Vestnik drevney istorii
81/3 (2021), 615–634

Вестник древней истории
81/3 (2021), 615–634

DOI: 10.31857/S032103910016265-4

ON THE CAMELS OF THE AORSI: DIOSCORIDES AND THE MEDICINE TRADE OF THE BOSPORAN KINGDOM

Part II. DIOSCORIDES ON THE BOSPORAN KINGDOM: BEAVERS, RHUBARB AND INDIAN TRADE

David Braund

University of Exeter, Exeter, UK

E-mail: d.c.braund@exeter.ac.uk

This paper discusses the brief comments of Dioscorides about the Black Sea region, especially on the goods traded there from the Volga region and northern India. Three particular medical materials are at issue. First, beavers and their testicles, which were a favourite theme of Roman culture and were strongly associated with the Pontic regions from the fifth century BC onwards. Second, wild rhubarb from the Volga region, which was important in ancient medicine and was traded via the Bosporan kingdom. Third, cardamom from the Himalayas, brought via Central Asia as far as the Bosporan kingdom. In economic terms, we glimpse a network of exchange and movement which stretched from northern India to the Volga region and westwards to the Bosporan kingdom in the later first century AD, when Dioscorides was writing. These were light, high-value goods, which were part of a wider set of merchandise – carried by way of the northern steppe above the main Caucasus range, on the camels of the Aorsi, who derived wealth and power from these goods, as Strabo earlier indicates. This route was evidently far more important than the much riskier route that might have been tried through the centre of the mountains and Iberia into Colchis. While there has been much consideration of the markets of the Colchian coast, we must also consider the profits made in the Bosporan kingdom from the medical materials and other light items that were traded there.

Keywords: Dioscorides, Sextius Niger, Pliny the Elder, Bosporan kingdom, beavers, castoreum, medical materials, India, Volga, rhubarb, rhaponticum, Aorsi, cardamom

Author. David Braund – Emeritus Professor of Black Sea and Mediterranean History, University of Exeter.

НА ВЕРБЛЮДАХ АОРСОВ: ДИОСКОРИД И ТОРГОВЛЯ ЛЕКАРСТВЕННЫМИ СРЕДСТВАМИ В БОСПОРСКОМ ЦАРСТВЕ

Часть II. ДИОСКОРИД О БОСПОРСКОМ ЦАРСТВЕ: БОБРЫ, РЕВЕНЬ И ИНДИЙСКАЯ ТОРГОВЛЯ

Д. Браунд

Университет Эксетера, Эксетер, Великобритания

E-mail: d.c.braund@exeter.ac.uk

В статье обсуждаются краткие сообщения Диоскорида о Причерноморском регионе, в особенности о товарах, попадавших туда из Поволжья и Северной Индии. Три лечебных средства находятся в центре внимания. Во-первых, это бобры и их яички – излюбленная тема римской литературы, ассоциировавшаяся с Понтийским регионом еще с V в. до н.э. Во-вторых, это ревень из Поволжья, который был важным препаратом античной медицины и приобретался через Боспорское царство. В-третьих, это кардамон из региона Гималаев, поступавший в Боспорское царство через Центральную Азию. С экономической точки зрения в конце I в. н.э., когда писал Диоскорид, мы можем наблюдать сеть обмена товарами, простиравшуюся от северной Индии до Поволжья и Боспорского царства. Эти легкие, но при этом дорогие предметы были частью более широкого набора товаров, перевозившихся на верблюдах через степи к северу от Кавказа аорсами, которым, согласно более раннему сообщению Страбона, эта торговля доставляла власть и богатство. Этот маршрут был, очевидно, гораздо более важным, чем более рискованный, хоть и возможный, путь через горы и Иберию в Колхиду. В то время как возможная прибыль от сбыта товаров на колхском побережье уже достаточно исследована, следует учесть и выгоду продажи медицинских и других легко транспортируемых товаров в Боспорском царстве.

Keywords: Диоскорид, Секстий Нигер, Плиний Старший, Боспорское царство, бобры, кастореум, лечебные вещества, Индия, Волга, ревень, рапонтикум, аорсы, кардамон

Dioscorides provides valuable information about medical substances that were traded in the Bosporan kingdom, and elsewhere around the region. By examining his short statements we can enhance significantly our understanding of trade in the region, especially in goods that were brought to the Bosporus from the Caspian region and further afield. If we date his work around AD80, as argued in Part I, his evidence is all the more interesting, because it offers rare insight into the continuity in economic activity in the region that seems to have accompanied the emergence of a major new political entity there, the Alans, who are first mentioned in classical texts in the reign of Nero, and who became a major factor on this frontier in the decades that followed him, when Dioscorides' work was probably published[1]. It should not be imagined that our author has much close knowledge of the region. We have seen that Heraclea Pontica might have drawn him there, but there is no word about Olbia and very little about the west or east coasts. His two mentions of the Bosporan kingdom are in that sense all the more notable, while his general references to Pontus are inevitably

[1] See in general Bosworth 1977, with further comment below.

ambiguous, as we have seen. In looking more closely at indications of Bosporan trade, in particular, we shall be concerned with an unusual set of materials, as was Dioscorides himself, which offer a substantial picture, when brought together: namely, beaver products (especially beaver-oil, *castoreum*), rhubarb, and cardamom.

BEAVERS: MYTH, TRADE, MEDICINE AND ABSURDITY

As we might expect from Dioscorides' stern remarks in the *Preface*, his apparent distaste for mythology embraced also a dislike of erroneous notions of other kinds. We may be sure that plant lore contained an abundance of notions which were inaccurate and potentially even dangerous. For example, his account of the mandrake, a magnet for such notions[2], is remarkable for its sobriety and restraint. The determined seriousness of Dioscorides immediately emerges from the merest glance at the various absurdities presented on medical materials in Pliny's *Natural History*, though not all there is nonsense of course[3]. The beaver is a good case in point, whether the much-vaunted Pontic beaver or its cousins in Italy and elsewhere[4]. In setting out its uses, Dioscorides takes the trouble to denounce the absurd notion that the beaver bites off its own testicles to escape the hunter (2. 24. 2):

> But the story that the animal when pursued tears off its testicles and throws them away is utter nonsense. For it is impossible for it to reach them, since they lie flat like the hog's. After cutting open the skin, you must remove the honey-like liquid with the membrane that surrounds it, and thus dry and store.
>
> (*Translation by L. Beck*)

Our author's fulmination here is very unusual in his work, though perhaps concordant with his concern for precision. Moreover, there was scant need for him to hold forth in this way, closing an account of beaver's parts which was as sober as usual in the work. The habits of the beaver were of no direct relevance to his theme, which was the purchase and use of the parts, under whatever circumstances they had been obtained. Two factors should be considered in explanation of his outburst here. First, there was a significant tradition in Roman culture about the (supposed) remarkable behaviour of hunted beavers in this regard, so that Dioscorides was addressing a topic which, however marginal to his theme, was at least familiar to his readers. This was not the abstruse detail that it might seem to be. Second, the whole subject of testicles was of course important to a medical man. Aside from beavers, Dioscorides mentions testicles no less than twenty times as medical material (including hippopotamus testicles, no doubt from Egypt) and as the medical problem to be treated, where testicular inflammation occurs with notable frequency. In that sense, testicles are a recurrent theme in the work and in Dioscorides' attention[5]. Moreover, the beaver is often treated in Roman culture as especially a Pontic

---

[2] Engstrom 1965.

[3] See further, Kitchell 2015, 125–151.

[4] There are only two kinds of beaver, the Eurasian and the North American: here the former is of course at issue throughout. See Kitchell 2014, 14–15.

