Theoretical and Applied Veterinary Medicine

ISSN 2663-1156 (print)
ISSN 2663-1164 (online)
Theoretical and Applied Veterinary Medicine, 13(1), 16–23
doi: 10.32819/2025.13008

Original research

Experimental aspects of diagnostic and treatment methods applied for productive animal husbandry in Dnipro area (Ukraine)

V. V. Vakulyk*#, P. M. Skliarov*, D. D. Bilyi*, V. V. Samoiliuk*, S. M. Maslikov*, N. I. Suslova*, V. V. Sharandak**

**Dnipro State Agrarian and Economic University, Dnipro, Ukraine*
***Word Organization for Animal Healht, Paris, France*

Received: 14 January 2025
Revised: 26 May 2025
Accepted: 07 Jule 2025

Dnipro State Agrarian and Economic University, Serhii Efremov Str., 25, 49600, Dnipro, Ukraine
Tel.: + 38-050-602-21-59
E-mail: *zemskiyvet@i.ua*

Word Organisation for Animal Healht, rue de Prony, 12, 75017, Paris, France
E-mail: *vala.77@ukr.net*

#**Corresponding author:**
V. V. Vakulyk
zemskiyvet@i.ua

Abstract. The publication explores the historical development of diagnostic, therapeutic, and experimental methods applied to non-contagious diseases within the zemstvo veterinary practice of Dnipro Ukraine. It traces the evolution of approaches, the adaptation of general biological and medical achievements, and the mutual influences between Ukrainian veterinary medicine and global scientific practice. Particular attention is given to the advancement of surgical techniques, anesthesiology, reproductive medicine, the design of surgical equipment, and therapeutic treatments. The work highlights the contributions of Mykhailo Maltsev, Moysey Koyranskyi, Mykola Shadrin, Serhii Yevseienko, Serhii Hrintser, Yevdokym Telychenko, and A. Popov. The impact of folk medicine and local veterinary culture on disease prevention and control is assessed. The study characterizes the patterns of veterinary progress, driven primarily by the zemstvo service. It demonstrates the dynamic integration of scientific developments into practice and the reciprocal influence of field experience on academic research. Following the elimination of major epizootic threats, a full-scale development of methods for managing non-contagious pathology began. The invention of an operating table for large animals by Moysey Koiranskyi serves as an example of professional competition and the complex journey from workshop innovation to industrial implementation. The publication conveys the "spirit of the era," comparing professional relationships of the late 19th – early 20th centuries with those of today. It acknowledges that the period under study coincides with the rule of the Russian Empire, when Ukrainian specialists lacked the opportunity to publish in their native language or establish independent veterinary institutions. Nonetheless, the role of periodicals as platforms for collegial exchange, experience sharing, and scientific discourse is emphasized. Zemstvo veterinary community has served as both the analysts and the expert cohort while their research aimed to solve practical aspects. They did not reject folk medicine, often turning to medicinal plants due to limited access to pharmaceuticals. This reveals a deep connection between veterinary practice and the everyday life of the population, forming a distinct national character and tradition within regional veterinary culture. The development of obstetrics, gynecology, surgery, and andrology, as well as the establishment of breeding centers and agricultural exhibitions in Southeastern Ukraine, had both local and international significance.

Keywords: Zemstvo veterinary medicine; non-infectious pathology of productive animals; innovations in veterinary equipment; veterinary culture in Ukraine.

Експериментальні аспекти застосування методів діагностики та лікування продуктивних тварин у земських губерніях Подніпрянської України

Анотація. У статті досліджена історія розвитку методів діагностики та лікування незаразних захворювань у земській ветеринарній практиці Подніпрянської України. Простежено еволюцію підходів, адаптацію загальнобіологічних і медичних досягнень, а також взаємовпливи української ветеринарії зі світовою наукою. Особливу увагу приділено розвитку хірургічної практики, анестезіології, репродуктології, конструюванню операційного обладнання, терапевтичним методам. Наведено приклади діяльності Михайла Мальцева, Мойсея Койранського, Миколи Шадріна, Сергія Євсеєнка, Сергія Грінцера, Євдокима Теличенка А. Попова. Оцінено вплив народної медицини та ветеринарної культури населення на профілактику і ліквідацію захворювань тварин. Охарактеризовано закономірності ветеринарного прогресу, рушієм якого стала земська служба. Показано динаміку впровадження наукових розробок у практику та зворотний вплив практики на науку. Після ліквідації епізоотичних загроз розпочався повноцінний розвиток методів боротьби з незаразною патологією. На прикладі винаходу операційного столу Мойсея Койранського висвітлено професійну конкуренцію та шлях інновації – від майстерні фахівця до виробництва. Представлене дослідження передає «настрій часу», порівнює характер професійних відносин кінця XIX – початку XX століття із сучасністю. Враховано, що досліджуваний період припадає на часи Російської імперії, коли українські фахівці не мали змоги друкуватися рідною мовою чи створювати власні видання. Водночас підкреслено роль періодики як простору для обміну досвідом і наукових дискусій. Земські лікарі виступали аналітиками й експертами, їхні дослідження були

Cite this article: Vakulyk, V. V., Skliarov, P. M., Bilyi, D. D., Samoiliuk, V. V., Maslikov, S. M., Suslova, N. I., & Sharandak, V. V. (2025). Experimental aspects of diagnostic and treatment methods applied for productive animal husbandry in Dnipro area (Ukraine). *Theoretical and Applied Veterinary Medicine*, 13(2), 16–23. doi: 10.32819/2025.13008

спрямовані на вирішення практичних завдань. Вони не відкидали народну медицину, зверталися до лікарських рослин через нестачу препаратів. Це засвідчує глибокий зв'язок ветеринарії з народним життям і формування національного характеру ветеринарної культури. Розвиток акушерства, гінекології, хірургії, андрології, племінних центрів і виставок у Південно-Східній Україні мав як місцеве, так і міжнародне значення.

Ключові слова: земська ветеринарна медицина; незаразна патологія продуктивних тварин; розвиток ветеринарних технологій; ветеринарна культура в Україні.

