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Illumination on the cover of this issue: James le Palmer, "The blessing of lepers", Omne Bonum, ca. 1360-1375, British Library, Royal MS E VI/2, fol. 301r.

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Naučno društvo za istoriju zdravstvene kulture je svojim osnivanjem 2010. uspostavilo kontinuitet sa nekadašnjim Savezom naučnih društava za istoriju zdravstvene kulture Jugoslavije.

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- *1979–1980 Acta historica medicinae, stomatologiae, pharmaciae, veterinae;*
- *1981–1991 Acta historiae medicinae, stomatologiae, pharmaciae, medicinae veterinariae;*
- *2013– Acta historiae medicinae, stomatologiae, pharmaciae, medicinae veterinariae;*

Naučno društvo za istoriju zdravstvene kulture i uredništvo je obnovom časopisa uspostavilo i kontinuitet s njegovim prethodnim izdanjima.

Scientific Society for the History of Health Culture with its founding (2010) has established continuity with former Association of Scientific Societies for the History of Health Culture of Yugoslavia.

The first president of Scientific Society was prof. Slobodan Đorđević (1921–2012), who was also the president of Association of Scientific Societies for the History of Health Culture of Yugoslavia.

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- *1961–1978 Acta historica medicinae, pharmacie, veterinae;*
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BALD AS AN EGG

(Baldness Remedies Through the Ages)

Abstract: The paper discusses medical prescriptions against baldness in a wide period from antiquity to the 19th century. Attention is first paid to the remedies that Pliny the Elder proposed in the 1st century in his work *Naturalis Historia.* Then, the data from a Byzantine medical treatise dating from the middle of the 11th to the second half of the 14th century are summarized. Finally, the recipes were presented from The Hodoch Code, a Serbian therapeutic anthology from the end of the 14th or beginning of the 15th century. Medications, which sometimes are accompanied by superstitions recommended by Serbian folk medicine, are also included.

Key words MeSH: Baldness, drugs, recipes

Non MeSH: Pliny the Elder, Byzantine medical treatise, The Hodoch Code, Serbian folk medicine

"Transient or permanent lack of hair, facial or corporeal hairs on a limited or entire surface of the overgrown skin... In the case of acquired baldness, the lost hair is not replaced at all or not sufficiently with equally valuable new hair." [1 p 777] This is the beginning of a definition of baldness from a general medical encyclopedia. It is a phenomenon that is far more common in men than in women, and besides the medical one, it also has an aesthetic dimension, among others. In other words, bald people can be the subject of hilarious quips, such as those who are too short or too tall, those who are clumsy or those who have a big nose.

During the coronation of the Byzantine emperor Alexios III Angelos (1195–1203) in 1195, an unusual event occurred, written about by the historian Niketas Choniates. This Byzantine historian records that in the procession behind the emperor, among the dignitaries, his uncle Sebastokrator John Angelos was also riding. This old man had an

unexpected accident during the ceremonial walk. Although no one touched the horse he was riding on, John Angelos's crown suddenly fell from his head. All the present observers screamed in surprise and then burst into laughter when, like a full moon, the Sebastokrator's bald head flashed before their eyes. John Angelos, who was hard to sway, kept his composure and accepted the trouble that happened to him with dignified calmness. At that moment, he took the roaring laughter of the crowd of the capital's life as a good-natured joke. He also managed to smile a little without showing the slightest sign of any discomfort. [2 pp 1-31; 3 pp 107-108]

In antiquity

Hippocrates, the "father of medicine", had some interesting remarks about baldness. He points out the following in one place: "Bald people are not susceptible to large varicose veins." However, when bald people's veins become dilated, they get hair again". [4 p 104; 5 p 79] In the second place, the famous doctor emphasizes that eunuchs do not suffer from bone pain and do not become bald. [43 p 103; 5 p 78]

The famous scholar Pliny the Elder, who lived in the 1st century, in his voluminous masterpiece, the magnificent encyclopedia Natural History (Naturalis Historia), talks about unusual tribes and peoples. He emphasizes that on the territory of Albania, in the Eastern Caucasus (today's Azerbaijan and part of southern Dagestan), "people with grey-green eyes and very sharp vision are born; they are bald from childhood and see better at night than during the day". [7 p 145] Elsewhere he writes: "Of all animals, man has most hair on the head: indeed this is the case indiscriminately with males and females, at all events with the races that do not cut the hair… Man is the only species in which baldness occurs, except in cases of animals born without hair, and only with human beings and horses does the hair turn grey, in the former case always starting at the forehead and only afterwards at the back of the head."[7 pp 512-515]

After these assessments, Pliny the Elder also brings a cure for baldness to light. The ingenious scholar writes the following: "Bear's grease mixed with ladanum and adiantum prevents the hair from falling out, and cures mange, and scanty eyebrows if mixed with the lamp-black from lamp wicks and the soot that collects in their nozzles. Mixed with wine, it cures dandruff." [8 pp 112-113] *Labdanum* or *ladanum* is the sticky resin of the *Cistus Ladanifer* and *Cistus creticus* bushes. It has been used since ancient times as an ingredient in herbal medicine.

In Byzantium

A text composed in the late Byzantine period represents a convincing testimony about the scope of Byzantine medicine, especially the part concerning pharmacology and pharmacopoeia, i.e., the preparation of drugs. It is an anonymous medical treatise, a medical compendium for practical use, a kind of encyclopedia that is partly a compilation and an original text. It was compiled by an obviously experienced doctor who did not hesitate to include his knowledge gained through many years of practice in the text. The medical treatise is dated to a wide period from the middle of the 11th

to the second half of the 14th century, and based on the current knowledge, it is impossible to narrow down this extensive period. The treatise is more oriented towards practical advice than remarks of broader theoretical importance. The section dedicated to pharmacology occupies the largest part of it. In Byzantium, pharmacology did not exist as an independent scientific branch. That means that Byzantine doctors were at the same time apothecaries and pharmacists who themselves collected medicinal herbs and made medicines from them.

The anonymous compiler of the treatise remembered that part of the Byzantine population - the male part - had problems with a lack of hair. As we have seen from the episode of the coronation of Emperor Alexios III Angelos, it could not be said that in the Byzantine epoch, baldness was a premium.

A Byzantine medical treatise, however, encouraged those who suffered from a lack of hairiness. It is written that if the hair falls from the head, it is necessary to smear it with a specific grease. Here is the recipe for preparing this ointment: take one litre of fresh myrtle and fresh leaves of schoenus (*σχοίνος*) each. [9 p 133] Here, a litre is a measure of weight, which is 327 grams. [10 pp 58-59, 71-74, 82-84; 9 p 43] After it has been chopped, the myrtle and the sieve should be boiled in five litres of water on low heat. The leaves should be squeezed and thrown out when half of the liquid evaporates. One litre of rose oil should be added to the rest of the liquid and cooked again on low heat until the liquid evaporates and remains oil only. In the following part of the recipe, as if everything had conspired against the bald people, there is a problem with the translation of the Greek word *σουκὺ* (or *σούκον?*), which most likely denotes some fragrant plant. It is said that incense and *σουκὺ* should be added to the obtained oil - one ounce or ungia each, which is a measure of weight and equals 27.3 grams. *Σουκὺ* is called *kalgan* - a kind of dill or resinous hair oil. [10 pp 58-59, 71-74, 82-84; 9 p 44] Then the head should be well rubbed with the mixture prepared this way. [9 pp 43-44]

If someone wants their hair to be black or cover up grey hair, they need to smear it with the juice of an anemone, i.e. windflower (*ἀνεμώνη*) and wash it with warm water on the third day. [9 p 44] If someone wants their hair to be black forever, they need to cut caper leaves, put them in a crock pot, pour donkey's milk, and boil the mixture. The solution should be applied to the head when it thickens and reduces to one-third. [9 p 111] In the following, the treatise's author emphasizes that it is a trustworthy recipe. [9 p 111] On the other hand, there is information that the Byzantines smeared their hair and beards with raven's eggs to dye them black. [11 p 44; 12 pp 60,63]

If someone wants their hair to be blonde, they should take the crushed residue of boiled wine and add the resin of pine cones in the proportion of half of the residue. Dissolve it all in rose oil, spread it on the hair, and wash it on the third day. [9 p 45]

For those with dandruff in their hair, the following treatment is suggested: remove dandruff by grinding the glass to a state where it becomes very soft and looks like dust on the road. Then, beetroot juice should be poured into the powder obtained this way, and the head should be carefully washed with this mixture. [9 p 44]

Baldness is mentioned interestingly in a Byzantine riddle: "A hairy woman gives birth to a bald child, a bald child, again, gives birth to a hairy child."/Solution: a bird and an egg/. [13 p 44]

In Serbia

Considering the medicine among the Serbs in the Middle Ages, it should be emphasized that at least three separate streams can be distinguished, which confronted, intertwined, and complemented each other. The first stream consisted of the medicine that the Serbs brought from their ancestral homeland, which is rudimentary Slavic medicine. Numerous old names for individual body parts and essential organs indicate a relatively good knowledge of anatomy among the Slavs. In medieval Serbia, the knowledge of medicine developed not only based on old Slavic medicine but also under powerful influences from Byzantium. Of course, it is well known that the Serbian medieval culture to the greatest extent arose from the aegis of the refined and superior Byzantine civilization. And finally, the third stream in the creation of what we can label as Serbian medieval medicine is the influence that came from Italy and other Western countries through the coastal cities on the eastern coast of the Adriatic Sea, Kotor and Dubrovnik. The influences from the Apennine Peninsula became stronger as the Middle Ages drew to a close. [14 pp 394-399]

One of the most important compilations of Serbian medieval medicine is the so-called Hodoch Code. [15 pp 3-23] It is a therapeutic collection from the end of the 14th or the beginning of the 15th century, which contains mixed medical material. [16 pp 123-131] Two recipes against hair loss are also preserved in The Hodoch Code. In the first one, the following is recommended: "Beat the cabbage leaves well, then mix it with strong red wine and apply it to the place where the hair fell out".[15 p 16] In another recipe, it is written: "Mix aloe vera with strong red wine and apply it to the place where the hair fell out." [15 p 16]

Various preserved recipes that existed in Serbian folk medicine are the best evidence of care for bald people whose hair is falling out. In one of them, it is said: "With pounded walnut (*Myristica Moschata*) in fat, the head is smeared against baldness." [17 p 186] Comfrey, a plant known as ox tongue (*Symphytum officinale*, Wallwurz), is used against baldness. [17 p 74]

Among the Serbian folk sayings, there are also "Bald as an egg", which we took as the title of our article, and "A bald one is easy to shave". [18 p 359]

Several recommendations are offered for those with hair loss on how to eliminate this unpleasant ailment: "Those who have hair loss should wash their heads with water in which sour cherry, cherry, strawberry and violet leaves have been boiled." [17 pp 67, 170, 232]

The compiler of The Code advises that grated radish (*Raphanus sativus*) with honey should be applied to burns and used against hair loss. [17 p 207]

Serbian folk medicine teaches us and offers several recipes for hair to grow better. In the first one, it is emphasized that hair growth is stimulated by valerian (*Valeriana officinalis*).[1 pp 180-181] In the second, the precious importance of lovage (*Ligusticum Levisticum*) is emphasized, which helps hair growth. It is also added that women spread on their hair olive oil that has been left overnight in lovage before St. George's Day or wash their hair in water in which lovage has been left overnight with black poplar leaves.[17 p 213] In the third one, it is recommended to rinse with water in

which the horse heal, i.e. elfdock (*Inula helenium*) has been submerged.[17 p 182] In the fourth, it is pointed out that grape juice particularly affects hair growth, the juice the vine releases in the spring when it is pruned is the so-called "Tear of the vine". Mainly is effective juice obtained on the eve of St. George's Day. Moreover, raindrops that have remained on the vines also have a beneficial effect, so girls and women also smear their hair with it to make it grow. [17 p 65]

A certain amount of superstition can be found in some of the prescriptions of the pharmacies supported by Serbian folk medicine. So, for example, nettle is also used against hair loss: "One should leave cut children's hair in the rpska, so it will grow quickly." [17 p 138] It is a piece of unusual advice that on Saint George's Day "before the sun rises, girls comb their hair on a willow tree, and then their hair grows like a willow tree." [17 p 73] There is also a recommendation that a woman with thick hair should cut a child's hair in hemp on Sunday, before the sun rises, and bury the cut hair under the hemp, and then the child will never go bald. [17 p 134] And, finally, folk experience accumulated over a long time promptly points to the fact that charlock mustard seeds (*Sinapsis arvensis*) with parsley and juniper (*Juniperus communis*) remove not only dandruff but also scabs on the head. [17 p 81]

Summarizing the data on anti-baldness medicines that are listed in the available sources (*Naturalis Historia of Pliny the Elder*, a *Byzantine medical treatise*, *The Hodoch Code*, recipes of Serbian folk medicine), it should first be emphasized that, geographically speaking, they primarily refer to the Mediterranean area (Roman Empire, Byzantium) and the Balkan Peninsula (Serbia). Chronologically speaking, it covers a wide period from antiquity to the 19th century. When discussing the medicines listed in them that were used against baldness, it should immediately be emphasized that the largest number are made from natural ingredients. Either of plant origin, as many as thirty-two medicines, or of animal origin, four medicines. The remaining two of the mentioned remedies were based on glass and soot ingredients. In the eras that preceded modern pharmacy and modern pharmacopoeia, such a relationship between the components of medicines could be completely natural and expected. However, it is difficult to express any specific, reliable and precise conclusion when it comes to the effectiveness and success of the mentioned cures.

Rezime

U radu se raspravlja o lekarskim receptima protiv ćelavosti, počev od lekarija koje je u I veku u svom delu *Naturalis historia* predložio Plinije Stariji, preko vizantijskog medicinskog traktata koji se datuje u širok vremenski period od sredine XI do druge polovine XIV veka, i tzv. *Hodoškog zbornika*, srpskog terapijskog zbornika s kraja XIV ili početka XV veka, zaključno sa medikamentima, uz koje u pojedinim slučajevima idu i naslage sujeverja, koje preporučuje srpska narodna medicina. Kada se govori o u njima pobrojanim lekovima koji su korišćeni protiv ćelavosti, treba naglasiti činjenicu da je najveći broj spravljan od prirodnih sastojaka bilo biljnog porekla, čak trideset dva medikamenta, ili životinjskog porekla, četiri medikamenta. Preostala dva od pomenutih lekova zasnivala su se na sastojcima koji su činili staklo i čađ. U epohama koje su prethodile savremenom apotekarstvu i modernoj farmakopeji, za takav odnos među sastojci-

ma medikamenata moglo bi se reći da je sasvim prirodan i očekivan. Kada je reč o delotvornosti i uspešnosti navedenih lekarija, međutim, teško je izreći nekakav određen, pouzdan i precizan zaključak.

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THE STAG AS AN HISTORICAL SOURCE OF MATERIA MEDICA

Abstract: This paper presents a brief overview of the items of *materia medica* harvested from male red deer [*Cervus elephas*]. The medicinal use of stag's antlers and other body parts began in classical times with the writings of Dioscorides and Pliny the Elder, and relied on the legendary vitality, sexual prowess, strength, alexipharmic and rejuvenative powers with which the animal was credited. In early modern times a wide range of organs harvested from stags killed in formal hunts were made available for use as amulets, Galenic simples and alchemical derivatives for incorporation into a wide range of medicaments used to treat a huge diversity of health issues ranging from deadly infections like the plague, through conditions such as barrenness and loss of sexual potency, to baldness. The stag provided a fundamental apothecarial resource which was exploited to the full.

Keywords: stag, antlers, plague, amulets, alchemy, *materia medica*

Non MeSH: Pliny the Elder, Byzantine medical treatise, The Hodoch Code, Serbian folk medicine

Introduction

Early modern medical texts in English often make reference to preparations obtained from the body of a 'hart'. This term refers to a male or stag of the red deer, *Cervus elephas* Linnaeus 1758 [Family Cervidae]. The species has a more-or-less pan-european distribution in suitable habitats but shows considerable biogeographical variation. One of the largest deer species, the male typically measures up to 250 cm from nose to tail base, stands 122 cm high at the shoulder and weighs up to 240 kg; the female [hind] is slightly smaller. In addition to their larger size, males, which live for around 10 years, can be recognised from their neck mane, visible during the autumn, and antlers. The latter grow in response to increasing levels of testosterone, and are covered by a specialised, highly vascularised layer of skin known as velvet. During the

autumn, falling levels of testosterone cause the velvet to be shed, the antlers cease to grow and begin to calcify in preparation for the rutting season when competing males go through a series of behaviours [including threatening parallel walking, stamping the ground, roaring and fights involving locked antlers] designed to assert dominance and attract a mate. The antlers are later shed only to be renewed during the following spring. A mature adult male has up to 18 antler points or tines. Recent genetic studies have suggested that the range of variation shown throughout its geographical distribution is illustrative of a species complex within which individual taxa are difficult to adequately define, and hybridisation probably obscures useful distinctions [1].

The red deer was one of the animals commonly hunted in medieval times; there was a formal, almost ritualistic approach to the hunt amongst members of the nobility. Designated areas of land [parks] were set aside for the hunt, which was often known as *chasse par force des chiens* [chase by strength of hounds]. The popularity of the hunt, particularly in 14th century France, is reflected in the number of volumes dedicated to the 'art of venery'. It is clear from these and later accounts, some written in verse, that little of the stag carcass was wasted and that many components were harvested for medicinal purposes [2 p40] [Fig. 1].