[5] 1.103.3; 2.3 (hippopotamus); 2.104; 2.105.2; 2.158; 2.169.2; 3.40.1; 3.45.3; 3.59.2; 3.60.2; 3.63; 3.102,3; 4.68.4; 4.78.2; 4.96.2; 5.3.3; 5.109.4; 5.150; 5.153.3; 5.156.2. Further passages might be added, both for the beaver and for the use of testicles to describe other things.

creature[6]. The specialness of *castoreum* from Pontic beavers is well illustrated by Scribonius Largus, who often mentions the substance, but specifies the Pontic variety only once, when describing a mixture plastered on the empress Livia herself[7]. From another perspective, we should also bring to bear the particular concern with testicles in accounts of the Black Sea region and its environs. In general culture, we should include in particular the self-castration of Attis, which tends to be located around Bithynia, especially as the key point in the beaver-story is that beavers also castrate themselves. With that in mind, one might consider Attis himself to have been hunted – by Cybele and the beasts of prey that serve her[8]. In a medical context, Dioscorides will have been aware of the Hippocratic account of the Scythian lifestyle and climate, as well as the Enarees[9]. Of course, Dioscorides will also have had some knowledge of the botany of Scythia, though we have no reason to think that he went there, while his silence on Olbia and much more suggests that he probably did not (Diosc. 3. 5). The key topic of milk also recurs, for him as for the Hippocratics, but without explicit reference to Scythia[10].

For his long account of beavers, Pliny explicitly relies on the medical writings of Sextius Niger, though how much has been inserted by Pliny himself remains unclear (*NH* 32. 26–27):

> The might of Nature, too, is equally conspicuous in the animals which live upon dry land as well; the beaver, for instance, more generally known as "castor", and the testes of which are called in medicine "castorea". Sextius, a most careful enquirer into the nature and history of medicinal substances, assures us that it is not the truth that this animal, when on the point of being taken, bites off its testes: he informs us, also, that these substances are small, tightly knit, and attached to the back-bone, and that it is impossible to remove them without taking the animal's life. We learn from him that there is a mode of adulterating them by substituting the kidneys of the beaver, which are of considerable size, whereas the genuine testes are found to be extremely diminutive: in addition to which, he says that they must not be taken to be bladders, as they are two in number, a provision not to be found in any animal. Within these pouches, he says, there is a liquid found, which is preserved by being put in salt; the genuine castoreum being easily known from the false, by the fact of its being contained in two pouches, attached by a single ligament. The genuine article, he says, is sometimes fraudulently sophisticated by the admixture of gum and blood, or else hammoniacum: as the pouches, in fact, ought to be of the same colour as this last, covered with thin coats full of a liquid of the consistency of honey mixed with wax, possessed of a fetid smell, of a bitter, acrid taste, and friable to the touch.
>
> The most efficacious castoreum is that which comes from Pontus and Galatia, the next best being the produce of Africa. (*Translation by J. Bostock*)

Pliny had earlier, when less concerned with medicine, repeated the usual story of self-castration in the face of danger, which tends to confirm that Niger's contribution to Roman knowledge on this matter had some significance. That is important context for Dioscorides' own comments on the beaver's self-castration, because in his *Preface* he not

---

[6] E.g. Plin. *NH* 8. 109. They first appear in classical texts in regions north of the Black Sea: Hdt. 4. 108–109, where nothing is said of this supposed behaviour.

[7] Largus 175, which appeared under Claudius; on Livia here, see Baldwin 1992, 74–75.

[8] Attis' relevance is noted by Larmour 2005 (albeit marginal to the Pontus); further, Harrison 2004.

[9] See *Airs, waters, places*; cf. Hdt. 1. 105.

[10] On milk-products, where he omits mention of Scythia, see Diosc. 2. 71.

only complains in general terms about more recent authors, listing names, but also directs most of his fire specifically at Sextius Niger, "who is considered prominent among them" (2–3). It seems that Dioscorides regarded Niger as his principal rival, although the fact that he was active under Augustus would suggest that he was dead by the time Pliny wrote, let alone Dioscorides. Niger's work and reputation lived on. In attacking Niger, he offers detailed criticisms about Niger's comments on materials, which he takes to demonstrate his rival's reliance on book-learning (as opposed to autopsy), and his failure to grasp even that, while also making a broader complaint about organisation in the work of Niger and his associates. While Dioscorides does not carry his criticisms through to the main body of his work (Niger is nowhere mentioned after the *Preface*), there must be some sense in which the shadow of Niger hangs over it, and not only with regard to the materials which Dioscorides names in the *Preface*. In fact, some scholars have seen Niger as Dioscorides' source in parts of his account. It is therefore especially interesting to observe Dioscorides' curt dismissal of the tale of beaver self-castration. Pliny indicates that this had been rather a triumph for Niger. Dioscorides (exceptionally) departs from his usual ways to tackle the success of his rival, who also wrote in Greek[11]. In effect, he seeks to diminish Niger's achievement, by briefly dismissing the story as clear nonsense. If, as Pliny suggests, Niger's work on the beaver was famous in intellectual circles, it hardly matters that Dioscorides does not bring Niger into his text. Meanwhile, in mitigation of any such purpose on our author's part, we must also observe that other ancient authors are slow to show any belief in the absurd tale, so that Niger had, at most, confirmed the general view of the more sophisticated in his world, that (as Dioscorides says) the tale was indeed absurd.

Dioscorides' information on the use of the beaver is also relatively brief (when compared with all that Pliny sets out), and he diverges in some details from the account of his rival (at least, as reported by Pliny). One aspect of that divergence is of particular relevance to the present discussion: Dioscorides says nothing about provenance of the beaver, although elsewhere in his work he very often offers an opinion about the best source for medical materials. The omission in this case seems to imply that there is no significant difference between beavers' parts by reason of their origin, and in fact the same Eurasian beaver is the only species across all Europe and Asia. Instead he is concerned about the sharp practice of traders (who might also of course deceive on the geographical source of their goods). Very possibly, sharp practice was especially at issue in this case, where the consumer might well not know what to look for without specialist advice. For Sextius Niger (through Pliny) was also concerned to warn his readers against such deceit. By contrast with Dioscorides, however, Niger had evidently given a view about the best source of beavers' parts, for Pliny reports that the best come from Pontus and Galatia and the next best from Africa, oddly[12]. As usual, the term Pontus is unhelpful, since it may mean either the Black Sea region as a whole or some part of it (especially the specific portion of Asia Minor, on the southern coast of the Black Sea), or indeed both. Given the broad Pontic associations of the beaver, it is tempting to prefer the last of the three options. However, Dioscorides' omission is more important, especially as he

[11] See Scarborough 2008 on Niger and Dioscorides' criticisms.
[12] Kitchell 2014, 14 denies their existence there in antiquity.

clearly knew Asia Minor well enough, and, as we have seen, may well have visited Heraclea Pontica in the southwestern Black Sea as well as Italy. The Pontic association with beavers was strong (not least for Pliny himself)[13], which may well have been enough for Niger and Pliny. However, the well-travelled and critical Dioscorides will have realised that beavers were to be found in very many regions, and in the matter of their parts there was nothing to choose between beavers from different places. The beaver was not an exotic creature in Italy, where it lived until the sixteenth century, when hunting by man (its main predator by far) drove it to extinction there. Therefore, we should not imagine that the beaver was somehow alien to ancient Romans, nor yet the fruit of Roman imperialism overseas[14].

The story of the testicles was indeed nonsense. In fact, Dioscorides was more correct than he knew, for these items were not testicles at all. They are a pair of sacs, which contain the key medical material, *castoreum* or simply castor oil, whose use has continued across the centuries from antiquity. The female beaver has these castor sacs as well as the male. They use these, as well as further anal apparatus, to deposit large mounds of very smelly material, so that we probably have here the origin of the bizarre notion that they bite off and leave their testicles to effect their escape from hunters. The beaver is territorial and in that sense static and easily located, especially in view of its taste for lodge-building and dam-making. Those who came to kill beavers would certainly find plentiful remains of stinking scent in particular spots. No doubt the beaver's prodigious teeth, mentioned by Pliny, also assisted in the development of the notion that they bit off their own testicles. The fact that the sex organs of beavers are in fact internal will also have contributed. Of course, the deeper significance of the tale of beaver self-castration is what mattered to most in Roman culture, not biological realities or folklore: both Niger and Dioscorides are unusual in that regard, by virtue of their medical concerns, which (at least in Dioscorides' case) did not stretch to explicit rumination on ethics, despite his evident concern with philosophical thought and idiom on his soldier's journey through life.

