

UTILITY IN NATURAL HISTORY: SOME EIGHTEENTH-CENTURY RUSSIAN
PERCEPTIONS OF THE LIVING ENVIRONMENTⁱ

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The issue of scientific utility – the idea that science should contribute to human well-being, either directly or indirectly – was one that greatly exercised the minds of those who initiated scientific societies and academies in European states in the seventeenth and eighteenth centuries (Webster, 1975; Hunter, 1981; Frängsmyr, 1989; Livingstone, 1992, pp. 65-66). In his Utopian sketch, *The New Atlantis*, published in 1627, Francis Bacon (1561-1626) had famously described his postulated, publicly-financed research institution, known as ‘Solomon’s House’, as a body whose purpose would be to understand ‘knowledge of Causes, and secret motions of things; and the enlarging of the bounds of Human Empire, to the effecting of all things possible’ (quoted by Hunter, 1981, p. 13). According to Bacon, in other words, the purpose of the new science which was now arising was to make a difference in the world, to advance human dominion over nature. This was a vision which moved the initiators of London’s Royal Society, founded in 1660 (Livingstone, 1992, pp. 65-66), and was to find considerable resonance over the next two centuries.

Perhaps nowhere was the notion of scientific utility to find greater emphasis than in the St Petersburg Academy of Sciences, founded by Peter the Great and opening just after his death in 1725.ⁱⁱ A Project presented to the Senate for discussion in January 1724 specified what the tsar evidently saw as the main purpose of the new institution: the establishment of ‘an edifice which will not only serve to spread the sciences of the present day to the glory of the state, but also through the teaching and propagation of the same be of use to the nation in the future’ (Materialy, 1885, p. 15). Through scientific achievement, therefore, the Academy was to add to ‘the glory of the state’ and, through its scientific and educational work, be of practical use for the future. The Academy was soon to acquire other practical aims: to comment on the veracity and usefulness of new discoveries and inventions, and to undertake specific investigations on government order (Kopelevich, 1977, p. 159). But such concerns quickly took a back seat by comparison with what was to become the Academy’s principal activity throughout much of the eighteenth century – to survey and map the Russian empire’s vast territory with a view to ascertaining its resource endowment and to the promotion of national development. The major vehicle for the attainment of these goals was to be the scientific expedition.

Eighteenth-century Russian scientific expeditions were typically furnished with a set of instructions specifying the principal goals and objectives of the venture. In such instructions utilitarian concerns generally loomed large. The expeditions of 1768-74, for example, which were conducted under the

auspices of the Academy of Sciences, were provided with a detailed set of instructions developed under the leadership of the German naturalist, Peter Simon Pallas (1741-1811), organiser of the expeditions (Fradkin, 1950). Among other things the expeditions' leaders were ordered to conduct studies of such matters as land quality, potentials for economic development (for example in arable and livestock farming), problems posed by disease, potentials for hunting and fishing, minerals, manufactures, medicinal plants and much else. In practice, such utilitarian purposes were soon mixed up with a general scientific interest in the variable character of the territory, its natural endowments, climatic conditions, soils, vegetation, fauna and other environmental characteristics – no doubt much influenced by international scientific curiosity, since the Academy was itself international in composition and its members had extensive international contacts (Osipov, 1995). In addition to their utilitarian orientation, therefore, the expeditions (including the Orenburg Expedition which, as shall be seen below, was not a scientific expedition in the classic sense) had a number of other significant characteristics. Firstly, and in keeping with a typical trait of the Enlightenment period, they were encyclopaedic in outlook, surveying both natural and human features of the landscape in accordance with the principle that 'all forms of knowledge could be brought into a methodically organised synthesis' (Gascoigne, 2004, p. 152). Secondly, and again very much in keeping with the spirit of the Enlightenment, they were moved by the desire to order and classify as in itself contributing to understanding (Gascoigne, 2004, p. 167)ⁱⁱⁱ. Finally, whatever may have been their immediate goals, they were stirred by what Barbara Maria Stafford referred to as a 'curiosité dévorante' (Stafford, 1984, quoted by Sörlin, 1989, p. 98) about nature and its inhabitants which essentially meant that they were unlimited in outlook and fully open to new discoveries.

What then is the relationship between this utilitarian perspective and the idea of science as a means of promoting understanding? Peter Dear has argued that our modern concept of science as both a way of explaining the world and of changing it is in fact quite recent (Dear, 2006, pp. 8-9). According to Dear, in medieval and early modern Europe the two aspects of 'science' were kept strictly separate, a distinction which goes back to Aristotle in the fourth century BC. The Greeks distinguished between *episteme* (later translated into Latin as *scientia*) and *techne* (translated *ars* in Latin). *Episteme*, or natural philosophy as medieval thinkers termed it, was regarded as tasked with explaining the world and universe as created and upheld by God. *Techne*, by contrast, had a much more practical orientation. In Aristotelian thought, needless to say, *episteme* was the domain of the aristocratic, leisured classes whereas *techne* required hands-on practical skills which were not thought appropriate to the elite. *Episteme* was therefore far more prestigious. Dear argues that it was only with the work of Bacon and Isaac Newton (1642-1727) in the seventeenth and early eighteenth centuries that such attitudes began to change, eventually begetting the understanding of science which prevails today.

