Vodka in Early Modern Muscovy: Foreign Doctors, Travelling Herbalists, and the Tsar's Kitchen

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Abstract: In this paper, I argue that a typically Russian perception of vodka as something that can both arouse appetite and stimulate digestion has its roots in early modern period, when vodka was used as a prescribed medicine and the term itself referred strictly to cordials distilled with local herbs and foreign spices. I briefly review what we know about the beginnings of vodka from the earliest accounts of distilled alcohol in Russia, some of which are introduced into Western historiography for the first time, and look at how imported medical practice, local herbalist tradition, and gastronomic needs and preferences of the Muscovite court have contributed to the identity formation of Russia's national drink.

Russian vodka is arguably the most gastronomic spirit in the world. Throughout its history it was – and still is, at least in its home country – mainly consumed as part of a hearty meal or accompanied by numerous *zakuski* (appetizers). But how did this come about? Why is vodka such an integral part of Russian culinary culture? In this paper I will briefly review what we know about the beginnings of vodka and look at how Western medical practice, local herbalist tradition, and gastronomic needs and preferences of the Muscovite court have all contributed to early identity formation of Russia's national drink.

The origins of vodka are obscure, and very little historical material is currently available from which we can safely ascertain when the inhabitants of what is now European Russia started to produce distilled alcoholic beverages and whether this was the result of a technology transfer or a purely domestic development. The earliest mention of spirit making in Muscovy is found in *Tractatus de duabus Sarmatiis*, a popular treatise on geography, history and culture of Eastern Europe composed by a Polish scholar and physician Maciej Miechowita and printed in Cracow in 1517. In a chapter dedicated to Muscovy he writes:

> They frequently use warming spices, and often distillates of spices and honey [*sublimatis de aromatibus de melle*] or other hot drinks; accordingly, they make burning water [*aquam ardentem*] from oats and drink it to repulse and drive away the cold and chill, otherwise from the coldness they will freeze.[1]

Aqua ardens ('burning water') was one of the Latin terms commonly applied to distilled alcohol since late medieval times. The name probably referred either to the burning sensation appearing in the mouth and throat after drinking spirit, or to the fact

that it contained enough alcohol to burn. The term could also have been derived from the actual process used to heat and vaporise the base liquid during distillation. Another popular medieval term related to spirits, *vinum adustum* (or *vinum crematum*), makes it clear what this base liquid originally was – literally, this means 'burnt wine'. However, in those countries where grapevines did not grow and wine was too expensive an ingredient for distilling, it was a mash of fermented grains that eventually became the principal raw material for making strong liquor.[2] It doesn't come as a surprise that spirits in Muscovy were apparently produced from cereals right from the onset of Russian distilling (even though not necessarily in all cases, as we will see). What is interesting to note in the passage above is that spices were also used in the process of distillation.

The author of *Tractatus de duabus Sarmatiis* never visited Muscovy, but according to some witnesses Miechowita's informants were Russian prisoners of war taken at the Battle of Orsha.[3] We can therefore assume that his account is still accurate to some degree, although its emphasis on the role played by 'hot drinks' in keeping Muscovites warm in freezing weather raises suspicion of certain stereotyping. Having said that, it is true that during the same period other nations living in similar temperatures were also consuming distilled liquor not for intoxication purposes but rather to fight the effects of the cold climate: in sixteenth-century Germany, for example, spirits were normally drunk in the morning – just as coffee is today – for warmth and 'strength', and mainly during winter months.[4]

That Russians were already familiar with distilled alcohol in the first quarter of the sixteenth century finds confirmation in the writings of a Habsburg diplomat Sigismund von Herberstein, who visited Moscow twice, in 1517 and 1526 – his first trip occurring during the same year Miechowita's book was published. Herberstein was born and grew up in the Duchy of Carniola (now in Slovenia), so when he came to Russia his knowledge of a Slavonic language allowed him to communicate freely with the locals. Energetic and capable ethnographer, he left rich and objective descriptions of Muscovy which were based mainly on personal observations.

