

## **ESTABLISHMENT AND DEVELOPMENT OF SCIENTIFIC FOUNDATIONS OF THE SANITARY AND HYGIENIC SCIENCE IN UKRAINE (SECOND HALF OF THE 19<sup>TH</sup> – BEGINNING OF THE 20<sup>TH</sup> CENTURIES)**

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### **INTRODUCTION**

Hygienic science has passed a difficult path of formation and development, relying on the best traditions, experience, and achievements of theoretical and clinical medicine, consistently developing a preventive direction in domestic medicine. Many prominent hygienists have been educated on the best traditions, leading-edge views of count doctors, who have developed and implemented the social and hygiene principles of public health.

Today, more than ever, the scientific thought proclaimed at the beginning of the twentieth century by Professor S. A. Tomilin remains relevant, stating that "... prevention is a social discipline and the prevention of infectious diseases refers to measures of general health, that is, measures aimed at raising the level of social immunity to acute infections"<sup>1</sup>. In this regard, it is important to focus on the experience of the past on the current problem of diagnosis and prevention of infectious diseases. The epidemic situation in recent years regarding such infectious diseases as tuberculosis, measles, and diphtheria has been complicated. As with the dawn of the emergence of hygiene science, conditions must be created to make information about preventative care available to the general public. In the framework of the implementation of prevention programs must also take part in the power structures, because improving the environment as a whole is the basis of prevention of infectious diseases.

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<sup>1</sup> Tomilin S. A. (1931). *Sotsial'no-meditsinskaya profilaktika : teoreticheskoe obosnovanie i prakticheskaya postanovka* [Social-medical prophylaxis : theoretical ground and practical raising]. Khar'kov : Gosmedizdat, USSR, pp. 32–33. (in Ukrainian)

At the same time, the transfer of historical experience from generation to generation, which determines the progress of hygiene science, helps to creatively solve urgent problems of hygiene in order to create favorable and safe conditions of human life, improve the health of the population. That is why there is a need to turn to the history of the development of hygiene as a science and practical field of medicine, to use the techniques and some methodological approaches of scientific discoveries of the past in a new round of socio-economic development in connection with the emergence of new diseases of the 21<sup>st</sup> century.

In modern historiography, there is a considerable amount of scientific work devoted to certain aspects of the formation and development of hygiene in Ukraine, eg. Bazhan T. A., Paranko N. M., Karnaukha N. H.<sup>2</sup>, Hrynzovkyi A. M.<sup>3</sup>, Kotsyr N. I.<sup>4</sup> and others. At the same time, there is an acute shortage of works that reflect the characteristic features and ways of developing hygienic knowledge and sanitary practices and the background of social, economic and political challenges of the second half of the 19th – early 20th centuries.

In this connection, the purpose of this work is to highlight the prerequisites for the emergence, features of the formation and development of scientific foundations of sanitary and hygiene in the territory of Ukraine in the second half of the nineteenth – early twentieth century based on the application of general scientific principles of historical search (historicism, objectivity, systematicity, continuity, complexity, etc.) and systems of complementary methods (interdisciplinary and historical).

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<sup>2</sup> Bazhan T. A., Paran'ko N. M., Karnaukh N. (2005). *O gighiene i gighienistakh* [About a hygiene and hygienists]. Dnepropetrovsk : Zhurfond. (in Ukrainian)

<sup>3</sup> Ghrynzovskij A. M. (2005). *Systemnyj analiz stanovlennja i formuvannja medyko-profilaktychnogho fakul'tetu ta ghighijienichnoji nauky Nacional'nogho medychnogho universytetu imeni O.O. Boghomol'cja* [System analysis of formation and formation of the Faculty of Medicine and Prevention and Hygiene Science of the OO National Medical University The worshiper] (PhD Thesis), Kyiv: Kyjivskij nacional'nyj medychnyj universytet imeni O. O. Boghomol'cja. (in Ukrainian)

<sup>4</sup> Kocur N. I. (2011). *Stanovlennja i rozvytok ghighijienichnoji nauky v Ukrajinii: shljakh krizj epokhy i socialjni potriasinnja (drugha polovyna XIX – 20-i rr. XX stolittja* [Formation and development of hygienic science in Ukraine: a way through epochs and social upheavals (second half of XIX – 20th years of XX century: monograph]. Korsun'-Shevchenkivskij. (in Ukrainian)

## 1. Prerequisites for the formation of scientific foundations in sanitary and hygiene matter

In the development of hygienic thought, the formation of the scientific foundations of sanitary and hygiene business in the second half of the 19<sup>th</sup> century in Ukraine played a major role in the rapid development of the economy, the growth of production, which set new, increasingly complex tasks for science and society. The reform of the abolition of serfdom in 1861 contributed to the delamination of the countryside and the rapid development of capitalism. At that time, the number of industrial workers was growing rapidly. At the same time, harsh working and living conditions, working days of 12–15 hours a day in factories, the widespread use of women's and children's labor, poor living conditions where many workers lived in dugouts and barracks, lack of occupational safety contributed to high morbidity and injury. At some plants (for example, in Katerynoslav, Dniprodzerzhynsk), the incidence was 1626 per 1,000 workers, of which 34% were infectious. Injuries were very high, in particular, out of 1,000 cases a year, 750 had boilermakers<sup>5</sup>.