1. Introduction

1.1. Conceptual acknowledgment of the unique role of Zemstvo veterinary service in Dnipro Ukraine in the second half of the 19th and early 20th century

Present study explores the evolution of veterinary science and Zemstvo veterinary practice in Dnipro Ukraine during the second half of the 19th and early 20th century, with emphasis on the unique role of the Zemstvo veterinary service in shaping both scientific and practical foundations for regional livestock support. The research employs historical-genetic, diachronic, comparative-historical, and statistical methods to analyze primary sources, including clinical experience, engineering innovations, and the testing of scientific discoveries reflected in veterinary documentation and periodicals of the era. The findings demonstrate that Zemstvo veterinarians played a crucial role in adapting general medical knowledge to veterinary contexts, developing specialized instruments, and organizing clinical workflows. Experimental anesthesiology, led by Professor Mikhail Maltsev, introduced species-specific premedication protocols and multicomponent anesthesia consistent with European standards. Engineering innovations, such as Moisei Koiransky's operating table for large animals, exemplified ergonomic and antiseptic design despite institutional resistance. The study also highlights the analytical and publicist contributions of Zemstvo veterinarians, whose publications fostered methodological exchange and scientific discourse. Ukrainian scientists including M.A. Shadrin advanced research in pathophysiology, endocrinology, and wound therapy. Other researcher together with A.G. Popov have investigate the phytotherapeutic substances extracted from endemic flora, integrating empirical knowledge with botanical pharmacology. Clinical experience in reproductive medicine, including differential diagnostics and surgical interventions, further illustrates the depth of Zemstvo expertise. The article examines the evolution of veterinary terminology and the anthropomorphic style of early veterinary literature, reflecting broader cultural and epistemological transitions. The concept of veterinary culture is interpreted as a synonym for therapeutic and preventive practice, shaped by moral dilemmas, popularization efforts, and the transformation of public awareness. Statistical data from Zemstvo provinces show a steady increase in the number of animals receiving qualified care, confirming the effectiveness of the Zemstvo model despite material constraints. Ultimately, Zemstvo veterinary medicine emerged as a professional and scientific community whose integrative approach laid the groundwork for biotechnology and contributed to the formation of a regional zootechnical tradition in livestock management.

Traditionally, it is believed that diagnosing and treating non-contagious diseases is where surgery (Bilyi et al., 2020), internal medicine, and obstetrics and gynecology are the priority areas (Natterson-Horowitz et al., 2022; King, 2021; Osburn et al., 2009). However, the definition of "non-contagious etiology" in this case is conditional. For example, surgery is constantly faced with the need to combat microflora that interferes with the normal course of the postoperative period, and sometimes, the object of the surgeon's activity is animals suffering from infectious or invasive diseases, the treatment of which is carried out surgically (Maslikov et al., 2019).

Extremely restricted number of historical evidence that many veterinary medicine methods were built in second part of 19th century determines the clarifying of cause and effect relationships between scientific progress and social factors.

1.2. The establishment and development of veterinary science and applied aspects of regional animal husbandry

The progress in veterinary medicine became possible under the interaction of various veterinary branches including both historical and scientific retrospective analysis (Kozakova, 2023). Furthermore, other items are no less important, particularly, its integral development that was carried out thanks to enthusiasm and close cooperation in scientific and practical spheres. Thus, by the beginning of the second half of the 19th century, surgery, as a scientific and practical branch of medicine, had accumulated significant anatomical and physiological knowledge and mastered the surgical interventions necessary for various surgical manipulations. However, the actual stumbling block in the further development of this medical direction remained postoperative complications that developed after the accession of surgical infection (Habib, 1992). It was pretty tricky, and sometimes impossible, to perform extended surgery operations due to the suffering of the patient and the possible death of the patient from pain shock.

In addition to the abovementioned circumstances, significant difficulties in the work of surgeons were also caused by several specific problems in veterinary medicine progress. Among them is the need to adapt general biological and general medical achievements and technologies into veterinary practice (Elsevier, 2019), develop and implement specialized tools and equipment, and organize medical activity. It should be noted that the practical solution of these tasks was entrusted to Zemstvo veterinary specialists. As researchers note, the creation of Zemstvo Veterinary Medicine and its further development significantly impacted the welfare of livestock, the development of science, and the expansion of veterinary education (Lohovskyi, 2013).

The purpose of the study was to analyze the development of methods for diagnosing and treating diseases of non-contagious etiology in the practice of Zemstvo Veterinary Medicine in Dnipro, Ukraine.

2. Object and methods

The main object of our research was the dynamics of the development of veterinary science and practice in Dnipro Ukraine, in the second half of the 19th – early 20th centuries in the context of Zemstvo activity. The methodological basis of the research is constructed with the complex of historic principles, objectivity, and comprehensive approach to study veterinary science progress in previous century. The study carried out with general scientific methods application: statistical analysis and synthesis, sociological and psychological (content analysis), and remarkable historical research methods: historical and genetic, diachronic, comparative and historical, etc.

The historical development of the science of genetics allowed us to trace the cause-and-effect relationships and patterns of the development of Zemstvo veterinary medicine and identify its dynamics and an evolution in the context of the development of

scientific ideas and their practical application. Using the diachronic method allowed us to reveal the internal content of several processes that took place in the life of Zemstvo veterinary medicine and highlight their development stages. The comprehensive historical approach and historical-scientific analysis provided the opportunity to assess the efficacy and practical feasibility of specific measures initiated by Zemstvo veterinary doctors of the region. We used the statistical method in cases where it was necessary to process large arrays of diverse information according to appropriate criteria.

3. Regional features of veterinary medicine progress in the governorates of Dnipro area in the second half of the 19th and early 20th century

3.1. Experimental anesthesiology in veterinary surgery: contributions of the Kharkiv scientific center and Zemstvo practices in Dnipro Ukraine

Of particular interest is the study of the zonal features of the development of surgical veterinary practice in the conditions of the Zemstvo provinces, including the Southeastern region of Ukraine. The successful development of surgery in the period we have indicated was primarily facilitated by the discovery of the narcotic properties of some substances and local anesthetics (Yu et al., 2019; Gazdić, 2020). The Kharkiv Scientific Center, which had a direct impact on the veterinary life of the entire Dnipro region, did not remain aloof from this kind of research. In 1903, at the First (All-Russian) Veterinary Congress, professor of the Kharkiv Veterinary Institute Mykhailo Maltsev has reported on the experiments carried out with using mixed anesthesia (Maltsev, 1903). In his report, the professor analyzed the pharmacological properties of such drugs for anesthesia as chloroform, ether, chloral hydrate, morphine, and ethyl bromide. Moreover, he used the phrase "our domestic animals," emphasizing the domestic specificity of veterinary practice.

