, this seems not to be applicable to the authority of another type, the "celestial" one. At the meantime the early 7<sup>th</sup> century evidences the merging of the Arabian tradition of prophecy and the Arabian Monotheist "Raḥmanist" tradition which produced "the Arabian prophetic movement". The Monotheist "Raḥmanist" prophets appear to have represented a supratribal authority just of the type many Arab tribes were looking for at this very time, which seems to explain to a certain extent those prophets' political success (including the extreme political success of Muḥammad).

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### **South Arabian puzzle**

For many years we were a bit puzzled by a strangely quick collapse of the South Arabian Empire of the "Kings of Saba' and dhū-Raydān and Ḥaḍramawt and Yamanat and Their Arabs in the Highland and the Coastal Plain" (*'mlk S<sup>l</sup>B' w-d-RYD<sup>n</sup> w-ḤDRMWT w-YMNT w-'rb-hmw ṬWD<sup>m</sup> w-THMT*) in the second half of the 6<sup>th</sup> century AD.

Of course, at the beginning of this century South Arabia experienced a series of rather turbulent events: dhū-Nuwās' coup, violent persecutions of the Christians, Ethiopian invasions and conquest, rebellion (successful) of the Ethiopian soldiers deployed in Yemen, their leader (Abraha) getting the royal power etc. – see Sabaic

inscriptions C 621; Ry 507; 508; 510; Ja 1028; as well as: Pirenne and Tesfaye (1982); Carpenter (1869); Møberg (1924); Berzina and Kubbel' (1990:203–249); Shahīd (1971); Lundin (1961); Kobishchanov (1980:10–88); Piotrovskij (1985:17–23); Smith (1954); Robin *et al.* (1996) etc. Then, however, under Abraha's rule the Empire seems to have stabilized and achieved reasonable florescence by the end of the 540s: Abraha managed to organize the successful repairs of the famous Mārib Dam ('*RM*' [C 541]), campaigns to Central and Northern Arabia etc. (Ry 506; Vasil'ev 1907; Kobishchanov 1980:64–89; Piotrovskij 1985:23–24 etc.).

And then in the second half of the century the Empire (together with the 1500-year-old South Arabian civilization) simply collapses without any apparent serious reason. The study of this collapse is further complicated by the fact that the catastrophe appears to have been so profound that the written texts seem to have stopped to be produced in South Arabia – since the 7<sup>th</sup> decade of the 6<sup>th</sup> century (this decade including) we have no authentic dated South Arabian texts up to the Islamic Age – which stands in a sharp contrast with the comparatively well documented first 5 decades of the Century.<sup>1</sup>

The collapse seems to have been so profound that when in AD 570 (Shahīd 1995:365) Khusraw [I] Parwēz reluctantly sent (as a sort of punishment) a few hundred convicted criminals to put Yemen into the Persian sphere of influence (considering this such an adventure that it would be wiser not to risk with the proper troops), they (the convicted criminals) did manage to overthrow the dynasty of Abraha, though, of course, not without the help of the Yemenites opposed to the dynasty – see *e.g.* al-Ṭabarī (1964:950–956).

### North Arabian puzzle

Of course, it is evident that what happened in the 6<sup>th</sup> century Yemen was not an isolated event. Already if we look at Arabia as a whole, we shall get a bit different perspective.

To begin with, in the Soviet Islamology up to the 1980s the dominant theory of the origins of Islam connected it with the crisis and degeneration of the clan-tribal system in the 6<sup>th</sup> – early 7<sup>th</sup> century Arabia, the process of the state and class formation (Tolstov 1932; Smirnov 1954:180f.; Beljaev 1965; Petrushevskij 1966:5–11; Mavljutov 1974; Zhukov 1974:29; Fil'shtinskij 1977:22,107; Negrja 1981 etc.; a preliminary critique of this point see *e.g.* Bol'shakov 1989:40). A somewhat strange theory, we must say, as the very well-known facts show quite clearly that the actual processes were simply contrary to the ones described above.

<sup>1</sup> The last dated Sabaic text (C 325 – see Müller 1991) is (see line 5) of year 669 of the "Himyarite" Era ~ AD 554/555, or much more likely AD 559/560, depending on the solution of the problem of the beginning of this era – for the current state of this question see de Blois (1990); Shahīd (1994); Kitchen (1994:1–9); and especially Robin *et al.* (1996).

The clan-tribal systems in pre-Islamic Arabia were strengthening and consolidating, whereas these were precisely the state structures which degenerated and disintegrated in the first century before *al-Hijrah*. Indeed at the beginning of the 6<sup>th</sup> century we see a few kingdoms controlling most of the Arabian territory: the already mentioned huge Kingdom of the *tabābi'ah* in Yemen (dominant not only over the whole Arabian South but also considerable parts of Central Arabia), the second Kindite Kingdom (the vassal of the first one) in Central Arabia, the Lakhmid Kingdom (dependent on the Sassanid Empire) in the Arabian North-East (controlling also considerable parts of Northern and Central Arabia), and the Ghassanid Kingdom (dependent on the Byzantine Empire) in the North-West – see *e.g.* Nöldeke (1879; 1888); Rothstein (1899); Olinder (1927); Pigulevskaja (1964) etc.

What is more, even in the territories outside the direct control of the above-mentioned kingdoms we normally find what should be more correctly described as chiefdoms rather than true tribes. Their heads often explicitly call themselves *amlāk* (sg. *malik*) "kings" – see *e.g.* Negrja (1981:103–104).

The situation at the beginning of the next century (say, at the time of the beginning of Muḥammad's Prophecy) differs dramatically. *All* the above-mentioned great Arabian kingdoms had disappeared together with most smaller ones. There were almost no "kings" left in Arabia; and where there were chiefdoms a century before, now we see true free tribes.<sup>2</sup>

### Some neglected causes of the crisis

It appears that the 6<sup>th</sup> century AD evidenced a simultaneous global climate deterioration and the peak of the tectonic and volcanic activity in the whole world (including the Mediterranean region [see *Appendix C* for detail]). Of course, on the face of it, it is not quite self-evident what this has to do with the 6<sup>th</sup> century AD Arabian crisis. Naturally, the earthquakes affected in some way the evolution of the 6<sup>th</sup> – early 7<sup>th</sup> cent. AD Arabian societies, leaving even some trace in *al-Qur'ān* – cf. *e.g.* the beginning of the famous Earthquake *sūrah* ([XCIX:] {1.} *idhā zulzilat<sup>i</sup> 'l-arḍ<sup>u</sup> zilzāla-hā* {2.} *wa-akhrajat<sup>i</sup> 'l-arḍ<sup>u</sup> athqāla-hā* {3.} *wa-qāla 'l-insān<sup>u</sup> mā la-hā* "When the earth is shaken with an earthquake, and the earth lifts its loads, and the man asks: 'What has happened to it?'" etc.). Stookey (1978:22) and Grjaznevich (1994:34) have already proposed to connect the final decline of the pre-Islamic South Arabian civilization with the seismic activity – indeed it may well have produced the final deadly blow to the most ancient civilization centers of the edges of the internal Yemeni desert, which were already on the brink of final collapse by the 6<sup>th</sup> century AD and which depended heavily on relatively large-scale irrigation structures that could be significantly affected by the

<sup>2</sup> Even for the 6<sup>th</sup> century Mecca there seem to be some grounds to suspect the transformation of a quasi-chiefdom polity into a tribal confederation (*e.g.* Dostal 1991:193–199; al-Ṭabarī 1964:1083–1100). At the age of Muḥammad local kings are still attested in al-Yamāmah (see *e.g.* ibn Hišhām 1858–1860:II:971), but even there at this age we seem to observe a clear trend towards the replacement of the "royal" authority with a political authority of quite a different type (see below in the section on "Origins of Islam: socio-political context").

earthquakes. But this does not seem to be the case with the kingdoms and chiefdoms of the Arabian North which could not be apparently affected by the earthquakes to a critical extent. Thus, the most significant outcome of the seismic activity seems to be volcano eruptions rather than earthquakes. Again, it is not self-evident how, say, the volcano eruptions on the New Britain Island near New Guinea could affect the evolution of the Arabian communities. Again, what is significant here is not the direct effect though some of the South Arabian sites were destroyed just in this way (though not necessarily in the 6<sup>th</sup> century – see *e.g.* Müller and Wissmann [1976]). What is really important are volcanic gases and tephra which are thrown to the atmosphere in great quantities during such eruptions. And this could affect significantly really huge areas. *E.g.* sulphuric aerosols would halt partially solar radiation, causing the cooling of the Earth surface and, hence, droughts, or otherwise floods, and various disbalances in the ecological systems, which could result in the outbursts of the numbers of the epidemic disease bearing animals, plague fleas etc., and the causal link between the tectonic and volcanic activity and the epidemics was noticed long ago.

However, the most significant factor seems to be the droughts – and there are documented cases when, say, changing solar activity or massive volcano eruption, resulting in a global climatic shift, caused severe droughts in various parts of the world (naturally, North Arabia could have been affected in such cases too [see *Appendix C* for detail]).

Hence, global climate deterioration and the peak of the tectonic activity produced such an array of primary, secondary, and tertiary factors (earthquakes and volcano eruptions themselves, epidemics, droughts, barbarian invasions caused by the socio-ecological crises on the barbarian peripheries) which could pose a deadly threat for the survival of most of affected civilizations of the time. We ourselves came to terms with the sudden death of the 1500-year-old pre-Islamic South Arabian civilization when we realized that this happened simultaneously with the severe crisis in the Byzantine Empire which put it on the brink of an almost complete collapse (the early 7<sup>th</sup> to early 6<sup>th</sup> century comparison would produce for Byzantine results rather similar to the ones obtained above for the Arabian North and South in any case). And what was an almost deadly blow for strong Byzantine appeared to have been just a deadly blow for the weaker South Arabian civilization as well as for most Arabian kingdoms.<sup>3</sup>

This is not a mere speculation, especially for the Arabian North. Indeed, as was mentioned above the second half of the 6<sup>th</sup> century history of South Arabia is documented very poorly (especially, in comparison with the earlier periods). But this is not as true for the Arabian North. It is not simply that by

<sup>3</sup> The weakening of the state structures of the Byzantine, Sassanid and Yemeni empires (caused to a considerable extent by the same socio-ecological factors), of course, led to the further decline of the Arabian kingdoms and chiefdoms most of which were to a considerable degree rather dependent on the support of those Near Eastern great powers.

the early 7<sup>th</sup> – early 6<sup>th</sup> century comparison we can deduce that most North and Central Arabian kingdoms disintegrated, without knowing what happened in between. No, it is possible not only to deduce this disintegration, but also to get to know in some detail how this disintegration proceeded. Indeed, we have at our disposal *e.g.* the wonderful pre-Islamic Arab historical tradition, the so called *Ayyām al-'Arab* ("The Days of the Arabs"). And one of the typical "Days" can be rendered as follows: there was some Arabian strongman (a head of a kingdom, or a chiefdom) who behaved sometimes in a bad and arrogant manner. Such a behaviour could consist of, say, shooting an arrow at a she-camel of some woman<sup>4</sup>, but, very noticeably, it could be manifested in attempts to collect taxes in a "lean" year (usually caused by a draught) – Ibn Ḥabīb (1942:249); Ibn al-Athīr (1867:368–369); see also *e.g.* Kister (1986:46); note also *e.g.* the description by the *Day of Ḥujr* tradition of the beginning of the Banū Asad uprising against Ḥujr (which finally [although by no means immediately] led to the killing of Ḥujr and the destruction of the respective kingdom):

*Inna Ḥujr<sup>am</sup> kāna fī Banī Asad wa-kānat la-hu 'alay-him itāwat<sup>am</sup> fī kullī sanat<sup>in</sup>... thumma ba'atha ilay-him jābiya-hu 'lladhī kāna yajbī-him, fa-mana'ū dhālik wa-Ḥujr yawma-idh<sup>in</sup> bi-Tihāmah – wa-ḡarabū rusula-hu wa-ḡarajū-hum* "Ḥujr was [the king] of Banū Asad, and the taxes from them were due to him every year... Once he sent tax-collectors to them [Banū Asad] and they [Banū Asad] refused [to pay taxes] (Ḥujr was that time in Tihāmah), beat the messengers and terribly wounded them" ("the Day of Ḥujr" – al-Iṣfahānī [1955–1964:IX:81]; see also Ibn al-Athīr [1867:376]; al-Mawlā-bik *et al.* [1942:113] etc.).

The beginning of the "Day of al-Nafrawāt" is also not without interest here. It can be rendered as follows (for the full quotation see *Appendix B*): when on a "lean" year the Hawāzin had to bring their taxes to the head of the Hawāzin chiefdom, the chief did not like the quantity and quality of the tax payment in kind brought by a certain old woman and rudely pushed her (al-Iṣfahānī 1955–1964:XI:77–78; Ibn al-Athīr 1867:413; Ibn 'Abdī-Rabbi-hi 1949–1965:V:135–137; al-Mawlā-bik *et al.* 1942:235–236 etc.).

A typical reaction to "royal" misbehaviour would be that some tough bedouins would go to such a chief and just kill him, which would provoke the revenge attempts on the part of the murdered chief's relatives, thus producing one more Arab "Day" which could last for years filled with series of violent actions on both sides (*e.g.* "the Day of Ḥujr" [al-Iṣfahānī 1955–1964:IX:81–103; Ibn al-Athīr 1867:373–382.; al-Mawlā-bik *et al.* 1942:112–123 etc.]; "the

<sup>4</sup> Incidentally, according to *Ayyām*, such an action once precipitated 40 year long violent hostilities, known by the name of the above-mentioned woman as "the Day (or War) of al-Basūs" (al-Iṣfahānī 1955–1964:V:29–55; Ibn al-Athīr 1867:384–397; Ibn 'Abdī-Rabbi-hi 1949–1965:V:213–250; Yāqūt 1410/1990:IV:418–419; al-Mawlā-bik *et al.* 1942:142–169 etc.), c.AD 490–530.