Utility can, of course, mean different things depending on the context in which science is practised and on the values of the practitioners themselves. For the eighteenth-century Russian scientific expeditions it was usefulness to the state which appeared paramount. However, the present paper will examine the writings of two Russian naturalists of the period, Stepan Petrovich Krasheninnikov (1713-1755) and Petr Ivanovich Rychkov (1712-1777), and consider whether their emphasis on utility also had other connotations. The conclusions drawn are based on the empirical observations and understandings of the two writers only, but the question is raised concerning what if anything their experience tells us about the practice of natural history in the eighteenth century.

STEPAN PETROVICH KRASHENINNIKOV AND *THE HISTORY OF KAMTSCHATKA*

Stepan Petrovich Krasheninnikov was best known for the fruit of his participation in what became known as the Second Kamchatka Expedition (1733-43), or alternatively the Great Northern Expedition, under the command of Vitus Bering. The overall aim of this vast undertaking was to explore and survey the territories of east Siberia and the Far East, including the northern and eastern coasts and adjacent seas and islands, plus the nearby coast of North America. Krasheninnikov took part in the so-called Academy detachment to the Expedition which, as the name suggests, was organised under the auspices of the Academy of Sciences and had a more strictly scientific purpose than the main Expedition. In the event neither of the leaders of the Academy detachment, the German naturalists Johann Georg Gmelin (1709-55) or Gerhard Friedrich Müller (1705-83), completed the arduous journey across to the Pacific coast and instead undertook their studies in eastern Siberia. They did, however, send their student-naturalist, Krasheninnikov on to the coast to undertake the hazardous voyage to Kamchatka (1737). He was eventually joined in Kamchatka by Georg-Wilhelm Steller (1709-46), a German naturalist. Unlike Krasheninnikov, Steller was university educated, having attended courses in theology and medicine at Wittenberg and Halle and subsequently appointed adjunct in natural history in the St Petersburg Academy. His scientific contribution to the study of Kamchatka undertaken by the two men was of the greatest importance.^{iv} Krasheninnikov's book, *The History of Kamtschatka*, was the most important product of the extensive scientific survey conducted on the peninsula.

Krasheninnikov himself, a Russian and native of Moscow, was the son of a soldier and was educated at the Slavic-Greek-Latin Academy in that city, which was effectively Russia's first institute of higher education (Fradkin, 1974). Presumably, as happened so often at this early juncture in Russian scientific education, his talents were recognised at an early stage and he was recruited as a student to participate in the Second Kamchatka Expedition, specializing in natural history. His book describing his studies in Kamchatka was published by the Academy of Sciences in two volumes in St Petersburg in 1756 (Krasheninnikov, 1756)^v. Recognition of the scientific significance of his work came by way of Krasheninnikov's appointment as adjunct (1745) and then professor (1750) of the Academy of Sciences for botany and natural history. It also came by way of the subsequent Russian editions of his book, and the numerous foreign translations. Since the northern Pacific was an area of keen interest to the British at the time, an abridged English translation by James Grieve was published by R. Raikes in Gloucester in 1764 (Krasheninnikov, 1764)^{vi}.

The *History* is divided into four parts. Part one is a general geographical description of Kamchatka. It also contains a description of the nearby American coast which Steller had visited in 1741-2 with Bering. Part two concerns natural history and is a typically encyclopaedic treatment of what we would today call the physical geography of the territory: the quality of the land, the climate, volcanoes and hot springs, metals and minerals, vegetation, fauna including mammals, fish, birds and insects, and a brief discussion of tides at the end. Part three is devoted to 'The Natives of Kamtschatka and their Customs and Manners'. Finally, part four approaches most closely to what would now be understood as a history with an account of the Russian conquest of the region and changing relations with the

indigenous peoples, of present-day settlement, of the way of life of the local Cossack communities, and of routes across Siberia to Kamchatka, including discussion of Krasheninnikov's own journey there.

Perusal of the chapters on natural history reveals the strongly utilitarian orientation in Krasheninnikov's book. Thus chapter V of part II, 'Of Trees and Plants'^{vii} begins as follows:

'The most useful wood is the larch, and the white poplar, which serves for building their houses and forts; and they are fit, not only for such boats as the inhabitants use, but even for the building of ships. The larch-tree, indeed, only grows upon the river Kamtschatka, and such other rivers as fall into it: in other places they make use of the white poplar. --- Although there be many birch-trees, yet they make little use of them, unless in their sledges, having none near their houses but what are crooked and useless; and it is very troublesome to bring the better sort from the distance at which it grows (Krasheninnikov, 1973, p. 81).