The beaver offered a focus for a large and important set of issue in Roman thought. For, according to the story of self-castration, it made a choice: it abandoned its dearest possessions in order to save its life, which was dearer still. For that reason the beaver could be adduced as a parallel for the merchant at sea, who jettisons his cargo in rough seas so as to save his life (Iuv. 12. 29–49). The money-grubbing merchant loves his cargo rather as the beaver loves his testicles, but both choose to abandon their treasures for life itself. The merchant has made the right choice, but under special pressure, rather as the beaver. Yet, as Juvenal asks, "who else now, and in what part of the world does someone dare to put their life before money, and their well-being before property?"[15] The satirist's point is clear: proper priorities are revealed under life-and-death conditions, for merchant as for beaver, but mankind does not perceive them otherwise. The beaver's contribution to the satire is to bring the natural world to bear: his supposed practice shows where nature stands on proper priorities. At the same time, of course, the beaver

[13] *NH* 8. 109; cf. Sostratus of Alexandria (above) and Juvenal (below).

[14] Smith 2020, 24. The claims of Devecka 2013 are therefore groundless.

[15] Iuv. 12, 48–49: *sed quis nunc alius, qua mundi parte quis audet argento praeferre caput rebusque salutem?*

brings a likely element of humour to the moralising satire, both in its bathetic self and by the implied characterisation of the merchant's cargo as a set of (his) private parts[16]. Of course the satirist is not concerned with the reality of the beaver-story. He deploys it because it suits his purpose, combining ethics and laughter. If he had wanted reality, Niger and Pliny were available, quite apart from Dioscorides. However, the beaver was a means to a different end. As Larmour observes, through its story "the satirist is able to link the motifs of castration and impotence in a novel way with the dominant Roman moral discourse surrounding greed and the accumulation of material possessions"[17]. Indeed, Dioscorides, whose claim to a military life suggests his awareness of moral philosophy at Rome, may also have been attuned to the ways in which the beaver's self-castration could be deployed in moral discourse, as here in satire.

Long before Juvenal, other Roman authors had used the beaver-story for rhetorical purposes, involving humour and moralising. Cicero had used it in defence of Scaurus, seeking to bring absurdity to bear in defending his client against claims about his immoral conduct towards a married woman, allegedly left to her fate by her fleeing husband: "no doubt he abandoned his wife there and made his escape, like beavers who, they say, pay off their hunters with the part of their bodies for which they are mostly hunted" (*pro Scauro* 2. 7)[18]. While Cicero makes the most of the humour (whereby the wretched husband is made a self-castrating beaver), his note of caution about the truth of the story indicates significant doubts about the truth of the tale, well before Sextius Niger's scientific breakthrough. For the tale was surely outlandish enough to encourage scepticism and ridicule. We may also observe that this story seems to be a Roman creation, insofar as it is nowhere attested in Greek texts before the Roman period[19]. The Augustan author, Sostratus of Alexandria, therefore counts as an early Greek writer on the theme: we see him treating the beaver very much as a Scythian beast, and again a firm distancing from the tale of the beaver's testicles (Schol. on Nicander's *Theriaca* 565d)[20]:

Sostratus says in the *On the nature of animals* that this creature is amphibious, that is to say the beaver. And that it is found in the empty lands of Scythia, and has testicles which are flat like a goat's. It is said that, when hunted, it cuts off its own testicles, aware that it is being hunted for their sake.

---

[16] Devecka 2013, esp. 94 (corrected in part by Scarborough 2020) perceives humour, but stresses inversion here. As far as I understand his claims, inversion comes only through his introducing the idea that the merchant has stolen his cargo, which is not in Juvenal's text. Nor is imperialism at issue here, so much as the folly of greedy trade (cf. Juv. 14. 256–302): Smith 1989. On philosophical links, see Larmour 2005; cf. Gellar-Goad 2018, stressing Epicureanism. Juvenal's choice of *castor* here (the Greek name not the usual *fiber*) evokes castration, perhaps, but may also be a wry allusion to Castor, with Pollux the saviour of sailors in storms (see Phaedrus, *Appendix Perrotina* 30. 1–4 on the Greek word, god and beaver).

[17] Larmour 2005, 142.

[18] *Scilicet relicta illic uxore ipse fuga sibi consuluit, quem ad modum castores, ut aiunt, a venatoribus redimunt se ea parte corporis, propter quam maxime expetuntur.*

[19] Aristotle's comments on beavers, under various names, has nothing of the sort: on these passages, see Kitchell 2014, 14–15.

[20] Wellmann 1891; Zucker 2008, 754.

Accordingly, we have no strong reason to suppose that the poem of Phaedrus (as it is thought to be) on the beaver-story has been taken from an original Greek fable[21], while its author's decision to allow doubt about the story's literal truth (*fertur*, it is said) is no more remarkable than Cicero's note of caution had been. In their different ways both Cicero (in mocking a tale of lust) and Phaedrus (in using the beaver to illustrate proper priorities) use the beaver-story in contexts of moralising discourse, while both also help further to illustrate how Niger's discovery was more a confirmation than a revolution in Roman thinking about the realities of beavers and their behaviour.

Set in that context, Dioscorides' curt dismissal of the beaver-story may also be understood as a scientific contribution to the discourse of morality. For, while the beaver-story seemed to offer a splendid example from nature of the appropriate approach to treasures, it was simply untrue and so invalid as a moral exemplum of any kind. In fact, we must search hard for an expression of belief in it. The clearest and earliest is Pliny, well over a century after Cicero, and we have seen that even Pliny combines assertion with subsequent praise of Niger's discovery, which confirmed earlier doubts. We have seen too that his beaver was by no means a mythical beast, and there is no reason to suppose it exotic to Greeks or Romans. Quite apart from the beavers of ancient Italy, and neighbouring regions[22], there were also beavers enough around the Mediterranean, as Pliny indicates, as well as their Pontic populations. Varro even mentions the beavers of Latium (*LL* 5. 13). However, beaver-hunting seems not to have been a pursuit of the gentleman, since we hear little of it (outside the beaver-story). They tend to be hunted by night and are commonly trapped, for their meat and their fur[23] as well as their castor sacs. While a beaver would feed a family, it was hardly the meat of the prosperous, and fur was of limited interest. The quest for castor was hardly the concern of high society, even if it might be valued by specialists in medicine and perfumery, and ultimately prized in those forms. On that very theme, Lucretius draws attention to the irony in a lady's use of beaver-product (*castoreum*)[24].

Therefore, the beaver-story had enjoyed a currency beyond the constraints of literal truth long before Aelian presented his version of it in his *De natura animalium*. The story suited his general purpose very well, for it combined entertainment of his readers with a moral tale which anthropomorphised the animal[25]. We have seen the opportunities for

---

[21] Larmour 2005, 147 observes the concern with self-castration in Lucilius, though beavers are not mentioned in the extant fragments. There is no particular reason that Phaedrus, *Appendix Perrotina* 30 has been translated from Greek, as Devecka 2013, 91 contemplates; its early lines were clearly not.

[22] In northern Greece, we may note the modern town of Kastorias, famous for its furs.

[23] Even its fur might be used in Roman medicine: Plin. *NH* 17. 265; 32. 119 with Kitchell 2014, 15, who also observes evidence on beaver-fur cloaks and the like in the later Roman empire (as at Hdt. 4. 109 in greater Scythia).

[24] Lucr. 6. 794–796 (cf. Hdt. 4. 109):
castoreoque gravi mulier sopita recumbit,
et manibus nitidum teneris opus effluit ei,
tempore eo si odoratast quo menstrua solvit.

[25] On Aelian's work, see Smith 2014, esp. 41 on castration in general. Apuleius, his contemporary, used the beaver story in much the same way: *Met.* 1. 9. For the larger issue of animal-human interactions in ancient texts, see Fögen, Thomas 2017.

humour and moralising alike in earlier treatments of the beaver-story, and Aelian develops them still further (*NA* 6. 34):

The beaver lives both on land and in the water. By day it hides itself in rivers, but at night it wanders around on land, feeding itself with whatever it finds. Hunters pursue it avidly, and the beaver knows this, so when it feels itself in danger it will chew off its own testicles and drop them in the hunters' path, just as a wise man pursued by robbers will drop whatever treasures he is carrying in order to save his life. If it has done this once but is pursued all the same, then the beaver will stand up in the path and show the hunters that their chase is pointless, for hunters believe that a castrated beaver does not taste as good as one that is fully equipped, so to speak. Often, however, beavers will tuck away their privates and then pretend they have been castrated, tricking their pursuers and keeping their own treasures.