Day of al-Nafrawāt" [al-Iṣfahānī 1955–1964:XI:77–83; Ibn al-Athīr 1867:411–414; Ibn 'Abdi-Rabbi-hi 1949–1965:V:135–137; al-Mawlā-bik *et al.* 1942:235–241 etc.]; "the Day of Khazāz" in Yaqūt's edition [1410/1990:II:418–419]; or the biography of the famous pre-Islamic poet 'Amr b. al-Kalthūm [*e.g.* al-Iṣfahānī 1955–1964:XI:38–54] who himself took an active part in his tribe's struggle against the Lakhmid Kingdom which seems to have contributed significantly to the weakening and final dissolution of this political entity; on the struggle of Arab tribes against the Ghassanid kings see *e.g.* Negrja [1981:36–37]; see also *e.g.* al-Bayātī [1407/1987:232f.] etc.). In any case, at the end we normally find original chiefdoms or kingdoms disintegrated with free true tribes in their places.

### **The Arab adaptation to the 6<sup>th</sup> century AD socio-ecological crisis**

Actually, what was described at the end of the previous part may well be considered as an important component of this rather effective adaptation. This was simply that most socio-political systems of the Arabs (or, for the extreme methodological individualists, the Arabs themselves, anyhow, it could be well described in both ways) reacted rather adequately to the socio-ecological crisis by getting rid of the rigid supratribal political structures (*i.e.* all those kings, chiefs and their retainers) which started posing a real threat to their very survival. Indeed, it is rather difficult to imagine anything more nasty than the royal messengers coming to you in a "lean year" (which may well have been preceded by one or two similar years) and demanding from you to pay royal taxes when you yourself have nothing to eat and to feed your children.

However, the Arabs did not only destroy most of those rigid political supra-communal structures which were alienating the tribal sovereignty; they also developed their alternatives – soft structures not posing any threat to the sovereignty of tribes. Most noticeable of them seems to be the development of the system of sacred enclaves, regular pilgrimages to them and the regular pilgrim fairs (*mawāsim*) which accompanied those pilgrimages.

The result was the development of rather effective intersocietal networks, of which the best known is the Western Arabian religious-political area (the functioning and evolution of which, incidentally, left a noticeable trace on the history of the World System as a whole). It seems to have been formed as a result of the expansion of the zones of influence of the respective sanctuaries, their interweaving into one more or less integrated religious-political area.

This of course was primarily a religious area, yet it had evident political dimensions too. It was in the pilgrimage-fairs (*mawāsim*) at the above mentioned sanctuaries "that traditional tribal society established its manifold contacts, the exchange of the religious and cultural ideas, as well as the barter of products with only use-value. Furthermore, the various legal problems (armistice, debts, benefits, payment of blood-money, bailing out of prisoners, finding of clients, looking for disappeared persons, questions of heritage, etc.) of the participants were also settled there. This exchange of ideas and goods, as well as the spreading of legal customs and cults common to several tribes, that

is, regular social contact in general, played no negligible role in the extension of particular tribal consciousness" (Simon 1989:90; also see especially Wellhausen [1927:88–91]).

As a result we can observe the formation of a certain political area more or less correlating with the religious one, an area where certain norms of not only religious, but also political culture were shared, where the people would avoid killing travelers in *ashhur ḥurum*, the holy months (and would consider the same parts of the year as the holy months), where the representatives of various tribes would go to the same places to settle their conflicts, and would observe the same rules of political mediation etc.. The most remarkable fact is the almost complete absence of significant intertribal warfare in "the Area of the Four Sanctuaries" (Majannah, dhū-'l-Majāz, 'Ukāz and Mecca<sup>5</sup>) between the time of its final formation (*i.e.* *Ḥarb al-Fijār* in the last decade of the 6<sup>th</sup> century AD) and the start of the clashes with the Muslims. Actually at this time we can observe in the "Area of Four Sanctuaries"<sup>6</sup> cultural-political entity, which in the absence of any significant political centralization secured the existence of a huge cultural network within which a very intensive (and very productive) exchange of information, energy and matter took place.<sup>7</sup>

Incidentally, this type of cultural-political entities seems to be ignored (without any reasonable justification) by practically all the "classical" theories of social evolution (*e.g.* Claessen and Skalnik 1978; Claessen *et al.* 1985; Fried 1967; Hallpike 1986; Lenski 1987; Parsons 1977; Sanderson 1990; 1995; Service 1971 [1962]; Spier 1996) and does not seem to fit in all these essentially unilineal evolutionist schemes, especially in their most popular *band – tribe – chiefdom – state* version (with all its

<sup>5</sup> Of course, 'Arafah and Minā could be also added to this list, separately from Mecca; however, they could be also regarded as parts of the Meccan *Ḥaram*.

<sup>6</sup> In the early 7<sup>th</sup> century AD it covered not only Western Arabia, but also considerable parts of the other Arabian regions.

<sup>7</sup> Being polycentric (it is rather doubtful that Mecca could be considered as its only important center [see *e.g.* Crone 1987]) the Western Arabian area seems to have had a considerably heterogeneous structure including a few interweaving subsystems centered on the respective sanctuaries. The best known is the *ḥums* amphyctyony centered on the Meccan sanctuary (*e.g.* Ibn Hishām 1858–1960:I:126–129; al-Azraqī 1858:118–125,130; al-Ja'qūbī 1883:I:297–298; Ibn Ḥabīb 1942:178–181). Kister observed that the tribes belonging to this amphyctyony were mainly spread along the trade routs of Quraysh (Kister 1965:134), from which the conclusion was made that this was a kind of trading alliance cemented by the shared religious norms (Simon 1989:63–64). This might appear implausible taking into consideration the fact that the affiliation to *ḥums* was normally transmitted through the matriline (*e.g.* Ibn Hishām 1858–1960:I:127; al-Azraqī 1858:122), which is apparently not quite convenient for the spread of any religious norms through alliances. However, it should be taken into consideration that the Quraysh before Islam practiced extensively exogamic marriages, whereas most of these marriages were not fortuitous at all and aimed at establishing alliances with important tribes and clans (Dostal 1991). It could be also taken into consideration that "the Quraysh gave not their daughters in marriage unless on the condition that the children would become *ḥums*" (*e.g.* Kister 1965:136, citing an unpublished Ms by al-Jāhiz; see also al-Azraqī 1858:115). It is known of some Arab tribes and clans that they became *ḥums* just in this way (*e.g.* al-Azraqī 1858:123). Hence, taking into consideration the fact that the main interests of the Quraysh were focused along their trading routes, it is not so surprising to find the *ḥums* tribes just in those areas.

modifications). Indeed, all the Western Arabian polities of the early 7<sup>th</sup> century appear to have had a rather "primitive" socio-political structures (which seems to be valid even with respect to the Meccan community [see *e.g.* Dostal 1991]) and, according, to such schemes could be only classified as "autonomous communities", "tribes", at most as "chiefdoms" (though most Arabian "chiefdoms" seem to have disintegrated in the second half of the 6<sup>th</sup> century AD). However, they were parts of a much wider cultural-political entity whose overall level of social complexity may well be compared with the one of an average "early state"; though lacking the political centralization this entity fails to find its place in the above mentioned schemes (this appears to be true with respect to any processes of socio-cultural growth which are not accompanied by the growing political centralization, or especially going in hand with the political decentralization).

In general, the Arabs appear to have developed a rather effective adaptation to the 6<sup>th</sup> century socio-ecological crisis. The soft intersocietal networks they created even permitted them to assume a role of the guardians of the important World System links in the World System Southern area, a role which the Great Powers of the late 6<sup>th</sup> – early 7<sup>th</sup> century were already unable to perform.

In the late 1980s two monographs specifically dedicated to the subject of the Meccan trade were published (Crone 1987; Simon 1989). Crone questioned the usual point that the Meccan trade was extremely profitable and important, and that Mecca itself was the capital of a huge merchant empire. Indeed, the plausibility of the caravan trade rout between Southern Arabia and the Fertile Crescent which the Meccans were supposed to serve does not appear very high after the beginning of the CE; as is well-known in the 1<sup>st</sup> century BC – 1<sup>st</sup> century AD the main trading routes between South Arabia and the North were transferred to the sea (J. Ryckmans 1951:331; Bowen 1958:35; Irvine 1973:301; von Wissmann 1981:66; Robin 1982a:I:98; 1982b:17; 1984:212; Crone 1987:23–36; Audouin, Breton and Robin 1988:74; Bauer and Lundin 1994:105–106; etc.). After that the old Transarabian caravan "incense" rout definitely lost all its importance unable to compete with the much more effective sea way. Hence, it is rather difficult to imagine after that anything like a "Meccan commercial empire" thriving on just the Transarabian caravan trade. *Meccan Trade and Islam* by Robert Simon was published two years after Patricia Crone's *Meccan Trade and the Rise of Islam*. Actually, Simon's monograph is the English translation of his *A Mekkai Kereskedelem Kialakulasa es Jellege* originally published by "Akademiai Kiado" in Budapest in 1975. However, the impression is that Simon's monograph was actually written after Crone's book, as he managed to find the "golden middle" between the uncritical traditional accounts of the ancient and huge "Meccan commercial empire" (*e.g.* Lammens 1910; 1924; Watt 1953:3; 1964:1; Donner 1977 etc.) and the hypercritical position of Crone. Simon has shown that the reasonably (though by no means excessively) profitable Meccan Transarabian trad-

ing network existed, but it was a rather late phenomenon, having arisen in a more or less full-fledged form in the 90s of 6<sup>th</sup> and the very beginning of 7<sup>th</sup> cent. AD – *e.g.* the Meccan direct trade with Iraq only developed at the beginning of the 7<sup>th</sup> century; Simon *e.g.* cites (p. 70) the following impressive words pronounced by a rather famous contemporary of Muḥammad, Abū Sufyān b. Ḥarb (the father of the first Omayyad Caliph, Mu'āwiyah), during what seems to have been the Meccan trading expedition which only at the beginning of the 7<sup>th</sup> century established for the first time the direct commercial links between Mecca and Mesopotamia: *in-nā min maṣīri-nā la-'alā khaṭar<sup>in</sup> mā qudūmu-nā 'alā malik<sup>in</sup> jabbār<sup>in</sup> lam ya'dhan la-nā fī 'l-quḍūm<sup>i</sup> 'alay-hi wa-laysat bilādu-hu lan-nā bi-matjar<sup>in</sup>* ("We are indeed in danger on our present journey till we reach a powerful king who did not give us permission to visit him and his country is no trading place for us" [al-Iṣfahānī: 1955–1964:XIII:207]). Simon directly suggests that the formation of the full-fledged Meccan trading network became possible just because of the destruction of the main Arabian kingdoms which before that controlled the Transarabian trade (*e.g.* any Meccan control over the Arabian trade with Iraq was highly problematic before the destruction of the Lakhmid Kingdom which actually controlled this trade). Thus the formation of the Meccan commercial network could well be seen as a part of the Arab adaptation to the 6<sup>th</sup> century socio-ecological crisis.<sup>8</sup>

<sup>8</sup> However, Simon seems to have overlooked one important factor which appears to have enhanced significantly the viability of the Transarabian trade, seriously contributing to the success of the Meccan trading network at the beginning of the 7<sup>th</sup> century. This was the final subjugation of Yemen by the Persians at the very end of the 6<sup>th</sup> century. The sea trade with Yemen seems to have been extremely risky for the Greek merchants already in the last quarter of the 6<sup>th</sup> century taking into consideration the very unstable situation in Yemen at that time (the first Persian expedition, internal strife etc.). And, of course, one can hardly imagine any reasonable sea trade by the Greek merchants with Yemen after the final Persian occupation taking into consideration the immense Greek-Persian hostilities just at that time (Persian-Byzantine war of AD 602–627). These circumstances appear to have been precisely those which created a niche for the reasonably (though in no way extremely) profitable Meccan overland Transarabian trade (including the trade between Yemen and Syria). Demonstrating the absurdity of the traditional uncritical accounts of the Meccan (and in general, Arabian) trade Crone presents them in the following way: "They were a curious people in that they sailed to Africa and India, but transported their goods by caravan on reaching their native shores" (Crone 1987:9, with reference to Kennedy 1898:248f.; Rathjens 1962:115; Doe 1971:50). This refers to the pre-Meccan epoch of the Arabian trade, as nobody seems to insist on the probability of the extensive Meccan sea-borne trade. Yet this appears to be valid for the 6<sup>th</sup> century AD as well – anyhow, it would be strange to imagine that any merchandises could be first delivered by sea to Yemen and then transported to the North by land, rather than the Red Sea. However, after the final Persian occupation of Yemen and the beginning of the 25 year Persian-Byzantine war this really strange arrangement, perhaps for the first time after the beginning of the CE, became reasonable. Peters, the author of the most recent monograph on "Muhammad and the Origins of Islam" (Peters 1994), who occupies an intermediate place between Crone and Simon (whose monograph, although, does not appear to be known to him), maintains that "the Arab caravan cities like Petra... still bear eloquent testimony to the prosperity of its merchants in the form of capital investment in municipal buildings and monuments. Muḥammad's Mecca, on the other hand, boasted one unroofed stone building, the Ka'bah, amidst its mud-brick dwellings" (p. 72). Surprisingly Peters fails to recollect at this point (though he manages to do this a considerable bit later [p. 102, 138–141]) that there was at least one major "capital investment" of this kind in pre-Islamic Mecca. This "investment" is rather well-known and that is the "re-construction" of the Ka'bah in c.AD 603–605, a "reconstruction" which, incidentally, involved the pulling down of the all sanctuary walls and the construction of the new ones, twice as high (c.9 m) as the old ones, as well as the *roofing* of the building (apparently for the first time in its history); addi-

### Origins of Islam: socio-political context

Though some pre-Islamic Arabian tribes managed to find a rather effective adaptation to the crisis along the lines described in the previous part, this adaptation does not appear to have been quite perfect everywhere. After the destruction of the political structures of the Arabian kingdoms and chiefdoms not all the Arabian communities entirely succeeded in working out effective substitutes for them. They seem to have succeeded *e.g.* in the Meccan area (and that is why there was no sufficient space for Muḥammad's Prophetic activity there), but they do not seem to have been so successful already on the periphery of this area, say, in Yathrib, where a few tribes could not sort out their relations in the absence of any effective supertribal authority.

Such a problem was not new in Arabia. And at the end of the 5<sup>th</sup>, or beginning of the 6<sup>th</sup> century the answer was quite clear – to send messengers to some great Arabian King and to ask him to appoint a king over those tribes (see *Appendix A*; or *e.g.* Ibn Ḥabīb [1942:249]).

