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(continued on page vi)

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Vladimir Mikhailovich Bekhterev (1857-1927). These scientists, who saw mental activity as the product of mechanical neural systems and conditioned reflexes, sought to study externally observable behaviors. Chelpanov derided behaviorism or reflexology, as it came to be called, as superficial, overly reductionistic, and even dilettantish. He believed that absent a priori philosophizing, behaviorism threatened to turn psychology into a mere mechanical trade. Chelpanov publicly sparred with the educational psychologist Alexandr Petrovich Nechaev (1870-1948), declaring psychology a young science whose purity and public standing were threatened by those quick to derive general theories of behavior or apply psychology's lessons to other fields, such as education.

In 1907 Chelpanov returned to Moscow University, taking over the chair of philosophy held by the late Sergei Nikolaevich Trubetskoi (1862-1905). After visiting Germany and the United States in 1910 and 1911 to study psychological facilities, Chelpanov informally established the Institute of Experimental Psychology at Moscow University in 1912. The institute, named after its patron, art dealer S.I. Shchukin, officially opened in 1914 with Chelpanov as its director. The second of its kind in Russia, after the St. Petersburg Psycho-Neurological Institute founded by Bekhterev in 1908, it was better equipped than any in Europe. The hallmark of the Institute was Chelpanov's insistence that his students gain a thorough grasp of the underlying philosophical questions before tackling the scientific problems of the field.

The Bolsheviks' accession to power in 1917 presented Chelpanov with a dilemma. Though he supported the new government's educational and social reforms, he rejected its efforts to assert ideological and political control of scientists and philosophers. As a result he steadfastly refused to support the Bolsheviks, even as some younger researchers began to introduce a brand of psychology based on Marxism. In an environment increasingly hostile to intellectuals who did not toe the line, Chelpanov's own intellectual development complicated his situation in the 1910s and early 1920s as he drew closer to the Würzburg school and its emphasis on introspection.

The showdown over the emerging lines of Soviet psychology sharpened in January 1923 at the First All-Russian Psychoneurological Congress, where Chelpanov engaged in a sharp debate with one of his students, Konstantin Nikolaevich Kornilov (1879-1957). Later Soviet scientists and historians maintained that Kornilov, who promoted an explicitly Marxist approach to psychology called reactology, won the debate by popular acclaim. In truth, he conceded most of Chelpanov's technical points, while loudly denouncing Chelpanov as a bourgeois reactionary. Soviet authorities concurred, and in November 1923 Chelpanov was replaced as director of the institute and chairman of philosophy at Moscow University by his erstwhile student.

Toward the end of his life Chelpanov retreated further into psychological idealism, adopting a position similar to Edmund Husserl's phenomenology. Psychologists, Chelpanov believed, should study pure consciousness, free from all

physical and verbal stimuli. Relegated to the shadows because of his rejection of Bolshevik politics and Marxist science, his death in 1936 went largely unnoticed. Although Chelpanov's works on philosophy and psychology passed out of print in the 1930s, he was not forgotten entirely. When Soviet universities revived the teaching of logic in the late 1940s, publishers rushed a late edition of Chelpanov's textbook on the subject into print.

In terms of his own scientific contributions Chelpanov is rightfully overshadowed by his rivals Pavlov, Bekhterev, and Nechaev. His real significance, in which he rivals any Russian scientist of his day, was as a teacher. As director of the Shchukin Institute and professor of philosophy and psychology, he educated the first generation of Soviet psychologists, including Kornilov and the more sophisticated Pavel Petrovich Blonsky (1884-1942), Nikolai Aleksandrovich Rybnikov (1880-1961), and Anatoly Alexandrovich Smirnov (1894-1980). Although Chelpanov rejected materialism and refused to employ Marxist modes of thought, his emphasis on the philosophical roots of psychology ironically equipped many of his students to find their own philosophical and ideological accommodations in the 1920s. Under his tutelage a cohort of experimental psychologists emerged who had both the philosophical bent and methodological rigor to set about creating Marxist psychology in the 1920s and early 1930s.

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Randall D. Law

CHEMISTRY IN RUSSIA AND THE SOVIET UNION. A physical science as it developed in Russia and the USSR.