Poor working and living conditions have contributed to the spread of cholera, smallpox, and typhoid epidemics. The demands of the workers, their protests about the improvement of working and living conditions increased. It was at this time that various societies began to emerge, discussing these problems, giving recommendations on the elimination of sources of various epidemics. An important role in this played the Russian Society for Public Health (1878), which had 27 offices in different cities, published scientific and popular hygiene magazines<sup>6</sup>.

The Society for the Protection of Cities also dealt with the issues of water supply to cities, improvement of living conditions, food, and

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<sup>5</sup>Ighumnov S. M. (1957). Narys rozvytku zemsjkoji medycyny na Ukrajinii [Essay on the development of Zemsky medicine in Ukraine]. *Materialy do istoriji rozvytku okhorony zdorov'ja na Ukrajinii* [Materials on the history of health care development in Ukraine] / Pid red. K. F. Duplenka. Kyiv: Derzhavne medychne vydavnytvo URSO, pp. 124–168. (in Ukrainian)

<sup>6</sup>Zabludovskiy P. E. (1970). *Puti razvitiya obshchestvennoy meditsiny* [Ways of development of public medicine]. Moskva, pp. 71–73. (in Russian)

demanded the organization of laboratories for quality control of products. The health statistics were gradually accumulating, which contributed to the dissemination of health information.

The development of domestic medical science in the second half of the nineteenth century was closely linked to the socio-economic and political situation of Russia. The reforms of the 1860s, including in the health sector, played a positive role in contributing to the rapid economic development of the country. In the field of health care, the county's reform promoted the emergence and rapid development of a special form of public medicine, the so-called counties, which later became a model for urban and factory medicine. During this period, more favorable conditions for medical training and scientific activities were created.

On the basis of great achievements in the field of chemistry, physics and other fields of science, the preconditions for the development of experimental hygiene are created. It was in the second half of the nineteenth century that the work of eminent hygienists, who laid the foundations of national scientific hygiene, for the development of which was based on the achievements of natural science, took place in the Russian Empire.

From the first years of the organization of county medicine after the county reform of 1861, it became clear that medical treatment alone could not ensure the health of the population and the fight against epidemics.

A major event in the history of county medicine is the congress of provincial conventions of county doctors in the early 1870s. They were initiated by Tver county (1871), followed by other counties. In Ukraine – Kherson county (1874). In the early '80s of the 19th century, congresses were held in all 34 provinces. In 35 years the largest number of congresses took place in Moscow and Kherson provinces – 16 each.<sup>7</sup> Topical issues of public medicine, including the issue of establishing a health organization, were raised at the congresses. But the sanitary business was implemented with great difficulty as its tasks relied on

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<sup>7</sup> Kagan S. S. (1965). K stoletiyu zemskoy meditsiny na Ukraine [To the century of zemskoy medicine on Ukraine]. *Ocherki istorii russkoy obshchestvennoy meditsiny (K stoletiyu zemskoy meditsiny)* [Essays of history of Russian public mediny (To the century of zemskoy medicine)]. M.: Meditsina, pp. 85–86 (in Russian)

county medicine. Only in the course of development of medical establishments and improvement of medical business, there was a problem of training of hygienists, meaning district sanitary doctors.

The development of hygienic thought and sanitation in Ukraine was greatly influenced by the activities of the County Sanitary Organization, which dealt with statistics, the study of morbidity, physical development, and population migration.

In the 60s of the 19<sup>th</sup> century in Ukraine, the initiator of many sanitary measures was Poltava county, which in 1867 organized a permanent commission of social and hygienic orientation.

Among the prominent county sanitary doctors, organizers of sanitary affairs in Ukraine, an important role was played by M. I. Tiaziakov, O. V. Korchak-Chepurkivskiy (Kherson province), A. L. Smidovych (Katerynoslav province), M. I. Igumnov (Kharkiv province). Under their leadership, the sanitation organization has achieved considerable success. At the same time, the county doctors were the most progressive health doctors because they had to conflict with the authorities in order to improve the health status of the population<sup>8</sup>.

The main role in the dissemination of hygiene knowledge among the population in the early '80s of the 19<sup>th</sup> century played congresses and commissions at the Pyrogov Society. This commission from Ukraine included M. S. Uvarov – one of the leading theorists of county medicine organization – a tireless advocate of public medicine, who fought for the introduction of teaching public medicine – social hygiene and its inclusion in the curricula of higher medical school<sup>9</sup>.

For the dissemination of hygienic knowledge among the population, the society used various methods: hygienic education at school, publication, and distribution of popular literature, equipment of museums and mobile exhibitions, organization of lectures, readings, and conversations.