However, such a practice appears to have become unacceptable by the 7<sup>th</sup> century. The decades of fighting which led to the destruction of the most of the

tionally the walls were plastered and artistically painted from inside (Azraqī 1858:104–118; Ibn Hischām: 1858–1860:I:122–126 etc.). Actually, the old unroofed sanctuary building was pulled down and the new twice as high roofed one was built. After that "Muhammad's Mecca" (*contra* Peters) could boast at least one decent *roofed* "municipal" building. Note, that this was a capital investment in the most strict sense of this word (of course, if one at least partly believes the traditional Muslim accounts of the fact that the Meccans derived a considerable part of their wealth from the servicing of the pilgrims coming to the Ka'bah, and that their commercial links enjoyed special protection due to their special association with this apparently rather venerated Arabian sanctuary [*e.g.* Kister 1965]). Of course this only major pre-Islamic "capital investment" do not fit well the traditional portrayal of the fabulously rich Meccan commercial empire flourishing all the way through the 6<sup>th</sup> century AD since the time of Ḥāshim, but it fits entirely well Simon's reconstruction, according to which the effective Transarabian Meccan trading network was a relatively recent phenomenon with the Meccan community achieving a reasonable (but by no means fabulous) level of well-being just by the time of the "Reconstruction of the Ka'bah". Anyhow, the general impression is that the Meccan Transarabian commercial network formed in its full-fledged form just at the end of the 6<sup>th</sup> century – the beginning of the 7<sup>th</sup> century. Just during the first decades of Muḥammad's life the Meccans appear to have managed to finalize the formation of their commercial network and to make it work rather effectively (Muḥammad himself took his part in this, *e.g.* participating in the 590s in the 'Ukāz Battle [*e.g.* Ibn Hischām 1858–1960:I:118–119; Ibn Saad 1905:181–182; Ibn Ḥabīb 1942:210,211,218; etc.] of the War of Fijār "by which Mecca eliminated the last internal and external middlemen and obtained supremacy over the transit trade [in] the Arabian peninsula" (Simon 1989:159; see, however, a different interpretation of these events in Crone 1987:145–148). Just by the beginning of Muḥammad's Prophecy the Meccans seem to have finally and completely succeeded in finding their rather effective way out of the 6<sup>th</sup> century Arabian crisis, having sorted out all the major economic and political problems and achieved a rather reasonable (but by no means fabulous) level of well-being. Note that the *Qur'ān* itself portrays a rather affluent society where it could be rather difficult to understand why some other people have to kill their new-born babies when there are such lots of food all around (VI/140–141; 151; XVII/31; CVIII etc.). Hence, there is no surprise that the Meccan community (which has sorted out all the major problems and did not really need any radical structural changes, any new type of political authority) was not at all the best place where Muḥammad's Prophecy could be completely accepted, though it seems to have provided a good environment for the initial development of the prophecy (with its lack of the political centralization and a reasonable level of well-being, when a considerable proportion of Meccans could afford to spend lots of time on thinking about the things other than their daily bread, without being too much afraid of some state-sponsored persecutions).

Arabian kingdoms and chiefdoms seem to have also led to the elaboration of some definite "anti-royal" freedom-loving tribal ethos codified in the tribal historical traditions and poetry – see *e.g.* *al-mu'allaqah* of 'Amr b. Kulthūm [*e.g.* 1983:263–269; or al-Zawzanī 1972:163–187], or such lines as: *wa-laysa 'alay-nā qatlu-hum [al-mulūk] bi-muḥarram<sup>in</sup>* ("It is not forbidden to us to kill the kings!" – al-Ḍabbī 1964:211 N 42, the second half of *bayt* 20; a line with a similar sense see *e.g.* in the "Warning to Imru'-l-Qays" by 'Abīd b. al-Abraṣ [1983:164/ *bayt* 20]) etc. The reflections of this ethos seem to be present even in *al-Qur'ān* – see XXVII/34: *al-mulūk<sup>u</sup> idhā dakhalū qaryat<sup>an</sup> afsadū-hā wa-ja'alū a'izzat<sup>a</sup> ahli-hā adhillat<sup>an</sup> wa-ka-dhālika yaf' alūn* ("The kings, when they enter a town, they corrupt it; they make the most glorious of its folk the most base, they do it this way"). The second Caliph, 'Umar, would even say: *inna-hu la-yaqbuḥu bi-l-'arab an yamlik<sup>a</sup> ba'ḍu-hum ba'ḍ<sup>an</sup>* ("It is disgusting for the Arabs that some of them reigned over others" – al-Ṭabarī 1964:2012) – a striking contrast with the situation a century before when most Arabs were subject (in one, or another way) to the kings.

Anyway, at the beginning of the 7<sup>th</sup> century a tribe which would recognize themselves as subjects of some terrestrial supertribal political authority, a "king", risked to lose its honour. However, this seems not to be applicable to the authority of another type, the "celestial" one.

Note, *e.g.* the words of a famous Arab poet al-Ḥuṭay'ah said at the time of the Arab tribes' revolts after the death of the Prophet during the reign of the first Caliph, Abū-Bakr:

*aṭa'nā rasūl<sup>a</sup> 'llāh<sup>i</sup> idh kāna bayna-nā  
fa-yā la-'ibād<sup>i</sup> 'llāh<sup>i</sup> mā li-Abī Bakr  
a-yūriṭhu-hā Bakr<sup>an</sup> idhā māta ba'da-hu...*

"We obeyed the God's messenger, when he was among us.

We are the servants of the God, not the servants of Abū Bakr!

Will he leave us to Bakr<sup>9</sup> as inheritance?" (al-İṣfahānī 1955–1964:II:130).

Hence, the impression is that whereas for many Arab tribes becoming subjects of some terrestrial king was entirely unacceptable, was tantamount to an enormous loss of honour, the recognition of some "celestial" authority (naturally through its terrestrial representative) was more or less acceptable.

Another group of facts should be also taken into consideration here. The pre-Islamic Arabia knew rather well the figure of "prophet" (*kāhin* – see *e.g.* al-Mas'ūdī 1965:151–176; Ibn Khaldūn 1415/1995:96–98; Fahd 1966:91–104 etc.). Anyhow, an average Arab seems to have known quite well how a "prophet" looked like, what the prophetic trans was, etc. However, all the pre-7<sup>th</sup> century Arab prophets (*kahanah*) were the ones of the pagan deities. Hence,

<sup>9</sup> *Abū Bakr* literally means "the father of Bakr".

their authority was not the best possible one, as the recognition of their authority would mean the recognition of the authority of the respective pagan deity, whereas all the cults of such deities would be normally connected with a specific tribe, whose protector this deity was – hence, such a recognition would imply the recognition of the authority of the respective tribe as well (as is amply evidenced *e.g.* by the South Arabian epigraphy – see *e.g.* Beeston 1984a).

Hence, the best possible figure here would be rather some Monotheist prophet. However, the prophets of the established Monotheist Faiths would not be entirely suitable as well, as the recognition of their authority would imply the dependence on some extra-Arabian powers, or in the case of Judaism would put in an advantage position the Arab Jewish tribes.

At the meantime there seems to have been a more or less independent Monotheist Arabian ("Raḥmanist"/*al-Ḥanīfiyyah*) tradition.<sup>10</sup> However, its North Arabian adherents (*ḥunafā'*) do not appear to have given any prophets before the 7<sup>th</sup> century (see *e.g.* Piotrovskij [1984:20]). Yet, in the early 7<sup>th</sup> century both traditions (the Arabian tradition of prophecy and the Arabian Monotheist "Raḥmanist" tradition) seem to have merged, producing what Piotrovskij calls "the Arabian prophetic movement" (Piotrovskij 1984). It should be taken into consideration that in addition to Muḥammad there were at least 5 other Monotheist prophets (pseudo-prophets, of course, from the Moslem point of view) in Arabia at the time of Muḥammad. Beside one Judaic prophet in Yathrib (Ibn Ṣayyād – see *e.g.* Halperin [1976]) and a para-Christian prophetess, Sajāḥ (*e.g.* al-Ṭabarī 1964:1911–1916), 3 other (al-Musaylimah, al-Aswad and [rather hypothetically] Ṭulayḥah b. Khuwaylid) seem to have belonged to the Arabian "Raḥmanist" tradition (*e.g.* Bartol'd 1925; Piotrovskij 1984). Note (*e.g.* al-Ṭabarī 1964:1933,1937; Balādhūrī 1866:105–107) that both al-Musaylimah and al-Aswad called the God *al-Raḥmān* (just as was done by Muḥammad – see especially *al-Qur'ān* XVII/110: *qul ud'ū '{A}llāh<sup>a</sup> aw ud'ū 'l-Raḥmān<sup>a</sup> ayyan-mā tad'ū fa-la-hu 'l-asmā'<sup>u</sup> 'l-ḥusnā* "Say – invoke the God, or invoke Raḥmān, however you would call, He has the best names" – it has been even suggested that *bi-smi '{A}llāhi 'l-raḥmāni 'l-raḥīm* may well be translated as "In the name of the merciful God Raḥmān";<sup>11</sup> note that after *c.* AD 460–470 the God was also called *Raḥmān(ān)* by the authors of pre-Islamic Monotheist inscriptions of South Arabia (incidentally, most of them could not be identified for sure either as Jewish, or as Christian [*e.g.* Robin 1980; 1991:146–147; Beeston 1984a; 1984b; 1984c]).

<sup>10</sup> This hypothesis is still under attack (see *e.g.* Rippin 1991), however we do not think it has been either finally proved, or rejected, and can be still regarded as a working hypothesis (see especially Shahīd 1989:154–156,162–172,332–338; and Beeston 1984a; 1984b; 1984c; Rubin 1990; Peters 1994:117–128; Korotayev 1996b etc.)

<sup>11</sup> "Dans l'invocation *bi-{'i}smi '{A}llāh ar-raḥmān ar-raḥīm*, il est clair que *ar-Raḥmān* était à l'origine un nom propre et que les sens premier était: `au nom du dieu *ar-Raḥmān* le miséricordieux`" (Robin 1991:146).

By the moment our impression is that there were actually two relatively independent autochthonous monotheist traditions in pre-Islamic Arabia: *millat/dīn Ibrāhīm* (= *al-Hanīfiyyah*?) of North-West and West Arabia, and "Raḥmanism" of Yemen and al-Yamāmah. For the most recent (and best, up to our knowledge) collection of data on pre-Islamic Western Arabian *millat Ibrāhīm* see Peters 1994:118–128; see also *e.g.* Rubin 1990:85–112, as well as Ibn Hishām 1858–1860:I:143–149, 293, 311–312 etc.; Watt 1975:168–170; Beeston 1984c:151 etc. The Raḥmanist tradition which in the 6<sup>th</sup> century produced at least two autochthonous Monotheist prophets (or, naturally, pseudo-prophets from the Muslim point of view), al-Aswad in Yemen and al-Musaylimah in al-Yamāmah (cp. *e.g.* al-Ṭabarī 1964:1933, 1937; Balādhūrī 1866:105–107), seems to have originated somehow later<sup>12</sup> than the Northern Abrahamic tradition, apparently among the superficially judaicized population of these areas (*e.g.* Korotayev 1996b); the fact that the North-Western Abrahamic monotheist tradition was considerably more ancient than the Southern Raḥmanist one seems to be shown by the data supplied by Sozomen and Theodorite (see *e.g.* Shahīd 1989:154–156, 167–172, 332–338; cp. Robin 1991:146). The point that unlike *millat Ibrāhīm* the Raḥmanist tradition seems to have been virtually unknown in pre-Islamic Mecca appears to be evidenced by the well-known fact: when Muḥammad during his second Meccan period started using *al-Raḥmān* as the name of the God, it turned out that this name (unlike the notion of *Allāh*) was unknown to almost all the Meccans, as is shown *e.g.* by the following Qur'anic *āyah*: *idhā qīla la-hum*<sup>12</sup> *'sjudū li-'l-Raḥmān*<sup>12</sup> *qālū wa-mā 'l-Raḥmān*<sup>12</sup>... "If it is said to them: `Prostrate yourselves before al-Raḥmān`, they will say: `And what is al-Raḥmān?`..." (XXV/60; see also XIII/30; XXI/36). Indeed, Raḥmān as the name of the God is attested in the Northern Jewish texts (Sokoloff 1990:522), including the epigraphic ones, *e.g.* *l-šmh d-Rḥmnh* "in the name of Raḥmān" (MPAT-A22/10; see also MPAT-A 39/2f). However, the pervasive use of *RḤMN*<sup>n</sup> as the name of the God (in the Jewish, Christian and indefinite Monotheist texts), seems to be a peculiar phenomenon of the late 5<sup>th</sup> – early 6<sup>th</sup> century South Arabia; at this time here the God was named Raḥmān<sup>an</sup> in virtually all the texts mentioning the God's name (c.2 dozen cases) (Robin 1980:85–96), which stands in quite a sharp contrast with *e.g.* the Jewish Palestinian Aramaic epigraphic texts of the Byzantine period where the God is named *Rḥmnh* only twice (Sokoloff 1990:522), though the total number of these texts exceeds the number of the late 5<sup>th</sup> – early 6<sup>th</sup> century South Arabian texts. Within such a context any Monotheists "deviating" from the established Monotheist faiths were most likely to call the God just *Raḥmānān/al-Raḥmān*. Incidentally, these developments could not be without repercussions in Central Arabia (including al-Yamāmah) where the Yemenites exerted considerable influence just at this time through their Kindite vassals (*e.g.* Gajda 1996; Robin 1996), hence, the presence

<sup>12</sup> In any case, apparently not earlier than AD 460–470 when *RḤMN*<sup>n</sup> appeared as the main name of the God in the South Arabian Monotheist inscriptions (*e.g.* Robin 1980; 1991:146–147).

in al-Yamāmah of the independent Raḥmanist tradition which at the age of Muḥammad even produced a Raḥmanist prophet (or, naturally, pseudo-prophet from the Muslim point of view) appears here of no surprise – for more detail see *e.g.* Korotayev (1996b). Irrespective of what have been mentioned above, in this paper we denote as "Raḥmanist" all the prophets belonging to the Arabian autochthonous monotheist traditions for the present-day lack of any other more adequate term.