The conclusions built by Mykhailo Maltsev contain several significant assumptions and statements for developing veterinary anesthesiology. The professor created the basis for pharmacological formulation for the animal anesthesia, that was so-called premedication. Through a series of experiments, he demonstrated the importance of an individual approach to apply anesthesia in different animal species. He analyzed in detail the effect of multicomponent anesthesia, illustrating the report with information in respect with possible combinations of drugs and the sequence of their supplementation. Several reports in science communication were agreed on the evidence of his observations. Obtained results were correlated with the subsequent world achievements in anesthesiology, highlighted at the meetings of the Surgical Society in Paris in 1902 (Richelot and Laborde reports). Thus, the scientific and practical connections of veterinary medicine in the Southeastern region of Ukraine with world veterinary culture are traced.

3.2. Engineering innovations in veterinary equipment: pioneering activities of Zemstvo physicians in the context of scientific and practical collaboration

The leading medical thought and the zemstvo veterinarians were not indifferent to the "scientific development and assessment of merit" (Koyranskyi, 1892). The ever-increasing effectiveness of the fight against zooanthroponoses allowed veterinarians to be more attentive to non-infectious pathologies and to move to the individual nature of medical, preventive, and research work (Vakulyk, 2007). Such changes actualized the need to develop new and modify old methods of suffocation and fixation of animals.

In 1892, the zemstvo veterinarian Moysey Koiransky proposed a new model of an operating table for large animals (although the first sample was ready in 1889 - it was being prepared for the Paris Exhibition) (Koyranskyi, 1892). According to the author of the invention, the prototype of the design he proposed was the "suffocation" table of Professor Zhuravsky (Maltsev, 1929).

The operating table of Moysey Koiransky, satisfying the requirements of strength and compliance with the dimensions imposed on such equipment, had the following advantages compared to previous models: compactness in combination with the necessary shapes and working surfaces, the possibility of dismantling and accessibility of all parts of the table for antiseptic treatment, mechanization of lifting devices allowed one person to operate the table, fixation, providing maximum access to various parts of the animal's body, etc. The existing operating table model was presented to the Moscow Society of Practitioners court and later transferred to the Main Military Medical Directorate.

However, despite the undoubted merits of the model, the resolution of the above-mentioned department under No. 9020 (Koyranskyi, 1892), sent to the author, had the form of a refusal. The reasons for this decision were the complex design of the table, the presence of only one copy of the table at the inventor, the absence of test reports, and the absence of an estimate for the production of the table. However, the main reason was that all previous attempts to design a similar table had failed. Then, the officials suggested that Moysey Koiranskyi, at his own expense, manufacture an operating table and test its suitability.

It should be noted that the future of abdominal veterinary surgery was closely connected with the operating tables for large animals designed by Žemaitis and Jurevičius, Herzen, and others (Doroshchuk et al., 2021). Moreover, while reading the catalogs of surgical instruments offered by French companies, Moysey Koiranskyi discovered a description of the so-called Daviau table, which was not much different from his table and even had a more complicated design with the same functions. However, the Daviau table was awarded a medal at the Paris Exhibition in 1889.

Moysey Koiranskyi also criticized advertising veterinary catalogs, which were full of samples of instruments that had not been tested in field conditions and did not meet the requirements of practice (Koyranskyi, 1909). As a result, delicate questions of scientific priorities and reasons that stood in the way of implementing the inventions of the enthusiastic doctor into practical veterinary life arose. Unfortunately, this topic is practically not covered in the historical and scientific literature, and the answers to the questions raised require a separate study of this branch of veterinary medicine. As for the primacy of creating an operating table for large animals, Moysey Koiransky provides weighty evidence in his favor, referring to such veterinary authorities as Mykola Shadrin and Serhii Yevseenko.

The activities of Moysey Koiransky quite reasonably claim the role of scientific research and were not some exceptional case. We are dealing with a remarkable phenomenon in developing veterinary medicine as a science and practice. Its immanent essence was the interpenetration of scientific ideas and practical experience. On the one hand, the immediate response of the scientific world to the needs of practical veterinary medicine; on the other hand, the active enrichment of science with the multifaceted empirical base of Zemstvo veterinary medicine in the form of providing opportunities for rapid testing of new methods and their experimental support by Zemstvo specialists, that is, direct participation in the creative scientific process (Vakulyk, 2004).

3.3. Analytical and publicist activities of Zemstvo veterinary doctors in Dnipro Ukraine as a motivational factor and resource for the development of the livestock

Gone are the days when veterinary science, lacking a sufficient methodological base, developed mostly chaotically, and veterinary practice, experiencing a catastrophic shortage of specialists, materials, and medical means, was ineffective. The time of socio-political upheavals, the collapse of the entire established system

of veterinary care had not yet come, when the collective farm veterinarian, squeezed by the requirements of almost industrial production in animal husbandry, was put in the position of a working conveyor with limited possibilities for search and experiment.

Zemstvo veterinarians' professionalism and scientific competence allowed them to act as analysts, disputants, and experts on the pages of the scientific periodical press.

Thus, the Zemstvo veterinarian of the Melitopol district, M.A. Shadrin, was repeatedly published in the "Veterinary Bulletin" with abstract articles on dissertation topics. His field of vision includes research in the field of the pathophysiology of burn injuries (Shadrin, 1892a), endocrinology and experimental surgery (Shadrin, 1892a, 1892b), issues of sorption therapy of wound injuries (Shadrin, 1892b), and many others, which are still relevant today.

Unfortunately, this tradition has been lost. In today's conditions, it is difficult to imagine a district veterinarian, burdened with routine duties, who simultaneously prepares review articles for professionally oriented periodicals with an analysis of doctoral dissertation materials (De Paula Vieira & Anthony, 2020; Armitage-Chan et al., 2016). Nowadays, this is the prerogative of almost exclusively "workshop" scientists.

Benevolence, awareness of common goals, and the desire to share their experience with colleagues and contribute to the common cause were, for many Zemstvo veterinarians, a convincing motive for journalistic activity. The study of such works provides the historian of veterinary medicine with a mass of documents and a mosaic of diverse details, from the totality of which, with careful consideration, a holistic and "living" picture of the phenomena of interest to us is built.