The therapeutic virtues claimed for each of the wide range of body parts of the stag were believed to be rooted in the legendary vigour and supposed longevity of the animal. According to the English cleric, Edward Topsell [circa 1572-1625], the hart was believed to live for over 2000 years and to be able to resist all types of fever [3 p67]. Consuming various organs of the stag was seen as transferring their intrinsic vitality to the consumer's immediate therapeutic benefit.

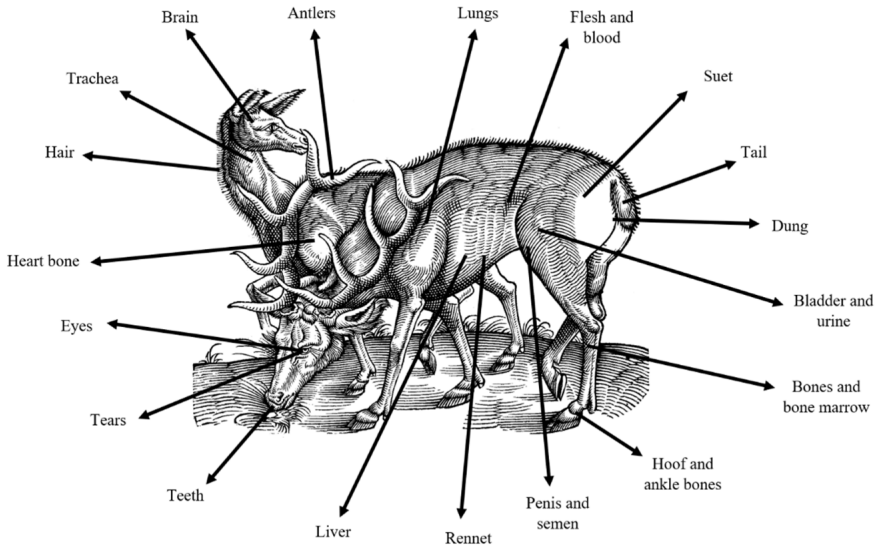
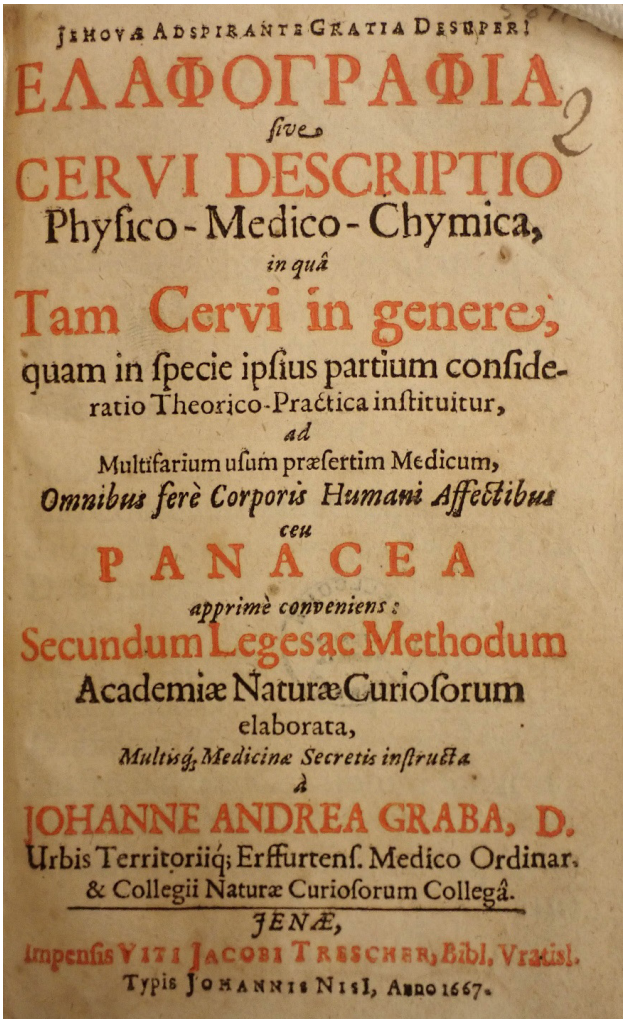


Fig. 1. The red deer [Cervus elephas] from Topsell [1658] A History of Four-footed Beasts [Author's copy] annotated to show the items of materia medica which it yielded.

The different body parts of the red deer were incorporated into medicinal amulets, used as Galenic simples, and processed to produce Paracelsian derivatives and concentrates. The details presented here have been culled from a widely scattered literature, but one publication has the red deer as its main focus. *Elaphographia* was published by Johann Andreas Graba [1625-1669] in 1667 [5] [Fig. 2]. He combines the traditional view of the longevity of the stag with a Paracelsian explanation of its cause; he conjectures that the animal is particularly well endowed with a life-preserving balsam, closely allied to the principle of salt. He speculated that this abundance of innate life principle invested in its bodily organs accounted for the wide range of medical virtues with which the animal was blessed, especially the volatile salt and spirit extracted by alchemical means from the horns and the blood.


IEHOVÆ ADSPIRANTE GRATIA DESUPER!

ΕΛΑΦΟΓΡΑΦΙΑ

sive

CERVI DESCRIPTIO

Physico-Medico-Chymica,

in quâ

Tam Cervi in genere,

quam in specie ipsius partium consideratio Theorico-Practica instituitur,

ad

Multifarium usum præsertim Medicum,

Omnibus ferè Corporis Humani Affectibus

ceu

PANACEA

apprimè conveniens:

Secundum Leges ac Methodum

Academiæ Naturæ Curiosorum

elaborata,

Multisq; Medicinæ Secretis instructa

à

JOHANNE ANDREA GRABA, D.

Urbis Territoriiq; Erffurtens. Medico Ordinar.

& Collegii Naturæ Curiosorum Collegâ.

JENÆ,

Impensis VITI JACOBI TRESCHER, Bibl. Vratisl.

Typis JOHANNIS NISI, Anno 1667.

Fig. 2. Title page of Johann Graba's Elaphographia [1677]. Wellcome Collection.

Stag-derived items of materia medica

1. Stag's tears or *Lacrymae cervi*

These have been considered in detail elsewhere [3] so, for the sake of completeness, only a brief summary will be presented here. In a tradition extending back to classical times, a natural enmity was believed to exist between deer and snakes; stags were believed to hunt down and consume them. The tears which the deer shed as a means of eliminating the snake's poison hardened to form solid, spherical, acorn-like concretions sometimes known as *Kenne*. They are the hardened secretions of the pre-orbital glands which extend as a dark slit anteriorly from the medial canthus of each eye [3 p79]. Believed to possess drying, strengthening, astringent, alexipharmic and diaphoretic qualities, these 'tears' were employed therapeutically [mostly as a Galenic simple, often taken in wine or honey] in cases of poisoning, fever, plague and other infectious diseases, jaundice, epilepsy and to help during labour, especially in cases of stillbirth [5 p214].

2. Heart bone or *Os e corde cervi*

The *os cordis* is a heterotopic bone – an ossification developing in the soft tissues and unrelated to the axial and appendicular skeleton. Two *os cordia* develop in the fibrous trigones of the heart as a result of age-related mineralisation and confer additional stability during cardiac contraction and relaxation. In addition to being a trophy of the hunt, perhaps unsurprisingly, the Stag's heart bone was deemed particularly efficacious in the treatment of cardiac conditions. Gaston Fébus [11th Count of Foix and viscount of Béarn; 1331-1391] dedicated his *Livre de Chasse,* written some time between 1387 and 1389, to Philip the Bold, Duke of Burgundy [1342-1404] [6 p21]. In an English translation from the early 15th century the bone is described as having 'great medicine, for it comforteth the heart, and helpeth for the cardiac, and many other things which were too long to write, the which bear medicine and be profitable in many diverse manners' [7 p34].

Fig. 3. Os e corde cervi from the red deer [Cervus elephas] from Aldrovandi [1642]: Paralipomena Accuratissma Historiae Omnium Animalium [Wellcome Collection].

Use of the bone blossomed in early modern times [5 p231] when, in addition to being prescribed for heart problems, it was used against plague and pestilence [8 p.31], melancholy [9 p58] and as a general cordial or strengthening medicine [10 p679]. It was commended against nightmares, nosebleeds, malaria and epilepsy [11 col104]. It was also incorporated into a large number of popular compound medicines such as *Laudanum paracelsi* [Paracelsus' opiate, used against dysentery], *Pulvis pannonicus rubeus* [Red Hungarian Powder against fevers, epidemics and poisons], *Confectio de Hyacintho* [Confection of Hyacinth, against plague and fevers] and the Countess of Kent's Powder [recommended for plague and a wide range of infectious diseases].

The morphology of a typical specimen was illustrated by the Italian naturalist, Ulisse Aldrovandi [1522-1605], in 1642 [12 p126; Fig. 3]. Specimens survive in several *materia medica* cabinets dating from the early 18th century [e.g. Heberden's cabinet in St John's College, Cambridge], although in many cases they seem to have been substituted by equivalent bones from oxen [Fig. 4].

Fig. 4. Os e corde cervi from the red deer [Cervus elephas]. Burges Collection, Museum of the Royal Pharmaceutical Society [author's photograph].

3. Teeth

Often harvested from the carcass as trophies of the hunt, deer teeth were frequently worked into items of amuletic jewellery and worn for good luck [especially when hunting] and protection against snakes and eye diseases [13 p109]. Mounted in finger rings, these *Hirschgranl* were used as amulets against toothache in Austria [14 p150] [Fig. 5].

Fig. 5. 19th century silver ring with red deer tooth. V&A 173-1872. Copyright Victoria and Albert Museum.

4. Eyes

According to the German polymath Heinrich Cornelius Agrippa von Nettesheim [1486-1535], the eye of a rutting stag, tied to an elder root and soaked with the urine of a red bull, is an infallible means of enhancing sexual potency [14 p150]. Also, a dried deer eye is noted as being worn as an amulet against toothache [14 p150].

5. Lungs

Pliny the Elder [AD 23-79] notes that, in Roman folk medicine, the lungs [or 'lights'] of a stag were dried by smoking, together with the gullet of the animal, and then beaten together with honey to form an electuary which was taken as a remedy for coughing and the spitting of blood [*haemoptisis*] [15 p343]. He further noted their use in cases of 'Corns, chaps, and callosities of the feet' [15 p353] and 'phthisis' [*pulmonary tuberculosis*] [15 p356; 16 p51; see also 5 p282ff.].

6. Blood

Whilst most parts of the stag could be relied upon to deter snakes, Pliny asserts that the blood, burnt on the fire together with certain woods and herbs, attracts them [15 p329]. He also commends stag's blood in cases of diarrhoea [15 p346]. The Polish scholar and physician, Johannes Jonstonus [1603-1675?] recommends the blood of a fawn slain *in utero* against snakebite, the bites of a mad dog and ingesting hemlock and poisonous fungi [16 p51], a point repeated by Topsell who writes 'His bloud stayeth the looseness of the belly and all fluxes, especially fryed with Oil, and the inferior parts anointed therewith, and being drunk in Wine, it is good against poisoned wounds and all intoxications' [4 p103]. The English naturalist, Robert Lovell [1630?-1690] concurs, stating it 'helps the ulcers of the intestines and old fluxes'. He also refers to Galen [129 – c216] noting that, suspended in vinegar, it was used as a psilothron or depilatory, and to Rhazes [864/5 – 935] who suggested that when drunk in wine it 'helpeth against venomed arrows' [20 p67; original references not checked in this study].

Nicholas Lémery [1645-1715] esteemed its qualities as being both sudorific [sweat-inducing] and resolutive [dissolving or relaxing] and suitable for use in cases of gout and pleurisy [17 p224; 5 p260ff.]. In German folk medicine, the blood was also employed against dizziness and epilepsy, and to help mitigate deafness. It was also employed in an oil given as part of an enema to treat pains in the hip and sides as well as intestinal problems. Drunk in wine, it was commended for poisonous apostems [abscesses], podagra [gout in the big toe] and convulsions [11 col106]. Johann Schroeder [1600-1664] recommended frying the blood in a frying pan as a treatment for 'Dysentery and Caeliack flux', and also its use against gout [18 p31].

One author explains how to produce a 'pain-soothing salt' [*de salibus dolorem sedantibus*] from the blood of an old stag [19], which was heated gently in a bath until an 'oile and salt' was driven off ready to be condensed in a receiver. The oil could then be used topically on the affected area.

7. Bones

The bones of the lower leg, sometimes identified as the pastern, heel or ankle bones, or *l'os de talon*, were singled out as being particularly efficacious. Most authors agree that when taken as a powder it was especially appropriate in cases of the bloody flux [dysentery] [4 p104; 17 p224; 18 p32]. One author adds that the leg bones were incorporated into a particular medicine against the gout, and that, being burned, were utilised against renal calculi and epilepsy [20 p68], as first mentioned by Pliny [15 p353].

8. Marrow

Once again, Pliny is the first to introduce the marrow of stag's bones into the materia medica. He esteems it the best type of mammalian marrow for therapeutic use because of its 'emollient, expletive, desiccative, and calorific properties' [15 p327]. He notes its use [hot] in a preparation used to treat suppuration from the ears [15 p145]

and also, together with various herbs, in cases of fistula [15 p201]. For sunburn he cites recipes combining stag marrow with veal suet and whitethorn leaves, or with resin, and for chapped lips in combination with goose-grease, resin and lime [15 p341]. Marrow mixed with certain oils could also be applied to ulcers in order to encourage the growth of new flesh [15 p359]. An enthusiast for the use of snails in the treatment of gynaecological and obstetric conditions, he suggests combining them with stag marrow in cases of uterine displacement [15 p463].

Some of these suggestions are carried over into early modern medical writings [e.g. 18 p32; 20 p72; 5 p285ff.], but a certain amount of expansion and adaptation also takes place. Topsell, for example, not only associates the marrow with the treatment of ulcers, fistulas and cracked lips, but also identifies its ability to disperse 'all bunches in the flesh and old swellings', in combination with calf suet to ameliorate pain in the mouth and jaws and, when drunk in warm water to 'aswage the pain in the bowels and small guts' [large and small intestines] and to help in cases of dysentery [4 p104]. When mixed with powdered oyster shells it could be used to cure chilblains, even when they are ulcerated ['kibes'] [4 p104].

Théodore Turquet de Mayerne [1573-1655] included stag marrow as one of the ingredients in his 'Balsom of Batts' commended for the treatment of 'Hypochondriacal Distempers' [21 p37]. Also, Jacques Guillimeau [1550?-1613] recommended including stag marrow in a liniment designed to maintain the health of the mammary glands during pregnancy [22 p.28], whilst John Pechey [1655-1716] suggested applying stag marrow to the feet of feverish children in order to bring relief [23 p73]. Elsewhere, it was associated with treating scalds, 'softening' the womb, and easing menstruation [16 p51] while Lémery commends it for rheumatisms, 'gout sciatique', fractures and to strengthen the nerves [17 p224]. In German folk medicine, it was also used to strengthen the limbs, and against tumours, ulcers, pneumonia, fractures, epilepsy, insomnia, poisonous boils and wounds, fevers, to promote menstruation, as well as being a component in suppositories and aphrodisiacs [11 col105]. In Swabian folk medicine, the bone marrow of a doe was dissolved in warm beer and drunk as a treatment for epilepsy [62 p231].

9. Fat and Suet

Suet is the hard fat found around the kidneys and both it and regular body fat are sometimes referred to as tallow which, in modern usage, is reserved for the rendered form. The German military physician Raymund Munderer [1570?-1621] was a strong advocate for the use of stag fat in abdominal treatments, presumably both for its effectiveness as a delivery vehicle and its supposed intrinsic medicinal virtues [24]. He suggested it be used to ease sores, and as a component in various clysters or enemas. One recipe for the latter combined stag suet with milk in which red hot pebbles had been quenched multiple times, beaten egg yolks, sugar and *album graecum* [dog faeces]. The concoction 'cleanseth and healeth the Guts, and allays the sharpness of the Blood and other corrosive humors, that annoy the Bowels' [24 p76]. His anecdotal claim was that the treatment had successfully cured a 'patient of quality' who had produ-

ced over 100 stools in a 24-hour period [24 p83]. He also suggested seating a patient on a board of heated oak smeared with stag suet and smearing the anus ['fundament'] with a suet-containing salve as a means of treating bowel problems [24 p89].

Others recommended stag fats for 'mollifying' or reducing the severity of tumours, as a wound astringent and anodyne as well as in the treatment of kibes [ulcerated chilblains] [18 p32; 20 p68; 5 p292ff.]. Topically, it was also used in preparations to maintain the quality and integrity of the skin during and after childbirth [25 p37], and to prevent chapping of the face and lips [26 p.91, 137]. It was also used in the treatment of horses for coughs, lung complaints and haematuria [blood in the urine] [20 p68]. Distillation of the fat produced an oil which was suggested as being useful in cases of gout [20 p72]. Several authors agree that stag fat was the best emollient then available [e.g. 27 p257]. In folklore, like the rest of the stag, the tallow was believed to protect against snakes, and in folk medicine it was used in cases of sore feet, wounding, burns, haemorrhage, haemorrhoids, overactive bladder and urinary urgency, swellings, fractures, tuberculosis, nosebleed, snakebite and against lice, ulcers and genital warts, toothache and to draw out worms [11 col105; 62 p231]. Children suffering from haemorrhoids were recommended to sit bare-bottomed for several hours a day on a warm, planed oak board thickly coated with deer tallow [62 p231]. It was also smeared on the chest to prevent vomiting in children and was a component in a corn plaster. The consumption of fat from around the right eye was believed to encourage enlargement of the genitals [11 col105]. In the Tirol it was also a component in an oil applied to the stomach by means of a sheet of blue paper in cases where a child was believed to have been bewitched [14 p151].