The Monotheist "Raḥmanist" prophets appear to have represented a supertribal authority just of the type many Arab tribes were looking for at this very time. Note, that all the "Raḥmanist" prophets achieved considerable political success in their areas (al-Musaylimah in al-Yamāmah [*e.g.* al-Ṭabarī 1964:1929f.], Ṭulayḥah in Central Arabia [*e.g.* al-Ṭabarī 1964:1885f.], al-Aswad in Yemen [*e.g.* al-Ṭabarī 1964:1851f.], though the political success of Sajāḥ in the Arabian extreme North-East [*e.g.* al-Ṭabarī 1964:1908f.] also appears relevant in this respect) – their success could not be compared with the one of Muḥammad, but their political success was considerable, however; and they seem to show, any way, that in the early 7<sup>th</sup> century Arabia such a success could be achieved by a "Raḥmanist" prophet rather than by a king.

In general, our impression is that the origins of Islam could be well considered as a rather logical outcome of the Arabian processes of adaptation to the 6<sup>th</sup> century socio-ecological crisis in the context of the developing autochthonous Arabian prophetic and monotheist traditions, *i.e.* this adaptation did not actually cause the formation of Islam, but rather created in many parts of the Peninsular a socio-political environment most suitable for the development of an autochthonous Arabian monotheist religion (spiritual preconditions of which already existed by the age of the crisis).

### **Some world system consequences: pilgrimage structures**

From what has been mentioned in the previous part it must be rather clear that to our mind the Arab adaptation to the 6<sup>th</sup> century AD crisis influenced the World System development mainly through one of its more or less logical outcomes, the formation of Islam.

Indeed, it seems possible to show that the Islamic civilization incorporated many of the important patterns, structures, values and attitudes elaborated by the Arabs during this adaptation.

One of the most obvious points here is the pilgrimage system of a typically Arabian type. Of course, the Arabian pilgrimage practices did not arise in the 6<sup>th</sup> century AD. They are much older being attested already in the first Arabian written documents of the beginning of the 1st millennium BC (*e.g.* in the earliest Sabaean epigraphy [YM 375 = YM 1064 = CIAS {1977} 95.41/r4]). However, it was in the 6<sup>th</sup> century AD when the most effective intersocietal communication network based largely on the enhanced pilgrimage

practices was elaborated in Western Arabia, the network which served as a rather potent substitute for the rigid supertribal political structures principally destroyed by the Arabs during their adaptation to the 6<sup>th</sup> century crisis.

Islam was embraced and spread by the people who grew up within the setting of the Western Arabian intersocietal network were the pilgrimage practices played an essential "structure-constituting" role. Of course, the pilgrimage (*al-ḥajj*) was prescribed by *al-Qur'ān*, but not all such prescriptions and prohibitions were applied by the Arabs to the same extent.<sup>13</sup> The pilgrimage prescription was applied quite consistently and effectively to a considerable extent because the necessity of the pilgrimage was self-evident for the Arabs.

For a specialist in pre-Islamic Arabia the proliferation of the Islamic civilization appears (to a considerable degree) as a spread (in a rather modified form) of many important ancient Arabian structures following some patterns which could be traced in Arabia for about 1500 years before Islam. Perhaps, a bit surprisingly some of these patterns look more like South (rather than North) Arabian.

The South Arabian religious-political areas were created firstly by the political expansion of respective South Arabian states which was accompanied by the expansion of the conquerors religion within the borders of the respective political entity, and the formation of the religious-political area, acquiring after that its own existence, relatively independent from the fate of its kingdom-creator (on evolution and functioning of an ancient South Arabian cultural-political area see *e.g.* Korotayev 1995; 1996a).

The Western Arabian religious-political area appears to have been mainly created by the proliferation of the religious authority of the respective sanctuaries (which could of course have some connection with the political activities of their guardians, however this political activity was entirely different from the mainly violent expansion of the South Arabian states).

The expansion of the religious authority of the sanctuaries led to the spread of the correlating political culture. Hence, in the process of the formation of the South Arabian religious political areas "the politics went in front of religion", whereas in Western Arabia the religion appears to have "gone in front of the politics".

Surprisingly, we can observe the South Arabian pattern with respect to the evolution of the religious-political area with the center in Western Arabia in the Islamic Age. This religious-political area is just what is usually called the "Islamic Civilization". Indeed, its evolution presents just the familiar South Arabian scheme of the development of a religious-political area: the political (mainly military) expansion creates an "empire" – the religion of conquerors spreads within this empire – after the disintegration of the empire religious-

<sup>13</sup> Note *e.g.* the prohibition of wine (a rather popular drink in pre-Islamic Arabia [*e.g.* Maraqtan 1993]) which was not applied quite fully as evidenced by the huge corpus of the Arab "wine poetry" (*khamriyyāt*).

political area remains and expands beyond its borders; the population of the area shares common religious norms and common norms of political culture; a very important role in the integration of the religious-political area is played by the pilgrimage to the central sanctuary.

Anyhow, the establishment of the Islamic Pilgrimage system had important consequences for the World System evolution.

It should be taken into consideration that the pre-Islamic West Arabian pilgrimage system (on the basis of which the Islamic one was formed) was very well adapted to serve as an integrating mechanism for an intersocietal communication network lacking the political unity. It might not be a mere coincidence that the Islamic one turned out to have rather similar properties. Of course, for the first 150 years of Islam the Moslem pilgrimage area was more or less identical with the territory controlled by the united Islamic polity. However, after the disintegration of the latter, this system turned out to work precisely as its pre-Islamic Arabian counterparts, serving as an important integrating mechanism for an intersocietal communication network not united politically.

Hence, one might suppose that one of the World System consequences of the Arab adaptation to the 6<sup>th</sup> century crisis was the formation of an important mechanism securing the integration of a huge intersocietal network covering some most important central areas of the World System (and many peripheral areas as well), a mechanism which secured the unity of some significant patterns, values and practices throughout all this territory, guaranteeing the annual meeting of the representatives of all the societies covered by the respective network in one place, the exchange of information between them, the constant reintegration of the network, etc.

### **Some world system consequences: tribal structures**

As has been already mentioned above Arabs elaborated a rather effective adaptation to the 6<sup>th</sup> century crisis to a considerable extent through the massive transformation of their state and chiefdom structures into the tribal ones. This could hardly be regarded as a "degeneration" because the newly elaborated tribal structures turned out to be able to serve the functional needs of rather complex stratified societies.

With the Islamic conquests these tribal structures and tribal ethos (*al-qabyalah*) appear to have proliferated through almost all of the territory of the new Islamic state.

Of course, it should be stressed that there is not so much of *al-qabyalah* in Islam itself. Yet it seems necessary to take into account the following moments.

To start with, within the Russian Islamic Studies the Islamic civilization was traditionally designated as the "Arab-Moslem" one (which naturally often

met strong objections on the part of our Moslem colleagues from the former Soviet Central Asia [*e.g.* Ahmadjonzoda 1988]).

However, we would stress that this designation is rather helpful in some respects. The fact is that this civilization (especially within the territory of the first Islamic Empire) seems to contain important Arab non-Islamic elements (and cannot be understood without taking them into account). And *al-qabyalah* appears to be one of them.

It is essential to mention that the Arabs were the dominant ethnos within the Islamic Empire at least till the Abbasid revolution in the middle of the 8th century AD; and the Arab culture as a whole (including its non-Islamic components, like *al-qabyalah*) acquired a rather high prestige and proliferated within the borders of the Empire.

The proliferation of the tribal structures and tribal ethos seems to have had both positive and negative consequences.

On the one hand, in the areas where most of the population acquired the tribal organization it often permitted the existence of complex systems of non-oppressed agriculturists (which is very difficult to find otherwise in the pre-industrial world). One of the most evident cases is the North-East Yemen Highlands of this millennium, where the tribal organization for most time effectively prevented the exploitation of most agriculturists (most plough agriculturists being armed honourable tribesmen), at the meantime securing the existence of an intense network of markets, towns, centers of learning etc. [see *e.g.* Dresch 1989].

Notwithstanding all the attractiveness of such systems some negative consequences of their proliferation should not be also overlooked. Looking rather attractive from inside they often looked entirely unattractive for their non-tribal neighbours, who often had to deal with rather destructive side-effects of their functioning. In general, the proliferation of the tribal structures seem to have played a rather important role in the inducing of the cyclical "Khaldunian" processes (for a model of such processes in addition to Ibn Khaldūn's *al-Muqaddimah* [*e.g.* Ibn Khaldūn 1958] itself see *e.g.* Gellner [1981:1–85]) which contributed significantly to the Middle Eastern "involution" in the 11–18<sup>th</sup> cent., and through this to the loss by the former central part of the World System of its central role.

## Appendix A

## The "inviting of the kings" in "pre-crisis" Arabia

## 1)

*Lammā tasāfahat Bakr ibn Wā'il wa-ghalaba-hum sufahā'u-hā ... ir-ta'ā ru'sā'u-hum fa-qālū inna sufahā'a-nā qad ghalabū 'alā amri-na fa-akala 'l-qawiyy<sup>u</sup> 'l-ḍa'īf<sup>a</sup>, wa-lā nastāṭī<sup>u</sup> taghyīr<sup>a</sup> dhālik, fa-narā an numallik<sup>a</sup> 'alay-nā malik<sup>an</sup> nu'tī-hi 'l-shāt<sup>a</sup> wa-'l-ba'īr<sup>a</sup> fa-ya'khudh<sup>u</sup> li-'l-ḍa'īf<sup>i</sup> mina 'l-qawiyy<sup>i</sup>, wa-yarudd<sup>u</sup> 'alā 'l-mazlūm<sup>i</sup> mi-na 'l-zālim<sup>i</sup>, wa-lā yumkin<sup>u</sup> an yakūn<sup>a</sup> min ba'd<sup>i</sup> qabā'ili-nā fa-ya'bā-hu 'l-ākharūn ... wa-lākin-nā na'tī Tubba'<sup>an</sup> fa-numalliku-hu 'alay-nā. Fa-ataw-hu fa-dhakarū la-hu amra-hum, fa-mallaka 'alay-him al-Ḥārith<sup>a</sup> 'bn<sup>a</sup> 'Amr Ākil al-Murār al-Kindī*

"When [the tribal confederation] Bakr b. Wā'il got corrupted and dominated by shameless people among it..., the leaders of them [*i.e.* of the confederation tribes] came to decision and said: `We are unable to change this; our opinion is to make king over us to whom we shall give (as a tax) sheep and camels, and he will protect the weak from the strong, and the oppressed from the oppressor; it is impossible that he will be from one of our tribes, as the other (tribes) will not accept him... Rather we shall come to the *tubba'* [the Himyarite king of Yemen], and make him a king over us`; so, they came to him and told him about their problem and he made al-Ḥārith b. 'Amr Ākil al-Murār al-Kindī king over them" (Ibn 'Abdi-Rabbi-hi 1949–1965:V:222; see also *e.g.* al-Iṣfahānī [1955–1964:XII:207]; Ibn al-Athīr [1867:374–375]).

## 2)

*Lammā tafāsadat<sup>i</sup> 'l-qabā'il<sup>u</sup> min Nizār atā-hu ashrafu-hum fa-qalū in-nā fī dīni-ka wa-naḥnu nakhāf<sup>a</sup> an natafānā fī-mā yaḥduth<sup>u</sup> bayna-nā, fa-wajjih ma'a-nā banī-ka yanzilūna fī-nā fa-yakuffūna ba'da-nā 'an ba'd<sup>i</sup> fa-farraqa wulda-hu fī qabā'il<sup>i</sup> 'l-'Arab fa-mallaka 'bna-hu Ḥujr<sup>an</sup> 'alā Banī Asad wa-Ghaṭafān, wa-'bna-hu Shuriḥbīl ... 'alā Bakr b. Wā'il ... wa-mallaka 'bna-hu Ma'adīkarib ... 'alā Banī Taghlib ... wa-mallaka 'bna-hu 'Abd<sup>a</sup> 'llāh 'alā 'Abd<sup>i</sup> 'l-Qays; wa-mallaka 'bna-hu Salamah 'alā Qays*

"When the tribes of the Nizār [confederation] got corrupted, their nobles came to him [*i.e.* to al-Ḥārith b. 'Amr, reigning in al-Ḥīrah at that moment] and said: `We are in your power (judgment) we are afraid that we shall annihilate each other because of what is happening between us; send with us your sons so that they will rule us – they will secure the order among us (lit.: hold some of us back from the others). So he distributed his offspring among the tribes of the Arabs: he made his son Ḥujr king over Banū Asad and Ghaṭafān, his son Shuriḥbīl ... – over Bakr b. Wā'il ..., his son

Ma'adīkarib ... – over Banū Taghlib ...; his son 'Abd Allāh – over 'Abdu-'l-Qays; his son Salamah – over Qays" (the beginning of "the Day of Ḥujr" – al-Iṣfahānī 1955–1964:IX:80–81; Ibn al-Athīr 1867:376; al-Mawlā-bik *et al.* 1942:112; see also the beginning of "the First Day of al-Kulāb" – al-Iṣfahānī 1955–1964:XII:207; Ibn al-Athīr 1867:406; Ibn 'Abdī-Rabbi-hi 1949–1965:V:223; al-Mawlā-bik *et al.* 1942:46; see also the beginning of "the Day of Khazāz" in the edition of Yāqūt [1410/1990:II:418–419]; al-Mawlā-bik *et al.* 1942:109–110).