Thus, the editorial staff of the “Archive of Veterinary Sciences” distinguished on its pages the following headings: “Practical Notes,” “From Veterinary and Obstetric Practice,” “Cases from Practice,” and the like, which, in essence, are the kind of collections of methodological recommendations and workshops for veterinary specialists. The information provided in them, among other things, is of scientific interest and contains scientific novelty, according to the journal (Popov, 1884; Tatarskyi, 1888).

3.4. Folk veterinary medicine as a hypothesis in the context of scientific experimentation: phytotherapy research in Zemstvo practice of Dnipro Ukraine

There was another side to the activities of veterinarians. Specialists who practiced in the conditions of Zemstvo provinces and counties often encountered the activities of folk healers, all kinds of healers who served both people and animals. The influence of popular veterinary medicine representatives on the peasant masses was significant, and they were often preferred to qualified veterinary care (Prusyazhnyuk, 2017). This phenomenon caused much trouble for local veterinarians, especially in cases of infectious diseases. Not being able to make a correct diagnosis and not understanding the essence of the infectious process, the folk farrier almost always resorted to bloodletting or other simple surgical manipulations (Redaktsiia zhurnala «Trudy Imperatorskogo Vol′nogo ekonomicheskogo obshchestva», 1855) as a universal method of treatment, which in a situation of high contagiousness of the pathogen created an additional source of infection.

However, professional objectivity did not allow veterinarians to unconditionally cross out the entire set of means and methods of folk medicine. Most often, feeling the lack of funds necessary for purchasing pharmacological drugs or their components, veterinarians turned their attention to medicinal plants of the local flora, which were actively used in folk medicine. Thus, the Kharkiv veterinarian A.G. Popov reported on the pages of the "Archive of Veterinary Sciences" (Popov, 1884) that the bark of buckthorn, known as "human" medicine, is widely used as an effective laxative. Still, references to the use of the berries of this plant are practically absent in both domestic and translated medical literature. As for the use of these berries in veterinary medicine, the author reports that their use is not only not described anywhere but has not been tested by his colleagues. Meanwhile, A.G. Popov drew attention to the fact that Ukrainian peasants traditionally collect, dry, and stock up on buckthorn berries (Frangulae), which are popularly called Rhamnus berries. This traditional medicine was usually applied in the form of a decoction as a mild laxative.

Further, the researcher reported the results of his study on the use of the abovementioned decoction for the treatment of horses and dogs. A.G. Popov descripted the rules of its main manipulations including preparation, relative content of components, drug dosage, storage conditions, as well as the botanical description of the berries, the time of collection, and recalls their biochemical composition, referring to the unique literature. The author built the summary of this report use his own results of clinical studies, a comparative analysis of the drug therapeutic effect. Thus, the deep connection of practical veterinary medicine in the region is traced not only with the leading scientific centers but also with the folklife itself (Zazdravnova, 2020), with veterinary culture as its part, which allows us to talk about the unique national features and national traditions of veterinary medicine in the studied historical and spatial context.

3.5. Reproductive veterinary medicine in Dnipro area and advance in clinical experience.

The urgent need of most livestock farms, both peasant and landlord type, was the reproduction and increase of livestock. Naturally, animal diseases that prevented this were a hot topic for animal owners. In this regard, veterinarians constantly accumulated valuable practical experience, analyzed the results obtained, and interpreted them, that is, carried out activities that significantly contributed to the formation of such veterinary areas as obstetrics, gynecology, surgery, and andrology.

Indeed, if the folk horsemen, which were discussed above, willingly undertook the castration of animals, then real life provided many such clinical cases when assisting an animal was possible only with the presence of medical knowledge and skills, abilities for creative medical thinking, and logic. In such situations, peasants and landowners sought qualified help from veterinarians. For the Zemstvo veterinarians, such cases provided an opportunity for professional improvement. The field of medical activity was so vast and often little known, and the results of the treatment provided and the Zemstvos' research were so valuable and interesting that the editorial boards of veterinary journals willingly published them, placing these materials next to the information provided by institutes, clinics, and laboratories.

Thus, the veterinarian of the Katerynoslav district Serhii Hryntser (later a high-ranking veterinary official), submitted to the veterinary court a clinical and therapeutic description and analysis of several cases of traumatic curvature of the penis with the subsequent development of paraphimosis in male farm animals. The same doctor in the press (Hryntser, 1887) described in considerable detail the method of differential diagnosis of diseases of the genitourinary sphere of males (associated with impaired urination) using urethral catheterization on a standing animal and rectal examination of the bladder neck and other diseases that were partly caused by ignorance and negligence of livestock keepers (Popov, 1882a).

3.6. Genesis and chronological specificity of veterinary terminology and style in the materials of Zemstvo doctors in Dnipro Ukraine: causes and an identification significance.

While studying the scientific and journalistic activities of A.G. Popov, we discovered a specific feature of his works, typical for all

veterinary periodicals of that time, namely errors (from the point of view of modern clinicians) in making the diagnosis, inaccuracies in terminology, etc. The feature is all the more surprising because further treatment was prescribed correctly. Analysis of the mentioned problem allowed us to conclude that what are errors are not such. As it should be understood, we are discussing some inconsistencies in the modern conceptual apparatus and veterinary terminology concerning similar concepts and terms of the studied period. Thus, in one of his publications in 1882 (Popov, 1882b), A.G. Popov reported on a case that took place in his practice, namely – inflammation of the brain and its membranes in a horse (by the way, the author uses the name encephalitis et meningitis, nowadays this disease sounds like meningoencephalitis). However, after reading the text, the modern researcher finds such unambiguity of the final diagnosis, which was based mainly on general details of the clinical picture, characteristic of other brain diseases, questionable.

Based on the information provided by A. Popov, the question arises about another, less depressing diagnosis: hyperemia of the brain and its membranes. In any case, analyzing the presented anamnestic data and the subsequent clinical picture, successful and relatively short symptomatic treatment (6 days until complete recovery), it is logical to conclude that the diagnosis made by A.G. Popov is not entirely accurate. For the sake of completeness, it should be added that analyzing the pathogenesis of the described case, A.G. Popov practically does not see or does not make a difference between "blood rush to the brain" and "inflammation of the brain."