At the beginning of the eighteenth century it was quite difficult to define chemistry as a field of natural philosophy anywhere in Europe, and Russia was no exception. The study of the properties and reactions of various substances is an area of intense investigation since antiquity, but the separation of what was to become a rigorous experimental branch of the natural sciences apart from the separate trends of learned alchemy, popular alchemy, Paracelsian medicine, apothecaries' practices, mining, and practical trades such as gunpowder production was not yet accomplished. At the accession of Tsar Peter the Great (r. 1682-1725), while there existed a disorganized collection of apothecaries, metallurgists, paper and gunpowder manufacturers, and other tradesmen later classified under the general rubric of chemistry, the science proper had not taken root in Russia yet. It only recently did so in the late seventeenth century in western and central Europe.

The introduction of chemistry to Russia was largely the product of Peter's founding of the Imperial Academy of Sciences in St. Petersburg in 1725 and the importation of European savants to serve as academicians and professors at the accompanying, but short-lived university. Chemistry was one of the original ten fields specified by Peter's project for the Academy of Sciences, and the science has

maintained a presence at the institution through all of its turbulent incarnations. Perhaps partly because of the strong associations of chemistry with pharmacy and medicine, academicians in this field produced works of far less import than their counterparts in sciences such as mathematics or astronomy. It was only in the late nineteenth century, when chemistry became the dominant science in all strata of the Russian intellectual hierarchy, that academicians in chemistry were as distinguished as their peers.

Because recruitment of a competent chemist who was willing to relocate to the infant city of St. Petersburg was so difficult, the academy settled for Michael Burger, a Baltic German, as its first chemist in September 1725. He died in late July 1726 after falling off a carriage, allegedly while drunk. His replacement was Johann Georg Gmelin (1709-1755), a young medical doctor with credentials from Tübingen and a member of a distinguished scientific family that left its imprint on chemistry for the next hundred years. Gmelin was first appointed as a curator at the academy, but two significant publications, now believed to be based on his father's earlier experimental work in Stockholm, led to his election to the post of academician in 1731. Gmelin spent 1733-1743 on the Great Northern Expedition to Siberia, where he mostly engaged in botanical and ethnographic researches. He resigned upon his return, once again vacating the chemistry post which seemed perpetually difficult to fill.

Essentially all later Russian and Soviet histories of chemistry date the dawn of a truly Russian tradition in the science to the work of Mikhail Vasilievich Lomonosov (1711-1765). Lomonosov is widely known as the first native Russian academician, the founder of Moscow University, and the composer of a canonical body of Russian lyric poetry. His claim as a distinguished chemist rests on much shakier ground, to say nothing of his failure to establish a tradition of chemistry through disciples. Lomonosov did expend a great deal of his seemingly boundless energy on chemistry, metallurgy, and allied sciences, including the construction of a fully-equipped chemical laboratory at the Academy of Sciences on Vasilievsky Island in St. Petersburg. Still his claims to original discoveries are in fact quite limited despite his own protestations and those of later historians.

Like many other native Russian academicians throughout the next hundred years, yet unlike the professors of chemistry at the universities, who were largely from noble stock until the advent of Mendeleev's generation, Lomonosov was not a member of the nobility (dvorianstvo). He attended the gymnasium and university of the Petersburg Academy of Sciences and was an adjunct of chemistry there from 1742 until his promotion to full academician upon Gmelin's resignation in 1745. Before this promotion Lomonosov went abroad to study with Christian Wolff (1679-1754) in Marburg. His study in Germany was part of a longstanding tradition that remained central to Russian chemical education until the late nineteenth century. Wolff, a disciple of Gottfried Wilhelm Leibniz (1646-1716), taught Lomonosov widely in natural philosophy but studiously avoided inculcating the young Russian with aspects of Newtonian thought, which left a detrimental impact on the latter's research. Lomonosov's early publications in chemistry in Latin

received severe criticism in western Europe. He eventually refrained from publishing and, several years before his death, even from research. Lomonosov is often cited as the formulator of the concept of conservation of mass, that matter is neither created nor destroyed in chemical or physical reactions and therefore the amount of products must exactly balance the amount of reactants, a doctrine almost universally attributed outside Soviet historiography to Antoine-Laurent Lavoisier (1743-1794). While he did engage in some valuable chemical experimentation, Lomonosov's work was largely ignored, and his energy was often dissipated in his myriad other activities. His largest contribution was his effort to construct a chemistry laboratory at the academy, but even this did not survive him for very long, as it quickly fell into disuse and disrepair and was dismantled in the 1780s.