Having mentioned the birch, Krasheninnikov immediately turns to a discussion of the other uses to which it was put:

'They make great use of the birch bark, which they strip from the trees while yet green; and cutting it in small pieces, like vermicelli, eat it with dried caviar. In the winter, whenever you enter any of their villages, you find the women employed in hacking this green bark with their bone or stone axes. They also ferment this bark with the juice or sap of the birch, which makes an agreeable drink. The birches of Kamtschatka are much fuller of knots and hard excrescences than those of Europe; but of these knots they make very useful plates, spoons and cups' (Krasheninnikov, 1973, pp. 81-2).

Understanding of the usefulness of local environmental resources, therefore, comes from close observation of the activities and ways of life of the local population, both the native peoples and the Russian settlers. Not least among the traits of the locals to interest the naturalists is their food and medicines:

'Their principal nourishment is from the nuts of the slantza, which grows everywhere, both in hills and dales^{viii}. This shrub, or tree, is truly of the cedar kind, only it is much less; and instead of growing straight, it creeps along the ground. Its cones and nuts are not half so large as those of the cedar: the Kamtschadales eat them with the shells. ---- The greatest virtue of these nuts is, that they are a good remedy against the scurvy, as all our seamen can witness: for in the most severe scurvy this is, as one may say, almost their only medicine ----' (Krasheninnikov, 1973, p. 82).

There follows a detailed discussion of a series of other useful plants, mainly used for food and medicine. Among these is one called the saranne, which was used as a substitute for grain. Another, the 'sweet plant' was used to distill 'brandy' or spirits (in Russian: *vino*). Krasheninnikov provides a detailed description of the method of distillation, as well as some pointed comments on the effects of imbibing it. The section on food concludes with the following observation:

‘These are the principal plants which they make use of in their kitchens; however there is a great number of others, and also of plants thrown out by the sea, which the Kamtschadales eat both fresh and dry in the winter: for, as Mr Steller observes, they refuse nothing, but eat everything they can get down, even the driest plants and nastiest rotten mushrooms, although one would imagine the consequence dangerous, as indeed it sometimes happens. However, he tells us the natives have obtained such a knowledge of plants, and of their use both in food and medicine, that he is surprised; and that one shall not find so much knowledge of this sort among any barbarous nation, nor even, perhaps, amongst the most civilized. They give a name to every one of their plants, and know all their properties, and the different degrees of virtue which they derive from the various soils and expositions in which they grow; and so accurate are they in these distinctions, and also in the proper time of gathering the several fruits and other produce, that it is truly wonderful. Hence the Kamtschadales have this advantage above other people, that they can find food and medicine everywhere; and, by their knowledge and experience, are in little danger from the noxious plants’ (Krasheninnikov, 1973, p. 91).

Although it is sometimes suggested that the Enlightenment insistence on the need to bring all scientific knowledge within the bounds of a single ‘map’ or synthesis frequently led to the dismissal or discounting of local knowledge systems (see, for example, Gascoigne, 2004, pp. 152-154), here we find just the opposite – not only a careful analysis of an indigenous knowledge system based on a practical understanding of nature, but a sense of wonder at how dependable this system was. Clearly both Steller and Krasheninnikov felt they had much to learn from the indigenous peoples as well as from Russian locals.

Having discussed the ‘Trees and Plants’ in chapter V of part II, the following chapter of Krasheninnikov’s book turns to consider ‘the Land Animals’. Here again the author takes the most utilitarian approach:

‘The principal riches of Kamtschatka consist in the great number of wild beasts: among which are foxes, sables, stone foxes, hares, marmottas, ermins, weasels, wolves, reindeer wild and tame, and stone rams. Their fox skins in the beauty, length and thickness of their hair equal, if not excel, all the foxes of Siberia; besides there are in Kamtschatka almost all the different species of foxes which are to be found in other places, such as the red, fiery, blue-breasted, or marked with a black cross, the chestnut, black chestnut, and the like; and sometimes white foxes are found there, but these very seldom’ (Krasheninnikov, 1973, p. 95).

Utilitarian interest is also reflected in Krasheninnikov’s account of the ways foxes are hunted locally:

‘The most useful method of taking them is either by poison, traps or bows. The poison is thrown in lumps in the fresh tracks; the traps are set upon the sides of hills, baited with a live animal; and for the greater security two or three of the traps are placed upon one hillock, that whatever way the foxes approach they may fall into one of them; and this is found necessary, for those, which have been once in danger from the stroke of this trap, proceed afterwards so cautiously, that they eat the bait without being seized; but, with all their cunning, it is difficult

to escape the several traps, which seize them sometimes by the head, and sometimes by the foot.’ (Krasheninnikov, 1973, pp. 95-96).