Upon his arrival to Moscow in April 1517 and while waiting for the audience with the Grand Prince, Herberstein resided in a house allocated to him by the authorities with food and beverages being brought in on a daily basis. Among the supplies were beef, pig fat, rabbit meat, chicken, live sheep, fresh and smoked fish, cheese, salt, spices such as saffron and pepper, mead and two types of beer. In his autobiography, written in German, Herberstein mentions that a small jug of 'burnt wine' (*pranndt Wein* in the original text) was also delivered and claims that 'they [the Muscovites] always drink it at the table before a meal'.[5]

The notion that Russians always consume spirits before taking their food can once again be found in a description of a ceremonial dinner that Herberstein attended at the Grand Prince's palace during his second visit to Moscow, given in his *Rerum Moscoviticarum Commentarii* – a detailed eyewitness ethnography of Russia, originally published in Latin in 1549:

> Finally, the stewards went out for food, [...], first they brought in *aqua vitae*, which they always drink at the commencement of the dinner; then they brought roasted swans, which it is almost always their custom to lay before their guests for the first dish whenever they eat meat.[6]

Aqua vitae ('water of life') was another generic term for distilled alcohol in late medieval and early modern times, the name implying that back in the day it was used mainly for medicinal purposes. It has been replicated in many languages, from French *eau-de-vie* to Gaelic *uisce beatha*, and in some countries even became the appellation of the national spirit (e.g. *akvavit* – Scandinavian grain distillate flavoured with a variety of herbs, the principal ones being caraway and dill seed).

Herberstein does not mention if *aqua vitae* that he encountered in Russia was infused or distilled with herbs or spices, but this is entirely possible, as Miechowita's account suggests. The very fact that spirits were consumed in Muscovy before meals may itself mean that the local liquor could well have been herbed and/or spiced – one of the reasons why distilled beverages in the early modern period were seen as something that can both arouse appetite and promote digestion laid in the properties attributed to plant extracts that they often contained.

In Western Europe distillation was applied to herbal material as early as in the fourteenth century, and by the middle of the fifteenth century extracting flavours and medicinal value from plants by boiling them in water or wine and then condensing the vapours became common practice – to such an extent that from early sixteenth century onwards many manor houses had a stillroom where herbal preparations were made and stored for future use.[7] Such a stillroom was often combined with the kitchen since distilling required a reliable source of heat.

The dissemination of distillation technology across the continent during the second half of the fifteenth and the first half of the sixteenth centuries accelerated with the invention of the printing press. One of the earliest and most comprehensive printed manuals on distillation of herbal 'waters' and their medical applications was *Liber de arte distillandi de simplicibus* by Hieronymus Brunschwig, written in German (despite its Latin title) and first published in 1500 in Strasbourg.[8] Having been immensely successful in Germany both in its original format and as a revised, longer version called *Liber de arte distillandi de compositis* (1512), as well as eventually becoming an integral part of popular herbal compendiums, it remained in print for more than a century and was translated into other languages, including Dutch (1517), English (1527) and Czech (1559).

There are several (at least six) known manuscript copies of what appears to be the Russian translation of Brunschwig's treatise, the earliest of which dates to the last quarter of the sixteenth century. It is called *Skazanie o propushchenii vod* and has a Muscovite origin, even though translation itself might have been done either in Pskov or Novgorod lands, or by someone originating from there.[9] Its emergence was most probably linked to

the creation in Moscow of the Apothecary Chancery (*Aptekarskiy prikaz*) – the medical department of the tsar's palace.

We don't know when the Apothecary Chancery was formed, but it seems to have been fully operational by 1582.[10] This institution grew out of the Russian monarch's private pharmacy and initially cared only for the royal household, but eventually ended up serving also the needs of the tsar's close courtiers, the nobility more generally, higher clergy, and the army. The Chancery was staffed by imported – Dutch, English, German – doctors and apothecaries, and relied in large part on Western medical texts, many of which were brought from Europe by the foreign specialists themselves. A number of important medical books were translated into Russian in this period, and *Liber de arte distillandi* must have been one of them.