10. Rennet

Rennet is the fluid produced in the stomach of ruminants; it contains a complex of protease and lipase enzymes utilised by the young mammal in the digestion of milk. Pliny continues to praise the stag for its ability to ward off snakes and treat snakebite. Deer rennet is no exception; he commends it, mixed with vinegar as an antidote so effective that merely touching it was believed to afford such protection for a full day [15 p329]. The same recipe was also suggested to treat haemorrhage [15 p358]. He also recommended rennet for intestinal problems, boiled with beef and lentils [15 p347].

11. 'Umbles'

'Umbles' is an archaism for the edible components of the viscera. The liver, spleen, lungs, trachea, brain, heart, bile and tongue will be considered here under this titular umbrella.

Topsell, whose work [including the figures] was based largely on an earlier publication of Conrad Gessner [1516-1565] [28], suggests placing the liver in the shoes as a means of easing sore feet. He also remarks on using dried liver reduced to a powder, together with the stag's trachea, and mixed with honey to treat cough and other breat-

hing problems [4 p104; 20 p70; 62 p231]. Elsewhere, the organ has been cited as a cure in cases of gout, dropsy [oedema], pains in the body and eyes, nyctalopia [night blindness], joint stiffening and immobility, haemorrhage and in aphrodisiacs [14 col105]. Hildegard von Bingen [1098-1179] recommended ingesting the liver so as to 'restrain his gicht [a word of unknown meaning in this context] and purge his stomach' [51 p213].

The brain has been recommended against epilepsy as well as for night phantasms [5 p280ff]. In Alpine folk medicine, the brain was made into an ointment used to treat hard ulcers and 'blood flow' [*Blutfluß*] [62 p213].

The heart was also prescribed against 'blood flow', the spleen against abdominal pain, bile against constipation and ailments of the teeth, eyes and skin, and the lungs against respiratory diseases [14 col105]. The ashes of the heart and skin were also seen to be good for wounds [20 p71]. One author recommends using three stag's hearts plus a series of herbal ingredients steeped in Malmsey wine in a complex recipe designed to treat palpitations of the heart [29 p47].

Another recommends the tongue of the stag for a condition known as 'the spleen' – probably a synonym for melancholy [30 p99].

12. Hair and skin

Stag's hair [*Pila cervinae*] is mentioned by Pliny; he indicates that wearing an amulet of the white flesh of a hyaena taken from its breast region wrapped up with seven hairs and the genitals of a stag in a gazelle's skin pouch will protect a woman from miscarriage [15 p311]. Burning deer hair as a uterine fumigant was seen as protecting against many gynaecological and obstetrical conditions [15 p361] and later on as a means of preventing miscarriage [16 p51; also 4 p104]. Wearing a stag's hide girdle around the waist was adopted as a means of preventing 'hysterick passions' [20 p72; 18 p31], easing childbirth [14 p152] and unspecified maternal complaints [11 col107]. Graba indicates that skin and hair could also be used to treat poisoning and convulsions [5 p307-310].

In Roman times it was said that the worms found in the body of a large hairy spider [the 'phalangium'], wrapped in a piece of deer skin and hung on a woman's body would prevent conception [15 p401].

Jonstonus remarks that a stag's skin, once depilated using vinegar and pumice, can be hung on the door to deter the entry of poisonous creatures, as well as being used to cure St Anthony's Fire [which probably embraces ergotism, erysipelas and possibly even shingles; 15 p357] and urinary incontinence [16 p51; 4 p104; 20 p68]. As mentioned above, stag skin ashes were mixed with oil and used to treat wounds [20 p.71].

Pila cervina also refers to trichobezoars obtained from the stomach of a deer, and which were accorded the same therapeutic virtues as bezoar stones [cordial and alexipharmic properties].

13. Dung and Urine

Stag's dung has been cited for its use in the treatment of oedema [4 p104] especially when reduced to ashes and dispersed in 'mulse' – a mixture of honey and wine or water [20 p71]. Pliny recommends the first dung voided by a foal following its birth when taken in wine, cures jaundice after three days' application [15 p354].

Topsell advises that stag's dung cures oedema and that its' urine 'easeth the pain in the Spleen, the wind in the ventricles and bowels, and infused into the ears, healeth their ulcers' [4 p104; 16 p51; 20 p71]. Graba cites the use of dung against 'intermittent fevers' [5 p303] and urine in cases of flatulence, hydrops fetalis [oedema in newborn children], gout, paralysis and ulcers in the ears [5 p303-304].

Lémery notes that the bladder of a stag should be applied to ringworm in order to effect a cure [17 p224].

14. Meat

Lovell gives the warning that the flesh of the deer 'nourisheth little and increaseth melancholy' [20 p67] but that, nevertheless, eating it protects against fevers [relying on the classical idea that stags never suffer from this condition] [see also 5 p275ff.]. Topsell, meanwhile, records that 'I am sure that I have known certain Noble women, which every morning did eat this flesh, and during the time they did so, they never were troubled with Ague [malaria]: and this virtue they hold the stronger, if the beast in dying, have received but one wound' [4 p103].

15. Hooves

The french pharmacist, Pierre Pomet [1658-1699], remarks that the hooves of the stag possess all the same virtues as are ascribed to the horns [see below], but that they are more powerful 'Cephalicks' or medicines suitable for treating the nervous system [27 p257; also 5 p259].

In Austria, deer claws were worn as amulets to protect against all types of cramp [62 p231].

16. Head

The Water of a Stag's Head is an ingredient that appears several times in early modern medical literature. The French alchemist, Nicolas leFèvre [1615-1659], explains how this water should be produced. Having been killed by dogs in the hunt some time between 15 May to the end of June, the 'Velvet-head', which presumably refers to the velvet-covered antlers, was cut into a series of sections and placed in a retort. This was then heated in a bath until no further volatiles were driven off for capture by condensation in a retort. The extracted fluid might then be mixed with wine, cinnamon, mace and saffron in order to enhance its efficacy in helping to ease labour, to help expel the afterbirth and to cleanse the womb from 'serosities' [various fluids].

It was also one of the ingredients of de Mayerne's anti-hypochondriacal Balsom of Bats [21 p54] and Samuel Hartlib [c. 1600-1662] prescribed it against cardiac conditions [32 p97].

The preparation sounds very similar to a preparation described by Schroeder using new antler growth [with the 'bloudy juyce in them'] to produce a preparation esteemed for its use in mitigating fevers [18 p30].

17. Genitals or *Priapi Cervi* and *Testiculorum cervi*

In early modern English texts, the penis is usually referred to by the archaisms 'pizzle' [also pisle, pizzel, pizzell, pissel, peezle, pesyl and pizle] and 'yard', whilst the testes are often called 'stones'. Once again, Pliny is the source of many of the suggested therapeutic uses of stag genitals. As cited above, the penis wrapped together with hyaena flesh and seven stag hairs in a gazelle skin pouch was worn in order to protect against miscarriage [15 p311].

It is not surprising that the main medicinal application of stag genitals was in the promotion of sexual drive and potency [5 p247ff.]. According to Topsell, the penis had 'a virtue to encrease lust in every creature, it being either dryed and drunk; or else bound fast to their privie parts' [4 p104] and Schroeder indicates that the testes, dried and drunk dispersed in wine 'stir up Venery' [18 p31]. That same mixture was also esteemed against snakebite, and Lovell further indicates that the 'ashes with wine applied to the genital of an admissary animal make it more strong for copulation' [20 p71]. In Alpine folk medicine, infertile women were recommended to take the powder of dry deer rod or deer mother after copulation [62 p231].

Quite complex penis-containing recipes are recommended by several authors in order to overcome barrenness and promote fecundity [33 p99; 34 p77; 35 p137], including the Satyrion Electuary of Moyse Charas [1619-1698] [36 p153]. One author commends stag pizzle for overcoming the 'Flaccidity of a Man's Yard, stirring up Libidinous Images' [37 p135]. In at least one instance, stag's penis was included in a medicine designed to treat gonorrhoea [38 p711].

The penis was also appreciated for its ability to ease abdominal problems, particularly dysentery and colic [e.g. 16 p51; 18 p31; 23 p207; 20 p71; 39 p68; 40 p120-122]. It was also an ingredient of choice in treatments for pleurisy [23 p207; 39 p68; 41 p16] and is listed by several authors as a simple in the treatment of hernias and ruptures [42 p287; 43 p616].

Finally, Adrian von Mynsicht [1603-1638] incorporated stag's penis in his Compound Powder of Plantain, which he recommended for 'those that loath their meat, that piss or spit blood; yea young Women, whose Urinary passage is injured after a hard labour. In Dysenteries, pains in the Guts, and superfluous Menstrua's; it yields great relief to all Ulcerations in the Guts, Reins, Bladder and Urinary passage, and soon removes all the Symptoms' [44 p104].

18. Horn or *Cornu cervi*

The antlers of the stag are a potent symbol of the strength, vitality and virility of the animal, and their regular shedding at the end of winter and new growth in the spring speaks of renewal – all qualities which were believed to be harnessed by using preparations derived from them in order to strengthen the individual, protect them against various dangers and treat a wide range of maladies.

Like the rest of the animal, stag's horns were esteemed because of their supposed ability to protect from and cure cases of poisoning. Topsell indicated that 'if men drink in pots wherein are wrought Harts horns, it will weaken all force of venom' [4 p103]. Similar qualities were claimed for cups made out of unicorn, ibex, rhinoceros and even cow horn. He also specified that the right antler, hidden in the ground, provides protection against bufotoxins, and that very young antlers could mitigate poisoning by Henbane [*Hyoscamus niger*] [4 p104].

Amulets made of stag's horn are quite common in European folklore. In Austria [Styria] rings made of antler, often decorated with an image of a deer, were worn to protect against epilepsy and eclampsia [14 p148]. In Spain, Portugal and Italy, deer horn pendant amulets [Fig. 6] were worn by children to protect against the evil eye and sometimes to ease teething [45 p456; 46 p216; 47 p64; 48 p404-5; 49 p66].

The *Geoponica*, a collection of 10th century agricultural lore compiled in 20 books for the Byzantine emperor Constantine VII Pyrogenitus at Constantinople, records the use of hart's horn amulets around the necks of horses in order to prevent them from falling ill [52 p93].

Fig. 6. 19th century stag's horn amulets [Spanish]. Left: V&A M.14-1917 [Length 95mm]. Right: V&A M.18-1917 [Length 65 mm]. Hildburgh Gift. Copyright Victoria and Albert Museum.

In many medical texts, *cornu cervi* is abbreviated to C.C. Completely unprepared horn supposedly resisted putrefaction, 'correcteth malignity', and acted as a sudorific, so strengthening the patient's vital force or 'Balsome'. Forceful sweating to eliminate harmful humors otherwise present in excess therefore made it useful in the treatment of measles, smallpox and fevers [5 p112; 18 p28; 20 p72]. Shavings of the horns [*cornu cervi rasurae*] were incorporated into a wide range of compound medicines, including the Margave anti-epileptic powder [57 p4].

Simple processing involved burning the horn until it passed from black through to white in colour. This was referred to as *Cornu cervi praeparatum* and is one of the common forms of storage for which dedicated drug jars were produced [Fig. 7]. The fumes from the burning horn could be employed as a fumigant in the treatment of epilepsy [16 p51].

Fig. 7. Drug jar for prepared stag's horn, 18th century, Lunéville. Pharmazie Museum, Basel University [author's photograph].

Burned hart's horn, taken in a drink, was well established as a medicament in classical times. Dioscorides [AD c.40-90] commended it for use in cases of haemoptisis, dysentery, bowel problems, jaundice, bladder pains, and leucorrhea. Baked in a clay pot until it turns white, the powder was also deemed suitable for ocular sores and discharges, toothache and for incorporation into dentifrices [50 p107]. According to Hildegard von Bingen, burning shavings of the horn together with frankincense produces an odour that 'chases off airy spirits, spells, and bad worms and checks magic' [51 p213]. In early modern times it was also commended for killing intestinal worms and being a suitable preparation for administering to children [18 p29; 20 p72]. In German folk medicine, powdered hart's horn is recorded as being taken in brandy both morning and evening, and utilised against possession and enchantment, epilepsy, [hysterical] fainting, excessive bleeding, urinary retention, hydrocele [serous fluid accumulation], jaundice, haemoptisis, colic, dysentery, stomach cramps, worms, plague, scabies, unspecified pain experienced in childhood, toothache, uterine prolapse, infertility and to initiate menstrual flow [11 col107].

Jonstonus records the topical use of [presumably] prepared hart's horn in the elimination of freckles and certain skin blemishes and, mixed with Sandarach [a resin from the cypress-like tree, *Tetraclinis articulata*] as a snuff to deal with nasal swelling [16 p51]. In combination with occasional other ingredients, he also notes its use in cases of the King's evil [Tubercular lymphadenitis], toothache, colic and worms. Applied to the head, both the oil and powder of hart's horn supposedly restored the hair of the scalp in cases of baldness, prevented further hair loss, killed nits and lice, and eased headaches [4 p104].

'Philosophical calcination' [rather more intense, alchemical heating as practised by Paracelsians] involved heating the horns with a little water in a retort for a period of three days until they turn white and friable. The resulting powder [*cornu cervi philosophicè praeparatum*] was praised for its sudorific properties and usefulness in 'malignant diseases' [18 p29].

Slightly more controlled heating resulted in fractional distillation in which, successively, a volatile liquor or spirit [5 p199, 205], salt [5 p189] and finally an oil [5 p210] were driven off and could be collected [31 p147]. These fractions could be purified further by subsequent distillations or rectification and then added to a wide range of compound medicines too broad to consider in great detail. The spirit of hart's horn [an aqueous solution of ammonia] was judged to be excellent at cleansing the blood, largely by promoting sweating and acting as a diuretic. More specifically, it was used to treat scurvy, sexually transmitted diseases and ulcers [31 p148-9]. In Austrian folk medicine, the spirit was rubbed on the feet of pregnant women as they gave birth in order to encourage easy labour, and also used to treat rheumatism and lumbago [62 p231].

The salt of hartshorn was actually a mixture of two components: sal ammoniac [ammonium chloride] and ammonium carbonate. LeFèvre is gushing concerning the therapeutic benefits of the salt, stating that it 'might truly be called a Panacea, or Universal Medicine' since it is 'soverain' against epilepsy, apoplexy [strokes] lethargy, all neurological disorders, resists all poisons, pestilence, fevers and malarial chills and cleanses the liver, spleen mesenteries, pancreas, kidneys, bladder, belly and lun-

gs. He further notes it is effective against diarrhoea and helps to control menstruation [31 p150], and that it can modified through further rectification and the addition of ethanol to form a tincture with even more concentrated properties than the salt itself [31 p151; 5 p204].

Oil of hart's horn, recommended topically in the treatment of gout [18 p32], may well have been the source of inspiration for the later *oleum animale* produced by the German alchemist Johann Conrad Dippel [1673-1734] involving the destructive distillation of animal bones, horns and leather [58 p197]. Dippel's oil was the result of multiple distillations of crude animal oil, two of the stages involving potassium carbonate [K_2CO_3] and burnt lime [calcium oxide, CaO]. Dippel claimed that the oil was an *elixir vitae* – a universal medicine capable of curing virtually everything [59, 60]. Dippel also produced a second popular liquid whose inspiration came from spirit of hart's horn. Despite the name, Dippel's Hartshorn comprised various carbonates of ammonia and was produced from dried Bull's blood and potash.

A perfume concocted from hart's horn, castoreum and brimstone supposedly encouraged delivery in cases of stillbirth [4 p104].

Boiling the antlers in water resulted in the extraction of the protein content, which was then collected as hart's horn jelly, commonly used to speed up difficult labours [27 p257]. The jelly was often added to various strengthening, restorative drinks and caudles [a hot beverage] as part of the treatment for plague [53 p22], including being incorporated both into the Philosopher's egg and Gascoigne's Powder for that purpose [54 p133, 173; 61 p1], and fevers [11 col107].

It is worth noting that stag antlers were also an important part of Chinese Traditional Medicine [TCM]. In this system, *fan* seems to be a term denoting an acute illness of unspecified origins. The word is usually qualified by the names of various organisms which characterise the external expressions of these conditions. Deer *fan* is described and illustrated in the *Huitu zhenjiu yixue* [Illustrated Acupuncture Made Easy], by Li Shouxian in 1798. The patient suffering from deer *fan* characteristically erupts in a purple rash and brings up a bloody froth [Fig. 7]. Treatment is by means of Deerhorn Glue [*lujiao jiao* or *colla cornus cervi*], which seems to be the essentially the same thing as hart's horn jelly. The preparation has been the subject of serious modern investigation [e.g. 55, 56].

Fig. 8. Early 20th century Chinese lithograph: 'Fan' diseases, including Deer fan. Wellcome Collection.

19. Stones

A series of stones are cited in the literature as being associated with the red deer. Following Pliny [15 p361], Topsell explains that the hind, on realising she is pregnant, ingests a 'certain stone' which can later be located either in the intestines or in the faeces [4 p104]. Since the hind was famed for its easy and rapid labour with only very rare

examples of miscarriage, the stone was esteemed to be 'profitable for all Women with childe and in travell' [4 p104].

Schroeder notes that further stones may be found in the heart, stomach, or intestines of the stag, and also the uterus of the hind. He comments that, medicinally, their virtues match those claimed for bezoar stones [18 p32; see also 15 p361, 16 p51, 20 p72].