The above account relates to the methods employed by the local Russian Cossacks (a description of how foxes are hunted with the bow follows), but Krasheninnikov is also interested in how the native peoples hunt:

‘The Kuriles, who live upon the Lopatka, catch foxes in a manner peculiar to themselves. They have a net made of the hair of whales’ beards, composed of several rings; this is spread upon the ground, and to a ring in the middle they bind a magpie; round the net is drawn a cord, the ends of which are held by a person concealed in a pit near at hand, who, when the fox springs upon the bird, draws the cord and gathers together the net, which surrounds the fox as the drag net does a fish’ (Krasheninnikov, 1973, p. 96).

The point, then, seems to be that foxes are valuable because of their fur, and local experience, both that of the Russian Cossacks and that of the indigenous peoples, can teach what may be the best means of catching them, an issue of potential significance to the Russian authorities as well, perhaps as telling us something notable about both the behaviour of the animals and about the way of life of the local population..

Not surprisingly, Krasheninnikov has much to say about that most valuable fur-bearing creature, the sable. In discussing this animal and the implications of its hunting for the sable population, he is unable to refrain from a moralistic observation on the want of industrious habits among the indigenes (clearly the negative implications of overhunting, and the advantages to be gained by copying the prudent approach towards nature exhibited by the native peoples with their seeming lack of avarice, did not occur to this eighteenth-century European naturalist):

‘Before the conquest of Kamtschatka there was so great a plenty of sables that one hunter would kill seventy or eighty in a year; and that not for the sake of the fur, but the flesh, which they esteem very delicious. The inhabitants at that time willingly agreed to pay their tribute in sables; and were glad to receive a knife for eight, and an axe for eighteen. --- The sables are still in much greater plenty here than in any other country, as is observed by everyone who has been upon the spot, and compared their tracts upon the snow with what are seen either upon the rivers Lena or Beloy ----. And if the people of Kamtschatka were as industrious in hunting as those about the Lena, they could sell a great many more than they; but such is their natural laziness, that they never kill more than they must pay in tribute, and what will pay their debts.’ (Krasheninnikov, 1973, p. 97).

Again there is a comment on how the sable is hunted by the native peoples.

Other fur-bearing animals are similarly evaluated in terms of market value and use:

‘Although the stone foxes and hares abound in Kamtschatka, yet hardly anyone thinks it worth his trouble to hunt them, their furs being of small value; and when they fall into the fox traps, they use their skins as coverings in their beds’ (Krasheninnikov, 1973, 98).

Occasionally such observations are accompanied by interesting comments on the appearance and habits of the creatures concerned:

‘Marmottas abound everywhere in Kamtschatka. The Koreki use their skins for cloaths; and indeed they are reckoned no ordinary dress, being both light and warm.--- When they eat, they sit upon their hind legs like a squirrel, and hold their food, which is roots, berries and cedar nuts, with their forefeet. They are pretty to look at, and whistle surprisingly loud. Nobody thinks it worth his while to hunt ermines, weasels, or common marmottas, unless by chance they meet with them, so that one cannot reckon ermines amongst the furs of Kamtschatka’ (Krasheninnikov, 1973, 98-99). Here, then, as well as the obvious utilitarian concern, there appears evidence of a broader natural-historical, scientific or even aesthetic interest in the animals themselves

Bears and wolves, we are told ‘are so numerous here, that they fill the woods and fields like cattle; the bears in summer, and the wolves in winter’ (1973, 100). There follows a detailed discussion of the way the native peoples hunted bears before the introduction of fire arms and of the uses to which the animals are put. The fur of the wolf, Krasheninnikov tells us, is highly esteemed in Kamchatka for its usefulness as clothing, though few wolves are caught and in general they do little but harm to the local economy. As regards their use for food: ‘Although the Kamtschadales are called universal eaters, yet they never eat the flesh of either wolves or foxes’ (1973, p. 104).

With regard to mice, Krasheninnikov notes that there are three kinds in Kamchatka, and makes some brief remarks on their lifestyles and eating habits. He makes some interesting comments on their migration habits:

‘These mice change their habitations like the wandering tartars, and sometimes for a certain number of years they all leave Kamtschatka, and go to some other place. This retirement is very alarming to the Kamtschadales, who think it forebodes a rainy season and a bad year for the chase; but when these creatures return, they confidently expect a fine one and good hunting; so that, as soon as they begin to reappear, expresses are sent to all parts to carry the good news. They always take their departure in the spring, first gathering together in vast numbers’ (1973, p. 105). Neither rivers nor even ‘arms of the sea’, it seems, prevent their westward spring migration on these occasions.

Krasheninnikov was assured by some of the inhabitants that certain rats, on leaving their nests, cover their stores of food with poisonous herbs to protect them against other rats and that, if they lose their entire stock of winter provisions, ‘they strangle themselves for vexation, squeezing their necks between the forked branches of shrubs’. However, in a remarkable spirit of scientific scepticism, he goes on: ‘Although all these circumstances are related by the most serious of the Kamtschadales, yet we must not implicitly rely on their authority, before the facts are better enquired into’ (1973, p. 106).