The beaver is credited with the knowledge that its story requires, as usual: it knows that hunters want its parts. The animal's knowledge was no doubt all the more plausible because of its ability to construct a home with timber it had cut down for itself, rather like a human. Aelian explicitly compares its abandonment of its treasures with the conduct of a wise man pursued by robbers, who leaves his goods for them in order to save his life. We have seen the key elements of this idea in earlier authors. However, Aelian extends the story by introducing the beaver who had already used this ploy, and must therefore show hunters that he does not have what they want. The intelligent beast is able also to deceive hunters into believing that he has already given up his parts. Aelian says that the beaver often does this: it was not only human traders who could deceive in the matter of beavers' parts. Moreover, the immorality of traders was not shared by the beaver, since, while traders were notoriously deceitful, the deceiving of robbers and the like was morally acceptable[26]. In exploring possible ramifications of the tired story, Aelian sought to improve its rationale in details which had escaped our other extant authors on the subject, and to re-invigorate it by doing so. For the hunter might wish to eat the beast in any case. To meet the point, therefore, and to explain how the lack of parts might somehow forestall consumption, Aelian invents (if he did not import it from elsewhere) a groundless belief among hunters that a beaver without parts was less tasty. His failure to address the same problem with regard to fur would tend to confirm that beaver-fur was not of great interest in imperial culture at this stage. Therefore, while the beaver story was familiar enough by Aelian's day, and unlikely to be taken literally by his readers, he made it contribute to his work by the familiar linkage to human morality and the unfamiliar, playful development of weaknesses inherent in the story as usually told.

Of course, these various versions of the beaver-story coexisted with the reality of the use of castoreum, and trade in the substance (in forms indicated by Dioscorides and Pliny), despite the fact that there was very little contact between the mercantile or medicinal realities and the beavers of literary men and moralists. Since Pliny's Niger cites Pontic beavers first, and since the written tradition is far more concerned with Pontic beavers than with any other locale for them, we can only infer that their parts were in fact traded around the Black Sea, and taken from there to Rome and elsewhere, though we must also be clear that beavers were widespread around the Roman world at large.

[26] On tricky traders, see Davidson 1993; on the ethics of deceiving robbers, see e.g. Braund 1993. For from the beaver's viewpoint what else were these hunters?

Archaeology is not well suited to the discovery of such delicate organic materials (especially in past times), but it can at least show us the consumption of beavers on the north coast of the Black Sea, thanks to the fundamental surveys of Tsalkin and Liberov, even if we remain unclear as to how these beavers were used: presumably their value was maximized, entailing the consumption of their meat, fur and of course their various parts, whose value is clear enough, not least from attempts to market misleading substitutes. These scholars report the archaeological discovery of beaver bones at various sites in the northern Black Sea, including Olbia[27]. However, such finds are rare. For those who brought goods from the interior to the coast had little interest in carrying whole beavers, which can be heavy[28]. Castor sacs (and indeed furs) were light and would have been gathered for shipment over any distance. Strabo does not specify them, understandably enough, in his outline of the substantial trade that took place at Tanais, but his general characterisation of exchange there would include beaver-parts[29]. For he perceives this trade as exchange between two systems, whereby the products of Scythian nature and pastoralism were exchanged for those of Greek and Roman culture, the manufactured goods that pastoralists might desire. In broad terms, Strabo's sense of these exchanges fits well enough with our inferences from the limited evidence, and such trade was no doubt replicated in large part across the region.

WILD RHUBARB OF THE DON AND VOLGA

Inevitably, perhaps, the more specialised goods traded at places like Tanais found little or no place in the literary record, and often they are unlikely to be detected by archaeology either. That is why Dioscorides is so important. He offers some invaluable detail, which not only extends our knowledge of goods traded, but more importantly contributes greatly to our understanding of the sources of Bosporan wealth and Bosporan significance in the ancient world, while indicating the long-distance exchange that could be involved. Beyond beavers, he happens to mention a trade in rhubarb, with a view not to food of course[30], but to its use in medicine. He is concerned with the root of the rhubarb, a rhizome, not the edible stalks. For that reason our author groups it in the beginning of his third book with other medicinal roots. The root can be chewed or rubbed on the body, but more usually it was dried and administered as a drink, especially in treating digestive problems.

However, the practical identification of rhubarb species is very difficult, and Dioscorides' description gives only a general sense of it. The most striking feature of his account is the little he says about its source (3. 2):

---

[27] Further, Smirnov 1960, 120. Their uncommon presence in the Greek cities and more frequent finds in the wooded steppe sites, probably attest the transport to the coast of the private parts and possibly fur, not the whole beaver, which can be heavy and will have been usually consumed locally. Cf. Hdt. 4. 109 on use of fur in the interior, and so the killing of the animal there.

[28] See Kitchell 2014, 14. Herodotus says nothing of beavers at Olbia, but holds forth on them in the interior.

[29] Strab. 11. 2. 3, where he makes it clear that his list is not complete. He is clear too that traders from the more southerly cities of the Bosporan kingdom came to Tanais for this exchange.

[30] Rhubarb has never been part of the "Mediterranean diet", as indicated by its omission from Dalby 2003.

Rha (rhubarb), but some call it *rheon*[31]. It grows in the lands beyond the Bosporus from where it is brought[32].

By "the lands beyond" he means the Don-Volga region, above and to the east of the Bosporan kingdom[33]. It is hardly a coincidence that the river Volga was named Rha (Rhubarb) by the Greeks of the Roman empire, as first attested in Ptolemy's *Geography* of the second century AD, in which it is a key landmark[34]. The obvious inference seems to be right: rhubarb was found growing by the river. Two centuries after Ptolemy, we happen to be told precisely that by Ammianus Marcellinus[35]. Later history can be misleading on these matters, for medicinal rhubarb was energetically sought later in Siberia and China, and some of this material was brought to the Volga region, en route to Moscow and St. Petersburg, where it commanded high prices[36]. However, this Far Eastern rhubarb seems not to have found its way into the Roman empire, at least not in sufficient quantities to disturb the Roman sense that rhubarb was sourced from the Don-Volga area[37]. Crucially, Dioscorides identifies only the Bosporan kingdom as its place of sale into his world, and refers (albeit vaguely) to the Don-Volga region as its source. This pharmacologist of Cilicia would surely have been aware of medicinal rhubarb crossing into the Roman empire at more southerly points, for example along the Euphrates. Similarly, Ammianus, who is usually thought to have his origins in Syria, possibly in Antioch on the Orontes, where he lived for many years. He also alludes to the Volga origins of this rhubarb[38]. Meanwhile, the reality of rhubarb growing on the Don and Volga has the authority of Linnaeus himself, in the sense that his collection showed examples gathered from both river-valleys. This was not the so-called Chinese rhubarb (*Rheum officinale*) with its powerful medical effects, but weaker local varieties of the plant, whose impact on the patient was less[39]. This "wild rhubarb" (*Rheum rhaponticum*) is now very much an endangered species, recorded only in a small area in Bulgaria, it seems: Linnaeus wrote that it lived in Thrace and Scythia, covering both areas[40]. We can make no assumptions about how this wild rhubarb was produced and gathered, though comparison with the

---

[31] = ῥῆον, the name preferred by Galen 12. 112 K. (*De simplicium medicamentorum temperamentis ac facultatibus*).

[32] ῥᾶ· οἱ δὲ ῥῆον καλοῦσι. γεννᾶται ἐν τοῖς ὑπὲρ Βόσπορον τόποις, ὅθεν καὶ κομίζεται. Dioscorides 3. 5 makes it clear that the "Pontic root" (*radix Pontica*, Celsus 5. 23. 3) is liquorice, not rhubarb, as sometimes claimed.

[33] On these rivers, see Dzhakson *et al.* 2007.

[34] There were few others available: see esp. Ptol. 5. 9. 12–13.