## Appendix B

### End of Arabian chiefdoms

#### 1)

The end of the previous story ("the killing of the kings" taking place in the 530–40s, *i.e.* after the beginning of the Arabian socio-ecological crisis):

*Mallakat Banū 'Āmir Sharāḥīl ibn<sup>a</sup> 'l-Ḥārith wa-mallakat Banū Tamīm ... Muḥarriq<sup>an</sup> ibn<sup>a</sup> 'l-Ḥārith wa-mallakat Wā'il Shuriḥbīl ibn<sup>a</sup> 'l-Ḥārith ..., kāna malik<sup>a</sup> Banī Taghlib ... Salamat<sup>u</sup> 'bn<sup>u</sup> 'l-Ḥārith, wa-mallakat baqiyyat<sup>u</sup> Qays ... Ma'adīkarib ibn<sup>a</sup> 'l-Ḥārith ... [!!!] fa-qatalat Banū Asad Ḥujr<sup>an</sup> ... wa-nahaḍat Banū 'Āmir 'alā Sharāḥīl fa-qatalū-hu ... wa-qatalat Banū Tamīm Muḥarriq<sup>an</sup> ... wa-qatalat Wā'il Shuriḥbīl... [!!!]*

"Banū 'Āmir made Sharāḥīl the son of al-Ḥārith king [over them]; Banū Tamīm ... made Muḥarriq the son of al-Ḥārith king [over them]; Wā'il made Shuriḥbīl the son of al-Ḥārith king [over them] ...; Salamah the son of al-Ḥārith became king over Banū Taghlib ...; and the rest of Qays ... made Ma'adīkarib the son of al-Ḥārith king [over them]... *Then Banū Asad killed Ḥujr ...; Banū 'Āmir rose up against Sharāḥīl and killed him...; Banū Tamīm killed Muḥarriq ...; and Wā'il killed Shuriḥbīl...*" (the end of the introduction to "the Day of Khazāz" in Yāqūt's edition [1410/1990:II:418–419]).

#### 2)

### End of an Arabian chiefdom

*[Kānat] Hawāzin lā tarā Zuhayr b. Jazīmah illā rabb<sup>an</sup> wa-Hawāzin yawma-'idh<sup>in</sup> lā khayr<sup>a</sup> fī-hā... wa-inna-mā hum ri'ā'<sup>u</sup> 'l-shā'<sup>i</sup> fī 'l-jibāl... wa-kāna Zuhayr ya'shuru-hum... fa-ta'tī-hi Hawāzin bi-'l-itāwat<sup>i</sup> 'llatī kānat la-hu fī a'nāqi-him fa-ya'tūna-hu bi-'l-samn<sup>i</sup> wa-'l-aqiṭ<sup>i</sup> wa-'l-ghanam... atat-hu 'ajūz<sup>un</sup> min Hawāzin bi-samn<sup>in</sup> fī naḥy, wa-'tadharat ilay-hi wa-shakat<sup>i</sup> 'l-sinīna 'llatī tatāba'na 'alā 'l-nās fa-dhāqa-hu fa-lam yarḍa ṭa'ma-hu fa-da'a-hā bi-qaus<sup>in</sup> fī yadi-hi 'uṭul<sup>in</sup> fī ṣadri-hā fa-'stalqat li-ḥalāwat<sup>i</sup> 'l-qafā... fa-ghaḍabat min dhālika Hawāzin wa-ḥaḡadat 'alay-hi ilā mā kāna fī ṣadri-hā mina*

'l-ghayz<sup>i</sup> wa-'l-diman... wa-tadhāmarat 'Āmir b. Ṣa'ṣa'ah wa-ālā  
Khālīd b. Ja'far fa-qāl wa-'llah<sup>i</sup> la-aj'alanna dhirā'ayya warā'a 'un-  
uqi-hi ḥattā uqta<sup>a</sup> aw yuqta<sup>a</sup> ...

wa-qāla Khālīd b. Ja'far yamunn<sup>u</sup> 'alā Hawāzin bi-qatli-hi Zuhay-  
r<sup>an</sup> ...:

bal kayfa takfuru-nī Hawāzin ba'da-mā  
a'taqtu-hum fa-tawāladū aḥrār<sup>an</sup>

wa-qataltu rabba-hum Zuhayr<sup>an</sup> ba'da-mā  
jada'a 'l-unūf<sup>a</sup> wa-akthara 'l-awzārā

wa-ja'altu ḥazin<sup>a</sup> bilādi-him wa-jibāli-him  
arḍ<sup>an</sup> faḍā'<sup>an</sup> sahlāt<sup>an</sup> wa-'ishār<sup>an</sup>

"The Hawāzin [confederation] considered Zuhayr b. Jazīmah [their] lord. *That time they lived in poverty*,... they grazed [their] goats in the mountains... Zuhayr was taxing them with 'ushr [a 10% tax]... The Hawāzin people brought to him the tribute which he imposed on them, they brought to him melted butter, cheese, sheep... Once an old Hawāzin women brought him a skinful of melted butter, *apologized to him [for the modesty of her tribute], and complaint of the ["lean"] years which struck [her] people* (The emphasis is ours – A.K., V.K., D.P.). He tried the butter, did not like its taste and pushed her with a stringless bow which he held in his hand – she fell flat on her back... The Hawāzin got angry because of that, bore rancour against him; this added to spite and rancour which they nursed against him. And [the tribe] 'Āmir b. Ṣa'ṣa'ah [one of the Hawāzin tribes] began to call for war, and Khālīd b. Ja'far swore: I swear in the name of the God that my hands will reach his neck – either I shall die, or he will..." [Finally {not without lots of trouble} Khālīd and his fellow tribesmen manage to kill Zuhayr and destroy his chiefdom.] "...And Khālīd b. Ja'far said, boasting in front of the Hawāzin of killing Zuhayr...:

Well, how may the Hawāzin not recognize me now after  
I brought free life for them – they have been reborn as free people!

I have killed their tyrant Zuhayr after the time when  
He cut off [their] noses and increased [their] burdens,

I have transformed their land which was cramped and rugged  
Into an open plain full of camels!... " (al-Iṣfahānī 1955–1964:XI:77–83; see also Ibn al-Athīr 1867:411–414; Ibn 'Abdi-Rabbi-hi 1949–1965:V:135–137; al-Mawlā-bik *et al.* 1942:235–241 etc.).

## Appendix C

### Some environmental backgrounds of the origins of Islam

Lately historical research has been coming into more and more close contact with natural sciences. Systematic socio-natural study of civilizations is being carried on, often allowing us to develop considerably our ideas about the historical process. We don't think that research of this kind is always quite necessary, but we are sure that when we deal with such a problem as genesis of civilizations, the socio-natural approach is the most objective of all the feasible ones. To understand sufficiently factors and course of the social evolution we need to be aware as fully as possible of environmental conditions of the social development.

The latest Russian interdisciplinary socio-environmental research in general history of civilizations (Klimenko 1998), as well as of separate cultures, *e.g.* China (Kul'pin 1990) and Egypt (Proussakov 1996), has shown that crucial historical ages are in close connection with natural processes and sometimes also with catastrophic natural impacts. All this is utterly relevant for the genesis of the Islamic civilization, as its birth was preceded by a series of disastrous environmental phenomena both in the Mediterranean region and in the Near East, as well as in the rest of the world. We are going to discuss here those phenomena, and though this will be rather of geophysical than historical pattern, it bears a direct relation to the origin and early history of Islam, because the Arabian society could not fail to feel consequences of the socio-ecological crisis of the 6<sup>th</sup> century AD.

For those who deal with socio-natural problems, the 6<sup>th</sup> century AD is quite an outstanding epoch. First of all, the middle of the first millennium AD is characterized by a considerable global cooling which culminated probably in the second half of the 6<sup>th</sup> century (Klimenko 1997). At that time mean global temperatures were about 0.7–0.9° C lower than now, *i.e.* close to the temperature level corresponding to the so-called "Little Ice Age" (between the late 16<sup>th</sup> and late 19<sup>th</sup> centuries). Evidence of this cooling can be found in various parts of the world: due to glacier advances in the Alps, Himalaya/Karakorum, Scandinavia, North and South Americas, New Zealand (Röthlisberger 1986; Grove 1988); dendrochronological observations of tree-ring widths and densities (Briffa *et al.* 1990; Scuderi 1993), palynological reconstructions of climate based on fossil pollen residuals (Klimenko *et al.* 1996); marine microfauna data, received through the analysis of deep-sea cores (Juillet-Leclerc and Schrader 1987); and historical documentary sources (Henning 1904; Easton 1928).

Among those listed, there are two methods of past climates reconstruction which have the best temporal resolution – close to one year – namely, dendrochronological and historical. Let us have a look what these two methods tell us about the climate of the middle of the first millennium. Dendrochronological evidence shows that years 535, 536, 541 and 685 were the coolest, and the time span 542–561 was the coolest bidecadal period of the past 2,000 years (Scuderi 1993). It should be noted, however, that dendrochronological data provide reliable information concerning only a warm part of the year, covering typically April through September. For the information concerning a cold part of the year one should consult the results provided by historical climatology (see *e.g.* Easton 1928; Weikinn 1958; Chu Ko-chen 1973). Historical evidence show that there were several unusually cold winters in Europe and Byzantine in the 6<sup>th</sup> and early 7<sup>th</sup> centuries – in AD 508, 509 (possibly these two

dates refer to the same event), 524, 545, 548, 554, 559, 565, 566, 568 (possibly these three dates refer to the same event), 609, 620 and 642 (Easton 1928; Weikinn 1958; Borisenkov and Pasetsky 1988; Camuffo 1987); Chinese records also confirm that the 6<sup>th</sup> century was one of the coldest and driest in the first millennium AD (Chu Kochen 1973:252; Zhang Deer 1984:826; Fang and Liu 1992:162). Later from around the middle of the 7<sup>th</sup> century the number of reports about cold winters and droughts sharply decreases. Therefore, there is a lot of direct evidence that the 6<sup>th</sup> and early 7<sup>th</sup> centuries have witnessed a considerable global cooling which affected undoubtedly all parts of the globe including Middle East and adjacent regions.

To one of the most important regional manifestations of global climate change one can attribute the resumption of the intensive monsoon circulation. As was shown by Fairbridge (1986), between 1400 BC and AD 500 the catastrophic collapse of regular monsoonal circulation above the North-Western part of the Indian Ocean took place which was followed by a general desiccation of the savannas of North-Western India and semi-deserts of South Arabia. After AD 500 Indian Ocean monsoon recovered, although since that time it has never reached the intensity which was recorded in the early and middle Holocene. Nevertheless, one can assume that in the course of the 6–7<sup>th</sup> centuries AD there was a sudden increase of summer precipitation in South Arabia. It may well be this which contributed to the final destruction of the famous Mārib Dam through a catastrophic flood. There is also another piece of indirect evidence pointing to the reappearance of intensive monsoon rains – the latest in historical times increase of the Nile discharge up to the levels which were by 30–40% higher, than the modern ones (Fairbridge 1976:535).

One can assume that the northern part of the Arabian Desert has also become wetter in the middle of the first millennium AD. Palaeoreconstruction data show that, starting from about the late 6<sup>th</sup> century, the Dead Sea level, which was extremely low in the preceding two millennia (or more), experienced a rapid rise (Varushchenko *et al.* 1987:149).

On the other hand, basing on the data of palaeoreconstructions and contemporary instrumental data, one can assume that in the middle of the first millennium AD climate of the major part of the Arabian Peninsula (excluding its northwestern and southern portions discussed above) was drier than at present (for details see Klimenko [1998] and references herein).

Apart from massive climatic changes, the 6<sup>th</sup> and 7<sup>th</sup> centuries AD were also a period of large worldwide tectonic and volcanic activities. In the history of the Mediterranean region, we may compare it, perhaps, only with the tectonic catastrophe of the middle of the 2<sup>nd</sup> millennium BC, which was crowned with the greatest Santorini eruption in the Aegean Sea (Ninkovich and Heezen 1965; Watkins *et al.* 1978) that seems to have become fatal for the Minoan Civilization (Marinatos 1939; Galanopoulos 1960; Duginov and Strekalov 1997). To understand properly the nature of these phenomena it is important to note that both ecological disasters in question, which had the most substantial climatic effect among all the explosive eruptions of the second half of the Holocene (Borzenkova 1992:203; Stothers and Rampino 1983a:412, tab. 1), correlate closely with minimums of the Northern Hemisphere temperature curve for the past 4000 years (Klimenko 1997:400, fig. 1). This latest curve was recently obtained in the Moscow Energy Institute with taking into account the superposition of three major long-term climate cycles: 2400-yr, 1100-yr and 850-yr connected probably to solar and planetary periodicities (Klimenko 1997). This

means that the ecological crisis of the 6<sup>th</sup> century AD was not accidental, and it may be actually explained from the standpoint of global natural laws, which mould the appearance of the Earth.

The problem of a relationship between volcanism and solar cycles has been quite recently disputable (Stothers 1989:17371) because of the lack of data (Newhall and Self 1982:1235). But after extensive catalogues of the world volcanoes (Gushchenko 1979; Simkin *et al.* 1981) as well as of solar activity (Schove 1983) were published in the late 70s and the early 80s, it became possible to establish a correlation between peaks of volcanism and extremums of solar activity. Moreover, it turned out that eruptions tend to concentrate first of all near the times of solar minimums, though a few large eruptions may also occur close to the years of solar maximum (Stothers 1989:17378–17379). The latest research by Russian scientists has shown that the later part of the 6<sup>th</sup> century AD was characterized by decreasing solar activity (Mikushina *et al.* 1997:321, Fig. 5) after a strong peak around AD 532. It may be that this peak which overlaps with great minimum of the superposed climatic cycles has played its part in the development of the global tectonic and volcanic disaster of the 6<sup>th</sup> century.

The mechanism of solar-volcanic relationships may be described briefly as follows. According to one of the hypotheses, in the scale of thousand-year solar cycles increase in the solar activity is accompanied by melting of the polar ice caps and continental glaciers and, correspondingly, by the eustatic rise of the World Ocean level; as a result, the angular velocity of the Earth slows down; the centrifugal forces decrease; the globe becomes less elliptical. On the contrary, lowering of the solar radiation and growing of the ice caps result in increase of the angular velocity, and the Earth becomes more "flattened" along the terrestrial axis. Such a pulsation of the Globe along its axis triggers in the lithosphere the processes towards restoration of the gravitational equilibrium: the planet figure adjusts to a new rotational conditions. During such "adjustments" numerous earthquakes and volcanic eruptions take place on the Earth (Reznichenko and Reznichenko 1964:173–175). In addition to this, minor solar variations cause changes in atmospheric circulation, and these changes induce additional crustal stresses (Rampino *et al.* 1979:828; Stothers 1989:17378). Such is the geophysical model that may be offered for explanation of the tectonic phenomenon of the 6<sup>th</sup> century.