Altogether, rats were clearly much more of a nuisance to human beings than a benefit in Krasheninnikov’s rendition. The same might also be said of the ‘insects’ (which, in Krasheninnikov’s account, appear to include lizards and spiders).

Of the domestic animals, Krasheninnikov devotes most attention to dogs, which were of course: ‘absolutely necessary in Kamtschatka, even though there should be plenty of horses; for they could seldom be used in winter on account of the great depth of snow, and the frequency of hills and rivers; and in summer, the bogs are so frequent, that some places are impassable even for men. Besides dogs have this advantage over horses; that in the greatest storm, when a man cannot see the path, nor even keep his eyes open, they very seldom miss their way ----- and when it is absolutely impossible to travel at all, which often happens, then the dogs lying around their master defend him from all danger’ (1973, p. 108). They also have their other uses: ‘They also give certain signs of an approaching storm; for, when they stop, if they scrape the snow with their feet, it is advisable, without loss of time, to look out for some village, or other place of safety. And, it is said, the dogs here serve instead of sheep, because their skins are used for cloaths; particularly those of the white dogs, with which all their different sorts of garments are trimmed’ (1973, p. 108). Of the other domestic animals, Krashenninikov notes that the locals have cows and horses, but conditions are unsuitable for sheep.

With respect to the other animals discussed by Krasheninnikov, the same approach is taken: consideration of their appearance, habits, and habitats coupled with observations concerning how they are hunted and the uses to which they are put. He clearly devotes most attention to those animals of greatest use to the locals. Under the heading ‘of the Sea Beasts’, he includes ‘such animals as are called amphibious, which although they live for the most part in the water, frequently come upon the dry land, and upon, or near it, bring forth their young’ (1973, p. 115). Among the latter are ‘those which live in fresh water lakes, and rivers, as the otter; those which live in fresh or salt water, such as seals; [and] those which are never found in fresh water, such as sea beavers, sea cats, and others’ (1973, p. 115). Krasheninnikov devotes most attention to seals, sea lions, sea cats, and ‘manati’, including particularly detailed descriptions of their appearances and habitats. The same is true of the chapter entitled ‘Of Fishes’, which includes the whale. Not surprisingly in view of its size and economic significance, most attention is paid to the latter animal, including a description of attacks on whales by killer whales (*kasatki*), observed by Steller. The same is also true of the chapter ‘Of the Birds’. Birds are divided into three classes: sea fowls, fresh-water fowls, and ‘those which frequent the woods and fields’. Again, the accent is on utility, though clearly not all are equally useful.

PETR IVANOVICH RYCHKOV (1712-1777) AND THE *TOPOGRAFIYA ORENBURGSKAYA*

Like Stepan Krasheninnikov, Petr Rychkov was born into fairly modest circumstances and seems to have lacked a formal higher education (Mil’kov, 1953). He was the son of a merchant of Vologda in northern Russia, but apparently moved to Moscow when he was about eight years old. He seems to have had an elementary education of some kind and is said to have excelled in mathematics and languages. Eventually he began work as a bookkeeper and translator in the port of St Petersburg. Here he evidently attracted the attention of Peter the Great’s associate, Ivan Kirilovich Kirilov (1695-1737), who among other activities was responsible for organising the cartographic survey of Russia together with other endeavours

of a geographical and scientific kind. In 1734 Kirilov recruited Rychkov as bookkeeper for the newly-created Orenburg Expedition. The latter, as noted earlier, was not an expedition in the normal sense but rather a government agency responsible for the defence, settlement and economic exploitation of the huge Orenburg Territory which spanned the southern Urals and extended south-eastwards towards Central Asia. In addition to fostering trade links with the Central Asian states and further afield, the expedition was responsible for the mapping and scientific survey of the territory over which it presided, including investigating the mineral wealth of the Urals. As head of the organisation, Kirilov was anxious to recruit capable young men into its service, hence, one assumes, his interest in Rychkov. According to Mil'kov (1953, p. 9), Kirilov encouraged in his young associate an interest in science, cartography and geographical description. Kirilov died in 1737, but was succeeded as head of the Orenburg Expedition by another of the former associates of Peter the Great, Vasilii Nikitich Tatishchev (1686-1750). Like Kirilov, Tatishchev was a proponent of science and geographical description, including cartography. Peter had commissioned Tatishchev to write a full geographical description of Russia but, given the highly uneven character of the geographical data that were available at the time, to say nothing of the range of other duties laid upon him, this was a task he never completed. However, he clearly impressed upon Rychkov the importance of undertaking this work at a local level, based upon a comprehensive study of the region, and although Tatishchev was soon to leave Orenburg, the continued correspondence between the two men reflected their shared interest in this activity.