[35] Amm. Marc. 22. 8. 28: "Next to this (i.e. the river Don, ancient Tanais) is the river Ra, on whose brows a certain plant-root of the same name grows, appropriate for many uses in medical treatments" (*Huic Ra vicinus est amnis, in cuius superciliis quaedam vegetabilis eiusdem nominis gignitur radix, proficiens ad usus multiplices medelarum*). Ammianus' knowledge is striking in any event. See Nutton 1972 on Ammianus' medical interests.

[36] Further, Monahan 2013.

[37] Amigues 2016 has shown that plants might have arrived earlier than usually imagined, notably pepper.

[38] On his origins, see Barnes 1998, 60–61. Note his medical interests: Nutton 1972.

[39] Foust 1992, 109, with details of sub-species.

[40] On Linnaeus and the Bulgarian evidence, see Libert, Englund 1989. I am not wholly convinced that the species has died out in southern Russia.

case of Indian black pepper suggests that it may well have been gathered by foraging, not through horticulture[41].

There is also the testimony of the edict of Diocletian on maximum prices, which has been neglected in this regard[42]. The edict itself is an historical curiosity, an imperial attempt from the early fourth century AD to stop price-inflation by setting maximum prices for a wide range of goods. It achieved nothing, but was widely inscribed. Its contents include rhubarb, listed with other medicinal plants, including Chian terebinth (probably mastic oil) and aristolochia. Two specific details demand attention. First, the rhubarb is named in Latin as Raponticum (Greek, Rhapontikon). The name seems to combine its origins on the river R(h)a and its market on the Pontus. Secondly, we have its maximum price, as set by the emperor: the artificiality of that price allows only a limited sense of its market-price. A pound of this rhubarb (dried?) is priced at 50 denarii: that is, it cost much the same as four pounds of pork or three pounds of sardines, also listed in the edict. It carries the same price as aristolochia and Chian terebinth as well as other medicinal plants listed. Apparently, this rhubarb was expensive enough in the Roman empire of the day, but by no means as expensive as often reported in later centuries of Chinese rhubarb, though we may also wonder whether the blanket-pricing of medicinal plant-products in the edict might illustrate some of the shortcomings in this imperial attempt to curb price-inflation. It seems broadly plausible that the less-effective Don-Volga variety of antiquity was less expensive than the later Chinese rhubarb, whose transportation (and chain of trade) was also much more extended, while rhubarb tends to degrade easily, even when dried[43]. The importance of rhubarb export from the Bosporan kingdom is hard to estimate, but the kingdom's apparent monopoly of the product is likely to have kept prices high.

CARDAMOM FROM INDIA

We also know another medicinal plant-product which was purchased in the Bosporan kingdom: it came there from much further afield. For Dioscorides tells us also of high-quality cardamom that could be acquired there (1. 6. 1):

The best cardamom is that brought from Commagene and Armenia and the Bosporan kingdom. It grows both in India and in Arabia[44].

As with rhubarb root, the pods of cardamom were small, light and easily transported, by land as well as by waterways. In recommending cardamom from northern markets, Dioscorides seems to prefer the black cardamom that was produced in the Himalayas, and is sometimes therefore called Nepal cardamom. Presumably less green cardamom

[41] De Romanis 2015, whose essay raises a series of possibilities about the role of this rhubarb in the local economy, for which we have no direct evidence. The silphium gathered in Libya may also be compared.

[42] See Lauffer 1971, ch. 36, 126.

[43] As Foust 1992, 4 observes, with little concern for the ancient evidence and non-Chinese varieties.

[44] καρδάμωμον ἄριστον τὸ ἐκ τῆς Κομμαγηνῆς καὶ Ἀρμενίας καὶ Βοσπόρου κομιζόμενον· γεννᾶται δὲ καὶ ἐν Ἰνδίᾳ καὶ Ἀραβίᾳ. On cardamom in Greek, see Dalby 2003, 74, correcting Miller 1969.

came that way, since much of it was produced in southern India and associated locations, from which it was more easily shipped into the Greek world via the Red Sea. It is not hard to appreciate the rationale whereby cardamom and the like was brought from the more northerly inland regions of the Indian subcontinent, across Central Asia to Commagene, Armenia or the Bosporan Kingdom.

In this way, Dioscorides illustrates how the Black Sea was linked into the great network of overland transport and exchange which brought goods in all directions across these great spaces. Further, Schneider has drawn valuable attention to Neronian satire (in many ways a precursor to the satire of Juvenal on trade, above) on the foolishness of greedy traders receiving these goods in the empire[45], rushing to bring them from the Black Sea (zander, beaver-oil, pitch-resins). As we can now understand, these goods are elided with goods more familiar as merchandise of the far south and east (ebony, frankincense, and silk). This is an imagined trade, like that of Juvenal's Catullus: the trader rushes to north and to south, eager to be first to seize the pepper from the still-thirsty camel as it arrives, wherever that may be. The merchant's folly is greed, for riches, not consumption (the folly of his customers). We should be clear that pepper was not only a condiment for food, but also an important part of medical material, so that Dioscorides has a lot to say about it[46]. There may also be a sense in which pepper is mentioned not only for itself, but also as an umbrella term for all such items, including cardamom and the rest.

The route from India to the Bosporan Kingdom was a long one, and was no doubt not so much a route as a fragmented network of exchanges[47]. It was especially appropriate for goods which started life to the north (notably the wild rhubarb) and in the northern and eastern interior of Asia and the Indian subcontinent, where sea-transport westwards was a relatively awkward option. Possibly some goods were vulnerable to damage in the damp conditions of sea travel, so that carriage by land might seem preferable. It is worth noting that it was in the north-eastern part of the subcontinent that a principal (and probably the earliest) pepper of the Mediterranean and Black Sea worlds had its origins: this was "long pepper" (*P. longum*), by contrast with the black pepper (*P. nigrum*) of the Malabar coast[48]. Indeed, we should observe Pliny's mention of writers who associated pepper trees with the sunny slopes of the Caucasus, which might suggest trade in pepper in the Caucasian regions, or at least ancient belief in such trade: we hear of ancient geographical perspectives that made the Caucasus and Himalayas into a single range[49]. While Central Asian routes have been considered extensively, Strabo's explicit and convincing testimony about the last part of the route to the Bosporus has largely been neglected in studies of trade movements.

---

[45] Schneider 2017 on Persius 5. 134–136; cf. 55. On camels of the north, see further below.

[46] Especially, Diosc. 2. 159, but it recurs through his work. See, in general, Ravindran 2006.

[47] Graf 2018 has explored these issues thoroughly, albeit in contributing to a collection of papers on the Roman imperial economy which ignores the Black Sea.

[48] See Dalby 2003, 254: long pepper was already used in Greece by c. 400 BC. See Parker 2008, 152 on products traded from the Himalayas.

[49] Plin. *NH* 12. 26. After Alexander, there was a tendency to link the Himalayas and the Caucasus: see in general Stoneman 2019.

For Strabo sketches the locations of peoples he identifies as the Aorsi (whom he divides into Upper and Lower) and the Siraci. He introduces them in the context of their links to the Bosporan kingdom, and more specifically their massive military contribution (in cavalry) to the forces of Pharnaces II, son of Mithridates Eupator. These connections were still important in the first century AD, as events of Claudius' Bosporan campaign showed. Accepting failure in that war for the Bosporan throne, Mithridates (usually numbered as Mithridates VIII) went to the king of the Aorsi, whom Tacitus names as Eunones[50], who arranged his surrender to Rome on terms which were far from unattractive: Mithridates lived on until Nero's death, among the elite of Rome, which helps to explain the space that Tacitus allots to his story[51]. While Tacitus stresses Eunones' alliance with Rome against Mithridates, we should observe his good relations with the Bosporans, not only the defeated Mithridates but also his victorious brother, Cotys. For what Tacitus presents as an alliance with Rome might also be interpreted as Eunones' military support of one Bosporan brother against the other. A very fragmentary inscription, apparently cut in the mid-first century AD, indicates the potential extent of regional Greek (Bosporan?) diplomatic dealings with the Aorsi[52].