Nowadays the most reliable method of reconstruction of the Holocene volcanism is through the detection in ancient glaciers of volcanic, first of all sulphuric, acid which is stored in the ice layers as a result of deposition of acid aerosols shortly (from 2 [Zielinski *et al.* 1994:948] to 3–4 or even 5–6 years) after eruptions (Asaturov *et al.* 1986:181). Rich sources of this information for the Northern Hemisphere are the ice cores drilled in the Greenland ice sheet; these cores are distinct, well dated acidity records. Nowadays several cores are at researchers' disposal. Thus, the core from Camp Century, North-West Greenland, 1390 m long (Johnsen *et al.* 1970; Johnsen *et al.* 1972), and the core from Crete, central Greenland, 404 m long (Hammer 1977:483–486; Hammer *et al.* 1980) both cover 10,000 years, giving us a clear picture of the Holocene volcanic history. A peak of acidity in the second core corresponds to AD 553, but unfortunately there is a 500-year gap in the data of the two cores including the first half of the 6<sup>th</sup> century: AD 40 to 540 (Hammer *et al.* 1980:230, fig. 1, 231, tab. 1; Stothers and Rampino 1983a:411–412). One of the latest, the so-called GISP2 Greenland ice core, providing a record of volcanism since 7000

BC, because of drilling problems tells us almost nothing about the 6<sup>th</sup> century (Mayewski *et al.* 1993a; Zielinski *et al.* 1994:949, tab. 1). Antarctic cores are silent also, because they are not deep enough (Legrand and Delmas 1987; Delmas *et al.* 1992). The lack of information is supplemented either by special modern volcanological research (Kelly and Sear 1984) or by original sources (direct or indirect atmospheric observations) (Stothers and Rampino 1983a; Stothers and Rampino 1983b), which corroborate the statement of high world volcanic activity in this period. For example, the year AD 536 was marked by Vesuvio explosion (Simkin *et al.* 1981:112). Besides this, famous historical event of the "dry fog" and other atmospheric phenomena in Europe and Middle East in AD 536–537 (Stothers 1984) were caused by an unknown eruption twice as large as that of Tambora in AD 1815; some scientists believe it to be the explosion of Rabaul volcano, on the New Britain Island near New Guinea (Palais and Sigurdsson 1989:41–42), which took place 1450±60 radiocarbon years BP (Heming 1974:1258); according to another theory, it might have been a volcano eruption at the upper reaches of the Yukon river, Alaska (Macdonald 1975:141), preliminary dated to AD 540±10, of estimated global acid fall-out of 70 million tons (Hammer *et al.* 1980:235); besides, it is not unlikely that both these explosions could take place almost simultaneously. The information about large explosive volcanic activities between AD 533 and 537 is confirmed by data from the Dye 3 Greenland deep ice core (Herron 1982:3055). According to the recent Russian research (Brajtseva *et al.* 1997) another giant eruption took place in AD 606 from the Opala volcano in Kamchatka – this one was the most violent Kamchatka eruption during the past 1,500 years and could match the most powerful in modern history Tambora eruption (AD 1815) which had long-lasting atmospheric and climatic consequences.

Volcanic explosions inject into the troposphere and stratosphere great volumes of silicate dust and aerosol-forming sulphur gases; while the fine ash gravitationally settles down within few weeks or months, aerosols are spread globally with stratospheric winds and suspend in the stratosphere for several years altering the planet heat balance and, therefore, climate (Hansen *et al.* 1978; Kelly and Sear 1984:740; Rampino and Self 1982; Rampino and Self 1984). The effect on climate of this phenomenon is double. During the first few months after an eruption, when aerosol and ash particles are rather large, a warming of the Earth's surface takes place due to the absorption of reflected terrestrial radiation by these particles (Pollack *et al.* 1976). But "large" grains soon decrease or are washed down by rains, and the net effect of the aerosols injection into the stratosphere is cooling of the Earth's surface because of high reflectivity of sulphuric acid to solar radiation (Baldwin *et al.* 1976; Hansen *et al.* 1978:1066). It is known that the Krakatau explosion in AD 1883 caused a 20% reduction of the atmospheric transmissivity in the Northern Hemisphere (Hammer 1977:482). The aerosols distribution after large eruptions is of global or hemispheric scale (Hammer 1977:482; Stothers and Rampino 1983a:411; Zielinski *et al.* 1994:948) and, in addition, rather rapid (Hansen *et al.* 1978:1065); thus, for example, if the volcanic explosion of AD 536 mentioned above is that of Rabaul near New Guinea, it would take not more than 2 or 3 weeks for the stratospheric aerosols to reach the Mediterranean region; as for the territorial scale, consequences of this eruption were described by contemporary authors from Rome, Constantinople and Mesopotamia; for example, the latter wrote: "The Sun was dark and its darkness lasted for eighteen months; each day it shone for about four hours, and still this light was only a feeble shadow ... the fruit did not ripen and the wine tasted like sour grapes" (John of

Ephesus, quoted from: Stothers 1984; Stothers and Rampino 1983b); the winter of AD 536–537 in Europe and Middle East was extraordinarily severe, with heavy snowfalls in Mesopotamia (Stothers 1984; Stothers and Rampino 1983b:6362–6363). Decrease of zonal mean temperature is observed from 1–3 to 5–7 years after eruptions (Spirina 1975). Thus, the Tambora event in AD 1815 was followed by the Northern Hemisphere temperature decrease within 0.5–1.0° C for 2–3 years; AD 1816 is famous as the "year without summer" in the North-East of the USA and in the North-West of Europe (Stommel and Stommel 1979). Even more dangerous from this standpoint are the so-called clustered eruptions that may cause cooling from 10 to 100 years. Influence of volcanoes on climate is so considerable that the information about volcanic eruptions was even used as a basis for estimating possible climatic effect of a nuclear war in various nuclear winter models (Rampino and Stothers 1985). The fact is established that massive volcanic eruptions triggered initially the great Pleistocene ice sheets (Bray 1974; Bray 1976; Rampino and Self 1992; Zielinski *et al.* 1996). A prolong term of volcanism is considered to be an actual cause of the so-called Younger Dryas – the period of near-glacial conditions which began 12–13 thousand years BP and lasted for 1300±70 years (Alley *et al.* 1993; Mayewski *et al.* 1993b). As for the social history, it is of great importance that cooling of the Earth's surface in all the tropical and some of the subtropical latitudes (including the Arabian Peninsula) results in droughts (Borzenkova 1992:162–174); droughts lasting for several years can sometimes lead to significant social transformations. Besides, warming and cooling after explosive eruptions, being abrupt climatic shifts, may disbalance the biosphere and trigger endemic hotbeds of plague or other diseases (Bogolepov 1912:21); for example, cooling in tropical latitudes creates favourable living conditions for fleas – carriers of plague (Cavanaugh 1971).

The ancient historical sources do not mention definitely volcanic eruptions in Arabia proper, but according to modern natural studies the influence of volcanism upon it is beyond doubt: it is conditioned both by geological structure and geographical location of the Arabian Peninsula. On the one hand, the Red Sea and the Ocean coasts of Arabia is a part of the seismic East-African Rift System (Belousov *et al.* 1974); thus, Western and Southern Arabia is situated in a volcanic zone (Belousov *et al.* 1974:I:41; Koronovskij 1971; Macdonald 1975:327, fig. 14-1). On the other hand, Arabia could feel the force of tectonism and volcanism of the Mediterranean region and the rest of the world, *e.g.* the consequence of earthquakes and injections of volcanic aerosols into the atmosphere. It is also important to note that there is natural hotbed of plague in Arabia (Kozlov and Sultanov 1993:201–203) and that earthquakes and plague epidemics often coincide (Biraben 1976:16–17).

In the 6<sup>th</sup> century AD the Mediterranean region has been going through one of the heaviest tectonic disasters in its recent history. According to historical data (Gezer 1867), it began in AD 512 with Vesuvio eruption (see also Simkin *et al.* [1981:112]). In AD 526 there was a great earthquake in Syria, where 250 thousand people perished only in Antioch; it was followed by heavy earthquakes in Asia Minor and Europe. In Egypt in summer 547 the highest Nile flooded the Delta and prevented the sowing; as a result, the whole country suffered from famine. In 551 a new wave of earthquakes rolled from Constantinople to Alexandria. Earthquakes and volcanism were accompanied by inundations, droughts and widest spread of plague – the so-called Justinianos pandemia, AD 531–580, during which about 100 million people perished (Ostrovskij 1978:258). It is important that volcanic activity at the same time was characteristic also for the Arabian Peninsula proper: in the 6–7<sup>th</sup> centuries AD

there were eruptions of at least 5 volcanoes in Arabia according to the recent volcanological research (Simkin *et al.* 1981:112; Aprodov 1982:269–270; Gushchenko 1979:12–13).

Taking into consideration the mechanism of interaction of processes in atmosphere, hydrosphere and lithosphere, as well as after-effects of seismic disasters (droughts, plague pandemics etc.), we have certain grounds to consider the 6–7<sup>th</sup> centuries AD as one of the most ecologically crucial periods in the history of the Middle East including the Arabian Peninsula. The scale of the ecological catastrophe under consideration forces us to bear it in mind studying the early history of Islamic Arabia. We think that a socio-ecological rather than a purely social crisis in the 6<sup>th</sup> century AD caused the disintegration of most Arabian kingdoms and chiefdoms and, consequently, the development of some alternative cultural-political structures which provided the optimum environment for the development of the autochthonous Arabian monotheist religion.

As volcanologists say, "empirical studies concerning volcanic effects on climate tend to raise as many, if not more, questions than they answer" (Kelly and Sear 1984:742). But we think the more questions we have, the more interesting our further work will be. In this paper we tried to raise an important problem of socio-natural evolution in Arabia at the age of its transition to the Islamic civilization. We hope that this approach will demonstrate its value in future research.

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### References

- Ahmadjonzoda, A. (1988), O probleme tak nazyvaemoj musul'manskoj kul'tury. *Vzaimodejstvie i vzaimovlijanie tsivilizatsij i kul'tur na Vostoke*. Moskva, pp. 3–4.
- Alley, R. – Meese, D. – Shuman, C. – Gow, A. – Taylor, K. – Grootes, P. – White, J. – Ram, M. – Waddington, E. – Mayewski, P. – Zielinski, G. (1993), Abrupt Increase in Greenland Snow Accumulation at the End of the Younger Dryas Event. *Nature* 362, pp. 527–529.
- Aprodov, V. A. (1982), *Vulkany*. Moskva.
- Asaturov, M. L. – Budyko, M. I. – Vinnikov, K. Ja. – Grojsman, P. Ja. – Kabanov, A. S. – Karol', I. L. – Kolomeev, M. P. – Pivovarova, Z. I. – Rozanov, E. V. – Hmelevtsov, S. S. (1986), *Vulkany, stratosfernyj aërozol' i klimat Zemli*. Leningrad.
- Audouin, R. – Breton, J.-F. – Robin, C. (1988), Towns and Temples – the Emergence of South Arabian Civilization. *Yemen: 3000 Years of Art and Civilization in Arabia Felix*. Innsbruck – Frankfurt/Main, pp. 63–77.

- al-Azraqī, Muḥammad b. 'Abdallāh (1858), *Kitāb akhbār Makkah*. Leipzig.
- Balādhūrī, Aḥmad b. Yaḥyā (1866), *Futūḥ al-buldān*. Lugduni Batavorum [Leiden].
- Baldwin, B. – Pollack, J. – Summers, A. – Toon, O. – Sagan, C. – Van Camp, W. (1976), Stratospheric Aerosols and Climate Change. *Nature* 263, pp. 551–555.
- Bartol'd, V. V. (1925), Musejlma. *Izvestija Rossijskoj Akademii nauk. Serija VI* 19, pp. 483–512.
- Bauer, G. M. – Lundin, A. G. (1994), Juzhnaja Aravija v X veke do n.é. – VI veke n.é.: osnovnye étapj istorii. *Krasnomorskie zametki*. Vol. 1. Moskva, pp. 86–117.
- al-Bayātī, 'Ādil Jāsim (1407/1987), *Al-malāḥim al-'arabiyyah: Muqāranāt fī ḍaw' al-asāṭir wa-'l-malāḥim al-kawniyyah al-sumiriyyah wa-'l-sāmiyyah*. Bayrūt.
- Beeston, A. F. L. (1984a), The Religions of pre-Islamic Yemen. *L'Arabie du Sud: histoire et civilization*. 1. *Le peuple yéménite et ses racines*. (Islam d'hier et d'aujourd'hui, 21), Paris, pp. 259–269.
- Beeston, A. F. L. (1984b), Judaism and Christianity in pre-Islamic Yemen. *L'Arabie du Sud: histoire et civilization*. 1. *Le peuple yéménite et ses racines*. (Islam d'hier et d'aujourd'hui, 21), Paris, pp. 271–278.
- Beeston, A. F. L. (1984c), Himyarite Monotheism. *Studies in the History of Arabia*. II. *Pre-Islamic Arabia*. Riyad, pp. 149–154.
- Beljaev, E. A. (1966), *Araby, islam i arabskij halifat v rannee srednevekov'e*. Moskva.
- Belousov, V. V. – Gerasimovskij, V. I. – Gorjachev, A. V. – Dobrovol'skij, V. V. – Kapitsa, A. P. – Logachev, N. A. – Milanovskij, E. E. – Poljakov, A. I. – Rykunov, L. N. – Sedov, V. V. (1974), *Vostochno-Afrikanskaja riftovaja sistema*. T. 1–3. Moskva.
- Berzina, S. Ja. – Kubbel', L. E., eds. (1990), *Istorija Afriki v drevnih i srednevekovyh istochnikah. Hrestomatija*. Moskva.
- Biraben, J.-N. (1976), *Les hommes et la peste en France et dans les pays europeens et méditerranées*. T. 2. *Les hommes face à la peste*. Paris – La Haye.
- de Blois, F. 1990, The Date of the "Martyrs of Nagrān. *Arabian Archaeology and Epigraphy* 1, pp. 110–128.
- Bogolepov, M. A. (1912), *Kolebanija klimata i istoričeskaja zhizn' (golod i vojna)*. Moskva.
- Bol'shakov, O. G. (1989), *Istorija Halifata*. I. *Islam v Aravii (570–633)*. Moskva.
- Borisenkov, E. P. – Paset'skij, V. M. (1988), *Tysjacheletnjaja letopis' neobichajnyh javlenij prirody*. Moskva.
- Borzenkova, I. I. (1992), *Izmenenie klimata v kajnozoe*. S-Peterburg.
- Bowen, R. L. (1958), Ancient Trade Routes in South Arabia. *Archaeological Discoveries in South Arabia*. (Publications of the American Foundation for the Study of Man, II), Baltimore, pp. 35–42.
- Brajtseva, O. A. – Sulerzhitskij, L. D. – Ponomareva, V. V. – Melekestsev, I. V. (1997), Geohronologija krupnejshih éksplozivnyh izverzhenij Kamchatki v golotsene i ih otrazhenie v grenlandskom lednikovom shchite. *Doklady Akademii nauk* 352:4, pp. 516–518.
- Bray, J. (1974), Volcanism and Glaciation during the Past 40 Millennia. *Nature* 252, pp. 679–680.
- Bray, J. (1976), Volcanic Triggering of Glaciation. *Nature* 260, pp. 414–415.
- Briffa, K. R. – Bartholin, T. S. – Eckstein, D. – Jones, P. D. – Karlén, W. – Schweingruber, F. H. – Zetterberg, P. (1990), A 1,400-year Tree-Ring Record of Summer Temperatures in Fennoscandia. *Nature* 346, pp. 434–439.
- Camuffo, D. (1987), Freezing of the Venetian Lagoon since the 9th Century AD in Comparison to the Climate of Western Europe and England. *Climatic Change* 10:1, pp. 43–66.