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<sup>8</sup> Kagan S. S. (1965). *K stoletiyu zemskoy meditsiny na Ukraine* [To the century of zemskoy medicine on Ukraine]. *Ocherki istorii russkoy obshchestvennoy meditsiny (K stoletiyu zemskoy meditsiny)* [Essays of history of Russian public medicine (To the century of zemskoy medicine)]. M.: Meditsina, pp. 88–89. (in Russian)

<sup>9</sup> Zabudovskiy Yu. P. (1991). *Istoriya meditsyny* [History of medicine]. Kyiv, pp. 329–330. (in Ukrainian)

M. S. Uvarov took an active part in the formulation and development of questions of medical statistics already at the 1<sup>st</sup> Pyrogov Congress of Physicians and essentially remained a recognized authority in these matters at all subsequent stages of the development of Russian public medicine.

The successor of sanitary and hygienic ideas of M. S. Uvarov was O. V. Korchak-Chepurkivskiy, who passed from county sanitary doctor of Kherson province to the academician of UAS. Working as a sanitary doctor, O. V. Korchak-Chepurkivskiy studies peculiarities of the development of diphtheria among the rural population based on the study of epidemics in the Kherson county from 1870 to 1889. The result of these studies was a monograph by O. V. Korchak-Chepurkivskiy “Materials for the study of the epidemic of diphtheria (epidemiology) in Russia” (1898), which he successfully defended at Kyiv University and received a doctorate in medicine<sup>10</sup>.

Thus, in 1886, a sanitary organization was formed in the Kherson region, which, along with Moscow, was considered the foremost in the Russian Empire. In their model, sanitary organizations were created in other provinces. The fight against epidemics was one of the main tasks of county doctors. Advanced county doctors in Ukraine – M. S. Uvarov, S. M. Igumnov, O. V. Korchak-Chepurkivskiy, M. I. Teziakov, and others became the initiators in the fight against epidemics.

Dissemination of hygiene knowledge among the population in all zemstvos was among the main tasks. In this work counties used mainly editions of the Pyrogov Society. Particularly widespread this work was in Kharkiv and Katerynoslav provinces. There were popular readings and conversations, popular postcards, etc. were distributed. Conducting such readings and conversations before 1906 was fraught with great difficulty. You could read only the brochures that had been published in advance, apart from general censorship, and also the special ones. These brochures had the right of the person who had obtained the

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<sup>10</sup> Igumnov S. M. (1957). *Narys rozvytku zemsjkoji medycyny na Ukrajinii* [Essay on the development of Zemsky medicine in Ukraine]. *Materialy do istoriji rozvytku okhorony zdorov'ja na Ukrajinii* [Materials on the history of health care development in Ukraine] / Pid red. K. F. Duplenka. Kyiv: Derzhavne medychno vydavnytstvo URSO, pp. 124–126. (in Ukrainian)

permission of the governor, under the control and responsibility of a special supervisor appointed by the director of public schools in a pre-determined room. In the following years, special lectures stood out and mobile exhibitions were created.

Thus, the formation and development of sanitary affairs during the Count Reform in Ukraine (1864–1917) took place in the difficult sanitary conditions of the tsarist regime and with great difficulty. But despite this, advanced county doctors, hygienists have made a significant contribution to the design and implementation of sanitary and anti-epidemic measures, public health education, control and prevention of infectious diseases.

## **2. Formation and development of hygiene science in universities**

Great importance in the development of hygiene ideas and knowledge in Ukraine had the opening in the 19<sup>th</sup> century of three universities: Kharkiv (1805), Kyiv (1834) with the medical faculty (1841) and Novorossiysk in Odesa (1865) with the medical faculty (1900)<sup>11</sup>.

In the development of university medical education, in the training of doctors in Ukraine a huge role belonged to the outstanding scientist, brilliant surgeon, teacher, and public figure M. I. Pyrogov. His scientific views and ideas were of great importance, especially during the period of his activity as guardian of the Odesa and Kyiv educational districts.

The opening of Kyiv University was of great importance for the development of medical science, culture, education. M. I. Pyrogov paid much attention to the activities of the Faculty of Medicine at Kyiv University: attended lectures, classes, promoted the implementation of preventive ideas, because he believed that the future belongs to preventive medicine.

There were no separate departments of hygiene during this period, but some of its sections were studied in the course of other disciplines (food hygiene was studied simultaneously with dietetics, the issue of combating the incidence of medical police). Increased interest in

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<sup>11</sup> Kryshchop B. P. (1985). *Vysshie meditsinskoe obrazovanie v Ukrainsskoy SSR* [Higher medical education in Ukrainian SSR]. Kyiv, pp. 51–52. (in Ukrainian)

occupational pathology and hygiene in connection with the development of industry, increasing the number of workers. An important role in this regard was played by the medical community.

From the second half of the 19<sup>th</sup> century, hygiene began to be regarded as a science, which should develop the basics of sanitary surveillance, which further contributed to its establishment as an important medical discipline.

The difficult economic and political situation, famine, epidemics, low cultural level contributed to the spread of morbidity and mortality. All this pushed the leading medical community to search for effective measures aimed at reducing the morbidity and mortality of the population, the urgent need to expand sanitary and anti-epidemic measures, dictated the expediency of the development of hygiene science.