Conclusions

The stag of the red deer [*Cervus elephas*] was the subject of considerable focus as one of the main targets in the organised system of medieval hunting amongst the European nobility. Perhaps the most bizarre therapy associated with later stag hunting is the use of the bullet with which it was shot to treat [without further details] cases of ganglion and umbilical hernias [11 col107].

Once slaughtered, the animal yielded numerous body parts which could be harnessed for their perceived therapeutic applications. The use of stag-derived simples dates from classical times but had its heyday in early modern medicine. According to legend the enmity between stags and snakes led to the stag being able survive the supposed consumption of the poisonous reptiles by being able to eliminate the venom from its body. This led to the idea that the entire body of the stag had alexipharmic properties. This, coupled with its supposed longevity, extreme strength, sexual potency and vitality and the ability to regenerate its antlers informed many of the medicinal applications of its body parts. Nearly all were accounted as being effective antitoxic agents in cases of envenomisation, even by such specific items as bufotoxins and herbal alkaloids such as hyoscyamine. This was also true for diseases which, in early modern times, were believed to have a toxic component associated with them [because people of different humoral types all suffered in the same way], such as plague.

The antlers harvested from the stag were the most versatile components. They were employed as amulets, rasped to provide shavings, burnt to provide a therapeutic ash, as well as being processed by alchemical distillation to yield spirit, salt, oil and tincture of hart's horn. Simple boiling in water led to the production of hart's horn jelly. All these preparations enjoyed a wide and varied therapeutic application. The remainder of the animal – skin, hair, bones, rennet, fat, marrow, lungs, eyes, brain, flesh, hooves, blood, liver, bladder, urine, dung, genitals and heterotopic bone in the heart – was also commandeered for therapeutic benefit. Overall, the stag enjoyed considerable popularity as a provider of diverse medicines during early modern times, gradually falling out of use from around 1750 as chemical medicines began to dominate the apothecarial market place. Some do survive, however, in Traditional Chinese Medicine even today, where active research is being conducted into their potential efficacy.

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Wellcome Collection and the Victoria and Albert Museum [London]. I am very grateful to Dr. Maria do Sameiro Barroso and a second, unidentified reviewer for their helpful comments at the review stage.

List of Illustrations

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5. 19th century silver ring with red deer tooth. V&A 173-1872. Copyright Victoria and Albert Museum.

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7. Drug jar for prepared stag's horn, 18th century, Lunéville. Pharmazie Museum, Basel University [author's photograph].

8. Early 20th century Chinese lithograph: 'Fan' diseases, including Deer fan. Wellcome Collection.

Rezime

U ovom radu dat je kratak pregled o medicinskim sredstvima (materia medica) koja su se koristila od mužjaka crvenog jelena (*Cervus elephas*). Medicinska upotreba jelenskih rogova i drugih delova tela ove životinje započela je u klasično doba, pominje se u spisima Dioskorida i Plinija Starijeg, a oslanjala se na legendarnu vitalnost, seksualnu snagu, te snagu, aleksifarmičke i pomlađujuće moći koje su se pripisivale ovoj životinji. U ranom modernom dobu, veliki broj organa jelena, ubijenih u lovu, bio je dostupan za upotrebu u vidu amajlija, galenski jednostavnih i alhemijskih derivata za ugradnju u širok spektar lekova koji su se koristili za lečenje velikog broja zdravstvenih problema, od smrtonosnih infekcija. poput kuge, kroz stanja kao neplodnost i gubitak seksualne potencije, do ćelavosti. Jelen je bio temeljni apotekarski resurs koji se u potpunosti koristio.

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ANATOMY IN THE

PAINTING OF REMBRANDT HARMENSZOON VAN RIJN

Abstract: Works of art have a substantial impact on viewers not only because of the beauty of the image but also because of the dominance of the decisive moment they express. Rembrandt Harmenszoon van Rijn managed with his group portrait *The Anatomy Lesson of Dr Nicolaes Tulp* to draw viewers into the scene of dissection of a body thanks to the dynamics of the painted characters. At the beginning of the 16th century, the practice of public autopsies spread throughout Europe. In 1555, King Philip II granted the Guild of Surgeons in Amsterdam the privilege of dissecting executed criminals for educational and scientific purposes. Dissections were performed once a year during the winter months to prevent rotting and decomposition of corpses, and the procedure itself often lasted several days. Dr Nicolaes Tulp performed the autopsy of a hanged convict in 1632, which Rembrandt immediately painted. With this piece, the artist presented the beginning of a new pedagogical approach to teaching anatomy. The picture represents Dr Nicolaes Tulp instructing seven onlookers as he is dissecting a hand and showing the flexor digitorum superficialis.

Key words MeSH: Anatomy, Dissection, Art

Non MeSH: Rembrandt, Nicolaes Tulpe

Development of the Guild of Surgeons in the Netherlands

Until the first half of the 14th century, educated doctors or *doctores medicinae* had mere theoretical knowledge of surgery, which they rarely applied practically in their daily work. As a craft, surgery was reserved more for trained barbers who did not have the necessary theoretical knowledge at that time. During the second half of the 14th century, individuals in the Netherlands embarked on surgical treatments. The initial period of such a system of surgeon education included both trained doctors and barbers. A few decades later, at the beginning of the 15th century, surgeons organised themselves into guilds, as did the other medieval European artisans.

Guilds were the organisations that gathered individuals of the same profession who were obliged to join the respective guild. The guild, as an organisation, protected the interests of its members. The first Dutch Guild of Surgeons was formed in 1466 in Leiden, while the guild in Amsterdam was formed in 1497 [1,2]. After establishing the Guild of Surgeons in Amsterdam, its members compiled the rules and regulations published in 1736 entitled "*Privilegien, willekeuren en ordonnantien, berebetten het Collegium Chirurgicum Amstelaedamense*". The rules and regulations clearly defined surgeons' obligations, including five years of education and training, the final exam, and how a surgeon and his student interacted. The relationship between a teacher and a student had to be modelled based on the relationship between a master and an apprentice. One of the essential educational elements was attendance at anatomy classes organised by the competent Guild of Surgeons [3].

Anatomy lessons in the Netherlands

The first public anatomy class in the Netherlands was the dissection performed in 1550 in Amsterdam's old convent of St. Ursula and the seat of the Guild of Surgeons was in Amsterdam as well [4]. In 1555, King Philip II granted permission to the Guild of Surgeons in Amsterdam to publicly dissect a human body exclusively for educational and scientific purposes. After receiving the permission, surgeons dissected one body a year. Such public dissections were performed during several consecutive days in the winter period to avoid the rapid decay of the tissue, which would prevent the unbearable smell of the corpse and the rapid loss of the morphological characteristics of the organs and the body [5]. It would take several decades to increase the number of bodies the Guild of Surgeons could dissect. During that early period of public dissections, only the bodies of death row inmates were allowed to be used. The course of public dissections and anatomy classes was regulated by the rulebook published in 1606 [1,6].

The place of autopsy of the Guild of Surgeons in Amsterdam was moved several times until, they got their final position in the De Waag building at the end of 1691, where a suitable amphitheatre was built (Figure 1).

Fig. 1. De Sint-Anthonis Waag, 1860. Drawing by Johannes Jacobus Antonius Hilverdink [7].

This building housed several guilds, including bricklayers, painters, surgeons, and blacksmiths. The building included the amphitheatre in the central part, the rotating dissecting table around which concentric wooden benches were arranged in several rows. The first row of benches with chairs was reserved for the members of the City Council, the members of the "Collegium Medicum", and surgeons aged fifty and older. The second and third rows were reserved for doctors, the members of the Board of the Guild of Surgeons and masters of surgery who had reached fifty years of age. The fourth, fifth and sixth rows were reserved for young surgeons. The seventh and eighth rows were reserved for the students of the Guild of Surgeons and citizens with enough funds to pay for the admission to a public anatomy class. This amphitheatre was in use until 1869 [1].

During the period of the formation of the Guilds of Surgeons, the teaching of anatomy had the methodology based on the fact that the leading dissector sat at his chair far above the body, reading the literature aloud, while a trained technician performed the physical part of the dissection. After the formation of the Guilds and the adoption of their rules, the role of dissectors was performed by the *Praelectores anatomiae*, who obtained a doctor's degree and were appointed by the competent Guild of Surgeons to teach anatomy. These doctors were precious members of society in their city, and some of them often became mayors or held some other vital function

in the city's administration. Maarten Janszoon Coster was appointed the first *Praelector anatomiae* in the Amsterdam Guild of Surgeons in 1578 [8]. The newly appointed *Praelector anatomiae* began with a completely different work methodology, teaching his audience by performing the physical part of dissection by himself. During the dissection, it was not allowed to walk around the amphitheatre, talk or interrupt the lecturer in any way [3].

To immortalise his essential figure in the education of many generations of doctors, almost every *Praelector anatomiae* commissioned his portrait at the moment of the dissection of the body. In Amsterdam, these paintings were exhibited on the first floor of the De Waag building in the room that was the meeting place of the guilds. After Napoleon's conquests and the dissolution of the Guild of Surgeons, part of the paintings ended up in the Association of Surgeons' Widows, and some were sold to collectors [4,6,9]. The first in a series of such images is the "Anatomy Lesson of Dr Sebastiaen Egbertsz de Vrij", completed in 1603 painted by Aert Pietersz. A decade and a half later, more precisely in 1619, Thomas de Keijzer presented the same anatomist during another dissection. Dr Johan Fonteijn was the next *Praelector anatomiae*, who is pictured giving an anatomy lesson in 1626. Rembrandt van Rijn painted the most famous picture with this theme in 1632, featuring Dr Nicolaes Tulp as its central figure. Two decades later (1656), the same artist painted Dr Johannes Deijman during a brain discectomy. Afterwards, the portraits of Dr Frederik Ruysch during dissection were painted by Adriaen Backer in 1670. The same doctor's dissection of a newborn was painted by Johan van Neck in 1683. Dr Willem Roëll's anatomy lesson was painted by Cornelis Troost in 1728, while the epoch of group portraits during dissection was concluded in 1758 when Tibout Regters painted Prof. Petrus Camper dissecting a corpse in the presence of his colleagues [1].

Dr Nicolaes Tulp *Praelector anatomiae*

Nicolaes Tulp was born as Claes Pieterszoon in Amsterdam on October 9th, 1593, in a family involved in the linen trade. When he was 17, he studied medicine at the University of Leiden. His most influential teacher was Pieter Pauuw (1564-1617), who was among the first one to perform dissections in the Netherlands [10]. Dr Nicolaes Tulp graduated from the Medical School after successfully defending his dissertation "*De cholera humana*". After that, he returned to Amsterdam and began his own medical practice.

During his first years of practising the medical profession, since he found the original version of his name, Claes, to be harsh and voiceless, he started using the name Nicolaes. He also changed his surname Pieterszoon to Tulp, alluding to a tulip flower he chose as his symbol. When Dr Tulp adopted the surname, tulips were scarce plants that arrived in the Netherlands via sailors. The first bulbs were planted at the University of Leiden, attended by Dr Tulp himself. It is unknown whether he did it because he compared his value and rarity with tulips [11].

What is known is that the doctor quickly developed his practice and was a famous doctor in Amsterdam. The price of his work went to such an extent that patient's

relatives had to send a cart with which Dr Tulp would come to the patient. In addition, Dr Tulp was engaged in scientific research and writing. "*Observationes Medicae*" is cited as his capital work in which he recorded and drew sketches of his 231 observations of unusual medical conditions such as hydrocephalus or conjoined twins (Figure 2). In that part, Dr Tulp also deals with anatomy, describing in detail the ileocecal valve named after him. The book was printed in 1641 and had three more editions in the next 100 years [12].

Interestingly, Dr Tulp was also involved in politics. He entered the Municipal Council of Amsterdam in 1622. As he served in the Council as a permanent member, he often resolved local court disputes, also acted as the supervisor of Amsterdam Bank, and the city treasurer. When he was thirty-nine years old (1653), he was elected the mayor of Amsterdam. He performed the function of the mayor in four mandates. Dr Nicolaes Tulp died in The Hague on September 12th, 1674. [13].

Fig 2. A representation of Siamese twins from the *Observationes Medicae* [14].

"The Anatomy Lesson of Dr Nicolaes Tulp" painted by Rembrandt van Rijn

The Amsterdam Guild of Surgeons made an illogical choice when they asked Rembrandt van Rijn to immortalise Praelector anatomiae Dr Nicolaes Tulp dissecting the body during a public anatomy class. At that time, Dutch painting was dominated by Thomas de Keyser and Nicolaes Pickenoy, while, unlike them, Rembrandt was a novice painter who was only 26 years old. However, Rembrandt had a strong patron,

the art dealer Hendrick van Uylenburgh, who recommended the artist to the Amsterdam Guild of Surgeons. The artist at the time was a prominent painter in his patron's studio.[12].

Rembrandt van Rijn immortalised the life-size dissection of the body of Aris Kindt, the criminal hanged the night before, by Dr Nicolaes Tulp on a canvas measuring 216.5 x 169.5 cm.

Fig. 3. The Anatomy lesson of Dr. Nicolaes Tulp by Rembrandt. (published with permission from Mauritshuis, The Hague) [12].

Due to a large number of petty thefts and violence, Kindt was forbidden to approach his hometown Leiden [15]. In January 1632, Kindt stole a cloak from a wealthy man, for which he was arrested, taken into custody, and hanged on January 31st of the same year [16]. Dr Tulp is the central figure sitting on the right side of the composition. The body of Aris Kindt occupies the central part of the composition and is placed diagonally, in black and white tones, and all its parts are exposed except for the pelvic girdle. Around Dr Tulp and Aris's body, seven other men are represented on the canvas who additionally paid Rembrandt to paint their portraits on his work [9]. In addition to the play of light, contrast and colour, Rembrandt succeeded in painting the fa-

cial expressions of the dissection participants to show their emotional state at that moment. In this way, the artist created a real theatrical scene instead of plain stiff figures.

The painting "The Anatomy Lesson of Dr Nicolaes Tulp" was restored between 1996 and 1998. During the restoration, the artwork was scanned to gain insight into the stages of creating this work of art [9]. Middelkoop et al. state that the painting techniques Rembrandt used during that analysis were also determined. Based on the analysis, Rembrandt shaped the painting on the canvas, changing the composition several times. During the first drawing, the painter presented Frans van Loenen, whose figure is at the top, with a black hat on his head. However, during the second act of painting, the painter left out the black hat, which in the final image is only worn by Dr Tulp as the composition's central figure and the autopsy's performer. In the background of the piece is a figure holding a bundle of papers on which Rembrandt, during the first painting, showed the hand's anatomy in the form of drawing. After the restoration of the picture during the 18th century, the anatomical illustration was overdrawn with a list of the names of the persons represented on the canvas. During the second restoration, the list of the names was partially removed, so Rembrandt's original drawing of the hand's anatomy on a sheaf of papers was again visible.

In the beginning, Rembrandt painted the left dissected hand in a slightly higher position than it is presented in the final painting. The artist decided to lower the dissected arm, as the realistic representation of the forearm muscles would be difficult to present in that position. In the picture, Dr Tulp raises and pulls the flexor digitorum superficialis towards the upper arm, thus wanting to tighten the muscle's tendons, which would lead to the flexion of the fingers, thereby representing its function. The right arm was amputated in the first image, while in the final version, the right arm is connected to the torso. In addition, the right hand appears shorter than the left one [6,11,12]. The thorax of the corpse seems enlarged in the anterior-posterior diameter, indicating that Aris probably had a deformity of the sternum, while the neck is not even represented, and the head appears to be pinned to the upper opening of the thorax [17].

The flexor digitorum superficialis is attached to the medial epicondyle of the humerus and to the coronoid process of ulna with its muscle body. Its tendons are attached to the middle phalanx of hand of the fingers of the hand. [18]. The subject of controversy is the impression that in the Rembrandt's painting, the flexor digitorum superficialis attachs its muscular body on the lateral epicondyle of humerus. Ijpma et al., after an experiment on a cadaver, supported the accuracy of the position and attachment of the muscles in the picture, claiming that the forearm is extended and in supination. At the same time, the elbow joint rests on the trunk, due to which the lateral epicondyle of humerus is directed outward and downward and is not visible in the picture. The medial epicondyle of humerus is directed inward and raised forward [5]. The order of dissection can also be considered as the lack of the painting. The dissections performed at the time of Rembrandt began with the opening of the trunk, while the extremities were dissected in the final stage. The reason is the rapid decay of the parenchymatous organs in the trunk, which are most prone to rotting. Nevertheless, the composition shows the dissection of the hand while the rest of the body is still intact.

Conclusion

Trained doctors had only theoretical knowledge of surgery until the first half of the 14th century. During the second half of the 14th century, individuals in the Netherlands embarked on surgical treatments. At the beginning of the 15th century, surgeons organised themselves into guilds. In this sense, public dissections were very important for the training of future surgeons. In the 16th century, public dissections of a human body were allowed, but only for educational and scientific purposes, and only the bodies of those sentenced to death. The course of public dissections and anatomy classes was regulated by the rulebook published in 1606. After receiving a license, surgeons could dissect one body per year. The anatomy teaching methodology was based on the leading dissector sitting at his chair far above the body, reading the literature aloud. At the same time, the physical part of the dissection was performed by a trained technician. To immortalise his essential figure in the education of many generations of doctors, almost every *Praelector anatomiae* commissioned his portrait at the moment of dissection of the body. In Amsterdam, these paintings were exhibited on the first floor of the De Waag building in the room that was the meeting place of the guilds. That was extremely important because dissections could not be performed often enough, so pictures of those events were rare educational material. Rembrandt van Ryne presented a life-size dissection of the body of Aris Kindt, the criminal hanged the night before, by Dr Nicolaes Tulp. Rembrandt managed to paint the facial expressions of the dissection participants to show their emotional state at that moment. With this piece, the artist presented the beginning of a new pedagogical approach to teaching anatomy, which was extremely important considering the low frequency of such events.