- [Carpenter, E., ed.] (1869), *Martirium sancti Arethae et Sociorum in civitate Negran. Acta Sanctorum* 10, pp. 721–759.
- Cavanaugh, D. (1971), Specific Effect of Temperature upon Transmission of the Plague Bacillus by the Oriental Rat Flea *X. Cheopis*. *American Journal of Tropical Medicine and Hygiene* 20, pp. 264–274.
- Chu Ko-chen (1973), A Preliminary Study on the Climatic Fluctuations during the Last 5,000 Years in China. *Scientia Sinica* 16:2, pp. 226–256.
- CIAS (1977), *Corpus des inscriptions et antiquites Sud Arabes*. T.1. Louvain.
- Claessen, H. J. M. – Skalnik, P., eds. (1978), *The Early State*. The Hague – Paris – New York.
- Claessen, H. J. M. – van de Velde, P. – Smith, M. E., eds. (1985), *Development and Decline: The Evolution of Sociopolitical Organization*. South Hadley, MA.
- Crone, P. (1987), *Meccan Trade and the Rise of Islam*. Oxford.
- al-Ḍabbī, Mufaḍḍal ubn Muḥammad. (1964), *Al-Mufaḍḍaliyyāt*. (Dīwān al-'Arab. Majmū'āt min 'uyūn al-shi'r, 1), al-Qāhirah.
- Delmas, R. J. – Kirchner, S. – Palais, J. M. – Petit, J. R. (1992), 1000 Years of Explosive Volcanism Recorded at the South Pole. *Tellus (Series B)* 44:4, pp. 335–350.
- Doe, D. B. (1971), *Southern Arabia*. London.
- Donner, F. M. (1980), Mecca's Food Supplies and Muḥammad's Boycott. *Journal of the Economic and Social History of the Orient* 20, pp. 249–266.
- Dostal, W. (1991), Mecca before the Time of the Prophet – Attempt of an Anthropological Interpretation. *Der Islam* 68, pp. 193–231.
- Dresch, P. (1989), *Tribes, Government, and History in Yemen*. Oxford.
- Duginov, B. A. – Strekalov, S. S. (1997), Katastroficheskoe tsunami na poberezh'e ostrova Krit i v Egipte v XIV–XV vekah do nashej éry. *Bill' o pravah cheloveka i prirody*. Moskva, pp. 142–151.
- Easton, C. (1928), *Les Hivers dans L'Europe Occidentale*. Leiden.
- Fahd, T. (1966), *La divination arabe*. Leiden.
- Fairbridge, R. W. (1976), Effects of Holocene Climatic Change on Some Tropical Geomorphic Processes. *Quaternary Research* 6:5, pp. 529–556.
- Fairbridge, R. W. (1986), Monsoons and Paleomonsoons. *Episodes* 9:3, pp. 143–149.
- Fang, Jin-Qi – Liu, Guo (1992), Relationship between Climatic Change and Nomadic Southward Migrations in Eastern Asia during Historical Times. *Climatic Change* 22:2, pp. 151–169.
- Fil'shtinskij, I. M. (1977), *Arabskaja literatura v srednie veka*. Moskva.
- Fitzmyer, J. A. – Harrington, D. J. (1978), *A Manual of Palestinian Aramaic Texts*. Rome.
- Fried, M. H. (1967), *The Evolution of Political Society: An Essay in Political Anthropology*. New York.
- Gajda, I. (1996), Ḥujr b. 'Amr roi de Kinda et l'établissement de la domination ḥimyarite en Arabie centrale. *Proceedings of the Seminar for Arabian Studies* 26, pp. 65–73, pl. I.
- Galanopoulos, A. (1960), Tsunami Observed on the Coasts of Greece from Antiquity to Present Time. *Annali Geofisici* 13.
- Gellner, E. (1981), *Muslim Society*. Cambridge – New York, NY – Melbourne.
- Gezer, G. (1867), *Istorija poval'nyh boleznej*. S-Peterburg.
- Grjaznevich, P. A. (1994), *Istoriko-arheologicheskie pamjatniki drevnego i srednevekovogo Jemena. Polevye issledovanija 1970–1971 gg.* (Juzhnaja Aravija. Pamjatniki drevnej istorii i kul'tury, 2/1), S-Peterburg.
- Grove, J. M. (1988), *The Little Ice Age*. London – New York.
- Gushchenko, I. I. (1979), *Izverzhenija vulkanov mira (katalog)*. Moskva.

- Hallpike, C. R. (1986), *The Principles of Social Evolution*. Oxford.
- Halperin, D. J. (1976), The Ibn Şayyād Tradition and the Legend of al-Dajjāl. *Journal of the American Oriental Society* 96, pp. 129–141.
- Hammer, C. (1977), Past Volcanism Revealed by Greenland Ice Sheet Impurities. *Nature* 270, pp. 482–486.
- Hammer, C. – Clausen, H. – Dansgaard, W. (1980), Greenland Ice Sheet Evidence of Post-Glacial Volcanism and its Climatic Impact. *Nature* 288, pp. 230–235.
- Hansen, J. – Wang, W.-C. – Lacis, A. (1978), Mount Agung Eruption Provides Tests of a Global Climatic Perturbation. *Science* 199, pp. 1065–1068.
- Hennig, R. (1904), *Katalog bemerkenswerter Witterungsereignisse von den ältesten Zeiten bis zum Jahre 1800*. (Abhandlungen des Königlichen Preußischen Meteorologischen Instituts, 2/4). Berlin.
- Heming, R. (1974), Geology and Petrology of Rabaul Caldera, Papua New Guinea. *Geological Society of America Bulletin* 85, pp. 1253–1264.
- Herron, M. (1982), Impurity Sources of F(-), Cl(-), NO<sub>3</sub>(-) and SO<sub>4</sub>(2-) in Greenland and Antarctic Precipitation. *Journal of Geophysical Research* 87, C4, pp. 3052–3060.
- Hoftijzer, J. – Jongeling, K. (1995), *Dictionary of the North-West Semitic Inscriptions*. Leiden – New York – Köln.
- Ibn 'Abd Rabbi-hi, Aḥmad Muḥammad al-Andalusī (1949–1965), *Kitāb al-'iqd al-farīd*. 7 vols. Al-Qāhirah.
- Ibn al-Abraş, 'Abīd (1983), Indhār ilā Imru'-l-Qays. *Al-rawā'i' min al-adab al-'Arabiyy*. 1. *Al-'aşr al-Jāhiliyy*. Al-Qāhirah, pp. 162–165.
- Ibn al-Athīr, Abū-l-Ḥusayn 'Alī (1866), *Kitāb al-kāmil fī 'l-ta' rīkh. Al-juz' al-awwal*. Lugduni Batavorum [Leiden].
- Ibn Ḥabīb, Muḥammad (1942), *Kitāb al-muḥabbar*. Hyderabad al-Dakkan.
- Ibn Hischām, 'Abd al-Malik (1858–1860), *Das Leben Muḥammed's nach Muḥammed Ibn Ishāq*. 2 vols., Göttingen.
- Ibn Khaldūn, 'Abd al-Raḥmān ibn Muḥammad (1415/1995), *Muqaddimah*. Şaydā – Bayrūt.
- Ibn Khaldūn (1958), *The Muqaddimah*. London.
- Ibn Kulthūm, 'Amr (1983), Al-Mu'allaqah. *Al-rawā'i' min al-adab al-'Arabiyy*. 1. *Al-'aşr al-Jāhiliyy*. Al-Qāhirah, pp. 162–165.
- Ibn Saad (1905), *Biographien Muhammedes*. Bd. 1/1. Leiden.
- Irvine, A. K. (1973), The Arabs and the Ethiopians. *Peoples of the Old Testament Times*. Oxford, pp. 287–311.
- al-Işfahānī, Abū-l-Faraj (1955–1964), *Kitāb al-Aghānī*. Vol. I–XXV. Bayrūt.
- Al-Ja'qubī (al-Ya'qūbī), Aḥmad b. Abī Ya'qūb (1883), *Historia*. 2 vols., Leiden.
- Johnsen, S. – Dansgaard, W. – Clausen, H. – Langway C., Jr. (1970), Climatic Oscillations 1200–2000 AD. *Nature* 227, pp. 482–483.
- Johnsen, S. – Dansgaard, W. – Clausen, H. – Langway, C., Jr. (1972), Oxygen Isotope Profiles through the Antarctic and Greenland Ice Sheets. *Nature* 235, pp. 429–434.
- Juillet-Leclere, A. – Schrader, H. (1987), Variations of Upwelling Intensity Recorded in Varved Sediment from the Gulf de California during the Past 3,000 Years. *Nature* 329, pp. 146–148.
- Kelly, P., – Sear, C. (1984), Climatic Impact of Explosive Volcanic Eruptions. *Nature* 311, pp. 740–743.
- Kennedy, J. (1898), The Early Commerce of Babylon with India. *Journal of the Royal Asiatic Society*, pp. 241–273.
- Kister, M. J. (1965), Mecca and Tamīm (Aspects of Their Relations). *Journal of the Economic and Social History of the Orient* 8, pp. 117–163.

- Kister, M. J. (1986), Mecca and the Tribes of Arabia. *Studies in Islamic History and Civilization in honour of David Ayalon*. Jerusalem – Leiden, pp. 33–57.
- Kitchen K. A. (1994), *Documentation for Ancient Arabia*. Pt. 1. *Chronological Framework and Historical Sources*. Liverpool.
- Klimenko, V. V. (1998), Klimat i istorija v épohu pervyh vysokih kul'tur (3500–500 do h.é.). *Vostok* no. 4, pp. 5–24.
- Klimenko, V. V. – Klimanov, V. A. – Fedorov, M. V. (1996), Istorija srednej temperatury Severnogo polusharija za poslednie 11000 let. *Doklady Akademii nauk* 348:1, pp. 111–114.
- Klimenko, V. V. – Klimenko, A. V. – Andrejchenko, T. N. – Dovgaljuk, V. V. – Mikushina, O. V. – Tereshin, A. G. – Fedorov, M. V. (1997), *Énergija, priroda i klimat*. Moskva.
- Klimenko, V. V. (1997), O glavnih klimaticheskikh ritmah golotsena. *Doklady Akademii nauk* 357:3, pp. 399–402.
- Kobishchanov, Ju. M. (1980), *Severo-Vostochnaja Afrika v rannesrednevekovom mire (VI – seredina VII vv.)*. Moskva.
- Koronovskij, N. V. (1971), Molodoj vulkanizm Éfiopii i Jemena. *Vestnik Moskovskogo universiteta, ser. IV (geologija)* no. 3, pp. 52–53.
- Korotayev, A. V. (1995), *Ancient Yemen*. Oxford.
- Korotayev, A. V. (1996a), *Pre-Islamic Yemen*. Wiesbaden.
- Korotayev, A. V. (1996b), "Aramaeans" in a Late Sabaic Inscription. *ARAM* 8, pp. 293–298.
- Kozlov, M. P. – Sultanov, G. V. (1993), *Épidemicheskie projavlenija chumy v proshlom i nastojashchem*. Mahachkala.
- Kul'pin, É. S. (1990), *Chelovek i priroda v Kitae*. Moskva.
- Lammens, H. (1910), La république marchande de la Mecque vers l'an 600 de notre ère. *Bulletin de l'Institut Égyptien. 5th series* 4, pp. 23–54.
- Lammens, H. (1924), *La Mecque à la veille de l'hégire*. Beirut.
- Legrand, M. – Delmas, R. (1987), A 220-Year Continuous Record of Volcanic H<sub>2</sub>SO<sub>4</sub> in the Antarctic Ice Sheet. *Nature* 327, pp. 671–676.
- Lenski, G. (1987), *Human Societies: An Introduction to Macrosociology*. Fifth edition. New York.
- Lundin, A. G. (1961), Juzhnaja Aravija v VI veke. *Palestinskij Sbornik* 8, pp. 1–159.
- Macdonald, G. (1975), *Vulkany*. Moskva.
- Maraqten, M. (1993), Wine Drinking and Wine Prohibition in Arabia before Islam. *Proceedings of the Seminar for Arabian Studies* 23, pp. 95–115.
- Marinatos, S. (1939), The Volcanic Destruction of Minoan Crete. *Antiquity* 13, pp. 425–439.
- Al-Mas'ūdī, Abū-'l-Ḥasan 'Alī ibn al-Ḥusayn ibn 'Alī (1965), *Murūj al-dhahab wa-ma'ādin al-jawhar*. Vol. 2. Bayrūt.
- Mavljutov, R. R. (1974), K voprosu o proishozhdenii islama. *Ateizm i religija* 1, pp. 202–209.
- al-Mawlā-bik, Muḥammad Aḥmad Jād – al-Bijāwī, 'Alī Muḥammad – Ibrāhīm, Muḥammad Abū-'l-Faḍl (1942), *Ayyām al-'Arab fī 'l-Jāhiliyyah*. Al-Qāhirah.
- Mayewski, P. – Meeker, L. – Morrison, M. – Twickler, M. – Whitlow, S. – Ferland, K. – Meese, D. – Legrand, M. – Steffensen, J. (1993a), Greenland Ice Core "Signal" Characteristics: An Expanded View of Climate Change. *Journal of Geophysical Research* 98:D7, pp. 12839–12847.
- Mayewski, P. – Meeker, L. – Whitlow, S. – Twickler, M. – Morrison, M. – Alley, R. – Bloomfield, P. – Taylor, K. (1993b), The Atmosphere During the Younger Dryas. *Science* 261, pp. 195–197.