The desire of the leading professors of the Faculty of Medicine of Kyiv University to solve urgent problems of medicine, was reflected in the speech of one of the students and followers of M. I. Pyrogov, Professor of Anatomy O. P. Walter (30.08.1886) on the theme: “On the Importance of Medicine for Russia”, in which he stated that it was not clinical medicine but public hygiene that should play a leading role in the public health system, and its development and wide practical application was one of the important tasks of state power. O. P. Walter suggested a number of specific measures aimed at raising hygiene to a level that would help to achieve its goals. Among the first, he calls the improvement of teaching hygiene in universities and teaching it in close connection with physiology, raises the question of the need for the organization of independent departments and points to the expediency of the division of the medical faculty into two departments – clinical and hygienic. Noting the state of hygiene teaching at Russian universities, O. P. Walter noted that public hygiene is taught only at the St. Volodymyr University in Kyiv<sup>12</sup>.

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<sup>12</sup> Barannik P. I., Benyumov R. Ya., Makarenko I. M. (1962). V. A. Subbotin – organizator i rukovoditel’ pervoy kafedry gigheny na Ukraine [V. A. Subbotin is an organizer and leader of the first department of hygiene on Ukraine] *Materialy k istorii gigheny i sanitarii na Ukraine* [Materialy to istorii gigheny I sanitarii na Ukraine] / pod red. D. N. Kalyuzhnogo, A. A. Grando. Kyiv, pp. 264–277. (in Ukrainian)



In the 50s of the 19<sup>th</sup> century at Kyiv St. Volodymyr University has already been taught many aspects of hygiene knowledge, but the main methods of research were mainly descriptive – demographic and epidemiographic.

In the 60s of the 19<sup>th</sup> century due to the rapid development of the economy, high concentration of population in cities, deteriorating sanitation, epidemics hygienic issues are becoming relevant among many scientists. Of particular importance was the widespread adoption of experimental methods in scientific research. The Kyiv Society of Physicians also attached great importance to this, at which the issue of the importance of teaching hygiene in educational institutions was heard (L. A. Marovskiy, 1864). And although the creation of the Department of Hygiene at Kyiv St. Volodymyr University had been planned since 1865 and began to function only in 1871. Its founder was a talented scientist, hygienist V. A. Subotin<sup>13</sup>.

Based on the achievements of various branches of science, medicine of the second half of the nineteenth century has moved to the scientific-experimental method of cognition. Numerous experimental studies have proven the need for and relevance of teaching students new principles and methods of preventive measures to effectively combat the causes of diseases. With the formation of hygiene, as an independent branch of medicine, immediately the question of training specialists in the preventive direction of domestic medicine immediately raises.

One of the first was recognized by the German School of Hygienists, where Max Pettenkofer (1818–1901) rallied around like-minded people and organized the most powerful hygienic institution of the time, which first worked as a department of hygiene, and then as the Hygienic Institute in the Munich University<sup>14</sup>. Today it is one of the leading scientific institutions in Germany, called the Institute of Microbiology and Hygiene named after Max von Pettenkofer of the Munich University.

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<sup>13</sup> Kocur N. I. (2011). *Stanovlennja i rozvytok ghigijenichnoji nauky v Ukraini: shljakh krizj epokhy i socialjni potrasinnja (drugha polovyna XIX – 20-i rr. XX stolittja* [Formation and development of hygienic science in Ukraine: a way through epochs and social upheavals (second half of XIX – 20th years of XX century: monograph]. Korsunij-Shevchenkivskij, pp. 407–408. (in Ukrainian)

<sup>14</sup> Bazanov V. A. (2009). Maks Pettenkofer i russkie gigienisty [Max Pettenkofer and Russian hygienisty]. *Gigiena i sanitariya*. № 5. pp. 41–44. (in Russian)

The first generation of Russian hygienists has been trained at the University of Munich under the direction of M. Pettenkofer. It should be noted that the first student from the territory of Ukraine was a graduate from the St. Volodymyr University in Kyiv, Doctor of Medicine V. A. Subotin.

During his stay abroad, along with his scientific work, V. A. Subotin thoroughly studied the method of teaching hygiene at Western European universities, in particular in Munich, where M. Pettenkofer taught hygiene. He also purposefully studied the formulation of teaching hygiene in Paris, where he also gave lectures by the famous French chemist Wurts. He also attended the relevant course in Berlin. The range of scientific issues that V. A. Subotin has worked extensively abroad in the laboratories of various Western European scientists, and has been extremely diverse. They touched upon the problems of physiology and pathology, general issues of hygiene, food hygiene, communal hygiene, military hygiene, sanitary statistics, organization of sanitary affairs, and epidemiology.

Thus, in assuming the duties of Head of the Department of Hygiene, V. A. Subotin had a broad scientific outlook both in the field of hygiene and in other areas of theoretical and clinical medicine.