However, despite all the above inaccuracies, the localization of the pathological focus, the nature of the disease, and further treatment were determined quite correctly, considering the means and capabilities at the doctor's disposal. The outlined features of diagnostics and professional language are explained by the natural impossibility of using by specialists of the late 19th - early 20th centuries the achievements of normal and pathological anatomy and physiology, several other scientific and research areas, the time of which has not yet come. Thus, the circumstance mentioned above can be used in some cases as a differential-chronological milestone to clarify the historical age of certain veterinary documents and materials that do not have a time date. The problem is significant and relevant for researchers in the history of veterinary medicine.

A vivid example reflecting the Evolution of veterinary terminology is the article by veterinarian A. Sobornov (who practiced in Kharkiv) (Sobornov, 1893), accompanied by a commentary by the Archives of Veterinary Sciences editors. Citing the symptoms of the disease, which are practically identical to those in the case of doctor A. Popov, which was considered above, and indicating a similar etiology, the author makes a different diagnosis – Vertigo. However, even more, revealing is the editors' explanation (in the form of a note) of the meaning of this term: "Old clinicians used the term Vertigo to denote all kinds of suffering of the nervous system, expressed by periodic seizures with loss of coordination of movements. Recently, the name Vertigo has been used to denote only a disease caused by the invasion of the brain by the parasite Coenurus cerebralis. Neither in the sense of former clinicians nor according to the latest terminology - the cases described by the author cannot be called Vertigo" (Liandesberh & Holikov, 1952). Continuing the editorial comment, it is necessary to add that the term Vertigo translates as a state of loss of consciousness and dizziness, and the above-mentioned invasive disease currently has a name – cerebral coenurosis.

As can be seen from this explanation, as veterinary science develops, the meanings of specific terms are clarified, the scope of their application narrows, and the possibilities of differential diagnosis increase. In addition, reviewing and commenting on publications by doctors who practiced in the conditions of the Zemstvo provinces indicates the inextricable connection between regional veterinary medicine and, without any doubt, highly competent editorial boards of veterinary periodicals, constituting the vanguard of domestic science.

Here, we can observe another characteristic feature of the veterinary printed word: the anthropomorphic nature of its style, which is gradually dissolving in the language of the 20th century. Thus, to denote the adaptive capabilities of an animal, manifested at the behavioral level, the terms “intelligence” (Smirnov, 1900) or “unpredictability” were used; “undesirable character traits” [ibid.] meant a variant of willfulness; sexual arousal of animals with the corresponding behavioral dominant was characterized as “the desire to satisfy sexual desire” (Sobornov, 1893); depression due to illness was perceived as an “unhappy appearance” (Kramarev, 1893) of the animal, etc. Moreover, a similar style, unacceptable today in official scientific speeches, sounds quite natural in the report of Professor Mykhajlo Melnychenko (Melnychenko, 1885) at the Kharkiv Entomological Congress. When assessing the conditions of keeping and feeding animals, the speaker uses such expressions as "poorly living working ox," "unenviable life of ... cows," or "steppe cattle, a gray race that deserves a better fate in life," etc.

This phenomenon certainly requires a separate additional study of a historical and philological nature, which is not included in the content and objectives of this work. However, the immaturity, a kind of dependence of veterinary vocabulary on the language of humanitarian medicine, which was due to the natural reasons of the more progressive state of human medicine, the long-term administrative subordination of the veterinary service to the Medical Department, and the specifics of veterinary education, is apparent. However, on the other hand, veterinary journalism, with all the features of its imagery and style and other printed monuments of national culture, reflects the internal meanings and content of the national worldview (as a subculture), which is reflected in the linguistic tradition.

3.7. Veterinary culture as a synonym for therapeutic and preventive practice: moral dilemmas, popularization, and pathways of influence on animal owners' awareness

In this context, the order of the Katerynoslav police chief seems interesting, as it talks about bringing to "legal responsibility" those labor carters who "undressed" horses, overloaded them, etc. (Derzhavnyi Arkhiv Dnipropetrovs′koi Oblasti. (n.d.)). Another component of regional specificity in the development of veterinary medicine is traced to cultural and moral-ethical aspects. In the conditions of the zemstvo provinces, where the organization of veterinary activities was almost entirely dependent on local self-government representatives, the latter's personal qualities played a significant role in the Evolution of veterinary life in the region. Thus, Mykola Shadrin, often quoted in our work, analyzing the circumstances that directly affect the effectiveness of veterinary care to the population, among the first highlighted the “mental and moral development of zemstvo figures,” their “personal views” on the goals and objectives of veterinary medicine and, finally, the ability and desire to “delves into the needs and interests of the people” [38]. In this context, “culture” acquires an entirely unexpected, unusual meaning and becomes almost synonymous with medical and preventive veterinary care. Moreover, Mykola Shadrin does not make such direct conclusions, not because he does not see them but because they are so evident and indisputable in the eyes of the public that, as a rule, they do not require additional comments. In his opinion, "... a high cultural mission is to bring into the primitive rural environment and into the dark mass of the people the true light of science in the person of previously unknown figures and plowmen in the forgotten and still untouched field of the people - the people's teacher, the people's doctor and the people's veterinarian" (Shadrin, 1905).

Mykola Shadrin finds consonance with his statement in

Mykola Pyrogov, who defined the task of zemstvo medicine as "the fight against the ignorance of the masses and the transformation of their entire worldview" (Shadrin, 1905). If we talk about Zemstvo veterinary specialists, the concept of culture (Sheviakov et al., 2022) most fully refers to their medical and preventive activities, which, on the historical stage, appeared as a secondary matter concerning police quarantine measures.

This genesis, among other things, highlights the internal tragedy of the first generation of Zemstvo veterinarians. The path to creating an effective veterinary service, the idea of which was based on the most humane and noble principles, began with the mass forced slaughter of cattle and horses, with plague riots and subsequent appropriate punishment, with the emergence of an additional financial burden. All this together created a negative image of the veterinarian in the eyes of the Ukrainian peasant. However, these measures made it possible to eliminate the centuries-old scourge of local livestock farming - rinderpest and other dangerous infectious diseases.