- Mikushina, O. V. – Klimenko, V. V. – Dovgalyuk, V. V. (1997), History and Forecast of Solar Activity. *Astronomical and Astrophysical Transactions* 12:4, pp. 315–326.
- Møberg, A., ed. (1924), *The Book of Himyarites*. Lund.
- MPAT – Fitzmyer and Harrington 1978.
- Müller, W. W. (1991), CIH 325: Die jüngste datierte sabäische Inschrift. *Recueil offert à Jacques Ryckmans*. (Publications de l'Institut Orientaliste de Louvain 39), Louvain-la-Neuve, pp. 117–131.
- Müller, W. W. – von Wissmann, H. (1991), Über die von einem Lavastrom bedrohten Tempel der Stadt Damhān, des heutigen al-Ḥuqqa, im antiken Gau Ma'dīn (Jemen). *Anzeiger der phil.-hist. Klasse der Österreichischen Akademie der Wissenschaften* 113, pp. 112–146.
- Negrja, L. V. (1981), *Obshchestvennyj stroj Severnoj i Tsentral'noj Aravii v V–VII vv.* Moskva.
- Newhall, C. – Self, S. (1982), The Volcanic Explosivity Index (VEI): An Estimate of Explosive Magnitude for Historical Volcanism. *Journal of Geophysical Research* 87:C2, pp. 1231–1238.
- Ninkovich, D. – Heezen, B. (1965), Santorini Tephra. *Submarine Geology and Geophysics*. London, pp. 413–452.
- Nöldeke, Th. (1879), *Geschichte der Perser und Araber zur Zeit der Sāsāniden, aus der arabischen Chronik des Ṭabarī*. Leiden.
- Nöldeke, Th. (1887), Die Ghassānischen Fürsten aus dem Hause Gafna's. *Abhandlungen der K. Akademie der Wissenschaften zu Berlin. Phil.-hist. Kl.*, pp. 3–60.
- Olinder, G. (1927), The Kings of Kinda of the Family of Ākil al-Murār. *Lunds Universitets Arsskrift N.F. Avd.* 1:23:6, pp. 1–118.
- Ostrovskij, G. D. (1978), Chuma. *Bol'shaja Sovetskaja Ėntsiklopedija*. T. 29. Moskva, p. 258.
- Palais, J. – Sigurdsson, H. (1989), Petrologic Evidence of Volatile Emissions from Major Historic and pre-Historic Volcanic Eruptions. *American Geophysical Union Geophysical Monograph* 52, pp. 31–53.
- Parsons, T. (1977), *The Evolution of Societies*. Englewood Cliffs, NJ.
- Peters, F. E. (1994), *Muhammad and the Origins of Islam*. Albany.
- Petrushevskij, I. P. (1966), *Islam v Irane v VII–XV vekah*. Leningrad.
- Pigulevskaja, N. V. (1964), *Araby u granits Vizantii i Irana v IV–VI vv.* Moskva – Leningrad.
- Piotrovskij, M. B. (1984), Prorocheskoe dvizhenie v Aravii VII v. *Islam. Religija, obshchestvo, gosudarstvo*. Moskva, pp. 19–27.
- Piotrovskij, M. B. (1985), *Juzhnaja Aravija v rannee srednevekov'e. Stanovlenie srednevekovogo obshchestva*. Moskva.
- Pirenne, J. – Tesfaye, G. (1982), Les deux inscriptions du negus Kaleb en Arabie du sud. *Journal of Ethiopian Studies* 15, pp. 105–122.
- Pollack, J. – Toon, O. – Sagan, C. – Summers, A. – Baldwin, B. – Van Camp, W. (1976), Volcanic Explosions and Climatic Change: A Theoretical Assessment. *Journal of Geophysical Research* 81, pp. 1071–1083.
- Proussakov, D. B. (1996), *Vzaimootnoshenie cheloveka i prirody v drevnem Egipte*. Moskva.
- Rampino, M. – Self, S. (1982), Historic Eruption of Tambora (1815) and Agung (1963). Their Stratospheric Aerosols and Climatic Impact. *Quaternary Research* 18, pp. 127–143.
- Rampino, M. – Self, S. (1984), Sulphur-Rich Volcanic Eruptions and Stratospheric Aerosols. *Nature* 310, pp. 677–679.
- Rampino, M. – Self, S. (1992), Volcanic Winter and Accelerated Glaciation Following

- the Toba Super-Eruption. *Nature* 359, pp. 50–52.
- Rampino, M. – Stothers, R. (1985), Climatic Effects of Volcanic Eruptions. *Nature* 313, p. 272.
- Rampino, M. – Self, S. – Fairbridge, R. (1979), Can Rapid Climatic Change Cause Volcanic Eruptions? *Science* 206, pp. 826–829.
- Rathjens, C. (1962), Die alten Welthandelstrassen und die Offenbarungsreligionen. *Oriens* 15, pp. 115–129.
- Reznichenko, T. D. – Reznichenko, S. D. (1964), O nekotoryh zakonomernostjakh v razvitii Zemli. *Zemlja vo Vselennoj*. Moskva, pp. 172–229.
- Rippin, A. (1991), RĤMNN and the Ĥanĭfs. *Islamic Studies Presented to Charles J. Adams*. Leiden, pp. 153–168.
- Robin, Ch. J. (1980), Judaisme et Christianisme en Arabie du Sud d'après les sources épigraphiques et archéologiques. *Proceedings of the Seminar for Arabian Studies* 10, pp. 85–96.
- Robin, Ch. J. (1982a), *Les hautes terres du Nord-Yémen avant l'Islam*. Istanbul, 2 vols.
- Robin, Ch. J. (1982b), Esquisse d'une histoire de l'organisation tribale en Arabie du Sud antique. *La péninsule Arabique d'aujourd'hui*. T. II. *Etudes par pays*. Paris, pp. 17–30.
- Robin, Ch. J. (1984), La civilisation de l'Arabie méridionale avant l'Islam. *L'Arabie du Sud: histoire et civilisation*. 1. *Le peuple yéménite et ses racines*. (Islam d'hier et d'aujourd'hui, 21), Paris, pp. 195–223.
- Robin, Ch. J. (1991), Du paganisme au monothéisme. *L'Arabie antique de Karib'ĭl à Mahomet. Nouvelles données sur l'histoire des Arabes grâce aux inscriptions*. (Revue du Monde Musulman et de la Méditerranée 61), Aix-en-Provence, pp. 139–155.
- Robin, Ch. J. (1996), Le royaume ĥujride, dit 'royaume de Kinda', entre Ĥimyar et Byzance. *Académie des inscriptions et belles-lettres. Compte rendus...*, pp. 665–714.
- Robin, Ch. J. – Beaucamp, J. – Briquel-Chatonnet, F. (1996), La persécution des Chrétiens de Najrān et la chronologie himyarite. *ARAM* 10.
- Röthlisberger, F. (1986), *10000 Jahre Gletschergeschichte der Erde*. Aarau.
- Rothstein, G. (1899), *Die Dynastie der Lahmidin in al-Hĭra*. Berlin.
- Rubin, U. (1990), Ĥanĭfiyyah and Ka'ba. An Inquiry into the Arabian pre-Islamic Background of the Dĭn Ibraĥĭm. *Jerusalem Studies in Arabic and Islam* 13, pp. 85–112.
- Ryckmans, J. (1951), *L'institution monarchique en Arabie Méridionale avant L'Islam (Ma'ĭn et Saba')*. (Bibliothèque du Muséon 28), Louvain.
- Sanderson, S. K. (1990), *Social Evolutionism. A Critical History*. Cambridge, MA – Oxford.
- Sanderson, S. K. (1995), *Social Transformations. A General Theory of Historical Development*. Oxford.
- Schove, D. J., ed. (1983), *Sunspot Cycles*. Stroudsburg, PN.
- Scuderi, L. A. (1993), A 2000-year Tree-Ring Record of Annual Temperatures in the Sierra Nevada Mountains. *Science* 259, pp. 1433–1436.
- Service, E. R. (1971), *Primitive Social Organization. An Evolutionary Perspective*. 2nd ed., New York.
- Shahĭd, 'I. (1971), *The Martyrs of Najrān. New Documents*. (Subsidia Hagiographica 49), Bruxelles.
- Shahĭd, 'I. (1989), *Byzantium and the Arabs in the Fifth Century*. Washington, D.C.
- Shahĭd, 'I. (1994), On the Chronology of the South Arabian Martyrdoms. *Arabian Archaeology and Epigraphy* 5, pp. 66–69.
- Shahĭd, I. (1995), *Byzantium and the Arabs in the Sixth Century*. Washington, D.C.
- Simkin, T. – Siebert, L. – McClelland, L. – Bridge, D. – Newhall, C. – Latter, J. (1981),

- Volcanoes of the World*. Stroudsburg, PN.
- Simon, R. (1989), *Meccan Trade and Islam. Problems of Origin and Structure*. Budapest.
- Smirnov, N. A. (1954), *Očerki izuchenija istorii islama v SSSR*. Moskva.
- Smith, S. (1954), Events in Arabia in the 6<sup>th</sup> Century A.D. *BSOS* 14, pp. 425–468.
- Sokoloff, M. (1990), *A Dictionary of Jewish Palestinian Aramaic of the Byzantine Period*. Jerusalem.
- Spier, F. (1996), *The Structure of the Big History: From the Big Bang until Today*. Amsterdam.
- Spirina, L. P. (1975), O dlitel'nosti i intensivnosti vozmushchajushchego vozdejstvija vulkanicheskikh izverzhenij na temperaturu severnogo polusharija. *Trudy Glavnoj geofizicheskoj observatorii* 330, pp. 126–130.
- Stommel, H. – Stommel, E. (1979), The Year Without a Summer. *Scientific American* 240, pp. 176–186.
- Stookey, R. W. (1978), *Yemen. The Politics of the Yemen Arab Republic*. Boulder, CO.
- Stothers, R. (1984), Mystery Cloud of AD 536. *Nature* 307, pp. 344–345.
- Stothers, R. (1989), Volcanic Eruptions and Solar Activity. *Journal of Geophysical Research* 94:B12, pp. 17371–17381.
- Stothers, R., – Rampino, M. (1983a), Historical Volcanism, European Dry Fogs, and Greenland Acid Precipitation, 1500 BC to AD 1500. *Science* 222, pp. 411–413.
- Stothers, R., – Rampino, M. (1983b), Volcanic Eruptions in the Mediterranean before AD 630 from Written and Archaeological Sources. *Journal of Geophysical Research* 88:B8, pp. 6357–6371.
- al-Ṭabarī (aṭ-Ṭabarī), Muḥammad b. Jarīr (1879–1901), *Annales quos scripsit Abū Dja'far Moḥammed ibn Djarīr aṭ-Ṭabarī*. Series I–III. Lugduni Batavorum [Leiden].
- al-Ṭabarī (aṭ-Ṭabarī), Muḥammad b. Jarīr (1964), *Annales quos scripsit Abū Dja'far Moḥammed ibn Djarīr aṭ-Ṭabarī*. Series I. Lugduni Batavorum [Leiden].
- Tolstov, S. P. (1932), Očerki pervonachalnogo islama. *Sovetskaja étnografija* no 2, pp. 24–82.
- Varushenko, S. I. – Varushenko, A. N. – Klige, R. K. (1987), *Izmenenie rezhima Kaspijskogo morja i besstochnyh vodoemov v paleovremeni*. Moskva.
- Vasil'ev, A., ed. (1907), Zhitie sv. Grigentija, episkopa Omiritskogo. *Vizantijskij vremennik* 14.
- Watkins, N. – Sparks, R. – Sigurdsson, H. – Huang, T. – Federman, A. – Carey, S. – Ninkovich, D. (1978), Volume and Extent of the Minoan Tephra from Santorini Volcano: New Evidence from Deep-Sea Cores. *Nature* 271, pp. 122–126.
- Watt, W. M. (1953), *Muhammad at Mecca*. Oxford.
- Watt, W. M. (1964), *Muhammad, Prophet and Statesman*. Oxford.
- Watt, W. M. (1975), Ḥanīf. *Encyclopédie de l'Islam*. T. III. Leyde, pp. 165–166.
- Weikinn, C. (1958), *Quellentexte zur Witterungschichte Europas von der Zeitwende bis zum Jahre 1850. Hydrographie*. Teil 1. Berlin.
- Wellhausen, J. (1897/1961), *Reste Arabischen Heidentums*. Berlin.
- von Wissmann, H. (1981), *Aravija. Materialy po istorii otkrytija*. Moskva.
- Yāqūt, Shihāb al-Dīn al-Ḥamawī al-Rūmī al-Baghdādī (1410/1990), *Mu'jam al-buldān*. 7 vols. Bayrūt.
- al-Zawzānī (1972), *Sharḥ al-mu'allaqāt al-sab'*. Bayrūt.
- Zhang Deer (1984), Synoptic-Climatic Studies of Dust Fall in China since Historic Times. *Scientia Sinica* (Series B) 27:8, pp. 825–836.
- Zhukov, E. M. (1974), Rol' religii v mirovoj istorii. *Ateizm i religija* 1, pp. 25–38.
- Zielinski, G. – Mayewski, P. – Meeker, L. – Whitlow, S. – Twickler, M. (1996), Potential Atmospheric Impact of the Toba Mega-Eruption (71000 Years Ago). *Geophysical*

*Research Letters* 23, pp. 837–840.

Zielinski, G. – Mayewski, P. – Meeker, L. – Whitlow, S. – Twickler, M. – Morrison, M. – Meese, D. – Gow, A. – Alley, R. (1994), Record of Volcanism Since 7000 BC from the GISP2 Greenland Ice Core and Implications for the Volcano-Climate System. *Science* 264, pp. 948–952.

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