The extent of *Skazanie*'s circulation is not clear, and its emersion by no means antedated Russian distilling as such. As we saw, alcohol distillation was practiced in Muscovy well before Brunschwig's work got translated (unless a much earlier copy of this translation is waiting somewhere to be discovered), with grain spirits being produced at least since early sixteenth century.[11] However, the appearance of this and similar books and transmission into Russia of the medical know-how that they manifested contributed significantly to a further development of the apparently already existing local practice of distilling with herbs and spices.

Since most, if not all, early modern medicines were derived from herbs (including by way of preparing medicinal distillates, as described in *Liber de arte distillandi*), herb collection and processing was one of the key functions of the Apothecary Chancery. Various plants of the *materia medica* were grown in its own apothecary gardens, and starting from at least 1630s collecting herbs and berries – such as juniper, for example – for the Chancery became an official seasonal obligation born by peasant communities in some parts of Muscovy. In addition, special herb-gathering expeditions were organized all around the tsardom.[12]

As can be seen from the available documents, Apothecary Chancery's staff herbalists (*travniki*) who normally led such expeditions, were almost always accompanied in the field by *pomyasy*, drafted from the tsar's kitchen (*Kormovoy dvorets*).[13] The meaning of the word *pomyas* is not very clear. According to *Dictionary of Church Slavonic and Russian language* (1847), *pomyas* is a person who is responsible for 'watching over the meat supplies'. Izmail Sreznevsky in his *Materials for the Dictionary of the Old Russian Language* (1902) also defines it, albeit not very confidently, as 'meatman'. In *Dictionary of Russian Language of XI-XVII Centuries* (1991), *pomyas* is 'someone who kneads dough or mixes ingredients during cooking'.[14] Such difference in suggested meanings can be explained by the similitude of the Russian words *myaso* ('meat') and *mesit'* ('to knead', also 'to mix'). Regardless of its etymology, it seems that the term was used to refer to a person involved in food (most likely, meat) storage and/or preparation. What is not clear is why of all the available personnel it was *pomyasy* who were regularly dispatched by the palace to assist *travniki* in collecting medicinal plants all over Muscovy.

The answer may be that in medieval and early modern cooking herbs and spices were not only used to help digestion or enhance food flavour; they also played an important role in the preservation of meat products due to their natural antimicrobial and antioxidant properties. It is not only imported oriental spices that possess such qualities – compounds that can be found in plants native to Europe, such as fennel, parsley, rosemary, thyme, sage, mustard, etc., are also able to eliminate or delay the action of pathogenic microorganisms that attack meat if it is stored at room temperature for more than few hours. Moreover, many herbs exhibit greater antibacterial potency when they are blended together than when used alone.[15] It could be that the 'ingredients' which *pomyasy* were supposed to be mixing in their kitchens were herbs and spices, and the main reason for them to be sent along with *travniki* to herb-collecting expeditions organised by the Apothecary Chancery was their expertise of working with herbal material.

Herbs, roots, flowers and berries collected in the field by *travniki* and *pomyasy* were used by the Chancery's *alkhemisty* (at Muscovite court this word denoted pharmacists and staff distillers, not alchemists in a philosophical or scientific sense) for the preparation of vodkas and essential oils, which would then be supplied to the tsar's courtiers and servicemen on special request. The earliest known approval of such a request was reported in November 1581:

> By order of *oruzhnichiy* [the tsar's armoury keeper] Bogdan Yakovlevich Belskiy, doctor Ivan took for *lovchiy* [master of hounds] Ivan Mikhailovich Pushkin endive vodka and ribwort vodka – a cup of each.[16]

Bogdan Belskiy, Ivan IV's bodyguard and minion, was the first head of the Apothecary Chancery – such choice being explained by the tsar's ever-present fear of poisoning. 'Doctor Ivan', who is also mentioned, is most probably the court physician, Dutchman Johan Eylof.