Like most domestic hygienists, Professor V. A. Subotin was not limited to an academic audience. In trying to give the hygienic aspects of the work a public character, he closely associates it with hygienic laboratories and a practical sanitation organization. An important point in improving the educational process was the more active involvement of students in scientific work. Special rules were issued at Kyiv University and subsequently spread to other universities in the Russian Empire, which defined the forms of student participation in scientific work. They consisted of conducting research under the guidance of professors in the clinics and laboratories in the university.

Professor V. A. Subotin constantly sought to increase the hours of study in the course of hygiene, the introduction of compulsory practical classes, equipment of the laboratory, the allocation of funds for the purchase of visual aids, the increase of educational facilities, etc. Thanks to V. A. Subotin's persistence was made some progress in the development of this department already at the stage of its formation. Topical issues of development of the department of hygiene were reflected in V. A. Subotin's note "On expanding the teaching of

hygiene in Russian universities”, which was presented to the Faculty of Medicine and published in the journal “Health”. “Public hygiene,” V. A. Subotin wrote, “has taken more than a secondary place in higher medical education for a very long time. The same secondary place of hygiene was occupied in the field of public health”<sup>15</sup>.

In the first years of the pedagogical activity, V. A. Subotin and other leading hygienists of the country had the task of great educational and methodological weight – to create original manuals and textbooks for domestic medical faculties. Simultaneously with the textbooks of such prominent Russian hygienists, such as F. F. Erisman and A. P. Dobroslovain, V. A. Subotin in 1882 published his “Short Course in Hygiene”<sup>16</sup>.

Analyzing the content of this textbook, we should note the scientific substantiation of V. A. Subotin the subject, goals, and tasks of hygiene. While denying the views of some of his predecessors that hygiene does not exist as an independent science, he notes that “thanks to the works of famous scientists – European hygienists – Petenkofer, Parkes, Levi, Merkel, J. Simon, and others., was a scientific path to this young, but not yet well-developed, field of knowledge that pursued its mission. It is hygiene designed to develop the area of knowledge that has the most powerful impact on physical well-being and human development. Since physiology, pathology, and statistics have taken a proper place in the study of hygiene, it has begun to acquire scientific foundations”<sup>17</sup>.

For the first time in his “Short Course in Hygiene”, V. A. Subotin shows the relationship of hygiene with other sciences. In particular, he notes that hygiene uses knowledge from every field of science.

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<sup>15</sup> Subbotin V. A. (1882). O rasshirenii prepodavaniya gigeny v russkikh universitetakh [About expansion of teaching of hygiene in Russians of universitetakh]. *Zdorov'ye*. № 10 (178) (okt.). pp. 231–254. (in Ukrainian)

<sup>16</sup> Subbotin V. A. (1882). *Kratkiy kurs gigeny profesora universitetu sv. Vladimira (sostavlenn pri sodeystvii studentov 5-go kursa meditsinskogo fakul'teta)* [Short-story course of hygiene to the profesora university sv. Vladimira (made at an assistance the students of 5th course of medical faculty)]. Kyiv : Tip. K. N. Milevskago. (in Ukrainian)

<sup>17</sup> Orlov V. D. (1899). Viktor Andreevich Subbotin, kak uchenyy i professor [Victor Andrey Subbotin, as scientist and professor]. *Universitetskie izv.* № 2, pp. 246–259. (in Ukrainian)

Accordingly, the entire body of knowledge is used by hygiene to address issues affecting human life and health. At the same time, natural sciences (physiology, physics, chemistry, medical geography, meteorology) play a paramount role, since they contribute most to the correct understanding of the conditions affecting human health. In addition to the natural sciences, when addressing certain social issues, hygiene refers to social sciences such as statistics, history, political economy, which help it to draw conclusions about the health of society as a unit. It should be noted that the most important role in the development of public hygiene V. A. Subotin assigns a statistical method of research. “Without it, – writes V. A. Subotin, – hygiene would never go beyond private dietetics and sanitary police would never rise to the level of public hygiene in the broad sense of the word”<sup>18</sup>.

Continuation of “Short Course of Hygiene” was issued by V. A. Subotin in 1883 “Notes on Hygiene. Issue 1.”, which outlined methods of practical study of air hygiene<sup>19</sup>. “Notes” also include a section on soil hygiene. In the same year, the “Hygiene Notes” were published lithographically, covering the issues of water hygiene and water supply. In 1884, two more issues of the “Notes on Hygiene” were published, covering other sections of the course on hygiene.

Therefore, the decisive role in the formation of the scientific foundations of hygiene in the second half of the nineteenth century had significant advances in the field of natural sciences (physics, chemistry, biology, physiology, microbiology). This contributed to the transition of hygiene from descriptive to experimental and its formation as an independent scientific field.

