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Medicines produced in Telšiai pharmacy (Vilnius governorate): analysis of prescription book from 1830

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The Museum of the History of Lithuanian Medicine and Pharmacy has a prescription book by a pharmacist Teodor. Geldner from Telšiai (the tsarist Russia's Lithuanian Vilnius Governorate), dated 1830. Each medication that was produced at the pharmacy had to be registered in this book. The entries included the composition of the drug, its form, usage, price, the physician's name, and (sometimes) the method of production. This paper presents the content analysis of this book. The study revealed which medicines were used for the treatment of patients back then, which principles of therapy predominated, and what the social status of the patients was.

1. Introduction

The 19th century was a period of important changes in pharmacy. Besides medicines of botanical and animal origin, various chemical compounds and newly discovered substances – organic acids and alkaloids – started gaining popularity. Pharmacy prescription books are an interesting and informative source revealing what medications were used during certain periods. Such books were obligatory official documents where the pharmacists registered all prescriptions – i.e. provided their detailed copies.

There are over a dozen surviving prescription books from the 19th–the 20th century in Lithuanian archives, museums, and private collections. One of the oldest such books in the Museum of the History of Lithuanian Medicine and Pharmacy is the prescription book by the pharmacist Teodor Geldner from Telšiai dated 1830 *„Shnurovaja kniga dlia zapisyvanie receptov postupajushczich v volnuju apteku Provizora Fedora Geldnera v gorod Telshiach sostojashcziuju 1830 goda"* (Fig. 1).

In 1830, Telšiai was the center of the tsarist Russian Empire's Lithuanian Vilnius Governorate, Telšiai County; in 1830, its population was over 4000 people. Only one pharmacy operated in the city between 1798 and 1868 (Archives 1867). In 1830, Teodor Geldner owned and ran the pharmacy. Other nearest pharmacies were 62 km away (Archives 1829).

During 1830, Telšiai pharmacy produced medications for 3,719 prescriptions. In this work, we conducted prescription content analysis, which revealed which medicines were used for the treatment of the local population, which dosage forms the physicians prescribed, what the prices of the medications were, and which botanical, animal, and chemical substances were used as crude drugs (raw material).

The evaluation of the pharmacological effect of the drug was based on 19th century pharmacological literature: *Kurt Sprengel, Lekarstvenik ili farmacologia Kurta Sprengelia* (Kurt Sprengel, Registry of medicines, or pharmacology) published in Moscow in 1820, pharmacists' periodical *Pamiętnik Farmaceutyczny Wileński (*Notes of Vilnius Pharmacy*)*published during 1820–1822 in Vilnius, and *H.Hager, Rukovodstvo k farmacepticheskoi i mediko- chimicheskoi praktike* (A manual for

Fig. 1: The prescription book by the pharmacist Teodor Geldner from Telšiai dated 1830. The archive of the Museum of the History of Lithuanian Medicine and Pharmacy (MLMP).

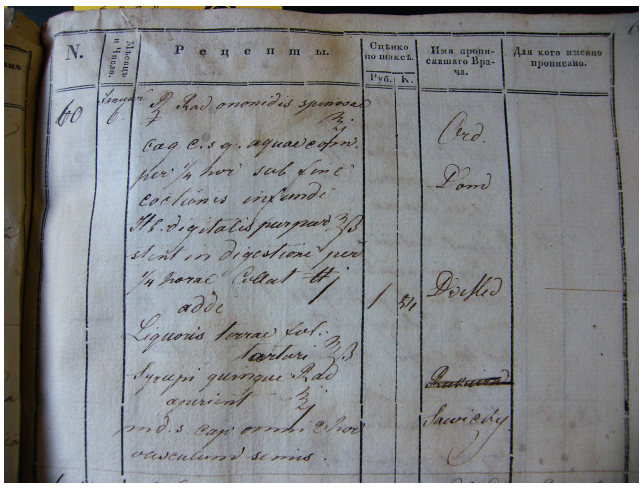

Fig. 2: Fragment from the prescription book.

pharmaceutical and medical-chemical practice) published in St. Petersburg in the late 1800 s.