Meanwhile, Strabo, taken together with Dioscorides' evidence on cardamom in particular, gives us insight into the economic aspect of the relationship between the Bosporus and the Aorsi, whose prosperity (especially in the case of the Upper Aorsi, it seems) Strabo traces to the trade from India and Babylon (11. 5. 8):

> ...One may almost say that the Aorsi ruled over most of the Caspian coast; and consequently they could import on camels the Indian and Babylonian merchandise, receiving it in their turn from the Armenians and the Medes[53], and also, owing to their wealth, could wear golden ornaments. Now the Aorsi live along the Tanaïs, but the Siraces live along the Achardeüs, which flows from the Caucasus and empties into Lake Maeotis.
>
> (*Translation by H. L. Jones*)

Camels are key, presumably the two-humped Bactrian variety, not the dromedaries of the south. However, we should observe that both dromedaries and Bactrian camels have been found in Hungary from the Roman period, where the former have been associated with troops from Syria and the latter with civilian trade and Sarmatian contexts[54]. In

---

[50] The name is attested in the Bosporan kingdom and the wider region to the east: *LGPN* IV s.v.; *SEG* 59. 1651.

[51] On Eunones, see Batty 2007, 436; Saprykin 2002. Mithridates was sufficiently integrated at Rome to be executed by Galba as a supporter of Nymphidius Sabinus' attempt to succeed Nero: Plut. *Galba* 15; cf. 13; Suet. *Nero* 24 probably refers to Eupator. He evidently knew the elder Pliny: *NH* 6. 17. Cf. Hekster 2010.

[52] Tac. *Ann*. 12. 15–21. The grand self-opinion of Eunones may be reflected in *SEG* 46. 947, honouring an envoy to the "greatest kings of Aorsia", perhaps a Bosporan inscription, though taken to be Olbian. As to the Siraci, see Marchenko 1996, esp. 114–116 seeking to reconcile archaeology with the remarks of Strabo and Tacitus. For the development of Graeco-Roman knowledge of the Aorsi and their neighbours, see Olbrycht 2001a, arguing that they had moved westwards from the Aral Sea area; cf. Olbrycht 2001b on long-distance trade.

[53] That is, from the south: Media Atropatene approximates to modern Azerbaidjan, on the western side of the Caspian.

[54] Daróczi-Szabó *et al*. 2014.

Dioscorides' list of the best sources for cardamom, his seemingly odd locations become cogent when we consider its journey by way of Central Asia. While many routes were possible, it was likely to be Nepal cardamom of northern Indian regions that found its way to Commagene, Armenia and the Bosporan kingdom, though some of the southern variety might have come too. While routes to northern Syria (Commagene) and Armenia are familiar, the way to the Bosporus is less well-known. It required passage by way of the Caspian, by sea or its coasts. On its northern edges, the Aorsi held dominion (as Strabo tells us, above) and used their camels to move Indian and other goods westwards. Their route lay across the plains north of the Caucasus mountains, where they held sway enough too. It was a long trek over the extensive steppe, sometimes called the North Caucasian Foreland, but it was secure for those who controlled the region[55]. The goods might find their Bosporan market first at Tanais or by the Kuban river, most obviously at Phanagoria. Accordingly, we should not be surprised that remains of camels were found at Phanagoria, and Tanais[56]. However, we should also be clear that camels also found their way to the Crimea, where we happen to have finds from Panticapaeum and inland at Ilurat, where they will have been especially useful[57].

Strabo is clear that the Aorsi amassed substantial wealth by moving these goods, which would suggest that their earlier prices had risen sharply by the time they reached the Bosporan market. Since Dioscorides identifies the Bosporan kingdom as the best source for rhubarb (which may have come by camel as well as by river from the Don-Volga network), and as one of the best sources for cardamom, we may reasonably speak of a Bosporan "spice-trade" in products which were in fact largely for medicinal use. Unfortunately, we have no way to measure the scale or value of that trade, but it brought great wealth to the Aorsi and may well, therefore, have also been significant for the Bosporans. Especially so, because, in addition to the Mediterranean demand indicated by Dioscorides, there was the regional market in the cities around the Black Sea. We should also consider the potential market among the Scythian elite and other non-Greek peoples of the region. Much later, Constantine Porphyrogenitus mentions the desire for "pepper" among the Pechenegs, who now occupied Scythia[58]. And already in Herodotus' account we see Scythians with access to much more than their famous cannabis[59], while Herodotus also displays clear knowledge of passage across the North Caucasian Foreland

[55] Mela 3. 33–50 (completed under Claudius) seems to reflect some knowledge of the region, as far as the Chineses (*Seres*). His concern with security by the Caspian and navigation on its waters are notable, while his belief in a narrow passage to an outer sea probably indicates the Volga. Cf. Graf 2018.

[56] Smirnov 1960, 106 (Phanagoria, Roman period); on Tanais, see Myagkova 2000, set in a larger context by Tomczyk 2016.

[57] Smirnov 1960, 101 (Roman Panticapaeum); 102 (Ilurat). Note also an example at Bol'shaya Znamenka, to the west of the Volga (Tambov region): Smirnov 1960, 104.

[58] *DAI* 6, together with textiles and more. Here pepper might mean a set of spices, while pepper itself was both medicine and condiment, as noted above.

[59] Hdt. 4. 71. Some of the specific substances listed must have come from the far south, by whatever route; cf. Diosc. 1. 4 and Asheri 2007 *ad loc*. (Corcella) for bibliography. Cf. Archibald 2007, 264 for inferences from containers found in Bosporan burials; also Stolba, Rogov 2012, 343, n. 1 on alabastra and their likely contents in burials at Panskoye in western Crimea.

and by way of the west coast of the Caspian[60]. In addition, we know that cardamom, for example, was in use by Greek doctors in the classical period (whether black, green or both)[61], so that we have to consider the possibility that some of it was shipped out of the Black Sea, from the Bosporan market, already at that stage. It may well be that Herodotus' reference to the use of beaver parts in treating problems of the womb is an allusion not simply to local practice, but to practice he knew among Greeks, using materials brought from the northern interior, whether or not by way of the Bosporan kingdom[62].

In addition to spices and the like, of course, archaeology has also produced a variety of small objects (lacquered boxes, jewellery, pearls, silk remnants, glassware) which somehow found their way to the northern Black Sea from the south and east[63]. We may reasonably suppose that some proportion of this also came into the region through the lands of the Aorsi, loaded on their camels. Meanwhile, if we are right that Dioscorides' work appeared around AD80, when the Alans had already been the major force of the North Caucasian Foreland for several decades, it would seem to follow that the pattern of trade between the Caspian and the Bosporus continued from the reign of Tiberius, when Strabo completed his work, whatever the new complexities across the region[64].

And finally, there is the vexed question of the supposed route from the Caspian through the Caucasus to Phasis on the eastern Black Sea coast. By and large, it seems agreed (though not universally) that this route was more an idea than a firm reality, not least because the surmountable difficulties of physical geography were made insurmountable by the insecurity that prevailed along most of the route. This was no way to transport high-value goods[65]. Dioscorides' remarks on cardamom have the extra importance that, while they envisage cardamom from Central Asia reaching the Bosporus, Armenia and Commagene, our author says nothing at all about its possible availability at Phasis or at some southern port of the region. While the explanation for his silence is a matter of inference, the simplest solution, in line with recent views on routes from the Caspian, is that cardamom and other such goods did not travel through the Caucasus, however enticing the potential of such a route might have seemed in antiquity. As Dioscorides' testimony indicates, we should not underestimate Roman awareness of the routes and river-systems of the Caucasian regions, especially after Corbulo's campaigning in Armenia. In AD77 Pliny not only mentions his conversations with Mithridates VIII, who had travelled among the Aorsi, but also the maps created by Corbulo, which he was bold (and unwise) enough to challenge.

Pliny also shows Roman thinking on the possibility of digging a canal to link the Don and Volga rivers, an idea worthy of Nero, which was, we are told, in the mind of the

---

[60] Hdt. 4. 12 (the route said to have been taken by the Scythians into Media).

[61] See Dalby 2003, 74 on Hippocrates, *Affections of Women* 34.

[62] Hdt. 4. 109; cf. Kitchell 2014, 14. On Herodotus and medicine, see Dawson, Harvey 1986; Thomas 2000.