Faculty of Medicine, Kyiv st Volodymyr University, wherein 1865 was created one of the first in the Russian Empire independent departments of hygiene, belonged to a special role in the development of domestic hygiene science thanks to the prominent scientists-hygienists, in particular, V. A. Subotin. It was he who founded the

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<sup>18</sup> Subbotin V. A. (1882). *Kratkiy kurs gigeny profesora universitetu sv. Vladimira (sostavlenn pri sodeystvii studentov 5-go kursa meditsinskogo fakul'teta)* [Short-story course of hygiene to the profesora university sv. Vladimira (made at an assistance the students of 5th course of medical faculty)]. Kyiv : Tip. K. N. Milevskago, pp. 269–270. (in Ukrainian)

<sup>19</sup> Subbotin V. A. (1883). *Zapiski po gigenie* [Messages on a hygiene]. Vyp. 1. Kyiv. (in Ukrainian)

Department of Hygiene at Kyiv St Volodymyr University, whereas a student and a follower of the prominent German scientist-hygienist, founder of scientific hygiene M. Pettenkofer, at a new scientific-theoretical and methodical level he created the concept of sanitary-hygienic education in universities of the Russian Empire.

Ideas of deepening and differentiation of teaching of hygienic science at Kyiv St Volodymyr University were embodied by the followers of Professor V. A. Subotin.

Professor V. D. Orlov, who headed the department in 1893–1914, succeeded in significantly improving the method of teaching hygiene. In 1894, his request to expand the teaching of hygiene was met, and he introduced practical hygiene training as a mandatory component of the educational process. From next year, he organizes field trips to get acquainted with the activities of the main sanitary institutions of the city. In 1905, Professor V. D. Orlov publishes “A Guide to Practical Occupational Hygiene and Medical Policing,” which introduces students to basic methods of hygiene research and is used as one of the basic textbooks. During the teaching of hygiene in practical classes, each trainee had to master all the techniques that were known at that time. “At the same time, it is necessary that the method is simple, accessible and facilitated to obtain the expected results,” – said V. D. Orlov in the manual <sup>20</sup>. In the section “General methods of sanitary researches” Professor V. D. Orlov points out the necessity of applying simpler methods by choosing scientifically proven methods and involving a large number of objects in the sanitary examination with the use of some methods of research.

Thus, Professor V.D. Orlov had great credit for developing practical hygiene classes and introducing them into the educational process.

Scientific advances in hygiene in the early 20<sup>th</sup> century and their practical implementation formed the basis for the writing by Professor V. D. Orlov of a series of brochures “An overview of the successes of

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<sup>20</sup> Orlov V. D. (1905) *Posobie k prakticheskim zanyatiyam po gigiene i meditsinskoy politzii dlya studentov meditsinskogo fakul'teta Imperatorskogo Universiteta sv. Vladimira* [Manual to practical employments on a hygiene and medical police for the students of medical faculty of Emperor's University sv. Vladimira]. Kyiv:Tipografiya Imeratorskogo U-ta sv.Vladimira, pp. 25–26. (in Ukrainian)

hygiene” (1902, 1903, 1904, 1905, 1907, 1908). The brochures analyze the publications of both domestic and foreign scientists in the field of hygiene.

In 1903, a private-associate course in epidemiology and sanitary statistics was organized at the base of the department for students of 4 and 5 courses. The emergence of the training course was due, first of all, to a high level of infectious disease, epidemics that periodically appeared in the late 19<sup>th</sup> – early 20<sup>th</sup> centuries. All this led to the need for the scientific development of epidemiology and teaching students the basics of infectious diseases.

In 1903, V. D. Orlov invited O. V. Korchak-Chepurkivskiy – known for his socio-medical and statistical studies of the epidemiologist and hygienist to read courses in epidemiology and medical statistics. Thus, during this period the Department of Hygiene consisted of a professor, Dr. V. D. Orlov, who taught hygiene, medical and veterinary police and teaching about epizootic diseases, as well as a private docent, Doctor of Medicine O. V. Korchak-Chepurkivskiy, who read the newly introduced courses<sup>21</sup>.

A prominent role in the development of hygiene science belongs to the first in the territory of Ukraine Kharkiv University. With the opening of the Faculty of Medicine, the process of forming the departments of both medical and preventive care began.

In the development of hygiene science of the 19<sup>th</sup> – beginning of the 20<sup>th</sup> centuries, two historical periods should be distinguished at Kharkiv University: the first is the teaching of hygiene by specialists of different branches of medicine at the combined departments (1806–1871); the second since 1872 was the creation of an independent department of hygiene and the formation of its scientific foundations by hygienists.

The formation of domestic hygiene science in the second half of the nineteenth century is associated with the names of such prominent scientists, professors of Kharkiv University as A. I. Yakobii

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<sup>21</sup> Kocur N. I. (2011). *Stanovlennja i rozvytok ghyghijenichnoji nauky v Ukrajinii: shljakh krizj epokhy i socialjni potrijasinnja (drugha polovyna XIX – 20-i rr. XX stolittja* [Formation and development of hygienic science in Ukraine: a way through epochs and social upheavals (second half of XIX – 20<sup>th</sup> years of XX century: monograph]. Korsunj-Shevchenkivskij, pp. 447–448. (in Ukrainian)

(1837–1907) and I. P. Skvortsov (1847–1921). By learning about the scientific outlook of these scientists and the level of science at the time, one can better understand and evaluate their theoretical concepts and practical activities.