In addition, eliminating epizootics for zemstvo veterinarians became a matter of honor. Having explicitly arisen to "stop the cattle plague," it became a hostage to the situation, being wholly connected with the routine, thankless work of forced slaughter of sick and suspected animals. Furthermore, at that time, no one spoke of veterinary culture as the mission of a zemstvo doctor. First, in the scientific community itself, there was no unanimity on the issue of mandatory slaughter of livestock. Second, this measure did not meet with support from the peasants and many zemstvo leaders. Third, the veterinarians were forced to engage in everyday activities, which, by their very logic, should instead have become the exception rather than the norm.

The very cultural "missionary" of Zemstvo veterinary medicine in the village required time and considerable effort to transform from cultural expansion (explanatory work, offering its services, popularization) to cultural demonstration (examples of large farms) and, finally, to turn into a cultural source. Only the organization of outpatient and mobile medical and preventive veterinary care ensured the formation of that veterinary service, which is a key moment in the interaction of scientific centers with practical animal husbandry, which often became a significant element of multicomponent scientific activity.

3.8. The phenomenon of Zemstvo veterinary medicine was a critic factor to provide the effective prevention and eradication of animal diseases in Dnipro Ukraine

Gradually, by the end of the 19th century, the organization of veterinary medical care for the population was realized in the Zemstvo provinces as a necessity (Veselovskyi, 1909). Meetings of Zemstvo veterinarians, meetings of Zemstvo, and district administrations increasingly discussed the issues of building outpatient clinics, providing veterinarians with medicines and necessary tools, staffing the stations with a sufficient number of medical and paramedical personnel, and providing them with housing (Vestnik Ekaterinoslavskogo Zemstva). At the same time, it became apparent that the so-called sporadic diseases caused losses to rural owners that were no less, and sometimes even more significant than the losses from outbreaks of epizootics. Subsequently, this opinion, based on the statistics of Zemstvo insurance, was confirmed at the All-Russian Congress of Veterinary Doctors 1903 (Shadrin, 1903).

Here, it is necessary to clarify the semantic or classification meaning of the term "sporadic diseases," which is widely used in documents of the period under study. In modern veterinary literature, it is customary to call sporadic infectious diseases with the lowest degree of intensity of the epizootic process those that manifest themselves locally, with difficult-to-trace connections between foci of the disease. The veterinary scientific tradition of the early 20th century attributed both infectious and non-infectious pathologies to the group of sporadic diseases, guided mainly by the criteria of the quantitative scale of the disease and the possible speed of its spread. Most likely, the reasons for this terminological discrepancy stem from the natural limited capabilities of veterinary science of that time; that is, they were dictated by the level of development of the etiological direction in pathology and the immaturity of the diagnostic base. However, the main difficulties that arose before Zemstvo veterinary medicine was due, most likely, not to the state of medical science but to reasons of a much more prosaic nature. Insufficient funding, the absence or shortage of unique premises for receiving animals, storing medicines, frequent problems with providing housing for doctors and paramedics, low salaries, and other difficulties were constant companions of Zemstvo veterinary medicine throughout its existence.

The more paradoxical development process of medical Zemstvo veterinary medicine at the beginning of the 20th century demonstrates a steady growth of the number of animals that annually received qualified veterinary care in the conditions of the Zemstvo provinces of Southeast Ukraine. To illustrate what has been said, we will present some figures published in the materials of the II All-Russian Congress of Veterinary Doctors (Table).

The present trend continued in the following years; only in the Ekaterinoslav province did the number of animals provided with medical care reach 300,000 heads in 1912 (Telichenko, 1912). Thus, evaluating the facts presented, it becomes possible to assume that the successful development of veterinary medicine in the zemstvo provinces of Southeastern Ukraine was carried out due to the presence of the zemstvo structure itself, which provided an opportunity to reveal the positive human factor of the enthusiastic doctor and even, despite the problematic material and technical conditions that accompanied his activity.

4. Prospects for further study

As a result of this research, previously overlooked and unpublished printed materials have been identified, serving as primary sources on the development of veterinary thought and its practical implementation. Based on their analysis, a historical reconstruction of events was carried out, including the nature of experimentation and the methods that drove the formation of veterinary science and practice. The study reveals consistent patterns in how scientific activity was motivated by the practical demands of livestock management, as well as the testing of new methods under the specific conditions of Zemstvo governorates in Dnipro area. The findings may be used to develop

Table – Number of animals that were provided with veterinary medical care annually in the Zemstvo provinces of Southeastern Ukraine

Governorates	Number of animals that received veterinary care			
	1900	1905	1906	1907
Katerynoslavska	23534	60586	79519	115210
Tavriyska	55883	109467	109517	119307
Kharkivska	26010	104746	178298	209206
Khersonska	13920	unknown	63523	89610

strategic frameworks for contemporary organizers of symbiotic collaboration between research institutions, laboratories, and applied veterinary medicine.

The results contribute to a more objective study and substantiation of theoretical issues of the history of the organization of science in Ukraine, particularly in medical, veterinary, agricultural, and biological sciences. They can be used when writing generalizing works on the history of medicine, history of veterinary medicine, history of biotechnology, etc. The reliability of the research and results were ensured by their methodological and theoretical substantiation, the use of a complex of complementary research methods, numerous printed and archival sources, and a thorough historiographical analysis of the problem.

Specific factual material, generalizations, and conclusions of the study can be used in pedagogical work – when teaching the disciplines "History of Medicine," "History of Veterinary Medicine," "History of Science and Technology," and in special courses of medical and veterinary disciplines. In addition, further research in the presented and related areas can fill a particular link in the history of medicine and veterinary science in Ukraine. To demonstrate the existence of a common European scientific and practical space and traditions in the context of the history of medicine and veterinary medicine.

Conclusions

Zemstvo veterinary medicine of Southeastern Ukraine in the last decades of the 19th century was a complex, comprehensive mechanism for combating animal diseases in the region, the functioning of which was determined by the interaction of scientific research and analysis, veterinary and sanitary control of production and local livestock traditions. At the beginning of its activity, the dominant task of the region's zemstvo veterinary medicine was eliminating cattle plague, which often took on the character of a national disaster.

The materials published by a group of Zemstvo veterinarians from the region – including Serhii Hrintser, Yevdokym Telychenko, Mykola Shadrin, O. Kramarev, and others — contained valuable scientific insights that were acknowledged by the academic community and the editorial boards of prominent veterinary journals.