The story of chemistry in imperial Russia from the age of Lomonosov to the birth of the Soviet Union is one of the gradual decline of the academy as the central location of chemical activity and the corresponding rise of alternative sites, mostly universities, and the rise in the importance of laboratories of the chemical industry in the latter half of the nineteenth century. The first university to herald this transition was Kazan University, founded in 1804, which was unquestionably the center of chemical knowledge in the Russian Empire until the 1860s when it was eclipsed by St. Petersburg University. Although not the first chemist at Kazan, the founder of its chemical tradition was Nikolai Nikolaevich Zinin (1812-1880). Zinin had no particular interest or training in chemistry in 1835, when the holder of the chair in chemistry was let go pursuant to that year's new University Statute and Zinin was pushed by the physico-mathematical faculty to take on the task of educating himself in chemistry despite his formal training in mathematics. He was sent abroad in this process of re-education, spending significant research time in Berlin, Giessen, and Paris, and visiting several other countries. Upon his return he began a series of experiments in organic chemistry that later led to remarkable discoveries that gained him a prominent European reputation. He also trained Aleksandr Butlerov in Kazan and after 1847 moved to the Military-Medical Academy, later the Military-Surgical Academy, in St. Petersburg, eventually rising in the 1860s to a chair (kafedra) at the Academy of Sciences. In Petersburg his legacy of training continued as did his substantial original researches.

While there was a continuous, though faint chemical tradition since the formation of the Academy of Sciences, there was an undoubted explosion in the number and diversity, both geographical and topical, of chemists and chemical works beginning in the 1860s and continuing at this elevated level until the collapse of the Soviet Union. Until the Soviets reversed it, the trend in chemistry was towards the rise of university-based science with a heavy emphasis on teaching and research combined, as opposed to the academy's separation of these two functions. The expansion of the number of chemists was largely driven by the tsarist state's interest in technical modernization after its defeat in the Crimean War in 1855, which influential individuals in the Ministry of Finance and the Ministry of Education, among others, blamed on inadequate domestic technical expertise.

The plan for expansion was written into the liberal University Statute of 1863. Instead of importing new institutions and scholars as Peter the Great had done, talented postdoctoral and graduate students were sent abroad, most of them on government stipends, to study at the major educational centers of Germany and France. The majority of Russian chemists sent abroad in the 1860s selected Heidelberg as their destination. Paris was the second most popular destination. At Heidelberg they worked more with the younger chemist Emil Erlenmeyer (1825-1909) than with luminaries such as Robert Wilhelm Bunsen (1811-1899), Gustav Kirchhoff (1824-1887), and Hermann von Helmholtz (1821-1894), who were also responsible for the attractiveness of Baden as an educational center. While abroad, several of these chemists, especially Dmitry Ivanovich Mendeleev (1834-1907), Aleksandr Porfirievich Borodin (1833-1887), who is better known from his later vocation as a composer, and physiologist Ivan Mikhailovich Sechenov (1829-1905) began to appreciate the value of organized chemical meetings and mutual interactions. In the later 1860s these Heidelbergers, along with chemists who had remained in the capital, interacted to establish the new institutions of Russian chemistry.

There were two main transformations beginning in the 1860s, both of which left distinctive characteristics which permanently shaped the development of chemistry in Russia. The first of these changes was institutional. The interest in expanding postdoctoral education by sending young chemists to Germany was conceived as temporary. Upon their return these scientists filled posts at the major education institutions of Russian cities, following the expansion of science faculties at universities according to the University Statute of 1863 and the proliferation of agricultural and technological institutions. As an increasing number of students began to study chemistry, graduate education expanded, and chemists recognized a need to replicate many of the professional structures available in the west. For example, since the only previous attempt at publishing a chemical journal in Russian, N. Sokolov's and A. Engel'gardt's Chemical Journal (Khimichesky zhurnal N. Sokolova i A. Engelgardta) foundered after just two years in the late 1850s, Russian chemists had to turn to either the Bulletin of the St. Petersburg Academy of Sciences or to foreign chemical journals in order to publicize their researches. All these journals published in German or French. Russians disproportionately patronized Emil Erlenmeyer's Zeitschrift für Chemie und Pharmacie, continuing to publish there even after Erlenmeyer relinquished control of the journal in 1864. As a domestic market for both the production and consumption of chemical research grew, however, the Zeitschrift lost its appeal.