It should be noted that the creation of public hygiene was one of the important stages in the development of hygiene science of this period. Hygienists have regarded human beings in an integral part of society, in close connection with the factors that affect them in the context of social development. A. I. Yakobii and I. P. Skvortsov belong to a cohort of scientists – hygienists of the second half of the nineteenth century, who understood the importance of the social factor and developed hygiene as a social science. In their scientific works and lectures, scientists have propagated this idea.

The hygiene course taught by A. I. Yakobii at Kharkiv University contained many sections. His lectures, published in 1885, have been preserved. The course of lectures is written by hand and reproduced in a limited number in a lithographic manner. This unique textbook has been preserved at Kharkiv Library named after V. G. Korolenko and is of exceptional scientific interest. The manual is published by the lecturer A. I. Yakobii under the title “Course of public hygiene”<sup>22</sup>.

Professor A. I. Yakobii manual “The course of public hygiene” covered the development of hygiene science and its implementation in practice in the second half of the nineteenth century. Professor I. P. Skvortsov improved the technique of teaching hygiene at the department and strengthened the experimental component of scientific work. His fundamental work, “Fundamentals of Hygiene and Hygiene,” first covered the doctrine of the essence of life as a unity of man and environment, which played a decisive role in the development of hygiene science in the early twentieth century.

The followers and students of Professor I. P. Skvortsov in the 20’s of the 20<sup>th</sup> century – Ya. M. Zilber, A.A. Tsvetaiev, V.O. Uglov expanded the scope and content of hygiene knowledge, laid the foundations for differentiation of hygiene into different branches – social hygiene, communal hygiene, occupational hygiene, nutrition

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<sup>22</sup> Yakobiy A. I. (1885). *Kurs obshchestvenoy gigeny (napisano vid ruki, rozmnozhenno litografichnim sposobom)* [Course of obshchestvenoy hygiene (otd hands are written, rozmnozhenno by a lithographic method)]. Khar’kov. (in Ukrainian)

hygiene and determined the direction of further research on topical issues of hygiene science and practice.

Therefore, a significant contribution to the development of domestic hygiene, the establishment and development of the first hygienic departments of the second half of the nineteenth century made by the hygienists of Kharkiv University – A. I. Yakobii and I. P. Skvortsov. They should be considered the founders of Ukrainian hygiene science, which by that time became experimental hygiene, and its foundation – the development of natural sciences.

The formation of the scientific foundations of hygiene and sanitation at Novorossiysk University was closely linked to the creation in 1903 of the Department of Hygiene at the Faculty of Medicine under the direction of Professor H. V. Khlopin.

In his scientific and pedagogical activity, H. V. Khlopin developed the ideas of the outstanding hygienists F. F. Erisman and A. P. Dobroslavin. According to the scientist, preventive medicine and public hygiene, the central object of which is a human being, should play a significant role in the development of health care.

The development of hygiene science H. V. Khlopin considered in close connection and mutual influence of research work and practice, their subordination to the tasks of health care. The scientist was convinced that the research should combine experimental analysis and rigorous scientific verification of all the facts that would form the basis for practical activities and the emergence of new scientific concepts.

Particularly noteworthy is the position put forward by H. V. Khlopin on the interrelation of phenomena and the need for the hygienist to study both the person and the conditions that surround him. Accordingly, under external conditions, he understood not only the surrounding nature but also the cultural environment and the social environment. “To exclude a social factor is to take the soul out of hygiene,” H. V. Khlopin emphasized<sup>23</sup>.

Most of the provisions in H. V. Khlopin’s scientific works are widely used in modern hygiene and medicine in general.

The hygienist, according to Professor H. V. Khlopin, must have mastered the statistical, physicochemical and physiological methods of

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<sup>23</sup> Khlopin G. V. (1921). *Osnovy gigheny* [Bases of hygiene]. Moskva, pp. 94–95. (in Russian)



research necessary for solving scientific and practical problems. At the same time, he pointed to the complex nature of sanitary and hygienic research. This provision was repeatedly emphasized in the Soviet period at the Pavlovsk Physiological Session of the USSR Academy of Sciences in 1950 and at congresses of hygienists.

In the Odessa period of scientific and pedagogical activity of H. V. Khlopin, the philosophical, prognostic approach of the scientist to the prospects of development of hygiene and the importance of sanitary-hygienic researches in the life of society were determined. Even at the dawn of modern hygiene, H. V. Khlopin drew attention to the sanitary protection of reservoirs and especially the coastal waters of the Black Sea. Along with the elucidation of the processes of self-purification and the study of the influence of harmful substances on living organisms of the sea, the fundamental importance of H. V. Khlopin's works was that he experimentally studied the factors of water pollution, applied not only sanitary-chemical but also bacteriological and sanitary – toxicological research methods.