Rezime

Školovani lekari su do prve polovine XIV veka imali samo teorijsko znanje iz hirurgije. Tokom druge polovine XIV veka pojedinci su se u Holandiji počeli obučavati za hrurški rad. Nekoliko decenija kasnije, početkom XV veka hirurzi su se organizovali u cehove. U tom smislu javne disekcije su bile veoma značajne za obuku budućih hrurga. Početkom XVI veka širom Evrope se proširila praksa javnih obdukcija. Kralj Filip II je 1555. godine cehu hirurga u Amsterdamu dao privilegiju disekcije pogubljenih kriminalaca u nastavne i naučne svrhe. Disekcije su se vršile jednom godišnje tokom zimskih meseci kako bi se sprečilo truljenje i raspadanje leša, a sam postupak je često trajao nekoliko dana.

Kako bi ovekovečili svoju važnu figuru u edukaciji mnogih naraštaja lekara, skoro svaki *Praelector anatomiae* je naručio vlastiti portret u trenutku disekcije tela. U Amsterdamu su te slike bile izložene na prvom spratu zdanja *De Waag* u sobi koja je bila mesto susreta esnafa. To je bilo izuzetno važno i zbog toga što disekcije nisu mogle biti dovoljno često izvođene pa su slike tih događaja bile redak obrazovni materijal.

Umetnička dela imaju snažan uticaj na posmatrača ne samo zbog lepote slike nego i zbog dominantnosti snažnog trenutka koji izražavaju. Rembrandt Harmenszoon van Rijn je uspeo svojim grupnim portretom *Čas anatomije dr Nicolaes Tulp* da uvuče posmatrača u scenu disekcije tela zahvaljujući dinamici naslikanih likova. Ovo delo nije izražaj običnog naturalističko-realističkog prikaza, niti je naslikano kako bi se stvorio izložbeni

predmet. Scena je dramatizirana kako bi se i na taj način pridoneo značaj naručiocu slike, što je u skladu sa običajima te epohe. Dr Nikolas Tulp je obdukciju obešenog osuđenika izvršio 1632. godine, što je Rembrandt odmah naslikao. Umetnik je, ovim delom, uspeo da predstavi i početak novog pedagoškog pristupa u nastavi anatomije. Na slici je predstavljen dr Nikolas Tulp kako podučava sedmoricu posmatrača dok vrši disekciju ruke i prikazuje površnski pregibač prstiju šake. Imena oduševljenih posmatrača su poznata, a zapisana su na papiru koji drži jedan od njih.

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THE PLAGUE IN POLJICE IN 1783[1]

Abstract: Due to its unique geographical position, Poljice represents an area that has retained certain autochthonous features for a long time and has accepted the Ottoman and then Venetian influences to a minimal extent. That had the effect that Poljice became an area with special status. Only on its territory the Venetian authorities did not appoint an official (*provveditore* or superintendent), as was the case in the parts of Dalmatia that belonged to the Republic based on the demarcation carried out in 1699 and 1718. Without a representative of the central government, residents did not readily accept its regulations, including sanitary ones. This fact determined this research, which tries to show how the plague epidemic was suppressed in the absence of state sanitary authorities in 1783, which was remembered as one of the most severe that hit Dalmatia in that century.

Keywords MeSH: plague, quarantine

Non-MeSH: Poljice, 1783, Dalmatia, sanitary cordon, Dolac village

Introductory considerations

The area of Poljice figured as a border area during the Ottoman-Venetian wars fought in the 16th and 17th centuries. It experienced attacks by the Ottoman army on several occasions but defended its neutrality towards the conflicting parties. Due to this fact, it represents a semi-isolated political entity whose favour both countries could gain by granting certain immunities to its inhabitants. If we put the problem re-

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alistically and look at it, Poljice remained isolated from all influences thanks to its location, emphasizing the fact that they were rarely the target of curious travellers or trade caravans. Such a position favoured the survival of local government organisation founded in the Middle Ages. It did not undergo significant changes until the end of Venetian rule, which was only nominally recognized. Before the Ottoman conquest, Poljice had a larger territorial extent than in later times. In the early modern era, this area included the territory bordered on three sides by the Cetina River, the Adriatic Sea and the Žrnovica River, and on the fourth by the villages of Žrnovica, Dugopolje, Kotlenice and Biska, all the way to the Cetina River. [1 p1] This is, to a certain extent, confirmed by the author of *Topografia Veneta*, published in 1787, Vincenzo Antonio Formaleoni, who stated that the area of Poljice stretched from the Mosora mountain to the Adriatic Sea and from the Žrnovica river to the Cetina river. [2 pp123–124]

Due to its position in the Republic's administrative system, the name of the Principality of Poljice, or the Republic of Poljice, was accepted for this area in historiography. Šime Peričić regards it as "a real administrative oasis because it represented specificity for the circumstances of that time". [3 p34] At the head of each village of Poljice was its elected count (*knez*). All 12 counts participated in the election of the Grand Count (*veliki knez*), who exercised administrative and judicial power together with the other counts. The Grand Count was responsible exclusively to the general providor of Dalmatia and Albania. At the end of the 18th century, the custom was still practiced, as it had been for centuries, that the people gathered on the day of St. George choose the Grand Count and twelve village counts. [2 p124] The Grand Count was elected for a period of one year. During the term of that office, he was not allowed to engage in agricultural work, despite Poljice being considered an area where the majority of the population was engaged in agriculture and cattle breeding.

The division into 12 administrative units, noted by Formaleoni [2 p124] according to Danica Božić–Buzančić, was a consequence of dominant agriculture, primarily developed livestock farming. However, this author does not list 12 villages, but 12 katuns into which Poljice was divided (Podstrana, Jesenice, Duće or Truše, Sirinjine, Sitno, Dubrava, Gata, Čićla, Zvečanje, Kostanje, Gornje Polje, i.e. Gornji Dolac, and Donje Polje, i.e. Donji Dolac). [4 p47] According to reports from the second half of the 18th century, agriculture in Poljice was more developed compared to the rest of Venetian Dalmatia. [4 p47] There was no city or larger settlement in it. [5 p332–333]

According to the first official census conducted by the Venetian authorities from 1766 to 1770, there were 6,396 inhabitants in Poljice. No members of the social category known as *civili*, or noble families (*Nobiltà*), were in them, but all 957 families were registered as commoners. According to the second census carried out in the period from 1771 to 1775, 4,715 people lived in the area. In contrast to the first, in the second census, 45 families were listed as nobles, 597 as *civilis*, and 379 were families of the commoners. [5 p333] These data differ somewhat from the data published by Danica Božić-Bužančić, according to which there were 1,021 houses in Poljice in 1771 and 1,090 in 1781. [4 p47] The same author stated that 4,715 people lived in Poljice in 1771 and 6,813 inhabitants ten years later, while Luka Garanjin, in a still unpublished manuscript, noted the number of 6,566 inhabitants. [4 p47] All this raised the question of

the origin of the data on Poljice in Anagraphs since in that area, Venice did not keep its officials who would conduct a census of its population (we hinted at this fact also in: [5 p333]. The inhabitants of that area were Catholics. Formaleoni, on his part, stated that 15,000 people lived in Poljice (1787), while 20 families belonged to nobles. [2 p142] He certainly did not refer to the data from the mentioned Anagraphs; therefore, it is difficult to determine his source. Certainly, not as many people lived in Poljice as he stated.

The Venetian government relatively early organized a health service aimed at fighting the plague, which penetrated Dalmatia from the direction of the Eyalet of Bosnia. From the first days, the functioning of the health service in Dalmatia was placed under the supervision of the most crucial body for these issues located in Venice - *Magistrato alla Sanità*. [6] Smaller health colleges were introduced in all communes (places with city status) in Dalmatia, most often mentioned under *Collegio della Sanità*. [3 p223] The scope of work of those collegiums was limited to the administrative area of the commune, i.e. the city and its surroundings.

Over time, the general *provveditor* of Dalmatia and Venetian Albania, who ruled in Zadar, stood out as one of this province's most significant figures in regulating health conditions. [5] In addition to administrative, judicial and military competencies, the general *provveditor* of Dalmatia had to influence the imposition of sanitary regulations in case the need arose. This duty of his was particularly evident at the time of the plague, which hit Venetian Dalmatia on several occasions during the 18th century. At that time, Venice created a sanitary cordon towards the Ottoman state, following the example of Austria [7; 8; 9], where many soldiers were engaged.

Lazarets had gained particular importance in the health care system: buildings where a person was quarantined when the need for it was announced. [10] The two oldest lazarets in Dalmatia were built in Zadar as its administrative centre and in Split when it was declared an "open" port in 1592. During the early modern period, the defence of Dalmatia against epidemics was reduced to those two lazarets. However, later, as Šime Peričić pointed out, the question of building new ones was raised on several occasions. Both proposals are related to the 18th century when the plague was gradually eradicated in Western Europe thanks to the Age of Enlightenment and the scientific disciplines and methods developed with it. The first proposal appeared in 1776 and related to the construction of a lazaret on the border with the Ottoman state, while according to the second proposal, presented in 1791, the tiny island of St. Paul, which is located not far from Šolta, was suggested as the site of its construction. However, none of them were accepted. [3 p224]

Poljice, as a relatively isolated and remote area, did not enjoy any of the fruits of the Venetian enlightenment or the efforts of the Venetian authorities to defend against epidemics. Although health colleges were introduced in all major cities and fortifications of Dalmatia, this attitude did not apply to Poljice. The inherited self-governing structure based on people's democracy did not recognize the need for organized resistance to outbreaks of epidemics. At the same time, the uncontrolled circulation of residents outside its borders became a typical form of behaviour even in crisis conditions of declared epidemics.

The appearance of the plague and the first reactions of the Venetian authorities

The plague that began tormenting Dalmatia inhabitants in 1783 had its source in Bosnia. In 1782, it greatly affected the inhabitants of some of its areas. [11; 12; 13] As Giulio Bajamonti stated, at the beginning of 1782, the population of Bosnia began to fall ill in large numbers with influenza, smallpox and other "acute fevers". [14 p27] As recorded in the Makarska Chronicle, in September 1782, upon the news that the plague had broken out in Sarajevo and Travnik, the Venetian government began introducing a sanitary cordon towards the Ottoman state. [15 p339] The same reason, only a different meaning, is imposed by reading the lines of the anonymous writer of the account of the plague in Split, who does not mention the term cordon, like other contemporary reports, but the line (*linee*). [16 p29] Let's note that the renovation of St. Mark's lazaret was completed in Zadar that year. [3 p224]

The plague appeared in circumstances where the inhabitants of that Venetian province were suffering from a terrible famine, one of the most severe in its history. Starvation was not rare during the 18th century, especially in the middle. There was hardly a year when the inhabitants of certain parts of that province were not hungry. [17; 18] Šime Peričić singles out the years 1733, 1747, 1757, 1764 and 1782 as particularly dangerous in this regard. [18 pp 183–188] For this reason, the compiler of the Chronicle mentioned above did not fail to say, many inhabitants of Dalmatia moved to Posavina in search of food. However, those regions also lacked food, so many forced refugees went to the sanjaks of Bosnia and Herzegovina. [15 p338]

Dalmatia is a classic example of an area where food shortages caused greater migration, or more precisely, emigration of residents to surrounding countries. The hungry Dalmatians faced two choices- going to Austria, which had grain, or to the Ottoman state. As a rule, those who immigrated to Austrian territory in such circumstances had a more challenging time deciding to return. However, those who moved to Ottoman Bosnia, which suffered from poverty, returned in greater numbers to their homes. It was the returnees from Bosnia who brought the plague to Dalmatia in 1783. [16 p9]

Communication between the inhabitants of the two countries - Ottoman Bosnia and Venetian Dalmatia - was a mutual necessity. The economic ties between them, established long before those events, brought benefits to both parties and primarily to Venice due to the policy of monopoly over certain products it introduced. Trade exchange encouraged communication and led to the mixing of members of two different cultural spheres. Numerous Ottoman merchants visited Dalmatian ports. Numerous inhabitants of Dalmatia, especially the Morlacs, often crossed the border to graze cattle on the Bosnian side but also, in case of famine, to find work. Although they became dependent on each other, the two economies were only partially complementary. It seems that the original measures to introduce the sanitary cordon gave way, so in June 1783, the authorities ordered its renewal. [16 p8]

According to one of the preserved reports, the plague was transmitted to Poljice by its inhabitants, who had fled to the Ottoman state for a time due to famine. On the

way back to their homes, these returnees did not pass the prescribed quarantine at the sanitary cordon, which was later cited as how it appeared. [16 p14]

The Grand Count of Poljice, Đorđe Novaković,[2] first informed the Venetian authorities in Split with a letter written on June 25, 1783, that the plague had appeared in Poljice. He was told the news by the count of the village of Dolac in Rudine, one of the districts of Poljice. And while official reports exclusively mention the village of Dolac, Giulio Bajamonti, in his account of this plague wave, mentions Gornji Dolac in Rudine. [14 p92] On June 22, Stefan Bartulović's child died of the plague here. The next morning, seven people were lying sick in four neighbouring houses and had bubonic plague on their bodies. The Grand Count immediately ordered that every village in Poljice be isolated. He demanded from the general providor in Zadar, Paolo Boldù, that medics and soldiers, supplied with gunpowder and ammunition, be sent to Poljice. [19 pp19–21]

The authorities in Split first reacted to the news of the plague in Poljice and took concrete measures to separate the residents. After the epidemic outbreak, an order was issued to recruit soldiers, placed under the command of Colonel Mazzucato. They were supposed to force the inhabitants to comply with the introduced quarantine. Giulio Bajamonti was also involved in this. He was supposed to give specific instructions to the doctor appointed to go to Poljice. The Venetian authorities realized that it was necessary to completely isolate the area of Poljice, which is why it was necessary to allocate four boats with the task of patrolling the coastal part of this district and preventing fishermen from setting sail to catch sardines. The village of Dolac had to be separated from the Sinj area and the Omiš area, for which soldiers and territorials were engaged. Lieutenant-Colonel Carrara, Superintendent of Imotska Krajina, and Captain Filareto, commander of the guard at Bili Brig, were ordered to tighten control of the crossing and prevent the arrival of people from Ottoman to Venetian territory. [19 pp 19–21]

Gabriele Pettorossi (listed as *medico fisico*), was assigned to serve in Poljice. He was originally from Split and a student at the University of Padua, where he completed his studies in medicine and philosophy. He was supposed to examine the corpses of the dead and the sick and confirm with his findings that it was the plague. [19 p23] A detailed and almost the only description of this disease's manifestations on the patient's body belongs to Giulio Bajamonti, who was employed by the Venetian authorities from the first days of its appearance. Bajamonti stated that in most cases, the disease occurred 2 to 5 days after the person was infected, and in some cases, although less often, after nine days. Some patients also had severe tremors. All of them, however, had a severe headache and loss of strength (fatigue) throughout the disease. Usually, on the second day, spots or blisters would appear, most often on the thighs. Most certainly, it was anthrax that turned into boils, most often on the neck or under the patient's armpits. Some patients felt a bitter taste in their mouths, which induced them to vomit. In some cases, the physiognomy was completely transformed, and despondency would set in. [14 pp92–93]

[2] The official Venetian reports do not mention his name, but the writer of the report on the plague in Split in 1784 clearly mentioned his name. [16 p14 and further]

In the meantime, details regarding the appearance of the plague in Dolac arrived in Zadar with the report that Pettorossi had compiled. He was urgently sent to Poljice, where on June 28, he compiled a report intended for Paolo Boldù, which indicated that families from the village of Dolac moved to Bosnia at the beginning of that year due to a terrible famine. Matija Lukašević and Pavle Lukašević, with part of their family, arrived in Uskoplje that way. From there, they returned to Dolac on June 12, bringing a bunch of stuff. Two days after their return, Matija, Pavle's son, died suddenly. At the time, no one suspected that it was the plague. Due to daily interaction, the residents of five neighbouring houses, who were related to the Lukaševićs, soon became infected. In the morning of June 25, the boy Matija, son of Matija Lukašević, died, then Cveta, wife of Antun Lukašević. They died on the third day after they were infected. The following day, Stipan Lukašević's wife, Manda, died, followed by Luka Lukašević and their sister. Some died on the third and others on the fourth day after being infected. They all had boils and carbuncles on their bodies, which undoubtedly led Petrosi to conclude that it was the plague. By June 28, six houses were infected in Dolac, eight people died, twenty were considered "suspicious", and four were infected, with obvious signs of plague on their bodies. [19 pp23-24]

Isolation as a preventive measure and the attitude of the local population

The Grand Count continued to maintain contacts with the authorities in Split, who he informed on June 27 that a total of 6 houses in the village of Dolac were infected. These were the houses of Tadija Lukašević, Pavle Lukašević, Zuan Zimunitić, Don Miho Lukašević, Stefan Lukašević and Antun Lukašević. In total, 24 people were isolated in infected and suspicious houses. They were all quarantined and kept from any contact with other residents. [19 p24]

On July 1, General *provveditor* Boldù issued a termination order according to which anyone coming from the territory of the Ottoman state had to undergo quarantine in improvised lazarets erected within the sanitary cordon. Also, such persons were not allowed to keep with them objects that could transmit the plague, primarily clothes and goods. Bajamonti pointed out that this provision mainly referred to Imotski, Sinj and Knin and their administrative areas.[14 pp94–95] He demanded that Poljice be completely isolated, which is why Colonel Pellegrini was employed to guard "this other inner line" with the horsemen he commanded. [19 p25]

Pettorossi was sent to Poljice with deputies and accompanied by Lieutenant-Colonel Surić, where he soon introduced a "small collegium" (*colleggetto*), following the example of health collegiums in other Dalmatian cities, to effectively defend against the plague and provide the necessary health prevention measures to vulnerable residents. On that occasion, he received more expansive powers regarding health care organization for the residents, where he had to cooperate with the Grand Count of Poljice and the counts of other villages in the district. [19 pp25–26] In Split, four barges were armed and equipped to guard the coast of Poljice, and a certain amount of zwieback was sent as food for isolated people and lime necessary for the burial of people who died from the plague. [19 p26]

Due to the efforts of the Venetian sanitary and military authorities, Poljice was isolated from three sides. In contrast, on the fourth side, boats were supposed to prevent the trade and economic activities of the inhabitants of Poljice during the plague by patrolling the coastal waters. In this way, Poljica was isolated from the rest of the Venetian territory by a sanitary line. Numerous checkpoints were erected along this line, and soldiers and residents guarded it. Similar measures should have been applied in the case of the village of Dolac. [19 p32]

According to the holding of the Venetian authorities, only the complete isolation of the area could have prevented the plague from spreading to other parts of Dalmatia when it broke out again on the territory of Bosnia. Those tasks were entrusted to Senior Major Stefano Nonveiller, appointed general military inspector for supervising the sanitary service in Poljice by the decision of Paolo Boldù. [16 p72] Danica Božić-Bužančić did not list specific information about him, publishing archival material about that wave of plague in Dalmatia. Nonveiller was a member of a distinguished family from Verona who had prepared his social rise several decades earlier. Thanks to the application of digital technology in historiographic research, we learn that in 1752 he published a eulogy in honour of the election of Doge Francesco Loredano (1752–1762) [20]. At that time, he was in the rank of captain in Verona. The writing mentioned above probably enabled him to advance in his military career.