The assortment of vodkas produced by the Apothecary Chancery was impressive, as demonstrated by a humble petition made to Tsar Mikhail Romanov by his courtier Ivan Mikhailovich Katyrev-Rostovsky:

> Order, Sire, to give me for my headache from your state apothecary [...] vodkas [made with]: rose hip, buckwheat, dill, mint, fennel. Your Majesty, have mercy, please![17]

Judging by their regular appearance in the surviving records, anise and wormwood vodkas were by far the most popular ones. Perhaps not coincidentally both of these herbs were considered as 'warm', being able to comfort and aid the digestive system (according to the medical theory of the time, overeating as well as bad appetite were caused by the loss of internal heat, resulting in a 'cold stomach' – the one that cannot generate enough warmth to be able to digest food). Coriander, hyssop, laserwort, mezereon, strawberry, cornflower and linden blossom vodkas are also mentioned in the materials related to the Apothecary

Chancery's functioning. Imported spices such as cloves, galangal root and cinnamon were used for vodka making, too.

It wasn't just vodkas made with individual plant species that were produced, various herbal mixtures were also quite common. Here is, for example, a seventeenth-century Russian recipe for *vodka Apoplectica*, which was considered to be a good remedy for migraines and paralysis:

> Take cinnamon, cloves, ginger, wormseed, mastic, frankincense, 20 *zolotniks* each. Nutmeg, peony root, sweet flag, olive pits, lemon zest, thyme, sawwort, 12 *zolotniks* each. Juniper berries, white mustard, coriander, ground cardamom, lavender, rosemary, marjoram, ¼ of a pound. Sage, hyssop, mint, betony, lemon balm – a handful of each. [Add] a pound of lily of the valley blossom, crush all this coarsely, cut the herbs, pour in two *vedros* of simple *vino* [i.e. single-distilled grain spirit], or half-and-half with *romanennaya vodka* [brandy made from *romaneya*, i.e. wine from Romanée region], and steep for two weeks; after it's infused, distil in a pot still – there will come out a *vedro* of vodka...[18]

Just as most of Brunschwig's 'waters', many early Russian vodkas did not contain any alcoholic enhancement. However, as can be seen from the recipe above, pre-distilled alcohol was used as a basis for some of the concoctions made by the Apothecary Chancery. These more potent vodkas should have been held in much greater esteem: not only is ethanol a better solvent for phytochemical compounds present in herbs, it also helps to keep the shelf life of the end product for longer by acting as a preservative. At some stage the inebriating qualities of alcoholic vodkas must have become increasingly appreciated, as well, contributing to their rising popularity.

It is interesting to see brandy (*romanennaya vodka*) being mentioned as one of the ingredients in the *Apoplectica* recipe. Wine from Burgundy seems to have been very popular at the Muscovite court, and despite its high price it was sometimes distilled, either on its own or with herbs and spices. In the latter case it was often done for the production of vodkas intended for the royal consumption, such as the one mentioned in the following document from 1645:

> By the order of His Majesty the Tsar and Grand Prince of all Rus' Mikhail Fedorovich, command *boyarin* [highest rank of Russian aristocracy] Fedor Ivanovich Sheremetev to distil in the Apothecary Chancery for *Sytnoy dvorets* for His Majesty's usage cinnamon vodka from four *vedros* of *romaneya*.[19]

The fact that it was to be distilled for *Sytnoy dvorets* clearly indicates that as early as in 1640s vodka was already used at the Russian court not only for medicinal purposes, but

also as a gastronomic drink. *Sytnoy dvorets* (or *Sytnoy dvor*, also sometimes called *Sytennoy*) was a subdivision of the catering administration of the tsar's palace overseeing the provision of beverages, including mead (hence the name, as the Russian verb *sytit'* was used to describe the process of diluting honey with water), kvass, beer, and wines.[20] Since the Apothecary Chancery also was a branch of the royal household, it was very natural for the palace's food and drink department to expect *alkhemisty* to meet the court's demand in spirits – the same way royal kitchen had to regularly provide its *pomyasy* for the Chancery's seasonal herb-gathering expeditions.