2. Contents of the prescription book

The prescription book has 287 bound sheets, i.e. 574 pages in total. Each page is divided into six sections where the following information is indicated: the number of the drug, the month and day of the production, the components of the drug and their amounts, the price, the name of the prescribing physician, and the patient's name (Fig. 2). The composition of medications is written in Latin. The manufacturing process is written in Latin, sometimes in Polish, and rarely – in German. Other information is presented in Polish.

On average, the Telšiai pharmacy produced 310 medications per month ca. 160 different components used in various combinations.

3. Physicians and patients

In tsarist Russia, not only private physicians worked in governorate county centers. There were also physicians in state service. County physician *"uezdnii vracz"* were the most senior of them. They were responsible for healthcare in the county, including its pharmacies. In 1825, the total number of state service physicians in Lithuanian Vilnius Governorate was 12, and 51 more physicians were in private practice (Archives 1826). In 1840, in addition to the county physician, two paramedics and an obstetrician worked in Telšiai city (Gadon 1846).

The section "Name of the prescribing physician" *"Imia propisavshevo Vracza"* also contained abbreviations "*Ord. Dom. Dr. Med.*", i.e. "*Ordinatio dominus doctoris medicus*" "prescribed by mister doctor".

The section "For whom exactly the drug was prescribed" *"Dlia kavo imeno propisano"* contained the patient's name. Usually, the family name was indicated, frequently adding "*Dla W. Pana*" (W. -wielmożnego) – "for honorable sir". Sometimes patients' positions were also indicated – e.g. judge, sergeant *"Dla W. Pana Mozayki Poruczika"*, rittmeister, priest, bishop, doctor, rabbi *"Dla Pana Rabina"*, or "daughter of the esteemed advisor" *"Dla corki W. Sovietnika Kormillowicza"*. Sometimes, the pharmacist only indicated the patient's social status without the aforementioned respectful abbreviation *"W"* – a student, a detainee, a recruit, a sacristan's wife, a beggar from Tryškiai, a Jew *"Dla Zydka"*, "a daughter of an unknown Jew" *"Dla newiadomego zydka còrki"*, or a stranger *"dla newiadomego"*. At times, prescriptions were written for non-personalized groups of people e.g. for peasants *"Dla Włościan storostwa Gutomszenskiego"*. Medications for the garrison were issued to a military doctor (medic) *"pro nosocomio militarum"*. Sometimes the physician dispensed medicines on loan, and in such cases indicated in the prescription books to whose account the loan went e.g. "to the account of duke bishop Giedraitis" *"Na konto W. Xięcia Biskupa Giedroycia"* (Archives 1830a). Prisoners were treated by the county physician V. Taratuta. In certain cases, the patient's name was not indicated – the pharmacist only placed a dash there (Archives 1830a).

4. Diseases

Telšiai County published a book leading noble in the area Michal Gadon (1807–1855), which among other things also describes diseases that occurred in that territory. The book indicates that the following diseases and disorders were most common in those parts: fever due to cold (especially during seasonal changes), mastitis, laryngitis, and pneumonia. Other common diseases included scarlet fever, croup, measles, "contagious plica"[1], and various rashes (Gadon 1846).

This information was also confirmed in the statistics report for 1830 by the Governorate Medical Administration concerning the number of patients treated in governorate hospitals, and their mortality and recovery rates. The document indicates that the most common disorders were various types of fever: "*Febre inflamat. simpl. et locali inflam.*"

Various chronic disorders *"morbis varrios chronic"* were also treated in hospitals: tuberculosis "*Phthysis varia*", hydropsy *"Hydropse"*, diarrhea *"Diarrhoea"*, etc. (Archives 1829).

Syphilis was the second most common disease registered in hospitals, topped only by fevers. During 1830, 21 patients died of this disease in county hospitals, 822 patients were "cured", and the total number of patients with this condition was 1,141. (Archives 1829).

5. Medications

The section "Prescription" "*Recept*" contains copied contents of the physician's prescription and the mode of administration. If the patients themselves had to prepare a decoction, the pharmacist indicated how it should be made.