As a state official, Rychkov was only partially engaged in scientific work and was obliged to undertake such activities in the midst of many other official duties. Nevertheless his work obliged him to travel frequently across the region, in the course of which he evidently acquired a close acquaintance with both its natural and human features. Following the opening of the Geographical Department of the Academy of Sciences in St Petersburg in 1739, which took on the task of mapping Russia and which was responsible for producing Russia's first atlas, the so-called Academy Atlas which appeared in 1745, the idea arose of producing an atlas of Orenburg Territory. Since the latter region was only just in the course of settlement and economic development, its detailed mapping and study was regarded as an important state task. Rychkov evidently played an important role in this endeavour, and the atlas was completed in 1755. As was often the case with Russian maps and atlases in the eighteenth century, the Orenburg atlas was to be accompanied by a detailed geographical description of the region. This was the origin of Rychkov's *Topografiya Orenburgskaya* (Topography of Orenburg), the first part of which he sent to the Academy of Sciences in 1755 where it was approved for publication. The rest subsequently appeared in serial form before the entire work was published as a single volume in 1762 (Rychkov, 1762)^{ix}. Since Orenburg Territory is far from the sea, and the British at this time were only just beginning to establish themselves in far away India and had little interest in Central Asia, there is, as far as the present author is aware, no English-language translation.^x

Rychkov's account is, on the whole, more systematic and ordered than Krasheninnikov's with little in the way of personal reference. It subsequently became a model for the large number of 'topographical descriptions'^{xi} which were to follow. Like its predecessor, it is

eclectic, embracing features of both the natural and human worlds, but it lacks Krasheninnikov's superbly detailed anthropological descriptions of indigenous peoples. The work is divided into two parts. The first is a systematic discussion of the region as a whole, beginning with consideration of the official name of the territory, a description of its extent and boundaries, of its provinces and districts, and of the various peoples who have lived there both presently and in the past. Chapter five of part one concerns the physical geography and natural history of the territory, with descriptions of its principal lakes and rivers, upland regions, caves (in which Rychkov had a particular interest), stones, minerals and metals, 'the ruins of old towns and buildings', 'cattle and beasts', insects and reptiles, birds, and fish. Discussion of the land animals, birds and fish is arranged in alphabetical order by species. Chapter six discusses commerce. Part two of the book is a systematic description of the territory's regional subdivisions, beginning with that of Orenburg itself.

A notable absence in Rychkov's book is a systematic discussion of the region's vegetation. The vegetation is described in general terms in the context of discussions of the varied landscapes of the region, but Rychkov is far less interested in individual plant species or in the uses to which they were put than is Krasheninnikov. Clearly, unlike Krasheninnikov who was able to rely on Steller, Rychkov suffered from a lack of botanical advice. Indeed, in the introductory part to chapter five of part one, he notes that the necessary full description of 'all that the surface and the interior parts of the land produces' would require a 'considerable knowledge of physics and of natural things' but that this would lead to a 'particular and not inconsiderable book'. For this reason he apologises for leaving such detail to those 'skilled in physics' and for rendering only a shortened account (Rychkov, 1999, p. 105)^{xii}. In what he does give us, however, is clearly reflected both the knowledge derived from his duties as a government official and what must have been a keen amateur interest in aspects of the physical environment, derived no doubt from his many travels in the region and long residence there. Thus there are detailed descriptions of weather and climate, of physiography (according to Mil'kov (1953, p. 29), Rychkov was the first scholar to study karst features in Russia), minerals and fauna. No doubt he was able to obtain much information in the course of his official duties, as he clearly did when it came to statistics on commerce and the like, and from discussion with locals, but much also seems to derive from personal observation.

With regard to the local fauna, like Krasheninnikov Rychkov demonstrates the same interest in their appearance and habits, and gives details regarding their habitats. Again a utilitarian interest is very apparent, with discussion of the uses to which animals are put by the locals, the ways in which they are hunted, and their roles in market trade.

Thus the *babr* (Turanian tiger), we are told, 'is a kind of tiger, in appearance like a lynx or a cat. Its fur is yellowish with stripes, eyes extremely sharp, neck short, bones exceedingly firm. Many are to be found among the reeds near the Aral Sea and along the Syr' Darya, which bring great harm to people happening to be there, and especially to camels and horses. They possess such speed and strength that they immediately kill not only horses but even camels which they catch. Although not very tall, they are so long that the biggest of them grow to a *sazhen*' or more. They catch the young ones and they say that the old *babry* feed them for three years and that during this time they are so submissive that they can be caught

without danger --- At Orenburg they fetch a tariff of thirteen rubles each for large, eight for medium and five for small skins' (Rychkov, 1999, p. 143).

In a rather similar way, the *barsuk* (badger) is accorded this description: 'a steppe creature which lives in burrows under the ground, of which there are many in steppe places. The Kalmyks kill and eat them and esteem the meat very highly on account of the fat, but their skins are in very little use' (Rychkov, 1999, p. 143).

With regard to the beaver, Rychkov tells us that hunters say that in Bashkiria they are caught with a particular kind of trap and that their skins are sold to the Asian peoples for two rubles a piece. Their castor (an oil secreted by beavers) is sold separately at 18 or more kopeks a pound. The black beaver pelts are most highly valued, according to Rychkov, the hunters calling them 'kingly' or 'princely' pelts.