During the course of the second half of the seventeenth century vodka once and for all ceased to be considered solely as a medicine and became a drink purely for pleasure and enjoyment. This change is very well illustrated by an entry in the palace register books, describing a royal banquet held by Tsar Alexey Mikhailovich in October 1674:

> After dinner the Great Tsar deigned to amuse himself with various games. And the Great Tsar was entertained, the pipe organs were played, the foreigner [*nemchin*] played the organ, *surny* [shawm-like instruments] and trumpets were blown, and *surenki* [small *surny*] were played, and all the drums and timpani were beaten. And the Great Tsar granted his archpriest, the Great Tsar's confessor, and his *boyars* and *duma dyaks* [members of the tsar's council], who attended the evening meal, with *votkas* [*sic*], Rhenish and *romaneya* wine and different other drinks, bestowing his grace upon them: and got them all drunk.[21]

Distilled alcohol seems to have already been known in Muscovy in the beginning of the fifteenth century, and judging by a well-documented Muscovite custom of drinking spirits before meals it was initially employed mainly to increase hunger and improve digestion. Western doctors, who started to come to Moscow in the second half of the sixteenth century in increasing numbers, used herbal 'waters' extensively for the treatment of a variety of diseases as well as in therapeutic purposes, including appetite stimulation, thereby contributing to a further endorsement of distilled liquor as a digestive. Eventually, this led to the development of a whole category of compound alcoholic beverages known collectively as *vodki*. Interestingly, it is this meaning – a cordial distilled with local herbs or foreign spices – that the term 'vodka' implied in Russia well into the nineteenth century, whereas the drink itself became firmly established as an important part of the local gastronomic culture.

Notes

1. Maciej Miechowita, *Tractatus de duabus Sarmatiis Asiana et Europiana et de contentis in eis* (Cracow: Johannes Haller, 1517), Tractatus secundus libri secundi, Capitulum primum de Moscouia.
2. In many such countries, the term 'burnt wine' was applied to any spirit, regardless of whether it was based on grapes or cereals. Muscovy was no exception – the name for a product of single distillation

(with no herbs or spices added) in early modern Russia was *goryachee vino* ('burnt wine'), somewhat later shortened to simply *vino* ('wine'). Not surprisingly, this is creating a lot of confusion for historians.