To a single patient, physicians frequently prescribed one or two drugs; three drugs prescribed to the same patient were less common, although sometimes four or even five medications were prescribed. At times, the same patient was given both internal and external drugs. Internal medications comprised 76%, and external remedies 24% of all the produced medications.

The variety of the components may be illustrated by an example of five sorts of water used for the production of the prescribed mixtures: common water *(Aqua Communis)*, distilled water *(Aqua Destillata)*, boiled water *(Aqua Fervida)*, spring water *(Aqua Fontis)*, and simple water *(Aqua Simplicis)*.

Fever was most commonly treated with cinchona *Quina* bark powder decoction, quinine, and Haller's acid elixir *Ac. Halleri*. Rhubarb root powder, castor oil, and tamarind fruit pulp were used as laxatives; ipecacuanha rhizome, tartaric acid salts, antimony wine, and other antimony compounds as emetics; and foxglove leaves, tartaric acid salts, etc. as diuretics.

The components of medications recorded in the Telšiai pharmacy prescription book can be distributed into three major

[1] Matted, uncombable, filthy hair; in Lithuania and Poland it was believed to be a dangerous contagious disease, and that the plica could not be cut off. The Latin name of this supposed disease was *Plica Polonica*.

groups: components of botanical, animal, and chemical origin. Botanical components comprised 71% of all the components.

5.1. Components of botanical origin

The most popular drug components were plants and their parts – flowers, roots, bark, fruit, seeds, and resin – and drugs made thereof, such as extracts, oils, elixirs, tinctures, infusions, decoctions, balms, etc. In total, the pharmacist used over 100 plants. Common marshmallow *Althaea officinalis* was the most commonly mentioned plant. Another popular plant, rhubarb, was also used in drug manufacturing. Powder made from its roots was used to produce extracts, paste (electuary), tinctures, or aqueous extracts.

Both local and imported botanical raw material was used for drug manufacturing. M. Gadon in his book mentioned 76 medicinal plants growing in the meadows and forests of Telšiai County (Gadon 1846). About a half of those plants were mentioned in the prescription book of the Telšiai pharmacy.

Imported raw materials were as popular as the local ones. The following plants were most commonly used: common marshmallow *Althaea officinalis,* foxglove *Digitalis purpurea*, acacia resin *Mucilaginis g. arabici* etc.

Poppy syrup, poppy flowers, and opium are mentioned in the composition of every fifteenth drug produced at the Telšiai pharmacy. In the 19th century, opium was one of the most popular drugs, and was used as an analgesic, an antipyretic, a sedative, and also for the treatment of dysentery and cough (Porter 1998). Both pure opium *Opium purum* and opium tincture *Tinctura Opii crocata* with saffron, clove, cinnamon, and wine were prescribed. Ethanol-based opium *Laudanum Liquidum* was the most popular opium preparation mentioned in the book. Opium preparations were prescribed not only to adults, but to children (Archives 1830a).

Another popular, although less frequently mentioned opium-containing preparation, compared to *Laudanum Liquidum,* was Dover's powder *Pulvis Doweri,* also called *Pulvis Ipecacuanhae opiatus***.** Ipecacuanha root powder is mentioned among the ingredients of emetic medications, alongside emetic tartar *Tartarum emeticum* and antimony wine *Vinum antimoniale Huxham* (Archives 1830a).

Henbane *Hyoscyamus* is a poisonous plant with analgesic, diuretic, expectorant, or antitussive properties (Hager 1893). Sometimes *Extr. Hyoscyami* was prescribed with sugar syrup, and sometimes as part of a multi-component drug (Archives 1830a).

The most popular botanical drugs for fever were cinchona bark powder and its extract. However, they were gradually replaced by the alkaloid salt extracted from the plant – quinine sulfate *Chininum sulphuricum*. In January, physicians more commonly prescribed cinchona tincture or cinchona bark powder, and quinine was mentioned in only one prescription (Archives 1830a). Gradually, the number of prescriptions for quinine increased, and in April, 26 prescriptions for the recently (in 1820) discovered substance were registered.