[63] See further Treister 2018; cf. 1997; Mordvintseva, Myskov 2005; Schörle 2015. Also on silk, de la Vaissière 2012; Graf 2018; Braund, forthcoming; cf. Kvavadze, Chichinadze 2020 on silk from Georgia, esp. Pichvnari, whose journey to Colchis remains obscure.

[64] Note the "chief translator of Alans" attested in the Bosporus: *CIRB* 1035 (early third century AD).

[65] See in detail Braund, forthcoming.

emperor Claudius, presumably in the context of his Bosporan war. Apparently, Claudius traced the idea to Seleucus I Nicator, whose realm included much of Central Asia, so that it is hard to resist the suspicion that Seleucus' consideration of such a canal was substantially connected with the movement of goods[66]. It is in this context of renewed reflection on the Caspian regions and associated routes (including passage to the Bosporus) that we must understand the isolated inscription that was hacked in the rock by a centurion of Domitian, on the dry plain close below the hills of Gobustan, replete with prehistoric carvings of all kinds, by the western shore of the Caspian[67]. It is at least an interesting coincidence that Domitian was sufficiently interested in spices to establish warehouses for large stocks, the so-called Pepper Barns[68]. Conceivably the emperor's concern with such materials played some part, with broader questions of military strategy, in the centurion's mysterious mission to the western Caspian. A few decades later, Aelian provides a picture of the Caspii, as he calls a local agricultural and fishing population of the Caspian region, who may include inhabitants of the northern and western shores. He speaks of their many fine camels, which carry preserved fish to Iran, and the isinglass which they produce from the remains of these sturgeon, both a glue and another medical substance[69]. Since similar fish-products were available more locally in the Bosporan kingdom, we cannot be sure how much of these products were carried in that direction. Dioscorides, whose knowledge of the Black Sea region should not be overrated, regards fish glue as a Pontic product, presumably meaning the whole Euxine, and perhaps encompassing also any that was brought there from the Caspian[70]. Meanwhile, we should observe Aelian's mention of the excellent textiles produced by these Caspii from the especially fine hair of their camels, clearly the shaggy Bactrian[71]. Unfortunately, we have only scattered and limited glimpses of the vigorous economic activity around the northern Caspain, with attendant uncertainties, but these literary indications combine with archaeological remains (we have no camel hair, as far as I am aware) to show in broad outline that the economic connection between the Caspian and the Bosporus was substantial, while other neighbouring regions (in Iran, Scythia, Bactria etc.) were also part of the bigger picture of this complex of production and exchanges. And Dioscorides' remarks – especially on beavers, rhubarb and cardamom – offer a valuable way into that environment in the later first century AD.

---

[66] On Corbulo's mapping, see Plin. *NH* 6. 40; cf. 30. On Seleucus' plan, only credible if a Don-Volga link was meant, see *NH* 6. 31: *Claudius Caesar a Cimmerio Bosporo ad Caspium mare CL prodidit eaque perfodere cogitasse Nicatorem Seleucum quo tempore sit ab Ptolemaeo Cerauno interfectus.* Ptolemy 5. 9. 13 describes the rivers' proximity. Cf. Stoneman 2019 on Seleucus' exploratory interest in northern India.

[67] Braund 2003, with photos; see also Smyshlyaev 2018, 581–610.

[68] See Houston 2003; De Romanis 2020.

[69] Aelian *NA* 17. 17; 32; 24. On medical isinglass, see Scarborough 2015.

[70] Diosc. 3. 88, with comments on his Black Sea knowledge, which is worthy, but narrow: see above on his possible visit to Heraclea Pontica, perhaps with nearby Chalcedon (Diosc. 3. 40). Dioscorides' remarks (2. 23) on Pontic absinth (wormwood) did not require a trip to the Black Sea. Pontic absinth was the best, specified in the edict on maximum prices, and well known (further, Crawford, Reynolds 1979, 205).

[71] Textiles may find a market anywhere: see Schaefer 1943 on Hellenistic woollens in northern Mongolia, preferring explanations in terms of Roman diplomacy.

References

Amigues, S. 2016: Plantes et produits végétaux de l'Asie profonde dans le monde grec antique. In: J. Jouanna, V. Schiltz, M. Zink (eds.), *La Grèce dans les profondeurs de l'Asie. Actes du 26e colloque de la Villa Kérylos à Beaulieu-sur-Mer les 9 et 10 octobre 2015.* (Cahiers de la Villa «Kérylos», 27). Paris, 121–36.

Archibald, Z.H. 2007: Contacts between the Ptolemaic kingdom and the Black Sea in the early Hellenistic age. In: V. Gabrielsen, J. Lund (eds.), *The Black Sea in Antiquity: Regional and Interregional Economic Exchanges*. (Black Sea Studies, 6). Aarhus, 253–272.

Asheri, D. 2007 *A Commentary on Herodotus. Books I–IV*. Oxford

Baldwin, B. 1992: The career and work of Scribonius Largus. *Rheinisches Museum für Philologie* 135, 74–82.

Barnes, T.D. 1998: *Ammianus Marcellinus and the Representation of Historical Reality*. Ithaca–London.

Batty, R. 2007: *Rome and the Nomads. The Pontic-Danubian Realm in Antiquity*. Oxford.

Bosworth, A.B. 1977: Arrian and the Alani. *Harvard Studies in Classical Philology* 81, 217–255.

Braund, D. 1993: Piracy under the principate and the ideology of imperial eradication. In: J. Rich, G. Shipley (eds.), *War and Society in the Roman World*. London–New York, 195–212.

Braund, D. 2003: Notes from the Black Sea and Caucasus: Arrian, Phlegon and Flavian inscriptions. *Ancient Civilizations from Scythia to Siberia* 9/3–4, 175–191.

Braund, D. forthcoming: The river Cyrus and its tributaries: routes through and beyond the Caucasus. In: A. Dan, D. Kassab-Tezgör, N. Inashvili, S. Lebreton (eds.), *Rivers between East and West: Axes, Frontiers, Transcapes*. Oxford.

Crawford, M., Reynolds, J. 1979: The Aezani copy of the prices edict. *Zeitschrift für Papyrologie und Epigraphik* 34, 163–210.

Dalby, A. 2003: *Food in the Ancient World from A to Z*. London–New York.

Daróczi-Szabó, L., Daróczi-Szabó, M., Kovács, Zs., Körösi, A., Tugya, B. 2014: Recent camel finds from Hungary. *Anthropozoologica* 49/2, 265–280.

Davidson, J. 1993: Fish, sex and revolution in Athens. *Classical Quarterly* 43/1, 53–66.

Dawson, W., Harvey, F.D. 1986: Herodotus as a medical writer. *Bulletin of the Institute of Classical Studies* 33, 87–96.

De Romanis, F. 2015: Comparative perspectives on the pepper trade. In: F. De Romanis, M. Maiuro (eds.), *Across the Ocean: Nine Essays in Indo-Mediterranean Trade*. Leiden, 127–150.

De Romanis, F. 2020: *The Indo-Roman Pepper Trade and the Muziris Papyrus*. Oxford.

Devecka, M. 2013: The traffic in glands. *Journal of Roman Studies* 103, 88–95.

Dzhakson, T.N., Kalinina, T.M., Konovalova, I.G., Podosinov, A.V. 2007: "*Russkaya reka": rechnye puti Vostochnoy Evropy v antichnoy i srednevekovoy geografii* [*"Russian River": River Routes of Eastern Europe in Ancient and Medieval Geography*]. Moscow.
Джаксон, Т.Н., Калинина, Т.М., Коновалова, И.Г., Подосинов, А.В. «*Русская река»: речные пути Восточной Европы в античной и средневековой географии*. М.

Engstrom, A.G. 1965: The voices of plants and flowers and the changing cry of the mandrake. In: J. Mahoney, J.E. Keller (eds.), *Medieval Studies in Honor of U.T. Holmes, Jr.* Chapel Hill, 43–52.

Fögen, T., Thomas, E. (ed.) 2017: *Interactions between Animals and Humans in Graeco-Roman Antiquity*. Berlin–Boston.

Foust, C.M. 1992: *Rhubarb: the Wondrous Drug*. Princeton.