The Zemstvo Veterinary Medicine of Southeastern Ukraine was formed as a professional society (corporation) aimed to animal diseases treatment. One of the main principles of which was a scientific and practical approach to solving production issues, which, in turn, stimulated the formation of a new veterinary, animal husbandry, and later socio-cultural tradition of the region. Being on constant trips, zemstvo veterinarians collected a large amount of factual material about the number of animals of various species in the surveyed territories. They found out their breed composition, economic purpose, features of keeping, feeding, breeding, etc. These data constituted scientific value, with their detailed generalization and statistical analysis, and motivated the separation from the zemstvo veterinary environment of a new scientific and practical direction called "zootechnics."

Zemsky veterinarians were confirmed as active community that studied and reorganized local livestock, transforming it into a stream of scientifically based biotechnological processes in the rural environment of the late 19th century. Veterinary reports on obtained results in aforementioned period are one of the vivid an evidence of the progress in research achievements of Zemsky veterinarians in the field of non-infectious pathology. An advance veterinary medicine covered a wide range of issues - from the preparation and use of pharmacological preparations from plants of the local flora to new methods of surgical research and operative practice.

Funding

Present research was carried out without external funding.

Conflict of Interests

The authors declare no conflict of interests.

References

Armitage-Chan, E., Maddison, J., & May, S. A. (2016). What is the veterinary professional identity? Preliminary findings from web-based continuing professional development in veterinary professionalism. Veterinary Record, 178(13), 318.

Bilyi, D., Hierdieva, A., Herhaulov, M., & Vakulyk, V. (2020). Analysis of prognostic factors for feline mammary tumours (overview information). Scientific Horizons, 23(10), 99–109.

De Paula Vieira, A., & Anthony, R. (2020). Recalibrating veterinary medicine through animal welfare science and ethics for the 2020s. Animals, 10(4), 654.

Derzhavnyi Arkhiv Dnipropetrovs′koi Oblasti. (n.d.). F. 11. Op. № 1. Sprava 662. Nakaz № 335 (in Ukrainian).

Doroshchuk, V. O., Sukhonos, V. P., Tkachenko, S. M., Solonin, P. K., Maliuk, M. O., Tkachenko, V. V., & Kulida, M. A. (2021). Operative surgery [Operatyvna Khirurhiia]. Kyiv: NUBiP Ukrainy.

Gazdić, V. (2020). A brief history of anaesthesia. SCR Medica, 51(3), 190–197.

Habib, N. A. (1992). Medical theory, surgical practice – Studies in the history of surgery (C. Lawrence, Ed.). British Journal of Surgery, 79(12), 1388.

Hryntser, S. V. (1887). Sluchai zaderzhaniia mochi vsledstvie sudorozhnogo sokrashcheniia sheĭki mochevogo puzyria (Dysuria spastica) [Cases of urinary retention due to spasmodic contraction of the bladder neck]. Arkhiv Veterinarnykh Nauk, 12, 107–109 (in Russian).

King, T. A. (2021). The One Medicine concept: its emergence from history as a systematic approach to re-integrate human and veterinary medicine. Emerging Topics in Life Sciences, 5(5), 643–654.

Kozakova, N. O. (2023). Komunikatsiia yak skladova profesiinoi kompetentsii spetsialista veterynarnoi medytsyny [Communication as a component of professional competence of a veterinary medicine specialist]. In Scientific researches and methods of their carrying out: World experience and domestic realities (Vol. 24, pp. 11–13). V International Scientific and Practical Conference.

Koyranskyi, M. M. (1909). Otkrytoe pis′mo tovarishcham [Open letter to comrades]. Veterinarnaia Zhizn′, 11, 168 (in Russian).

Koyrans′kyi, M. (1892). Model′ peredvyzhnoho operatyvnoho stola dlia krupnykh domashnikh tvaryn [Model of a mobile operating table for large pets]. Veterynarnyi Vestnyk, 1, 83–97.

Kramarev, O. V. (1893). Nabliudeniia nad epizootieĭ zlokachestvennoĭ kataral′noĭ goriachki rohatogo skota v Pavlohradskom uezde v 1890 hodu [Observation of an epizootic of malignant cattle fever in Pavlograd region in 1890]. Arkhiv Veterinarnykh Nauk, 3, 53–81 (in Russian).

Liandesberh, Ya. S., & Holikov, N. N. (1952). Latinskiĭ iazyk: uchebnoe posobie dlia veterinarnykh VUZov i fakultetov [Latin language: manual for veterinarian Universities and Faculties]. Moskva: Sovetskaia nauka (in Russian).

Lohovskyi, I. M. (2013). Robota mistsevykh orhaniv vlady Kharkivskoi hubernii po zapobihanniu stykhiinykh lykh ta likvidatsii yikh naslidkiv (Druha polovyna XIX – pochatok XX st.) [The functioning of local government departments in Kharkiv region as regards the prevention of catastrophes and its aftermath]. Doctoral dissertation, V. N. Karazin Kharkiv National University.

Maltsev, M. (1903). K voprosu o smeshannoy anestezii [On the issue of mixed anesthesia]. In Trudy pervogo Vserossiyskogo veterinarnogo s″yezda v Sankt-Peterburge (Vol. II, pp. 130–134). Sankt-Peterburg.

Maltsev, M. A. (1929). Operatyvna khirurhiia dlia veterynarnykh likariv i studentiv (3-e vyd., vypr. i dop.) [Operative surgery for veterinarians and students]. Moskva–Leningrad: Hosvydav.

Maslikov, S. N., Bely, D. D., Samoiliuk, V. V., Vakulik, V. V., & Spitsyna, T. L. (2019). Pathogenetic role of Staphylococcus aureus in purulent keratoconjunctivitis in cats. Regulatory Mechanisms in Biosystems, 10 (4), 507–512.

Melnychenko, M. M. (1885). O merakh protiv chumy rohatogo skota [On measures against cattle plague]. Arkhiv Veterinarnykh Nauk, 9, 191–202 (in Russian).

Natterson-Horowitz, B., Desmarchelier, M., Winkler, A. S., & Carabin, H. (2022). Beyond zoonoses in One Health: Non-contagious diseases across the animal kingdom. Frontiers in Public Health, 9.

Noakes, D. E., Parkinson, T. J., & England, G. C.w. (2019). Veterinary reproduction and obstetrics. Saunders Ltd.