5.2. Components of animal origin

At the beginning of the 19th century, medicines containing substances of animal origin were still popular. In the prescription book of the Telšiai pharmacy, such components comprised 6% of all ingredients. Most frequently, adhesive plasters *Emplastrum Vesicatorii* containing powder of Spanish flies *Cantharides.*

The plaster had an irritating effect, and it was applied on painful areas, such as the abdomen, the chest, or behind the ear. It was also prescribed for headache, inflammations, and cough (Hager 1887).

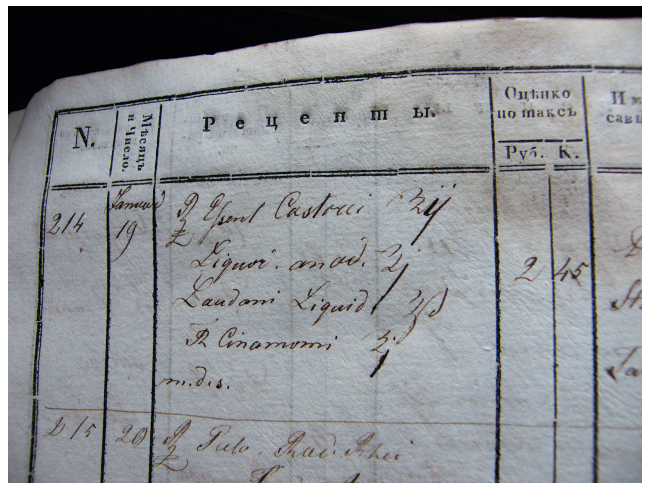

Fig. 3: Prescription for medication with beaver castor sac powder, opium, and ether.

Drugs made of beaver glands *Castoreum* were intended for internal use. This was a pungent-smelling powder from castor sacs of beavers, having a similar effect to that of musk. It was written that *Castoreum* had a nervous system-stimulating effect and was prescribed as an antispasmodic, for headache, apoplexy, and hysteria (Shprengel 1820). Physician Taratuta prescribed medications containing beaver castor sac powder, opium, and ether *Essent. Castorei, Laudanum liquidum,* and *Liquor Anodyni* both to himself and to his patients (Archives 1830a) (Fig. 3).

Bee products were used in cough mixtures and in emollient ointments.

Formic acid *Spiritus Formicarum* was mentioned as a component of external drugs for inunction, and was used for common colds and articular disorders.

Among the less commonly mentioned components of animal origin was *Lapides Cancrorum* – powder of the stony concretions in the stomach of a crayfish. The powder was intended for internal use, and was mostly prescribed to children, to strengthen their bones.

The composition of several drugs lists an expensive substance of animal origin – musk *Moschus Sibirici*.

The bile of a bull *Fel. Tauri* was mentioned in the prescription for laxative pills and electuary *Electuarium* to be used in the treatment of a child (Archives 1830a).

Beaver castor sacs and musk were expensive imported raw materials, and as such were sometimes falsified (Wolfgang, 1820).

In the 19th century, the use of drug components of animal origin in medical practice was decreasing, while chemical compounds were gaining popularity. They comprised 23% of all components mentioned in the Telšiai pharmacy prescription book.

5.3. Chemical compounds

Frequently, potent and toxic substances were prescribed, such as mercury, lead, antimony salt, ether, and concentrated acids.

Medicines containing mercury compounds comprised 7% of all drugs manufactured at the Telšiai pharmacy. At that time, mercury was the principal drug for syphilis. Mercuric chloride *Calomel* was the most popular mercury preparation prescribed both for external and internal use. Literature indicates that "calomel, if used carefully, is well tolerated not only by delicate children, but also by weak women and even patients with fever" (Shprengel 1820).

Besides calomel, T. Geldner also used the following mercury compounds for drug manufacturing: mercury sulfide *Cinnabar*

and a compound drug called *Pulvis Antispasmodicus Stahl* consisting of the aforementioned cinnabar, potassium nitrate, potassium sulfate, and sugar. In addition to that, he also used mercury solution *Sol. Mercurii vivi*, and mercury oxide *Mercurius solubilis Hahnemanui* (Archives 1830a).

Mercury preparations might have also been used for the treatment of boils or even a pseudo-disease plica *Plica Polonica*. The account of the Governorate Medical Administration for 1829 indicates that "the poor population of Telšiai county is largely afflicted by this condition, which is accompanied by convulsions" (Archives 1829).