At the beginning of July, the number of infected remained limited to six isolated houses. [5 p34] Until then, due to the danger coming from Bosnia, the Austrian authorities on the territory of Lika introduced a sanitary cordon towards the Ottoman state on that part of their border. [19 p35] Senior Major Nonveiller visited the sanitary lines surrounding the Poljice area in mid-July. His visit aimed to ensure compliance with sanitary regulations and the determination of Grand Count Novaković to take measures to combat the infection. Until then, Novaković had implemented the order to isolate infected persons and those who were suspected of being infected.

Nonveiller had the opportunity to see the residents' resistance to the mentioned measures, which he, on this occasion, described in less than complimentary terms. Since they were wild and rude, it was difficult to impose compliance with sanitary regulations on those people. [19 p37] It was most difficult for the Venetian representatives to impose movement restrictions on the inhabitants of Poljice and to force those marked as suspicious to remain in isolation. All these cases indicate an indifferent attitude towards the plague, which was basically the attitude that Muslims steadfastly maintained as followers of Sharia. That was best observed by Giulio Bajamonti, who stated that "our morlacs are not less fatalists compared to Muslims". [14 p65]

The living conditions in which the people lived were terrible. The houses were mostly built of stone; poor construction and equipment represented a danger in suppressing the plague. Grand Count Đorđe Novaković won the sympathy of the authorities because he was determined to stop the spread of the plague among the inhabitants of Poljice. However, his behaviour and communication bothered the Venetian authorities' representatives, which Paolo Boldù did not fail to mention in his letter dated July 16, 1783. Specific measures taken by Novaković were not to Paolo Boldù's liking. Still,

he considered that it was wise not to oppose him under those circumstances because only he could deal with those raw and rude people. [19 p38]

To the inhabitants of Poljice, the government regularly provided zwieback, while Pettorossi monitored their state of health. [19 p39] In the meantime, Pettorossi could state that another person was infected. That was Stefan Lašić. Buboes appeared on his body, indicating that it was the plague. His household stood out as the seventh house affected by this epidemic in Dolac. [19 p41]

During July, the village of Dolac remained isolated from the rest of Poljice and Poljice remained isolated from the rest of Dalmatia. In total, until July 9, seventeen of its inhabitants died of the plague, while eighteen died due to injuries when they tried to escape from quarantine or cross the sanitary line. [19 p45] This proportion reveals to the best extent not only the attitude of the inhabitants of Poljice towards the health policy of Venice but also its ultimate possibilities to persuade them to comply with it. After July 12, there were no new cases of infection, while seventeen people marked as "suspicious" lay in improvised quarantine. Two people had been ill with the plague for three weeks. [19 p45]

The general providor of Dalmatia announced the termination by which he forbade the infected and suspected to leave the quarantine, as well as the residents of Poljice, to leave their area under the threat of the death penalty. For compliance with this order, the Venetian authorities placed great hopes on the behaviour of the Grand Count, who was expected to make the order known to the people under his administration.

After that, for the infected and those "suspicious", the authorities provided medical care and food delivery, and their clothes and personal belongings were regularly aired. That was to destroy the "malignant seed", which was believed to transmit the plague. They were supervised by a surgeon, who was entrusted with overseeing the health condition of the "suspicious" and the treatment of two patients. In all of this, Grand Count Đorđe Novaković proved to be a loyal official of the Venetian authorities who conveyed and imposed on the people all their decisions. [19 p48]

At the end of July, the plague subsided in the village of Dolac. Paolo Boldù was informed about this based on reports from Stefano Nonvellier and the Grand Duke. [19 p54] It remained to disinfect two churches in the area out of fear that the infection has not lingered in them. At the beginning of August, that area had more favourable conditions. By then, a surgeon and the necessary staff had arrived in Poljice to help the two patients, Stefan and Ivan Lukašević. As it turned out, none of the seventeen "suspicious" were infected with the plague. The boy who died in the meantime in the village of Dolac Stinji or Rodović, as it was inferred, was not infected with the plague, but the death occurred as a result of his "bad physical constitution". [19 p58] Despite this, the Venetian authorities continued to insist on the isolation of the entire area. That is why the inhabitants of the hamlet of Vela Njiva, part of the village of Dolac, were forbidden to move to the territory of the village of Gardun. They owned land there, and that area belonged to the administrative area of Sinj [19 p65]

The total number of dead in the village of Dolac, according to contemporary sources, was 36 people. Paolo Pineli, a physician by profession and the author of a short

work related to this wave of plague in Dalmatia did not fail to mention the role and merits of the Grand Count of Poljice in suppressing it. [21 p6] However, he was aware that the plague in Poljice represented only an episode. Although it was quickly localised and suppressed, the government failed to prevent it from appearing in Sinj and its area and in certain parts of Dalmatia, especially Split, soon after being suppressed in Poljice.

Conclusion

The extent of the Venetian territory in Dalmatia was finally rounded off in 1718, and the proximity to the Ottoman land carried the danger of being exposed to waves of the plague. During the 18th century, plague was on the decline in the western part of Europe. But it remained a constantly present phenomenon on the territory of Bosnia and Herzegovina. From there, it was usually transferred to Venetian Dalmatia through trade or constant migration of inhabitants from one domain to another. The epidemic in Bosnia in 1782 was not limited to this Ottoman province but was also transferred to Dalmatia in the following year. First, it affected the area of Poljice, where it was suppressed due to the coordinated action of representatives of the central and local authorities. However, the danger was not limited only to Poljice. Still, since it was suppressed in that administrative district, the plague with much greater ferocity affected Sinj and its administrative area than the area of Imotski, as well as the island of Brač, so that from the spring of 1784, hit Split with massive lethality.

After the Ottoman-Venetian wars ended (1718), the border between the two states was finally stabilized. That served as a reason for Venice to start organizing its possessions on the eastern Adriatic coast. That process marked the entire 18th century, and a few decades before its end, the division of Dalmatia into 22 administrative areas was established. Venice appointed a representative in each of them. Poljice stood out as the only area where Venice did not set a representative. Still, the administration was left to the Grand Count and twelve counts, who were elected by the residents of Poljice themselves.

From the first days of the appearance of the plague, Venice began to insist on preventive defence against it and its Dalmatian possessions were not neglected either. As time passed, the Venetian health organization in Dalmatia started to decline. Despite this, the government tried to react promptly to the appearance of the plague, primarily for financial reasons. Local sanitary authorities were introduced in the Dalmatian communes, supervised by the authorities in Zadar and, on the last occasion, by the Health Magistrate in Venice. However, such an organization did not exist on the territory of Poljice. Therefore, in their case, the defence against the plague is a particularly interesting phenomenon, especially for researchers who deal with the administrative structure of Venice in Dalmatia and its coordination with public institutions.

The plague epidemic, which required urgent action, put the Venetian representatives in Zadar, the province's centre, on standby, then the sanitary authorities in Split and Omiš, towards which Poljice gravitated. The Venetian government sent a medic to Poljice to provide the necessary medical assistance and, above all, to reliably determine that it was the plague since smallpox and influenza afflicted the inhabitants of

Bosnia in the period preceding this research. At the first hint that the plague had appeared in Bosnia, a sanitary line was introduced, following the example of the sanitary cordon introduced by the Austrian authorities on their part of the border. The case of suppressing the plague in Poljice in 1783 reveals the attitude of its inhabitants towards this disease, but ultimately also the attitude towards Venice as the supreme sovereign and respect for its regulations.

Rezime

U radu autorka istražuje pojavu kuge 1783. godine u oblasti Poljica, koje su u upravnom sistemu Venecije zauzimale specifičan položaj. Poljice su bile spečifičan upravni entitet koji se u istoriografiji pominje kao Poljička knežina ili Poljička Republika. Venecija je u ovom slučaju bila primorana na kompromis uslovljen položajem ove oblasti, lokalnom tradicijom u (samo)upravi, koja se pozivala na privilegije dobijene krajem srednjeg veka, i u novim okolnostima nametnutim susedstvom (Osmansko carstvo). Zbog toga je Venecija nakon konačnog osvajanja Poljica (1684) ovoj oblasti prizna autonomiju koja se zasnivala na izboru lokalnih prvaka umesto zvaničnih predstavnika centralne mletačke vlasti. Autorka nastoji da ukaže kako je kuga sa uspehom suzbijena 1783, nakon mesec dana od njene pojave u okolnostima u kojima zbog specifičnih uslova nisu postojali sanitarni organi i institucije mletačkog zdravstvenog sistema.

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THE KINGDOM OF YUGOSLAVIA AND THE RETURN OF THE "PLANNED ELITE": THE CASE OF PROF DR ĐORĐE JOANNOVIĆ[1]

Abstract: The paper analyses the society of the newly created Kingdom of SCS/Yugoslavia, which aroused great expectations from various members of the intellectual elite. Majority of them, educated in the West as the "planned elite", returned to the country to help its social development. Nevertheless, the case of the Viennese professor, the influential European pathologist and oncologist Prof Dr Đorđe Joannović (1871-1932), although different from others, can be considered paradigmatic. Returning to the country of his parents and leaving the comfortable life of Viennese scientific circle Joannović devoted himself to building several medical institutions in Belgrade, from the Faculty of Medicine to the Institute of Pathology. However, many who, like Dr Joannović, enthusiastically came to the new country, ready to work and contribute to its overall development, experienced severe disappointment, and even personal tragedy. In this context, the fate of the famous doctor and distinguished Viennese professor, the first Serbian oncologist, one of the world's pioneers in the study of autoimmune diseases, the founder of many medical institutions and the world-renowned scientist, is one of the paradigms of the Yugoslav society. The strong connection with the students and the support he provided to them, his loyalty to the principles of university autonomy and his reluctance to put himself at the service of the authoritarian and repressive government brought him into conflict with the bearers of the state terror of the Sixth of January regime. From the conflicts and pressures to which he was exposed from the top of the government, the well-known and recognised European scientist seeked salvation in suicide.

Keywords MeSH: the history of medicine, pathology, oncology

Non MeSH: the Kingdom of SCS/Yugoslavia, Prof Dr Đorđe Joannović, state repression

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Introduction

Created in the whirlwind of the First World War and proclaimed by the Act of 1st December, 1918, the Kingdom of SHS/Yugoslavia was, from the first days of its existence, burdened, as it will be shown, by intractable problems concerning the fundamental aspects of the state life. Many of the abovementioned problems originated from the once-opposed legacies of the individual constituent parts of the newly created state.

In the same community, different traditions, uneven levels of development, opposing historical awareness, life and social habits were all of a sudden confronted.[1 p48] Along with the indisputable closeness that had an integrative effect on the Yugoslav community, regional differences persisted: "confessional, political, dialectal, cultural, regional, and experiential, having been acquired due to a long life within foreign countries".[2 p.20] The problem which is of indirect, but still highly relevant interest for this paper is the low political culture of even the highest level of government officials, primarily viciously manifested in the attitude towards opponents in any field: politics, economy, culture, and science. That became particularly noticeable during the monarchic dictatorship from 1929.[3]

It also generated context-conditioned particular differences in individuals. These differences, in turn, reflected the mentioned different contexts in everyday life, sometimes being manifested as insurmountable obstacles to the normal functioning of institutions, society, and even individuals in it. Suppose the legacies of the Austro-Hungarian political system and that of the Kingdom of Serbia are viewed as two antipodes, as it was actually the case. Therefore, the following conclusion is inevitably drawn: undemocratic Austro-Hungarian bureaucracy was limited by the rudimentary rule of law. This fact generated a particular political culture and a "tendency towards order". On the other hand, the democratic heritage of the Kingdom of Serbia was primarily opposed to the rule of law. Despite the undeniable reach in terms of political freedom, the society was burdened by violence and voluntarism. However, without the rule of law and the respect for an individual, in a civil state, democracy itself is impossible, which was demonstrated in practice in Yugoslavia.

This paper presents a life experience resulting from meeting these two heritages. It depicts the "Yugoslav period" in the biography of the doctor and university professor Đorđe Joannović, how he responded to the challenges while performing his scientific work and university duties in the Kingdom of Yugoslavia, especially under the dictatorship of King Alexander and his right-hand man in the Sixth January regime, General Petar Živković.

Who was Đorđe Joannović: his life until he arrived in the Kingdom of SCS

Đorđe Joannović was born in Vienna on 16th June, 1871. He came from a relatively wealthy landowner family. Father Hariton was a lawyer from the small town of Beodra (today's Novo Milosevo) in Bánság in southern Hungary.[4 pp5-22] Before leaving for Vienna, Đorđe Joannović's father was a municipal clerk in Kikinda and a member of the district magistrate. Even in the previous generation, the Joannović family

had close relations with the Jakšić family, which is why the chroniclers note the close ties between Hariton Joannović and the poet and painter Đura Jakšić. The help and support that Joannović provided to him was valuable for his further artistic work. [5 pp7-14]

After meeting one of the richest feudal lords in the area, the baron Simon, Hariton Joannović left for Vienna in 1861, where he worked as the secretary and manager of his vast estate. In Vienna, he married Marija Vlahović and sons Simeon (1869) and Đorđe were born.

Hariton Joannović practised law in Vienna and amassed a considerable fortune, which is why he was able to provide his sons with a good education. After elementary school, Đorđe graduated from the prestigious Imperial-Royal High School (1881-1889) and enrolled in medical studies at the prestigious Medical Faculty in Vienna, which was then one of the central points for the study of medicine in Europe and the institution with a tradition of more than a century. He was taught by the leading medical experts of the time (Carl Toldt, August Vogl, Theodor von Billroth, etc.). As an excellent student, he was chosen in 1896 to be an assistant at the Institute for General and Experimental Pathology under the famous Viennese pathologist Richard Paltauf (1858-1924), a Louis Pasteur and Robert Koch student. [6 p418-419]

In that period, at the beginning of his career at the Institute for Pathological Histology and Bacteriology, he stood out as a great histological diagnostician. He wrote his first works on plasma cells. Thus, in 1899, he published his first scientific paper on the origin of tissue plasmocytes, which he viewed as a form of lymphocytes and wrote about "adventitial degenerated lymphocytes". He proved the basics of his theory with the experiments on dogs. He soon published two papers more. One paper referred to a case of ossified atheroma, while the other was a histological diagnosis of branchiogenic carcinomas. [7 p33]

In August 1904, after his habilitation, he was appointed assistant professor; in 1910, he was appointed associate professor; and in 1919, he was appointed full professor. Until the end of his career, which was both in science and teaching. His research predominantly focused on two medical problems: pathological anatomy and pathological physiology. At the beginning of his career, he devoted most experimental attention to pathological changes in the liver, the occurrence of jaundice, and the therapeutic effects of extirpation of the spleen. He presented his valuable research in 1903 in the paper "Experimental Research on the Pathology of Icterus", and the Belgian Royal Academy of Medicine awarded that paper. Most of his experiments at that time were labelled experimental and were performed to detect various pathological conditions of the liver and histological changes in liver tissue in cases of jaundice. [7 pp33-34]

After the end of the war and the creation of the new state of the South Slavs, scientists and intellectuals educated in the West were invited to return and help the newly-founded community. [8] Quite a few responded, including Đorđe Joannović. On 6th September 1921, he informed the competent ministry in Vienna by letter, which on 1st January 1920 had confirmed his title of full professor of general and experimental pathology at the University of Vienna, that he had accepted the invitation to continue his work as a full professor of pathological anatomy at the newly established Medical Fac-

ulty of the University of Belgrade. Therefore, he definitely moved to Belgrade, where he would stay for the rest of his life, which ended eleven years later.