Osburn, B. I., Scott, C., & Gibbs, P. (2009). One world – One medicine – One health: Emerging veterinary challenges and opportunities. Revue Scientifique et Technique (OIE), 28(2), 481–486.

Popov, A. H. (1882). Sluchai vospaleniia mozga i ego obolochek u loshadi (Encephalitis et meningitis) [Cases of the brain and meninges inflammation in horses]. Arkhiv Veterinarnykh Nauk, 9, 222–226 (in Russian).

Popov, A. H. (1882). Sluchai vypadeniia matki u kobyly posle vykydysha mertvoho zherebenka (Prolapsus uteri) [Cases of uterine prolapse in horses after miscarriage of a stillborn foal]. Arkhiv Veterinarnykh Nauk, 9, 219–222 (in Russian).

Popov, A. H. (1884). Plody slabitel′noĭ krushiny (Baccae spinae cervinae s. Domesticae ot Rhamnus Catharticus) [The fruits are laxative Rhamnus Catharticus]. Arkhiv Veterinarnykh Nauk, 3, 52 (in Russian).

Popov, A. H. (1884). Ranenie briushnoĭ polosti s vypadeniem chistoĭ briushiny i unichtozheniem kishok v razryve [Abdominal injury with prolapse of the peritoneum and intestinal damage]. Arkhiv Veterinarnykh Nauk, 3, 51–52 (in Russian).

Prusiashniuk, V. (2017). Pochatky likuval′noi spravy tvaryn u Lvovi [The beginnings of the treatment of animals in Lviv]. Scientific Messenger of LNU of Veterinary Medicine and Biotechnologies, 19(82), 114–119.

Redaktsiia zhurnala «Trudy Imperatorskoho Vol′noho ekonomicheskoho obshchestva». (1855). Entsiklopedicheskiĭ uchebnyĭ domashnikh zhivotnykh i dvorovykh ptits [Encyclopedic textbook on domestic and wild birds] (Vol. 1). Sankt-Peterburg (in Russian).

Shadrin, N. A. (1892). O vliianii udaleniia shchitovidnoĭ zhelezy na gazoobmen u koshek: referat stat′i A. Mikhel′sona [On the effect of thyroid removal on gas exchange in animals]. Veterinarnyĭ Vestnik, 3, 6 (in Russian).

Shadrin, N. A. (1892). O vliianii vnutrennego upotrebleniia vody na gazovyi obmen u zhivotnykh: referat doktorskoĭ dissertatsii I. Tuvim [On the influence of internal water consumption on gas exchange in animals]. Veterinarnyĭ Vestnik, 1, 97–99 (in Russian).

Shadrin, N. A. (1903). Veterinarno-lechebnoe delo Rossii nakanune XX-go veka [Veterinary and forestry in Russia at the beginning of the 20th century]. Veterinarnoe Obozrenie, 1, 10–21 (in Russian).

Shadrin, N. A. (1905). K sorokaletnemu iubileiu russkoho zemstva. Veterinarnoe Obozrenie, 7, 1–14 (in Russian).

Sheviakov, O., Burlakova, I., Kornienko, V., Vakulik, V., & Slavska, Y. (2022). The history of medicine as an element of the psychoprophylaxis of the crisis of professional training among veterinary medical specialists. Public Administration and Law Review, 3, 97–105.

Smirnov, V. P. (1900). Loshadi v kamennougol′nykh shakhtakh na Yuge Rossii [Horses in the coal mines of southern Russia]. Arkhiv Veterinarnykh Nauk, 8, 129–142 (in Russian).

Sobornov, A. V. (1893). Vertigo et Amentia u loshadeĭ [Vertigo et Amentia in horses]. Arkhiv Veterinarnykh Nauk, 1, 11–15 (in Russian).

Soveshchaniia zemskikh veterinarnykh vracheĭ Pavlohradskoho uezda 20-go iiunia 1905 hoda [The reports of the veterinary doctors meeting in Pavlograd region June 20, 1905]. Vestnyk Ekaterinoslavskoho Zemstva, 30, 787–789 (in Russian).

Tatarskyi, V. H. (1888). Referat otcheta veterinarnogo vracha Melitopol′skoho uezda, Tavricheskoĭ gubernii za 1886 h. Shadrina [Short report of veterinary doctor Shadrin from Melitoplol area, Tavria region on 1886]. Arkhiv Veterinarnykh Nauk, 10, 96–98. (in Russian).

Telichenko, E. V. (1912). Nuzhdy Zemskoi Veterinarii Ekaterinoslavskoĭ gubernii [The requirements of local veterinary in Ekaterinoslav region]. Yuzhnoe Khoziaĭstvo, 1, 25–28 (in Russian).

Vakulyk, V. V. (2004). Evoliutsiia vnutrishnikh vzaiemovidnosyn naukovo-praktychnoi veterynarii Naddnipriansh chyny v epokhu rozvytku kapitalizmu (kinets′ XIX – pochatok XX st.) [The evolution of internal interactions scientific-practice veterinary of Dnipro region in capitalism development epoch (end of 19th – start of 20th century]. Ukrains′kyi Selyanyn, 8, 174–177 (in Ukrainian).

Vakulyk, V. V. (2007). Tekhnichne suprovodzhennia u veterynarnii medytsyni Ukrainy kintsia XIX – pochatku XX stolittia [Technical management of veterinary medicine in Ukraine during end of 19th – start of 20th century]. In Pytannia ahrarnoi istorii Ukrainy: Materialy shostykh naukovykh chytan′, prysviachenykh pamiati profesora D. P. Poidy (pp. 78–82). Dnipro.

Veselovskyi, B. (1909). Istoriia zemstva za sorok let [History of regional community during years]. In Veterinariia i strakhovanie skota (Vol. 2, 703 pp.). Sankt-Peterburg: Izdatel′stvo N. O. Popovoĭ (in Russian).

Yu, S., Wang, B., Zhang, J., & Fang, K. (2019). Development of local anesthetics and their applications outside anesthesia. International Journal of Clinical and Experimental Medicine, 12(12), 13203–13220.

Zazdravnova, O. I. (Ed.). (2020). Ahrarna osvita i nauka: sotsial′no-filosofs′ke osmyslennia [Agrarian education and science: social-philosophic view]. Kharkiv: FOP Brovin O. V. (in Ukrainian).