A famous professor of Vilnius University, the physician Joseph Frank (1771–1842) in his memoirs wrote that at the beginning of the 19th century, in the Lithuanian Vilnius Governorate, mercury inunctions were used to treat "urinary bladder paralysis" and acute neurological diseases, while corrosive sublimate (mercury chloride) was used for apoplexy, croup, scarlet fever, and also as a diuretic, etc. (Frank 2001).

Antimony *Antimonium* and its salts were other toxic components that were frequently mentioned in the prescription book. Physicians prescribed antimony wine *Vinum antimonii Huxham* containing emetics to be used by children. The prescription also indicated a specific use of antimony wine: "one teaspoonful every two hours, or half a cup several times until vomiting is induced". In order to increase the emetic effect, this component was supplemented with other emetic substances such as ipecacuanha root powder *Pulv. Rad. Ipecacuanhae*, liquorice extract *Extr. Liquiritae,* sea squill syrup *Sir. Scillae,* and others. Lead compounds were used externally as components of solutions *Aq. Vegeto-mineralis* and adhesive plasters *Emplastrum de Vigo* and *Empl. Diachylon* (Archives 1830a).

Sulfur *Flor. Sulphuris* was a component of laxative pills and powders.

For nervous diseases, the most commonly prescribed chemical preparation was ether and its alcoholic mixtures. Physicians used the ethanolic ether solution *Liquor anodynus, Aether Sulphuricus* in combination with opium or a compound drug *Laudanum liquidum,* where opium was the principal component. All the aforementioned drugs were used as drops: 20–40 drops were to be applied on sugar, and the mixture was supposed to be sucked upon every 2–3 hours, or three times per day (Archives 1830a).

6. Dosage forms and methods of administration

For internal use, the pharmacy manufactured fixed dosage forms (powders, pills, and globules) as well as non-dosed medications (mixtures, syrups, tinctures, elixirs, electuaries, and herbal mixtures). For external use, the pharmacy produced ointments, oils, balms, and solutions.

Mixtures comprised 41% of all dosage forms. Physicians recommended using mixtures "one tablespoonful every two hours", "one teaspoonful taken with water" or "half a cup". Drugs with potent ingredients, such as henbane extract *Extr. Hyoscyami* or antimony sulfide *Sulfur aurati Antim.,* were supposed to be taken "if cough occurs". The *Elixir Acidi Haleri* mixture was to be taken at doses of 10 (sometimes, 30–40) drops in water. Antimony wine *Vini antimonii Huxham* was to be taken every quarter of an hour until vomiting was induced. The herbal mixture with potassium-sodium tartrate *Sal. Segnetti* was supposed to be used "until pain subsides" or "as needed", while guaiacum decoction *Lign. Guajaci* had to be used "as a drink" (Archives 1830a).

The laxative castor oil was supposed to be taken lying down, and at the dose of a coffee spoon. Laxative powders containing inorganic salts were to be taken "on the tip of a knife".

Physicians prescribed herbal mixtures from which patients had to prepare infusions, decoctions, or teas. The doses of such forms of medicine are even more difficult to measure.

For instance, an unidentified client received 20 packs of an expensive (32.40 rubles) herbal mixture containing *Sarsaparilla* and *Specia quinque Rad*. (a mixture of the roots of five medicinal plants), which was supposed to be prepared by the patient and used "as an ordinary drink". The same client also bought mercury-containing powder *Mercurium solubile Hahnemanni* measured in doses. The patient was instructed to use this powder one dose per day and told what to do in case of adverse reactions: "if the usage of the medication causes pain in gums and abundant salivation, calcium powder should be used" (Archives 1830a).

A precisely dosed drug form, namely pills, was rarely prescribed, 2% of all prescribed medications. Prescriptions for powders were much more common — 11%. The unpleasant-tasting quinine, foxglove leaf powder, or calomel was prescribed in a mixture with sugar to improve their taste. Sometimes only sugar was prescribed (Archives 1830a).