Life and Work in the Kingdom of Yugoslavia

To realistically estimate Joannović's decision to move to Belgrade it is necessary get a glimpse at the environment in which Đorđe Joannović came. Everyday life in the Kingdom took place under the heavy shadow of enormous casualties and war invalids, having belonged to conflicting parts during the war, burdened even more due to the demographic, military, and financial exhaustion of Serbia and Montenegro after an almost uninterrupted series of six war years. The new country entered a new reality with six legal systems, two scripts, three major confessions, two languages of the majority nations, and the most diverse languages of discriminated and hostile minorities.

Economic underdevelopment was the most visible and brought about poverty, a low level of health culture, political anger, and widespread corruption - negative phenomena that the Kingdom of Yugoslavia had neither the strength nor the time to deal with in just over two decades of its existence. The basis of the economy was undeveloped agriculture with small peasant holdings as its carrier. Economically unsustainable farms of less than 5 hectares accounted for over 2/3 of all estates (67.8%) and could not feed even numerous members of their own households. [9 p321] Almost half of these estates had an area of less than 2 hectares, most often in the barren regions of Dalmatia, Montenegro, and Bosnia and Herzegovina. Only the estates more extensive than 10 hectares, about 12%, could feed the inhabitants in the Kingdom, providing a small market surplus and a small accumulation.[10]

A hungry, poor, underdeveloped village was the primary bearer of traditionalism, backwardness, illiteracy, superstition, and lack of enlightenment. Every day, people in the countryside had to deal with humiliating poverty and diseases, which had been already treated for a long time in the developed world. The struggle for bare survival left no space for the development of basic cultural needs, the modernisation of production methods, and the raising of the culture of living. Slight improvement in the middle of the twenties quickly turned into despair at the end of that decade resulting from a major economic crisis in agriculture, i.e. sudden, unstoppable fall in the prices of agricultural products. The price disparity between the excessively high costs of industrial products and the ever-lower prices of farm products was destroying the peasants. They sought salvation from complete ruin in borrowing, often for consumer purposes. They became victims of banks and moneylenders, who caught them in their credit networks with high-interest rates, deepening their economic misery. [11] A large percentage of people in the countryside, except a thin layer of wealthy peasants, worked hard without the help of modern technical inventions, earned little or nothing, lived miserably, often starved, and often fell ill. As V. Bajkić vividly described, "A peasant lives like a dog; in the winter, he gets a little under the skin due to lazing; but in the summer, his belly and back come together." [12 p80]

The data on the professional and social structure of the population clearly illustrate that more than 3/4 of all households in the first Yugoslavia earned a living from

agriculture, i.e., about 80% of the inhabitants. [13 p35] Taking into account the well-known fact that the same amount of work in agriculture creates significantly smaller surplus value than in other occupations, it is not surprising that the Kingdom of Yugoslavia was a stagnant, backward and poor society on the European periphery for the entire time of its existence, where any progress, even cultural one, was extremely slow. The degree of social mobility was worryingly low. [14]

Having agriculture as the main activity, only a small percentage of the active population was employed in the non-agrarian sector - industry and crafts (in 1921 about 7%, in 1931 about 11%); trade, loans, and traffic (3% or 4%); and public services, free trades, and the army (4%). Such a low share of non-agricultural professions in the total population structure, primarily intended to be the "engine" of development due to the educational level, was insufficient to initiate the necessary process of social modernisation essential for raising the level of health care and emphasising the importance of health prevention. [13 p36]

The most visible indicator of the devastating backwardness of a distinctly rural and autarchic society, whose economy was dominated by small peasant farms, was that more than half of the population (51.5%), according to the 1921 census, was illiterate. Needless to say, the data varied from area to area - in Bosnia and Herzegovina and Macedonia, the number of illiterates exceeded 80% - and the number also depended on the gender structure since illiteracy among women was much more present. According to the census data, in 1931, illiterates decreased to 44.6%. However, the percentage of the formally literate population who only knew how to sign but did not understand the context of what was read (functional illiteracy), remains unknown. [15]

The wide spread of social diseases (acute infectious diseases, tuberculosis, venereal diseases, malaria, alcoholism, chronic and degenerative diseases) convincingly testify to poor housing, nutrition, hygiene, low health education, prevention, and general culture. Tuberculosis, a dangerous chronic infectious illness closely related to unfavourable living conditions and starvation, killed at least half a million people in the Kingdom of Yugoslavia. [2 pp93-97; 16 pp203-2016] However, the researchers note that the interwar years did improve housing conditions for the better. It primarily referred to introducing military beds into houses, changing the hearth for the stove, and introducing metal dishes instead of wooden ones. It was an indisputable yet insufficiently strong modernisation process that engulfed the village.

The Vidovdan constitution contained quite detailed provisions concerning health care. Article 27 stipulated that the state took care of the improvement of "general hygienic and social conditions" that affected public health, such as "special protection of mothers and small children", "protecting the health of all citizens", "the suppression of acute and chronic infectious diseases as well as the suppression of alcohol abuse", and, finally, "free medical assistance, free provision of medicines, and other means for safeguarding the health of poor citizens". Such an extensive constitutional provision, which in scope exceeded the guarantees contained in the Weimar Constitution, being a model for the section on social rights guaranteed by the constitution of the Kingdom of SHS, testified to the clear awareness of the framers of the constitution that the need for health prevention and protection of the population was urgent. [17; 18

p457] Nevertheless, despite some efforts, comparatively modest results were achieved during the following period. [19 pp9-39-48]

After arriving in the Kingdom of SCS, Đorđe Joannović, together with Milan Jovanović Batut, Drago Perović and Vojislav Subotić, participated in the founding of the Faculty of Medicine in Belgrade in 1920. Two years after he arrived in Belgrade, the Institute of Pathology and the Department of Pathology at the Faculty of Medicine were founded on his initiative. Joannović gave the first lecture to the students in Belgrade in 1923. He was one of the most respected professors at the Faculty of Medicine among his students and colleagues. [20 pp1-16]

In the following years, Dr Đorđe Joannović visited all renowned European medical institutions, thanks to the American scholarships. Based on the knowledge he gained on those trips, he created the concept of the new Institute for Pathological Anatomy, which housed numerous other institutes and laboratories necessary for the work of the Faculty of Medicine. In April 1926, numerous dignitaries from both scientific and political life attended the oppening of the Institute of Pathology. Dr Joannović held the introductory lecture. The Institute's spacious building housed the Institute of Pharmacology and Toxicology premises, apartments for assistants, and the private apartment where Joannović himself lived as the director, devoted to science, research, and his vocation. His closest collaborators at the Institute were Dimitrije Tihomirov, Ksenofon Šahović, Marija Višnjić Frajnd, and Živojin Ignjačev.[7 38-45]

Apart from the institutional work at the Institute of Pathology, Joannović significantly contributed to the work of the newly established Faculty of Medicine, being one of the founders. He was elected dean on several occasions - 1923/24, 1926/27, 1927/28, and 1928/29. In addition to the numerous obligations regarding establishing the central medical scientific and teaching institution and the efforts to set up the system, he was also engaged in establishing the Physiological-Histological Institute and constructing the Institute of Pathology. The construction of the Internal Clinic and the Children's Clinic began during his tenure as the dean. Thanks to the efforts of Prof Dr Joannović, the Faculty of Medicine established connections with the leading European and world institutions of a similar profile, and the most influential world experts held lectures in Belgrade on their latest achievements in medicine. In particular, there was close medical cooperation with France, a key Yugoslav ally. Together with his colleagues from Paris, Prof Dr Đorđe Joannović founded the Yugoslav-French journal "Annals of Medicine and Surgery" in 1927. [7 pp55-57]

As for the basic directions of Prof Dr Đorđe Joannović's scientific research, they primarily focused on the causes and development of autoimmune diseases, such as auto aggression. He was the first Yugoslav scientist to investigate these phenomena and to prove them experimentally. He began his research on auto aggression during the First World War, researching the soldiers who had head injuries and who experienced certain changes in the brain after successful operations. As he concluded, the organism created toxins that affected the injured brain tissue. The scientific valorisation of the results of autoimmune diseases happened in the second half of the 20th century. [7 pp45-46]

The second and central scientific-research area studied by Prof Dr Đorđe Joannović was cancer research, and it can be reasonably claimed that he was the first educated scientist and oncologist in Serbia. Acutally, he started dealing with this problem back in 1901 in Vienna. Globally, his achievements in experimental oncology and pathological morphology of tumours had a great resonance. Joannović's conclusions about some of the causes of cancer, related to the stimulation of certain chemical substances, had a revolutionary and pioneering significance for oncology. He pointed out the importance of nutrition and disturbed metabolism on cancer development. He determined the role of the thymus and nucleoproteins in the development of malignancy, the multiplication of cancer cells, and the importance of chronic inflammatory processes. He did not offer any solutions or hypotheses for the interdependence of cancer cell multiplication and immunity, but he believed that neoplasms created the body's immune response. Even before arriving in Belgrade, he had tried experimentally to determine the scope and possibilities of curing cancer by extracting removed tumours. In those experiments, he proved that immunity against malignant neoplasms appeared due to the resorption of the decay products of dead cells from malignancy. Joannović's idea of the immunological therapy was unique in the Yugoslav medicine at that time. The results he was getting gave him a reason for optimism when it came to cancer treatment, but that optimism turned out to be largely unfounded. Nevertheless, many of his findings were ahead of their time and on the trail of modern methods and interpretations. He attached great importance to prevention. In treatment, he prioritised the surgical knife and concluded that cancer is not only a local disease but a local symptom of a general disease. Furthermore, on the initiative of Prof Dr Đorđe Joannović, the Yugoslav Society for the Study and Suppression of Cancer was founded. It was the third such institution in the world, and he was the head of it. He strongly insisted on constructing the Institute of Oncology and Radiology building, which was completed after his death.

Prof Dr Đorđe Joannović, due to his outstanding reputation in the profession, was the representative of Yugoslavia in numerous international forums, organisations, associations, institutions, and conferences aimed at research, suppression, and treatment of cancer. [20 pp1-16; 7 pp46-52] For his scientific work, Prof Dr Đorđe Joannović was elected a member of the Serbian Royal Academy of Sciences on 18th February 1926. [6 p418-419] That was not the only recognition of his scientific and experimental work. He was, among other things, a member of the Yugoslav Medical Association, the All-Slovenian Medical Association, the Association of Yugoslav Physicians, the Main Medical Council of the Kingdom of Yugoslavia, the Hospital Committees of the Ministry of Health of KY, The Belgrade University Senate, the Microbiological Society, the Biological Society, the Educational Council of KY, the Permanent Epidemiological Commission of the Ministry of Health, the Sanitary Maritime Council of KY, the Sanitary Council of the Serbian Medical Society, the German Pathological Society, the Vienna Medical Society, the French Society for Pathology, the French Society for Public Hygiene, the International Society for the Fight against Cancer, the German Society for the Fight against Cancer, the Committee of the International Institute for Geographical Pathology, the International Committee for Standardisation in Frankfurt,

and the International Committee for Combating Rheumatism. He was also the permanent delegate of Yugoslavia to the International Office for Public Hygiene in Paris, as well as the president of the Student Committee for building a student dormitory in Belgrade, the director of the Pathology Institute, the dean of the Faculty of Medicine and the lifetime president of the Fund for Helping Poor Students, to whom he told on every occasion that he would never "leave them stranded".[7 pp72-80] The impending events quickly put his claim to the test.

Nationalist passions and turbulent political life, whose amplitudes peaked during the election campaigns (1921, 1923, 1925, 1927), reached a climax in June 1928. In the parliamentary assassination, the radical MP Puniša Račić killed several Croatian MPs, among them the leader of The Croatian Peasant Party, Stjepan Radić.[14 pp166-170] Taking advantage of the tragic events in the Assembly, the king decided that "there should be no mediators" between him and the people, so he dissolved the compromised parliament, suspended the disputed Vidovdan constitution, and banned the work of political parties altogether. That was the beginning of the second phase of the life of the Yugoslav Kingdom, known as The Sixth January or monarchist dictatorship from 1929. Its main features were repression and terror in political and social life and total national unification. The ideological thread of the new reality was the ideology of integral Yugoslavia, implemented through violent national levelling. The goal was to form a new Yugoslav nation. For this purpose, the country's name was changed to Yugoslavia, and the new administrative division into nine counties (banovine) aimed to erase national names and the old historical provinces from people's minds and prevent further disintegration processes. National unification was accompanied by legislation, but all this could not erase the fact that the new reality was introduced with excessive violence. The great economic crisis and the collapse of the peasantry, which coincided with the beginning of the dictatorship, would become its worst ally. Corruption continued to strengthen, and the face of the new regime of violence and terror became General Petar Živković, the man with no reputation in the army and no political credibility. His only recommendation was unswerving loyalty to the autocratic monarch. [22 pp296-207]

Clash with the regime and (unexplained) death

The student population became the main point of resistance to the new regime. Clashes between leftist-oriented opposition students, mainly under the auspices of the illegal and persecuted Communist Party of Yugoslavia, and fascist students from Dimitrije Ljotić's United Militant Labour Organization (*Zbor*) broke out on daily basis. [23 pp303-313] The authorities were mainly on the side of the rightists. That led to violent clashes between the students and the gendarmerie. Đorđe Joannović, as the dean and a professor, had excellent relationships with the students and enjoyed their respect and trust. The fact that he was the lifetime honorary president of the Fund of Poor Students, organised by the left-wing youth close to the Communist party, speaks of this. In the first year of the dictatorship (1929), more severe faculty disagreements, including Joannović himself, arouse. The culmination of the political pressure on the

students of the Faculty of Medicine occurred in January 1932 due to the organisation of the St. Sava Ball. The students refused to invite the prime minister of the dictatorship, General Živković, to the event. The traditional invitation to King Alexander and Queen Maria was not disputed. Nevertheless, there was a possibility that critically oriented students, due to the intense repression, increased corruption, and violence of the Sixth January regime, would expose the monarch to inconvenience.[24]

Hence, the ceremony was cancelled by the decision of Prof Dr Joannović, which was why he was invited to the Cabinet of the Minister of Education to explain that act. At the meeting that Đorđe Joannović had with the Minister of Education, there was a bitter verbal conflict between him and General Živković. According to the testimonies from secondary sources, the discussion was interrupted by the former leader of the White Hand, the striking force of the Karađorđević repression and so-called white terror, Petar Živković. After uttering insults against Joannović, Živković slapped the distinguished professor because he could not alleviate critically oriented students.

The testimonies that speak indirectly about the abovementioned incident point out that the Viennese doctor was deeply shocked by General Živković's aggression and primitivism and did not respond to the insults. A student and an associate who saw him immediately after leaving the Minister of Education's office testified that Joannović said: "It's like I'm having the most terrible dream. I need to be completely alone…" [7 pp81-86]

The following day, 28th January 1932, Prof Dr Đorđe Joannović was found hanged in his apartment on the premises of the Institute of Pathology. The regime did not allow the autopsy, which Joannović's brother Simeon and the Faculty of Medicine requested, so the question arose as to whether it was suicide. Moreover, the police report on the investigation into the circumstances of the death of Đorđe Joannović disappeared. [20 pp1-16] An influential French newspaper learned from its sources that Joannović was asked to hold the ball and to guarantee that there would be no political diversions. In the heated atmosphere of the conflict between the regime and the students, Joannović could not do that, and with the insults and a probable slap, he was also pressured to retire early. [25 p161]

Two days after his death, a large procession of citizens saw off Prof Dr Joannović, whose body was sent to his parent's house in the village of Beodra in Banat, where he would spend his free time. The telegrams of condolence arrived from all over the world, and Patriarch Varnava, who knew Dr Joannović personally, set a precedent by approving the funeral to be performed by the clergy of the Serbian Orthodox Church, even though there was suspicion of suicide. Many interpreted the patriarch's gesture as the fact that he did not believe in the official version of suicide. Additionally, members of the illegal Communist party and leftist students organised demonstrations against the government due to the unexplained death of the famous professor. They blamed the top of the regime and King Alexander himself for that. They also expressed anger at the Faculty of Medicine towards Ksenofon Šahović, a close associate of Joannović, who was believed to have stalked him on behalf of the regime. Đorđe Joannović was buried at the village cemetery in Beodra on 31st January 1932, in the presence of thousands of people. [8 pp223-257; 7 pp87-108]

There was a lot of controversy in public about the causes of the death of Prof Dr Đorđe Joannović. From the vital question to which the investigation did not give a clear answer whether it was murder or suicide to what caused the premature death of the famous scientist. Some of the researchers divided the reasons for the suicide into academic and political. As for the academic reasons, it could be the ambition of Joannović's assistant and one of his closest collaborators, Dr Ksenofon Šahović, and his close ties with the Court.[2] However, there are much more logical arguments related to the political background and the pressures from the very top of the government that led to the suicide of the well-known scientist. Prof Dr Đorđe Joannović was an uncompromising advocate of university autonomy and regularly defended persecuted students, medically helping especially those who experienced beatings and torture in the state prisons. In that sense, he was already a hindrance to the regime. The immediate reason for the conflict with the top authorities was, as mentioned, the organisation of the St. Sava ball in January 1932. However, there is evidence and testimony that Joannović was in contact with a prominent activist of the secret organisation Black Hand, a Comintern agent and a Communist party member Mustafa Golubić.[27] If it is taken into account that the prime minister of the Sixth January regime, General Petar Živković, was the leader of the counter-organisation of the White Hand regime, the officers loyal to King Aleksandar Karađorđević, then the conflict between the top regime and the Viennese professor takes on a different dimension and political meaning. [25 pp223-257]

Conclusion

Despite many unsolved problems (mainly due to their number), the newly created Kingdom aroused enormous enthusiasm among numerous citizens. Intellectual elites, especially, desired to shape it with their efforts, such as the realisation of a centuries-old dream and the pinnacle of enlightened emancipation. One of the idealists who left the chair and peaceful life in Vienna and came to help the country that he regarded as his own, and in which he was not even born, was Đorđe Joannović, being the respected doctor and university professor at that time.