Rychkov's discussion of bird life likewise displays utilitarian interest, though it is clear that this does not apply in all cases and that once again his interest extends to the nature and habits of the animal itself. Thus with regard to the *baba* (rose pelican), he tells us that this is: 'somewhat like a swan, but much bigger in size, with white feathers. [They] usually live along large rivers; along the Yaik in the summer period live not a few --- they feed on fish which they catch in a surprising manner, namely - gathering together near a sandy place, they swim together towards the nearby bank and, when they are close, they join their wings and, thrusting them into the deep, make a semicircle and in this way, like a dragnet, they drive the fish towards one place and, having driven them towards the bank, fall on them all and eat them' (Rychkov, 1999, p. 152). This description bears all the hallmarks of personal observation, not to say a certain fascination with the creatures concerned. Utilitarian interest, in other words, is mediated by nature's wonders.

CONCLUSION: UTILITY IN EIGHTEENTH-CENTURY NATURAL HISTORY

In their studies of the local fauna, the two Russian naturalists display certain common concerns. They clearly wish to know what animals exist within their regions, animals extending from the land and sea mammals to insects, birds and fish. They frequently describe the appearance of the animals, sometimes in considerable detail. The animals' behaviour and habits, particularly their feeding habits, also interest them. Furthermore, the naturalists often allude to the animals' habitats, to the environments in which they survive. This may be linked to their interest in the usefulness of the animals to the local human populations, and in the ways in which animals are caught or hunted. A concern with the usefulness of animals seems commensurate with an interest in where and how the animals live and also in how those persons with the necessary experience and skills actually catch them. But the naturalists write not only about those animals which are useful to humans. They also describe the seemingly non-useful ones, and particularly those which are harmful.

The work of the two naturalists points at certain conclusions. Firstly, at this stage of the development of natural history, knowledge of the local flora and fauna is clearly not based on truly systematic survey of the territory, as would be the case in later centuries, but on close

acquaintance with the region, an acquaintance which, in the case of our Russian naturalists, extended over a period of years.

Furthermore, such knowledge comes not only from personal observation, but from local and indigenous knowledges, and from an understanding of how the local people themselves utilise nature. In other words, local knowledges are valued, though there is some evidence of scepticism in the case of some of the more esoteric claims.

Thirdly, and to repeat the point, the naturalists are not only interested in things which are useful or harmful, but also in non-useful things. Issues of utility, in other words, are mixed up with 'pure' science. Neither writer, particularly Krashenninikov^{xiii}, puts things down in a systematic way, as if responding purely to the demands of the Academy and government for useful information, or information which might inform future policy. Both seem fully involved in field observation or 'science'. Both, and especially Krashenninikov, are responding to remote and unfamiliar environments. Both are seeking to make sense of those environments.

Clearly one important factor which motivates both writers is the need to respond to the general demand on the part of government and the Academy for practical information about nature and its possible uses. Even in the case of the Orenburg Expedition, which as noted already was not an Academy venture, the accent on practicality is clear. The methodical and careful study of nature as provider of resources for exploitation is an important indicator of modernity (Koerner, 1999; Glacken, 1967, pp. 494-7). Hence an emphasis on utility and practicality are a common feature of eighteenth- and early-nineteenth century natural histories. One finds it, for example, in the *Zoographia* of Peter Simon Pallas (Pallas, 1811), in the physico-geographical and natural-historical description of the Russian Empire by Johann Gottlieb Georgi (Georgi, 1797-1802), and, in the first half of the nineteenth century, in Eduard Eversman's natural history of Orenburg Territory (Eversman, 1840-50). More broadly, and internationally, this orientation is also reflected in the travel journals of Joseph Banks (Banks, 1998, for example pp. 89-91, 95-6), and of Johann Reinhold Forster (1996, for example pp. 113, 138ff.), in the work of Linnaeus (Frängsmyr, 1983; Koerner, 1999) and in that of many others. However, the question arises whether, in the case of our two Russian naturalists, the accent on utility is purely the product of a more instrumental view of nature abetted by the processes of modernisation and the onset of capitalism. Peter Dear has written of Buffon's great work, the *Histoire naturelle*: 'The *Histoire naturelle* eschewed Linnaean-style taxonomy in favour of morphological description, accounts of characteristic behaviours and habitats, and even the animal's use to human beings. This last, apparently surprising element of Buffon's natural history reflected his belief in the importance of the senses and empiricism in learning about nature -----'. Accordingly, human uses of animals and animal products represented the most intimate practical knowledge of those animals in human acquaintance with organic nature' (Dear, 2006, p. 51). What Dear seems to be intimating here is that the utility of animals to human beings was one of the ways in which animals might be understood – one of the ways of making sense of nature. Despite the effects of the Scientific Revolution, the eighteenth century was a period still steeped in religious ideas and imagery

when the notion of a meaningful universe was widely accepted (Pickstone, 2000, pp. 41-48). In these circumstances, the idea that nature exists or is somehow constructed to serve human ends must have made a great deal of sense. That being so, seeking to know the utility of natural phenomena would have been an essential element in trying to understand them.