3. *Trattamento di pace tra il Serenissimo Sigismondo Re di Polonia, et Gran Basilio Prencipe di Moscovia, Hauuto dalli Illustri Signori, Francesco da Collo, Cauallier, Gentil'huomo di Conegliano, et Antonio de Conti Cauallier, Gentil'huomo Padouano, Oratori della Maestra di Massimilian, Primo Imperatore L'anno 1518* (Padua: Lorenzo Pasquato, 1603), p. 56.
4. B. Ann Tlusty, 'Water of Life, Water of Death: The Controversy over Brandy and Gin in Early Modern Augsburg', *Central European History*, 31, no. 1–2 (1999), 1–30 (p. 14).
5. 'Selbst-Biographie Siegmunds Freiherrn von Herberstein, 1486-1553', in *Fontes Rerum Austriacarum*, vol. I, ed. by Th. G. von Karajan (Vienna, 1855), pp. 67–396 (p. 121). In German-speaking countries the product of burning, that is, distilling wine (as well as distilled ale or beer – see note 2) was called *geprannter Wein*, or *prannt Wein* for short (also *branntwein)*. English word 'brandy' was coined in the seventeenth century from the Dutch *brandewijn*, itself derived from the German contraction.
6. *Rerum Moscoviticarum Commentarii Sigismundi Liberi Baronis in Herberstain, Neyperg et Guettenhag: Russiae, et quae nunc eius metropolis est, Moscouiae, breuissima descriptio* (Basel: Johannes Oporin, 1556), p. 128. In 1557, Herberstein's own translation of his book into German was published in Vienna (*Moscovia der Hauptstat in Reissen, durch Herrn Sigmunden Freyherrn zu Herberstain, Neyperg und Guetenhag obristen Erbcamrer und öbristen Erbtruckhsessen in Kärntn, Römischer zu Hungern und Behaim Khü. May. Etc. Rat, Camrer und Presidenten der Niderösterreichischen Camer zusamen getragen* (Vienna: Michael Zimmerman, 1557)). In the German version the distillate that the author came across in Muscovy is referred to as *Prandtwein* or *Prantwein*.
7. R.J. Forbes, *A Short History of the Art Distillation from the Beginnings Up to the Death of Cellier Blumenthal* (Leiden: E.J.Brill, 1948), pp. 62–66. On the ubiquity of household distilling in Britain in Tudor times see C. Anne Wilson, *A History of Wine-Distilling and Spirits, 500 BC – AD 2000* (Totnes: Prospect Books, 2006), pp. 169–188.
8. *Liber de arte distillandi de simplicibus: Das Buch der rechten Kunst zu distilieren die eintzige Ding von Hieronymo Brunschwig* (Strasbourg: J.Grüniger, 1500). It was not the first printed book on distillation – Michael Puff von Schrick's *Von den ausgeprannten Wassern* was published in 1477 in Augsburg and seems to have been rather popular, undergoing 44 editions by 1500 (Gregory A. Austin, *Alcohol in Western Society from Antiquity to 1800: A Chronological History* (Oxford: Clio Press, 1985), p. 122). Brunschwig's book, however, became much more influential and was instrumental in spreading the practice of distillation across Europe.
9. N.A. Bogoyavlensky, *Drevnerusskoe vrachevanie v XI-XVII vv.* (Moscow: Medgiz, 1960), pp. 72–83. For a more recent overview of *Skazanie* and its surviving copies see K.I. Kovalenko, '"Skazanie o propushchenii vod" kak leksikograficheskiy istochnik' in *Acta linguistica Petropolitana. Trudy Instituta lingvisticheskikh issledovaniy RAN*. Vol. XIII, Part 2 (St Petersburg: Nauka, 2017), pp. 416–472; and O.S. Sapozhnikova, 'Vklad drevnerusskikh knizhnikov XVII veka v otechestvennuyu meditsinu (Dionisiy Zobninovskiy, Ivan Nasedka, Sergiy Shelonin)' in *Materialy i soobscheniya po fondam otdela rukopisey BAN*, Issue 7, ed. by Podkovyrova V.G. (St Petersburg: BAN, 2019), pp. 249-273.
10. According to the inventory of the Russian royal household from 1582/83, a herbal belonging to the palace had been kept in *Aptekarskaya izba* – literally, 'Apothecary House' (*Vremennik Imperatorskogo Moskovskogo obschestva istorii i drevnostey rossiyskih*, vol. VII (Moscow, 1850), pp. 1–46 (p. 6). In 1540s-90s the word *izba* was used in the Muscovite state to designate permanent administrative offices with fixed location and specialization. Unkovskaya's claim that the aforementioned inventory related to 1572 (M. V. Unkovskaya, 'Learning Foreign Mysteries: Russian Pupils of the Aptekarskii Prikaz, 1650-1700,' *Oxford Slavonic Papers*, 30 (1997), 1–20 (p. 5)) must be a result of her miscalculation of the year corresponding to '7090 from the creation of the world' in the original document.
11. The earliest reference to distilled alcohol in a Muscovite document is found in the instructions given by Joseph Volotsky, a Russian Orthodox theologian and abbot of a monastery at Volokolamsk, to his brethren not to drink or store any liquor, dated between 1479 and 1515 (*Dopolneniya k Aktam istoricheskim*, Vol. 1, no. 212 (Saint Petersburg, 1846), p. 360). The term used by Joseph was *goryachee vino* (see note 2 above).
12. I. Ya. Gurliand, *Mozhzhevelovaya povinnost': Materialy po istorii administratsii Moskovskogo gosudarstva vtoroi poloviny XVII veka* (Yaroslavl: Tipogragiya Gubernskogo Pravleniya, 1903).