Electuaries *Electuaria* were most frequently used internally as laxatives. The most commonly mentioned electuaries were *Electuarium lenitivum* with senna leaves, and an electuary made of rhubarb powder.

The following indications were usually attached to medications: "*pro usi externum"* "for external use", "*pro usi noto"* "to be used as indicated", for ointments "to be applied before evening", "to be applied on the chest in the morning and in the evening", or "to be applied on the eyes". Compresses were supposed to be applied "on the aching site", or "on the wound". Poultices were to be placed "on the abdomen" and plasters were put "between the shoulder blades, and kept until blisters form".

7. Prices of medications

During 1830, the profit of the Telšiai pharmacy for prescription drugs was 5,500–6,000 rubles (rub.). The mean price of one drug was 1.60 rubles. The prices of the medications were very precisely calculated — in a few cases, to half a kopek, e.g. 1.851/5 rubles (Archives 1830a).

The highest prices were charged for drugs that included expensive imported raw materials of animal origin *Castoreum*, or *Moschus*, and botanical material from South America and Asia *Balsamum Copaivae*, *Radix Sarsaparillae*, *Pulpa Tamarindorum*. Iodine compounds were exceptionally expensive components.

When writing prescriptions, physicians also took into consideration their patients' financial capacities, prescribing more expensive remedies to richer patients. For example, one patient received mercury ointment and a mixture containing *Aqua Calcis*, *Calomel,* and *Laudanum liquidum*. Both medications cost 0.88 rub. (Shnurovaja kniga, 1830a). Another, seemingly richer patient was also prescribed mercury ointment *Ung. Hydrargyri* with balm *Balsami Peruvian*, this time for 3.55 rubles, and a mixture of *Aqua Calcium, Calomel,* and *Mucilag. g. arabici* for 1.69 rubles (Archives 1830a).

The cheapest drug was sold for 0.3 rub., and the most expensive for 13.19 rub., excluding drugs sold to groups of people. Pills were the most expensive drug form. Their price ranged between 2.37 to 4.2 rubles. For comparing, some prices of that period were: 1 kilo of beef cost 40 kopecks, a live chicken in the market cost 70 kopeck and one goose 1.20 rubles. The apprentice of pharmacist earned 5 rubles per month, and the pharmacist assistant salary ranged from 30 to 40 rubles. The officer of czarist army earned about 60 rubles per month.

The majority of the patients were officers of the tsarist army, tsarist administration officials and their family members, the clergy, and other members of the higher social strata.

8. General survey

After the partition of the Polish-Lithuanian Commonwealth in the late 1700 s, Lithuania became a distant Western province of the Russian Empire. At that time, the University in Vilnius was still operational, and European pharmacy news from this center of science reached pharmacies of the Lithuanian Vilnius Governorate until the University was closed down by the tsarist government in 1832. All county centers had their pharmacies, and the contents of the Telšiai pharmacy prescription book suggests that the pharmacies had a rather broad assortment of various raw materials (crude drugs), including substances that had only been recently discovered in Europe (e.g. iodine and quinine salts), and chemical compounds, which were used with increasing frequency. The book more frequently mentioned botanical remedies imported from the Mediterranean region, India, or the Americas than those brought from the distant parts of tsarist Russia (such as Siberia, the Caucasus region, etc.). The prescription book did not mention such previously popular "cure-all" medications as *Cranium Humanum*, *Theriaca*, or *Bezoar*, which in 1773 were still listed in the books of Vilnius and Slutsk pharmacies. Opium was frequently prescribed, but no prescriptions mentioning its derivative, the alkaloid morphine, were found for the studied period.

Patient treatment was based on the principles of the humoral theory. To restore the balance of fluids (humors), physicians prescribed diuretics *Diuretica*, emetics *Emetica*, laxatives *Laxantes*, diaphoretics *Diaphoretica*, and expectorants *Expectorantia.*

The contents of the prescription book of the Telšiai pharmacy reveal the development of pharmacological treatment in the 19th century, characterized by an abundant stock of medications, new substances, rejection of the old "miracle" drugs, and an increasing list of chemical preparations. However, we can also see that some medications could not help the patient, but instead could cause harmful adverse reactions.

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