Stepan Krasheninnikov and Petr Rychkov studied some of the remoter parts of the Russian Empire whose natural environments and endowments were little known. Their contributions to the science of their day were considerable. If our argument here makes sense, their emphasis on the utility of the natural phenomena they studied may reflect not only the increasingly pragmatic approach to nature which was characteristic of the eighteenth century, but also the way in which remote and unfamiliar regions were then understood. In other words, their practical understanding was as traditional as it was modern.

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ⁱⁱ It has been argued that a strong utilitarian emphasis, oriented towards internal national development as against more general military, strategic and commercial concerns, also characterised the Royal Swedish Academy of Sciences founded in 1739 with Linnaeus as its first president (see: Sörlin, 1989; Liedman, 1989, pp. 27-8, 43). It may be that this utilitarian emphasis lasted longer in these two cases than in those of analogous institutions in London, Paris and Berlin.

ⁱⁱⁱ The eighteenth century has been famously described by Foucault and others as an era dominated by the 'classical episteme' in which the accent in science was on such activities as collecting, ordering and classifying. The naturalist discussed in this paper were primarily involved in such activities. The period witnessed only the very beginnings of attempts at the scientific explanation of natural phenomena (as against religious or speculative explanation which, as Dear suggests, was more traditional). Only in the nineteenth century did empirically-based scientific explanation as now understood become more common.

^{iv} In his preface to the work, the Russian editor writes as follows: 'When Mr. Krasheninnicoff (*sic*) had given the Academy of Sciences a full report of all his observations at Kamtshchatka, and had likewise received all Mr.

Steller's papers, it was thought proper to join these two works, and to commit their compilement to the person who had the greatest share in the merit of the discovery. This is the origin of the following description of Kamtschatka ---' (Krashenninikov, 1973, p. xi). Having died in Siberia in 1746, Steller was unable to participate directly in the composition of the book.

^v According to B. P. Polevoi (Krashenninikov, 1994, p. 16), although the date 1755 appears on the book's title page, it was actually published in 1756.

^{vi} *Kamtschatka* follows the English spelling by Grieve. The word *History* in Grieve's translation presumably follows the contemporary understanding of the term as 'enquiry', 'research' or even 'catalogue'. I have used a modern facsimile edition of the Raikes edition (Krashenninikov, 1973) and all quotes are taken from this source. Spelling has been modernized where appropriate for ease of comprehension. According to Cross, James Grieve, a graduate of Edinburgh's medical school, had a lengthy career in medical practice in Russia before returning to London in the early 1750s where he began work on translating Krashenninikov's book (Cross, 1997, pp. 131-2). Grieve's translation has been checked against the text of the original Russian in a modern Russian-language edition of that of 1756 (see Krashenninikov, 1994). Grieve's translation may be said to be 'free' in the sense that he departs here and there from the original, adding a little in places, and excising a great deal. His changes appear to be governed by a concern to make the text more understandable to the English reader, and to omit things which Grieve considers to be of little interest to the latter. Indeed, as Cross relates, the translation was savagely attacked at the time by August Schlözer who accused Grieve of omitting passages which he did not understand. However, in the passages quoted here, the translation is sufficiently close to the original to be sufficient for our purposes.

^{vii} The original Russian reads: 'Of living things' (*proizrastayushchikh*), especially those which serve for the sustenance of the local peoples'.

^{viii} The original Russian here literally reads: 'of which a great many grow both in the hills and on the tundra (*po tundram*)'. The word 'tundra' would have had little or no meaning for the average English reader.

^{ix} According to Aleksandrovskaia (1989, 222), the title of the 1762 edition, *Topograficheskoe opisanie Orenburgskoi gubernii*, had been changed by Academician Müller from Rychkov's original, *Topografiya Orenburgskaya*.

^x I have therefore used the Russian editions and all translations are based on these. See Rychkov, 1762, 1999.

^{xi} Following Classical precedent, a 'topographical description' in the eighteenth century implied a description of a particular region or territory, as against an entire country.

^{xii} Again, early in part 2, Rychkov laments the fact that the likes of Gmelin and Müller had been unable to study the region in detail because of an uprising among the Bashkir peoples. He notes that he has done what he could working in the provincial chancellery, but that many areas are poorly studied – there is a need for 'skilled and diligent people' – and in the meantime he hopes that his simple description will suffice (Rychkov, 1999, 168-9).

^{xiii} As noted above, whereas Krashenninikov's account takes the form of a narrative, Rychkov's is more systematic and ordered. In this sense it may be considered an early exercise in the application of the encyclopaedic method to Russian scientific and geographical writing (Withers, 1996).