13. *Pomyasy* start to appear in the surviving Apothecary Chancery materials beginning in 1632, while the first document mentioning their affiliation with the tsar's kitchen dates to April 1645. From another record made in June 1645, we learn that some of the *pomyasy* drafted from the royal kitchen a couple of months earlier had to be replaced due to their drunkenness and lack of zeal (see K.S. Khudin, '"Travniki" i "pomyasy". K vorposu o deyatelnosti Aptekarskogo prikaza (1629-1645 gg.)' in *Tret'i Chteniya pamyati akademika RAN L.V.Milova 'Rus', Rossiya. Srednevekovye i Novoe vremya'* (Moscow, 2013), pp. 423–427). For a good overview in English of both *pomyasy* and *travniki*, as well as a recapitulation of the juniper obligation in Muscovy, see Rachel Koroloff, '*Travniki*, *Travniki*, and *Travniki*: Herbals, Herbalists and Herbaria in Seventeenth-Century and Eighteenth-Century Russia', *Vivliofika*, vol. 6 (2018), 58–76.
14. *Slovar' tserkovno-slavyanskago i russkago yazyka*, Vol. III (St Petersburg: Tipografiya Imperatorskoy Akademii Nauk, 1847), p. 331; I.I. Sreznevsky, *Materialy dlya slovarya drevne-russkago yazyka po pis'mennym pamyatnikam*, Vol. II (St Petersburg: Tipografiya Imperatorskoy Akademii Nauk, 1902), p. 1176; *Slovar' russkogo yazyka XI-XVII vv.*, Issue 17 (Moscow: Nauka, 1991), p. 45.
15. See Marija M. Škrinjar and Nevena T. Nemet, 'Antimicrobial Effects of Spices and Herbs Essential Oils', *Acta Periodica Technologica*, 40 (2009), 195–209; Davide Gottardi, Danka Bukvicki, Sahdeo Prasad and Amit K. Tyagi 'Beneficial Effects of Spices in Food Preservation and Safety', *Frontiers in Microbiology*, 7 (2016), 1–20; and Paul W. Sherman and Jennifer Billing, 'Darwinian Gastronomy: Why We Use Spices: Spices Taste Good Because They Are Good for Us', *BioScience*, Volume 49, Issue 6 (1999), 453–463.
16. G. Zharinov, 'Zapisi o raskhode lekarstvennykh sredstv, 1581-1582 gg.', *Arkhiv russkoy istorii*, Issue 4 (Moscow, 1994), pp. 103–125.
17. *Akty istoricheskie, sobrannye i izdannye Arkheograficheskoyu kommissieyu*, Vol. 3 (St. Petersburg: Tipografiya II-go Otdeleniya, 1841), p. 289. The request was made in February 1630.
18. V. M. Florinskiy, *Russkie prostonarodnye travniki i lechebniki. Sobranie meditsinskikh rukopisei XVIi XVII stoletiia* (Kazan: Tipografiya Imperatorskago universiteta, 1879), p. 213. *Zolotnik* was an old Russian unit of weight equal to 4.266 grams. Russian pound, or *funt*, was equal to 409.5 grams. *Vedro* ('bucket') was a liquid measure equal to 12.3 litres.
19. *Akty istoricheskie*, p. 472. Fedor Sheremetev was the head of the Apothecary Chancery in 1638-39 and 1645-46 (D.V. Liseytsev, N.M. Rogozhin, Yu.M. Eskin, *Prikazy Moskovskogo gosudarstva XVI-XVII vv. Slovar-spravochnik* (Moscow: Tsentr gumanitarnykh initsiativ, 2015), p. 34).
20. According to Grigoriy Kotoshikin, a Russian diplomat and high-ranking official at the Ambassadorial Chancery who in 1664 defected first to Poland and then to Sweden and later wrote a treatise on the Muscovite state, *Sytennoi dvor* had more than thirty cellars with various drinks stored on ice, as well as a separate cellar for imported wines (G. Kotoshikhin, *O Rossii, v tsarstvovanie Alekseya Mikhailovicha* (St Petersburg: Tipografiya Eduarda Pratza, 1840), p. 60).
21. *Dvortsovye razryady*, Vol. III (St Petersburg, 1852), p. 1081.