In October 1868 the Ministry of Popular Enlightenment approved the proposal made by the chemistry section of the First Congress of Russian Natural Scientists and Doctors to establish a Russian Chemical Society, thus making official the various informal chemical circles that developed in St. Petersburg over the course of the decade. Along with the right to convene formally and organize chemical discussion, the society was granted the imprimatur to publish the Journal of the Russian Chemical Society (Zhurnal russkogo khimicheskogo obshchestva). The

journal, edited for over thirty years by St. Petersburg University chemist Nikolai Aleksandrovich Menshutkin (1842-1907), became the template for Russian scientific organization. An increasing number of Russian chemists published their research here before sending articles abroad, and many chose to publish only in Russian, as foreign chemical societies increasingly began to abstract the Russian articles in response to the rising stature of the Russian community. The Russian Physical Society, formed in 1874, also used the chemists as their model, and the two societies fused in 1878 to form the Russian Physico-Chemical Society, publishing a joint journal until after the 1917 Revolution. This society soon expanded its membership across the empire, diluting the dominance of Petersburgers, but not eliminating it entirely until the Soviet period.

The second major transformation of the late nineteenth century was conceptual. Beginning in the early 1860s a series of discoveries emerged from Russian chemists' research in chemical theory in both organic and inorganic chemistry, forming the bedrock of chemical knowledge to the present day. The best known of these is the 1869 formulation of the periodic table of chemical elements by D.I. Mendeleev. Mendeleev in 1867, six years after his return from Heidelberg, obtained the leading post as professor of general chemistry at St. Petersburg University. Given the recent reform of atomic weights at the Karlsruhe congress of chemists in September 1860, Mendeleev found no adequate textbook in Russian and considered that any Russian translation of a western European book was bound to be out of date by the time it appeared. He began to compose his own textbook of general chemistry directed to first-year students at the physical-mathematical faculty of his university. While composing this text, *The Principles of Chemistry* (first edition, 1868-1871, eight editions in Mendeleev's lifetime), he confronted the problem of how to organize all of the knowledge of chemical elements in a pedagogically accessible format. After several halting attempts Mendeleev arranged them by order of increasing atomic weight and in natural families. By 1871 he developed a complete version of the periodic system which allowed for the prediction of three new elements. Upon the discovery of these predicted elements, gallium in 1876, scandium in 1880, and germanium in 1886, Mendeleev's system received wide recognition and still forms the basis of almost all chemistry education across the globe.

The contribution of Russian chemists in organic chemistry was also substantial. During the course of his lectures in this subject at Kazan University in the late 1850s and early 1860s Aleksandr Mikhailovich Butlerov (1828-1886) developed a theoretical framework for organic chemistry which argued that one could best explain the properties of compounds by analyzing the topological distribution and connectivity of atoms within a molecule, rejecting earlier treatments of organic chemistry which argued that such intramolecular knowledge was beyond the scope of the science. Using this theory, Butlerov was able to explain the phenomenon of organic isomerism, where compounds contained the same elements in the same proportions but with vastly different properties, by arguing that they differed in terms of connectivity. He went on to predict several novel compounds which were

later discovered. Similar theories were being developed simultaneously in western Europe, most notably by August Kekulé (1829-1896), and these two chemists engaged in a vigorous dispute about priority which has not yet disappeared from the historiography. Butlerov also founded a strong school of organic chemists, including Vladimir Vasilievich Markovnikov (1838-1904), known in the western literature as Markownikoff, and Aleksandr Mikhailovich Zaitsev (1841-1910), known in the west as Saytzeff, both of whom made fundamental contributions to organic theory. Markovnikov also initiated a broad research endeavor to analyze the composition of Baku petroleum, the start of a distinguished Russian tradition of oil chemistry.

Since Russian chemistry was both the most professionalized of the sciences at the dawn of the twentieth century and the one with the clearest links to industry, it was quick to become involved in the political, social, and economic transformations of war, revolution, and Bolshevism. Before the approach of the World War I chemistry in particular received its fair share of the ballooning enrollment of students, and the strain this imposed on all disciplines was acutely felt, given the importance of material supplies in chemical pedagogy. The coming shocks to the educational establishment of the Russian Empire, therefore, were easy for chemists to interpret as a set of opportunities to develop the science's position in society.