Hygiene scientists of Novorossiysk University (H. V. Khlopin, A. I. Rammul, K. E. Dobrovolskyi, K. K. Bogoliubov, N. F. Galanin, I. D. Kuptsys, V. A. Uglov, V. A. Yakovenko, etc.), in the late 19<sup>th</sup> – early 20<sup>th</sup> centuries, the scientific foundations of such preventive directions in medicine as communal hygiene, nutrition, military hygiene, school hygiene, etc. were laid. Hygienists in scientific development, on the one hand, took into account the latest achievements of European hygiene science, on the other – regional, historical, cultural, natural features that influenced the living and working conditions of the multinational population of the Russian Empire. The discoveries and scientific achievements of the scientists of the Department of Hygiene of Novorossiysk University were implemented in practical medicine, and the experimental researchers were directly involved in addressing the urgent needs of social health<sup>24</sup>.

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<sup>24</sup> Kocur N. I. (2011). *Stanovlennja i rozvytok ghghijienichnoji nauky v Ukrajinii: shljakh krizj epokhy i socialjni potrijasinnja (drughha polovyna XIX – 20-i rr. XX stolittja* [Formation and development of hygienic science in Ukraine: a way through epochs and social upheavals (second half of XIX – 20th years of XX century: monograph]. Korsunj-Shevchenkivskij, pp. 511–512. (in Ukrainian)

Thus, the leading role in the development of hygiene science in the second half of the nineteenth – early twentieth century was played by the progressive views of scientists on finding ways to reduce morbidity and mortality precisely through the introduction of hygiene measures, the need for the organization of independent departments of hygiene, special training for sanitary and sanitary doctors.

## **CONCLUSION**

The formation of the scientific foundations of sanitary and hygienic matter in the territory of Ukraine began with county medicine, which had not only medical but also sanitary and prophylactic orientation. The development of county medicine at a certain stage led to the emergence of a special sanitary organization, created a favorable ground for the combination of medical and preventive work.

The analysis of the county period of development of the sanitary and hygienic matter shows, first, the variety of issues that the counties in the sanitary plan (from sanitary statistics to the medical case) took care of; second, it differs in depth from the theoretical understanding of the practical tasks to be solved (from sanitary descriptions to research). Overcoming objective and subjective obstacles to the development of the sanitary and hygiene business, county doctors made invaluable sanitary and hygienic, anti-epidemic, educational contributions to the prevention and control of infectious diseases.

An important role in the formation and development of hygiene science was played by the departments of hygiene of universities of the Russian Empire – Kyiv St. Volodymyr, Kharkiv and Novorossiysk. Despite the existing socio-economic and political obstacles, Kyiv St. Volodymyr University became a leader in the development of domestic hygiene science, having created in 1865 the first hygiene department in the Russian Empire. Through the efforts of the head of the department, Professor V.A. Subotin, in sharp discussions of scientific circles of hygiene, she was distinguished into an independent scientific branch on health and disease prevention.

Departments of hygiene in its formation and development have passed several stages: from transitional – the proclamation of formation and artificial association in one structural subdivision of disciplines of different branches of medical science, to the proper hygienic

department with a set of training courses, which in some modified form have reached our days were staffed by specialist hygienists.

The creation of hygiene departments was based on the latest achievements of foreign medicine. The heads of the departments and the leading teachers were trained in the most famous scientific centers of France, Germany, the USA, where they adopted the scientific experience and organizational principles of building a sanitary and hygienic case, which they introduced at home.

An important feature of scientific life was the publication of a series of textbooks and manuals on hygiene by V. A. Subotin, V. D. Orlov, A. I. Yakobii, I. P. Skvortsov, H. V. Khlopin, which for a long time remained methodological and methodical facilitated the qualitative preparation of hygienists at the medical faculties of the Kyiv St. Volodymyr University, Kharkiv and Novorossiysk Universities.

## **SUMMARY**

The proposed article reveals the prerequisites for the formation and development of scientific foundations of sanitary and hygiene in the territory of Ukraine in the second half of the nineteenth – early twentieth century. These issues are important in the process of reforming the national health care system and improving prevention technologies.

In the course of the research, qualitative changes in structural and organizational components of hygienic science in the process of its formation and development, mutual influences and contradictions of county, university, scientific and public social medicine, personal measurement of scientific results, positioning of national hygienic science on the background of social, economic and political challenges of the second half of the nineteenth – twenties of the twentieth century. The process of formation of hygiene science as a social phenomenon, which, on the one hand, influenced the development of society, and, on the other, changed itself under the influence of political, economic and socio-cultural factors. The role of the scientist-hygienist in society from the perspective of the moral and ethical portrait of the era in which he lived and carried out scientific research is revealed, his social responsibility for human health is determined.

An important place in the mentioned research is given to the contribution of the first universities in Ukraine – Kyiv St. Volodymyr,

Kharkiv and Novorossiysk in the formation and development of hygiene science. The process of establishing independent departments of hygiene at medical faculties is revealed, the contribution of scientists of hygienists – V. A. Subotin, V. D. Orlov, O. V. Korchak-Chepurkivskiy, A. I. Yakobii, I. P. Skvortsov, H. V. Khlopin in providing educational and methodological support at the departments of hygiene, training of hygienists, creation of the first domestic textbooks and manuals on hygiene.

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