Gellar-Goad, T.H.M. 2018: Trouble at sea in Juvenal 12, Persius 6 and the proem to Lucretius, *De rerum natura* 2. *Cambridge Classical Journal* 64, 49–69.

Graf, D.F. 2017: The Silk Road between Syria and China. In: A. Wilson, A. Bowman (eds.), *Trade, Commerce and the State in the Roman World*. Oxford, 443–530.

Harrison, S. 2004: Altering Attis: ethnicity, gender and genre in Catullus 63. *Mnemosyne* 57/5, 520–533.

Hekster, O. 2010: Trophy kings and Roman power: a Roman perspective on client kingdoms. In: T. Kaizer, M. Facella (eds.), *Kingdoms and Principalities in the Roman Near East*. Stuttgart, 45–55.

Houston, G. 2003: Galen, his books, and the *Horrea Piperataria* at Rome. *Memoirs of the American Academy in Rome* 48, 45–51.

Kitchell, K. 2014: *Animals in the Ancient World from A to Z*. London–New York.

Kitchell, K. 2015: A defense of the "monstrous" animals of Pliny, Aelian, and others. *Preternature: Critical and Historical Studies on the Preternatural* 4/2, 125–151.

Kvavadze, E., Chichinadze, M. 2020: Palynological analysis of organic materials from Pichvnari (including the earliest silk in Georgia). In: N. Sekunda (ed.), *Wonders Lost and Found: A Celebration of the Archaeological Work of Professor Michael Vickers*. Oxford, 102–107.

Larmour, D. 2005: Lightening the load: castration, money, and masculinity in Juvenal's *Satire* 12. *Syllecta Classica* 16, 139–172.

Lauffer, S. (Hrsg.) 1971: *Diokletians Preisedikt*. Berlin.

Libert, B., Englund, R. 1989: Present distribution and ecology of Rheum rhaponticum (Polygonaceae). *Willdenowia* 19/1, 91–98.

Marchenko, I.I. 1996: *Siraki Kubani* [*The Siraces on the Kuban River*]. Krasnodar.
Марченко, И.И. *Сираки Кубани*. Краснодар.

Miller, J.I. 1969: *The Spice Trade of the Roman Empire 29 B.C. to A.D. 641*. Oxford.

Monahan, E. 2013: Locating rhubarb: early modernity's relevant obscurity. In: P. Findlen (ed.), *Early Modern Things: Objects and Their Histories, 1500–1800*. London–New York, 227–251.

Mordvintseva, V.I., Myskov, E.P. 2005: [Burial with the remains of Chinese varnished casket from the burial-ground Oktyabrskiy V]. *Nizhnevolzhskiy arkheologicheskiy vestnik* [*The Lower Volga Archaeological Bulletin*] 7, 314–318.
Мордвинцева, В.И., Мысков, Е.П. Погребение с остатками китайской лаковой шкатулки из могильника Октябрьский V. *Нижневолжский археологический вестник* 7, 314–318.

Myagkova, Yu. Ya. 2000: [The analysis of osteological material from Tanais]. *Donskaya arkheologiya* [*Don Archaeology*] 2, 64–71.
Мягкова, Ю.Я. Анализ остеологического материала из Танаиса. *Донская археология* 2, 64–71.

Nutton, V. 1972: Ammianus and Alexandria. *Clio Medica* 7/3, 165–176.

Olbrycht, M. 2001a: Die Aorser, die oberen Aorser und die Siraker bei Strabon. Zur Geschichte und Eigenart der Völker im nordostpontischen und nordkaukasischen Raum im 2.–1. Jhdt. v. Chr. *Klio* 83, 425–450.

Olbrycht, M. 2001b: Der Fernhandel in Ostsarmatien und in den benachbarten Gebieten. Zweite Hälfte des 2. Jhs.– 1. Jh. v. Chr. *Laverna* 12, 86–122.

Parker, R. 2008: *The Making of Roman India*. Cambridge.

Ravindran, P.N. 2006: *Black Pepper (Piper nigrum)*. Amsterdam.

Saprykin, S. Yu. 2002: *Bosporskoye tsarstvo na rubezhe dvukh epoch* [*The Bosporan Kingdom Between Two Epochs*]. Moscow.
Сапрыкин, С.Ю. *Боспорское царство на рубеже двух эпох*. М.

Scarborough, J. 2008: Sextius Niger. In: P.T. Keyser, G.L. Irby-Massie (eds.), *The Encyclopedia of Ancient Natural Scientists: The Greek Tradition and Its Many Heirs*. London, 738–739.

Scarborough, J. 2015: Fish glue (Gr. ΙΧΘΥΟΚΟΛΛΑ) in Hellenistic and Roman medicine and pharmacology. *Classical Philology* 110, 54–65.

Scarborough, J. 2020: Dioscorides on beavers. In: L. Totelin, R. Flemming (eds.), *Medicine and Markets in the Graeco-Roman World and Beyond: Essays on Ancient Medicine in Honour of V. Nutton*. Swansea, 37–40.

Schaefer, H. 1943: Hellenistic textiles in northern Mongolia. *American Journal of Archaeology* 47/3, 266–277.

Schneider, P. 2017: From India to the Black Sea: an overlooked trade route? *Archive ouverte HAL*. URL: https://hal.archives-ouvertes.fr/hal-01376630v2; accessed on: 09.08.2021.

Schörle, K. 2015: Pearls, power and profit: mercantile networks and economic considerations of the pearl trade in the Roman empire. In: F. De Romanis, M. Maiuro (eds.), *Across the Ocean: Nine Essays in Indo-Mediterranean Trade*. Leiden, 43–54.

Smirnov, A.P. (ed.) 1960: *Istoriya skotovodstva v Severnom Prichernomor'e* [*History of Cattle Breeding in the North Pontic Area*]. Moscow.
Смирнов, А.П. (ред.), *История скотоводства в Северном Причерноморье*. (Материалы и исследования по археологии СССР, 53). М.

Smith, M. 2020: *Hats: A Very Unnatural History*. East Lansing.

Smith, S. 2014: *Man and Animal in Severan Rome: The Literary Imagination of Claudius Aelianus*. Cambridge.

Smith, W.S. 1989: Greed and sacrifice in Juvenal's twelfth satire. *Transactions of the American Philological Association* 119, 287–298.

Smyshlyaev, A.L. 2018: Latin inscription from Azerbaijan: Problems and history of interpretation. *Vestnik drevney istorii* [*Journal of Ancient History*] 78/3, 581–610.
Смышляев, А.Л. Латинская надпись из Азербайджана: проблемы и история интерпретации. *ВДИ* 78/3, 581–610.
Stolba, V.F., Rogov, E. 2012: *Panskoye I*. Vol. 2: *The Necropolis*. Aarhus.
Stoneman, R. 2019: *The Greek Experience of India: From Alexander to the Indo-Greeks*. Princeton.
Thomas, R. 2000: *Herodotus in Context: Ethnography, Science and the Art of Persuasion*. Cambridge.
Tomczyk, W. 2016: Camels on the northeastern frontier of the Roman empire. *Papers from the Institute of Archaeology* 26/1, 1–13.
Treister, M. 1997: New discoveries of Sarmatian complexes of the first century AD. *Ancient Civilizations from Scythia to Siberia* 4/1, 35–100.
Treister, M. Yu. 2018: [Chinese "imports" in the burials of the nomads of Eastern Europe in the second half of the 1st millennium BC – first centuries AD]. *Stratum plus* 4, 153–200.
Трейстер, М.Ю. Китайские «импорты» в погребениях кочевников Восточной Европы во второй половине I тыс. до н.э.– первых веках нашей эры. *Stratum plus* 4, 153–200.
Vaissière, E. de la 2012: Central Asia and the Silk Road. In: S.F. Johnson (ed.), *The Oxford Handbook of Late Antiquity*. Oxford, 142–169.
Wellmann, M. 1891: Sostratos, ein Beitrag zur Quellenanalyse des Aelian. *Hermes* 26/3, 321–350.
Zucker, A. 2008: Sostratos of Alexandria. In: P.T. Keyser, G.L. Irby-Massie (eds.), *The Encyclopedia of Ancient Natural Scientists: The Greek Tradition and Its Many Heirs*. London, 754.