When war broke out in 1914, Russia experienced numerous economic shocks as crucial industrial chemicals and products imported primarily from Germany were cut off by hostilities. Russia now had to develop its own sources of various chemicals, as well as specialty items such as optical glass. This need was exacerbated by the flight of foreign capital during the war. Chemists responded by offering their services to the state. Chemists were important participants in the Commission for the Study of Natural Resources, formed in 1915 to advise the government on military needs through the Academy of Sciences and continued to function past the October Revolution. The Chemistry Section of the Russian Physico-Chemical Society was tremendously influential in coordinating the activities of its members for the war effort, and when fighting ceased, chemists were not about to let the previous dependence on foreign supplies resume. This led to heavy investment by the state into the development of an almost fully self-sufficient chemical and pharmaceutical industry, especially during the Stalin years. More than other scientists, chemists threw their lot in with the communists as the best hope for their discipline.

This early enthusiasm for the Soviet government, which was only discernable as enthusiasm because the other sciences were so cold to the new government's overtures of patronage, meant that chemists benefitted directly from the industrial expansion of the coming decades and suffered less in the principal academic reorganization of the Stalin years, the resurgence of the Academy of Sciences. In the late imperial period the Academy of Sciences lost ground to the universities, which fast became the central sites of original scientific research. Throughout the 1920s the Bolshevik regime began to sideline the universities, separating research from teaching in an effort to keep tsarist-era bourgeois experts from access to impressionable young Soviet minds. This culminated during the years of the cultural

revolution (1928-1931) in the reform of the Academy of Sciences into a Soviet-friendly institution. In the process teaching was almost totally severed from research in an institutional sense. It was not until after the Second World War that world-class chemists emerged from universities in the Soviet Union since the best chemists flocked to the Academy of Sciences and its labyrinth of subsidiary institutes. In November 1930 all chemical societies and subdivisions were abolished except the Russian Chemical Society, which was granted existence for one more year, when it was finally taken over and transformed into the D.I. Mendeleev All-Union Chemical Society in 1933. This society survived the collapse of the Soviet Union with a slight emendation in name.

The history of chemistry during the Soviet period has been very sparsely studied. The only exception to this general neglect was the debate over resonance theory, in many ways a consequence of the coziness of chemists with the regime and the top-heavy dominance of the academy. Resonance theory was developed by American chemist Linus Pauling (1901-1994) in 1930 to account for the fact that many organic molecules could be written as having several distinct molecular structures, even though there was only one molecule present. Pauling argued that each of the structures counted as part of the molecule's true structure, which was in the end a weighted average of all the various possible formulations. In 1949 Gennady V. Chelintsev, an ambitious but not particularly remarkable chemist, argued for an alternative way of writing organic formulas, which would account for the findings of quantum mechanics but not require multiple representations for each molecule, and claimed that this was more in accordance with dialectical materialism. The debate over the theory of resonance occupied the higher levels of the Academy of Sciences and was later interpreted as an attempt to establish an orthodox Lysenkoism in chemistry akin to that in genetics. This interpretation fails on several accounts. First, this debate was initiated from below, by chemists, and not from above, as the analogy with Lysenko would suggest. Second, claims made against resonance actually had philosophical coherence and were received somewhat sympathetically even outside the Soviet Union. Third, this effort failed to become orthodoxy, eventually fading away as a critique, much as resonance itself faded away with the more-comprehensive quantum chemistry of molecular orbital theory.

It is difficult to disentangle the end of Soviet chemistry from the fate of the other sciences, as excessive centralization in the Academy of Sciences, fragmentation into various specialized and classified institutes, and inadequate material supplies and funding hurt all the sciences. Chemistry, unlike ecology or physics, did not play an especially significant role in the collapse of the Soviet order, although a new phase may have opened with the end of the Cold War because chemists' expertise is necessary to help destroy the stocks of chemical agents they helped build for a state whose patronage no longer sustained the science.

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Michael D. Gordin

CHEPTSOV, EFIM MIKHAILOVICH (1874-1950). Socialist realist painter.