This enthusiasm stood in the way of the fact that during less than two and a half decades of its existence, the Kingdom of SCS/Yugoslavia failed to find a modus vivendi, a minimum of internal consensus in international relations, in the matter of the state organisation, democratisation, and the foreign policy direction. All of that strongly impacted economic, social, and cultural policies. The political and intellectual elites exhausted themselves in defining the state framework, neglecting the social content, and failing to provide creative answers to the challenges.

Many of those who, like Prof Dr Đorđe Joannović, enthusiastically came to the new country, ready to work and help its social development, experienced severe disappointment, and some of them even personal tragedy. In this context, when it comes to

[2] Dr Šahović also expressed open hostility and an insufficiently clarified role in the campaign that would force one of the most prominent European and German oncologists Dr Ferdinand Blumenthal to the escape from Yugoslavia, who had taken refuge in Yugoslavia in 1933. [26 pp143-158]

Yugoslavia, the fate of this famous doctor, the distinguished Viennese and, afterwards, a Belgrade professor, the first Serbian oncologist, one of the world's pioneers in the study of autoimmune diseases, the founder of a large number of medical institutions and the world-renowned scientist, is one of the paradigms of that era.[3] Joannović matured intellectually and politically in Central Europe, inheriting its best traditions. He readily responded to the "inner call" to devote himself to solving some of the most important of a considerable number of problems of the country he considered his homeland - the health care problem. Joannović's career also was an upward trajectory in Belgrade, but later, he would undergo the experience that Pero Čingrija expressed as early as in 1920: "*Che desillusione*"! He ended his life tragically in an encounter with the darker and, at that time, dominant side of the legacy of the environment to which he had come to make his selfless contribution.

Kraljevina Jugoslavija i povratak "planirane elite": Slučaj dr Đorđa Joannovića

U radu se analizira društvo novostvorene Kraljevine SHS/Jugoslavije koja je probudila velika očekivanja različitih pripadnika intelektualne elite. Mnogi od njih, školovani na Zapadu kao „planirana elita", vratiće se u zemlju kako bi pomogli njen društveni razvoj. Ipak, slučaj bečkog profesora, uticajnog evropskog patologa i onkologa dr Đorđa Joannovića (1871-1932), iako je bio različit od drugih, može se uzeti i kao paradigmatičan. Vrativši se u zemlju svojih roditelja i napustivši komforni život bečkih naučnih krugova, Joannović se u Beogradu posvetio podizanju čitavog niza medicinskih institucija, od Medicinskog fakulteta do Patološkog instituta. Međutim, mnogi od onih koji su, poput dr Joannovića, sa entuzijazmom došli u novu državu, spremni da rade i doprinesu njenom sveopštem razvitku, doživeće teško razočarenje, a neki i ličnu tragediju. U tom kontekstu sudbina poznatog lekara, uglednog bečkog profesora, prvog srpskog onkologa, jednog od svetskih pionira studija o autoimunim bolestima, osnivača mnoštva medicinskih institucija i naučnika svetskog glasa, jedna je od paradigmi jugoslovenkog društva. Čvrsta povezanost sa studentima i podrška koju im je pružao, odanost principima autonomije univerziteta i nesklonost da se stavi u službu autoritarne i represivne vlasti, dovešće ga u sukob sa nosiocima državnog terora Šestojanuarskog režima. Iz sukoba i pritisaka kojima je bio izložen iz vrha vlasti, poznati i priznati evropski naučnik spas će potražiti u samoubistvu.

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Book review

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CONFERENCE REVIEW: POST-EPIDEMIOLOGICAL STRESS: HISTORICAL AND MEDICAL DILEMMAS

The scientific conference Post-epidemiological stress: historical and medical dilemmas, organised by the Scientific Society for the History of Health Culture, was held at the Faculty of Philosophy in Belgrade on May 23rd2023.

A long period of human history has been marked by numerous political, economic, cultural, and other changes. A large number of different traumatic situations have, in many ways, influenced the overall development of human society and individuals as well. Such phenomena have been diseases, epidemics, pandemics, and post-traumatic stress. Nowadays, we are witnessing one such condition caused by the effects of the COVID-19 pandemic, which encouraged researchers to devote themselves to analysing similar situations in the past from several different aspects. The conference participants, Post-epidemiological Stress: historical and medical dilemmas, presented their conclusions based on insights into innumerable events and processes throughout history as well as taking into account the contemporary events and trends related to the COVID-19 pandemic and its consequences.

From the earliest periods of human history, diseases and epidemics have had far-reaching consequences on society, the state, the economy, and culture. Danijela Stefanović presented two epidemic waves in the area of the Old East during the 2nd millennium BC. The first wave in the territory of today's northern Syria and northern Iraq in the first half of the 18th century BC was of a regional character. Whereas, the second wave, which took place in the middle of the 14th century BC covering the area of the front of Asia, was of a global character. The second wave was in the middle of the 14th century BC covering the area of the front of Asia and was of a global character. The author concludes that the consequences of the first wave were reflected on the economy in individual city-states whose inhabitants had been affected by the disease. The implications of the second epidemic were, on the other hand, far more devastating for

the states and societies of the Old East and it could be one of the factors that played a key role in the collapse of the political entities at the end of the Bronze Age. Dragoljub Marjanović analysed how Byzantine writers understood «The Plague of Justinian». Either as a continuous epidemiological problem lasting for three centuries or a periodic occurrence of local epidemics, it was observed in isolation and in connection with the political and religious turmoil that simultaneously marked social life in the Byzantine Empire. Marija Kocić considered the consequences of one of the most devastating epidemics that hit the city of Venice during the early modern era. It was a plague that started in 1575. The epidemic took lives of many members of the patricians, who were considered the source of sovereign power. That caused a series of social and economic changes, and during the next century, this country became an oligarchy where a few patrician families monopolised all the power in it.

The measures to prevent the spread of diseases implemented by the Habsburg Monarchy during the plague epidemic in the Banat during the Austro-Turkish War of 1737-1739 were analysed by Miloš Đorđević. Having learnt from the previous experiences how to prevent the spread of plague, the rulers published proclamations in the printed media banning the movement of people, goods and animals from the southern Habsburg provinces. The Habsburg Monarchy used all the military and administrative apparatus during the 18th century to remove the danger and secure the border with the Ottoman Empire. Until the end of the 18th century, the defence system against plague was based on improving quarantine measures when crossing borders. In the light of the same epidemics in a broader context, Vladimir Abramović showed the consequences of the plague epidemics that affected people's lives in southern Hungary during the 18th century. The author analysed the methods of overcoming the population's post-epidemiological stress, that is, how to return to everyday, ordinary life after analysing the reactions and actions of the people after the epidemics had ended.

Societies often suffer similar consequences both after wars and epidemics as well, regardless of the fact whether a disease escalated during war conflicts. In the first place, in this sense, the decrease in the number of population and the negative impact on the economy should be singled out. In light of the demographic and economic consequences of the war events related to the conquest of Preveza in 1798, Haris Dajč put forward the thesis that Ali Pasha's attack on Venetian Dalmatia, i.e. the former Venetian cities on the coast of Epirus, was particularly significant because, for the first time after 1716, it gave the Turks the opportunity to fully control the western coast of the Ionian Sea. Preveza, one of the wealthiest cities of Epirus, had 8,000 inhabitants before the Ali Pasha's attack, but after 1798, that number plummeted to only a few hundred. Moreover, in terms of war events, Maja Vasiljević reflected on the process of treating the soldiers of the Serbian army in North Africa during the Great War from the spring of 1916. to the fall of 1918. The traumas of Serbian soldiers, which the author observed on three levels, were particularly highlighted. Firstly, as a consequence of participation in the war and the complexity of the involvement in the conflict. Secondly, the trauma was analysed as a consequence of leaving home, the concrete difficulties of crossing the Albanian mountains, and the late arrival of the evacuation ships, in which many had already died of hunger and exhaustion. Finally, as a third consequence of the traumatic

experience, the fear caused by the treatment in Africa was analysed since most soldiers had left their villages and towns for the first time to participate in the war.

In the work of the conference, important parallels were drawn between earlier historical events and processes and the COVID-19 pandemic. Regarding the topics of Crisis and sensitivity: the «Vienna years» (1683–1699) and the COVID-19 years (2019-2022), Jelena Mrgić started from considering the term «crisis» in the socio-economic and cultural-historical contexts of the pre-industrial period, on the one hand, and the «Anthropocene» on the other hand. This neologism denotes the overall negative impacts of global industrialisation and demographic explosion over the last two hundred years on the natural environment worldwide. The author explored some of the possibilities of researching crisis processes in the modern globalised world in the years of the pandemic and after them, and in that process environmental humanities would be extremely relevant. Nevena Divac noticed several similarities between the Spanish flu epidemic and the COVID-19 pandemic. In addition to numerous victims, the Spanish flu virus burdened the already weakened population tortured by the war, with the consequences reflected in impaired physical and mental health, probably contributing to the following economic crisis and the emergence of totalitarianism in interwar Europe. Nevertheless, the previous epidemics of SARS and MERS warned the world about COVID-19. The obstructions in the form of manipulation of information from the source country, strong anti-vaccination movements and the incompetence of populist governments made it difficult to bring the pandemic under control. After the pandemic, there were long-term consequences in the form of long COVID, which affected almost all organ systems in more than 10% of patients in a highly unpredictable way. It is impossible to draw a direct parallel between the Spanish flu pandemic and the COVID-19 pandemic, but there is a similar tendency to indulge in oblivion. Evidence-based medicine, appreciation of timely information and raising of awareness of collective responsibility are essential.

The conference participants also analysed the direct consequences of the COVID-19 pandemic on human society globally. Nikola Samardžić presented the thesis that the Western world faced the pandemic at the end of 2019 unprepared, and the influence of populists contributed to the partial rejection of the measures prescribed by scientific medicine. Insufficient success in vaccination overshadowed the success in quickly finding effective vaccines. The long duration of the COVID-19 caused cultural and social decadence and human degradation. The long COVID is an ethical and systemic decadence which is still happening. The obstruction of vaccination led to unnecessary deaths. Since rational and enlightened institutions were forced to retreat and make concessions, the death of any person as a result of social turmoil leads to the death of an organised society. Emphasising the negative impact of the COVID-19 pandemic on the economy, Ognjen Radonjić underlined that in 2020 the world economy faced a severe economic standstill due to the COVID-19 pandemic. Thousands of billions of dollars in potential production were lost due to the significant number of infected and dead, the disruption of supply, the demise of shipping across the Atlantic and the Pacific, and the temporary lockdown around the world. Inevitably, there was a significant drop in world production and a rise in unemployment.

The conference participants discussed the issue of prevention, an adequate response to the challenges posed by the COVID-19 pandemic to society, and the ways how to mitigate its consequences. The role of new technologies in finding the answers to the difficulties caused by the sudden social crisis caused by the COVID-19 pandemic was discussed by Isidora Jarić, Miloš Milenković, and Marko Milenković. The analysis showed that access to health care during the pandemic was limited and that the protocols set by the state and the health care system did not consider the specific needs of the patients suffering from chronic diseases. Wanting to overcome this frustrating situation, patients and their associations, using new technologies rather than the health system, offered a whole range of responses to the pandemic challenge. The authors emphasised the importance of incorporating empirical insights from the social sciences and humanities in implementing new public health protocols in crises to reduce their potential syndemic effect. Ljubica Milosavljević and Ana Banić Grubišić analysed the difficulties and problems faced by elderly population parts of the population in old age: from the possibility and right to move, through the reduction of social contacts, the right to make decisions, to the unavailability of medical care or its postponement until an uncertain future. In such circumstances, an increase in stressogenic factors and their intensity was registered, which led to a more significant decline in the quality of life than expected at this stage of life. Special attention was paid to the period defined as post-pandemic to understand the observed consequences to help prevent potential crises in the future. Milena Vukmirović regarded the presentation of the concept «The 15-minute city», the breadth of its application, and the different attitudes related to its implementation in urban areas. Immediately before the declaration of the COVID-19 pandemic, Anne Hildago promoted the concept of the 15-minute city at the beginning of her campaign for mayor. The circumstances during the implementation of the measures to prevent the spread of the COVID-19 pandemic made it possible to implement the idea of a 15-minute city on the territory of Paris. Furthermore, to avoid future crises, Marko Šuica and Ana Radaković highlighted the importance of paying attention to history in terms of the critical aspects of the consequences of epidemics and natural disasters on social, economic and demographic phenomena and processes in the past. Being aware of the existing controversies surrounding the outbreak of the COVID-19 pandemic and the accompanying conspiracy theories, the authors raised the question of whether the teaching of history in the Republic of Serbia placed an appropriate emphasis on similar social phenomena from the past, as well as on the scope of scientific and technological discoveries in medicine that changed the history of humankind. Consequently, new generations will be able to raise awareness of the importance of scientific procedures and the harmfulness of pseudo-scientific discourses.

The framework of the conference made it possible to reflect on numerous aspects throughout history and look at the processes related to pandemics, both the past and the current ones, the consequences of which we are still dealing with. Analysing different micro units over a long period, the authors presented the experiences accumulated for centuries and cause-and-effect relationships of pandemics with other so-

cial processes that history teaches us. Overall, the authors emphasised numerous negative consequences but also proposed potential solutions to mitigate the problems that have already arisen and those that may befall human society in the future.

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REVIEW OF THE BOOK *INSIGHTS INTO PORTUGUESE MEDICAL HISTORY: FROM THE BIRTH OF THE ART OF ASCLEPIUS* BY MARIA DO SAMEIRO BARROSO, CHRISTOPHER JOHN DUFFIN AND JOÃO ALCINDO MARTINS E SILVA, EDITORS, CAMBRIDGE SCHOLARS PUBLISHING, NEWCASTLE UPON TYNE 2022, XXVI+516 P. ILLUSTR. ISBN (10):1-5275-8831-9; ISBN(13):978-1-5275-8831-8

As the title and introduction by the editors suggest, the book presents excerpts from the Portuguese medical history. Bearing in mind that the topic encompasses millennia – counting from the evidence of Neolithic skull trepanations to the present day – to condense such a rich medical history between covers of a book is an impossible task. Therefore, a selection had to be made. Howsoever it was done, some pieces of that mosaic will be missing. The selection in *Insights* spans from the Roman times, across Early Modern era – which comprises the most of the book – up until and including the 20th century. However, the absence of topics related to the Medieval medical history is noticeable. Although it does not diminish the significance and value of the book, we feel that it would have been a valuable addition, considering the vibrant Medieval history of the Iberian Peninsula and its western territories that would in time become Portuguese.

This mosaic of topics presented in the volume is varying in both length and scope. Some of the chapters could be considered as case studies of limited subjects, while the others could serve as all-encompassing stand-alone studies, especially those written by Christopher Duffin in his pioneering work on emeralds as Materia medica and Maria do Sameiro Barroso on the history of spectacles, with special focus on Portugal in the 16th century.

Other chapters, more limited in scope, explore a variety of subjects, such as those from the Antiquity, for example the analysis of the Roman and Graeco-Roman surgical instruments and pharmacy tools kept in Portuguese museums, as well as exploring the concept of *Salus* based on Roman epigraphic documents from the province of Lusitania. A significant part of the book is dedicated to sanitary precautions against plague in Portuguese ports and the operation of the Maritime Lazaretto of Lisbon. Other chapters devoted to the Early Modern era cover the biographies and careers of renowned Portuguese physicians, both home and abroad, as well as the representation of plague in French baroque painting representing the disease's outbreak in northern Italy in 1630. As we reach the 19th and 20th century, the focus shifts to Portuguese contribution to the discovery of quinine, the epidemic of Spanish flu in Portugal, the Portuguese echo of works of Maria Ropala Cickersky, the first female Romanian forensic physician and a panegyric devoted to Fernando de Almeida, who made significant contributions to Portuguese medicine and archaeology.

The publisher opted for a thick hardback cover with a solid, sewn binding, which is a necessity for the book of such voluminosity. It also indicates that the target audience is primarily professional and expert public. Unfortunately, the impressum does not contain information on book circulation, so we can only hope that the number is high enough to satisfy the demand – both of the professional and general public – which an edition such as this certainly deserves.

This book, with its broad palette of topics and subjects, represents a valuable contribution to the study of history of Portuguese medicine. Its publication in English opens the door for international researchers to access this field of medical history, hitherto the preserve of Portuguese scholars.

UPUTSTVO ZA AUTORE O PISANJU RADOVA ZA ACTA HISTORIAE MEDICINAE STOMATOLOGIAE PHARMACIAE MEDICINAE VETERINARIAE

Acta historiae medicinae, stomatologiae, pharmaciae, medicinae veterinariae je časopis koji se bavi temama istorije zdravstvene kulture (medicine, farmacije, stomatologije i veterine), mentaliteta, privatnog života, urbane i ruralne svakodnevice i životnih uslova, strukture gradskih i seoskih naselja, istorijom demografije, granica (strukture, institucije, promet ljudi i robe, kretanje zaraza, regulacije i kršenje regulacija), zdravstvene deontologije kao i istorijom arhitekture i urbanizma u kontekstu istorije zdravstvene kulture i institucija. Časopis izdaje dve sveske godišnje, uz objavljivanje: izvornih naučnih članaka, preglednih naučnih članaka, kratkih naučnih članaka, prikaza i bibliografija.

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