Cheptsov ranks among the leading Soviet genre painters of the revolutionary era. He was born in the village of Medvenka, near Kursk, in 1874. His initial training came at the icon painting school at the Monastery of the Caves in Kiev, after which he worked as an icon painter and illustrator. He also studied at the Tenisheva School and between 1905 and 1911 at the St. Petersburg Academy of the Arts. Between 1911 and 1913 he traveled and studied in Germany, Austria-Hungary, France, and Italy. His work from as late as 1918 has been described as bearing the obvious stamp of late academicism.

After the Bolshevik Revolution he adapted the quasi-documentary style associated with Vasily Perov and other Russian painters of the 1860s to Soviet subjects in the 1920s and 1930s. Among his most famous works are A Meeting of the Village Communist Cell (1924) and the Retraining of Teachers (1925). He was an influential teacher at the Soviet Academy of Art in Leningrad from 1937 and at the Potemkin Pedagogical Institute in Moscow. His later work is completely typical of socialist realism. Representative works are included in the collections of the Tretiakov Gallery and the Kursk Art Museum. He died in Moscow in 1950.

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Abbott Gleason

CHERDYN. Capital of Cherdyn territory (raion) of Perm district (oblast).

Cherdyn is located 185 miles (300 km) north of Perm on the right bank of the Kolva River, a tributary of the Vishera, which flows into the Kama. The Russian town arose on the site of a settlement that was continuously occupied from the eighth to the fifteenth century by the Komi- Permiak, an aboriginal people of the Urals. It is first mentioned in the Vychegda-Vymsky chronicle in 1451 in connection with the appointment of viceroy (namestnik) Mikhail Ermolich by the Moscow prince

Vasily II. In the official list of fifteenth- to seventeenth-century chronicles the town is called Great Perm Cherdyn. In 1462 the population of the town and region accepted Orthodoxy. In that same year the Ioann Bogoslovsky Monastery, the first to be established in the Urals, was founded at Cherdyn. Great Perm Cherdyn was incorporated into the Russian state in 1472. In 1535 a fortress was erected at the town to protect the eastern borders of Muscovy from raids by Siberian Tatars and Voguls (Mansi).

In the middle of the sixteenth century Cherdyn became the center of Cherdyn district, the largest in the Urals. Moscow's viceroys were replaced by commanders (voevody) in 1572. In 1579 there were 290 households in Cherdyn, including 326 men. Sixty-five merchants and five forges did business there. In the sixteenth and seventeenth centuries the town and district supplied servicemen and supplies to the newly founded cities and settlements beyond the Urals. In the sixteenth and seventeenth centuries Cherdyn district was increasingly populated and dominated by Russian peasants, who had come from the Northern Dvina River basin and Lake Onega area. In the mid-seventeenth century Russians became the dominant ethnic group not only in Cherdyn district but throughout the northern Urals.

Cherdyn ceased to be important as an administrative and defensive center in the eastern borderlands in the seventeenth and eighteenth centuries. It ceded that role to Solikamsk, Kungur, Stroganovsky Novy Usol, and then to Perm. Despite that, Cherdyn remained the center of a district containing extensive lands of the northern Kama and the upper Pechora rivers. The borders of Cherdyn district remained unchanged from the seventeenth century until 1923.

As a district center Cherdyn remained relatively important. Cherdyn merchants controlled most of the transit trade among the Kama, Pechora, and Vychegda river basins. The district zemstvo, which was established in 1870, contributed greatly to the economic development of the area.

Stone churches and cathedrals soon replaced wooden structures in Cherdyn. The Ioanno-Bogoslovsky Cathedral was erected in 1718. The Voskresensky (1750-1785, reconstructed 1908-1911), Preobrazhensky (1756, 1853), Bogoiavlensky (1751-1778), Uspensky (1754-1784, 1884), Troitsky (1817-1838), and Vsesviatsky (1815-1817) cathedrals followed during the next century. In 1857 a stone shopping arcade with an open gallery was constructed on market square. Other public buildings and the estates of the wealthier merchant families helped shape the appearance of Cherdyn. The merchant house of cooperatives built in 1891, the town's administrative center in the second half of the nineteenth-early twentieth century, the women's high school and the parish school in the late nineteenth-early twentieth centuries, the trade school in 1900, district hospital in 1913, and the complex of buildings of the G.M. Lunegov almshouse and shelter of the late nineteenth century were among the most significant. The Aliny, Gusev, Cherny, Protopopov, Michurin, and Merkuriev family estates in the second half of the nineteenth and early twentieth centuries were among the most architecturally impressive.