THE ROMANCE OF RUSSIAN MEDICINE

Michael L. Ravitch

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ILLUSTRATED

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TO MY WIFE, BETTIE,
A MOST HELPFUL AND
PATIENT PARTNER.

CONTENTS

	PAGE
INTRODUCTION	xi
POPULAR MEDICINE IN RUSSIA	17
COURT MEDICINE	43
THE REBIRTH OF RUSSIAN MEDICINE	75
LA RÉGNE DE LES FEMMES DÉBAUCHÉES	95
ZEMSTVO MEDICINE	131
SOVIET MEDICINE	157
PIONEER AND PRESENT-DAY PHYSICIANS WHO BROUGHT RUSSIAN MEDICINE TO THE FOREGROUND	195
RED CROSS AND RED CRESCENT	327
CONCLUSION	331
BIBLIOGRAPHY	335
RULERS OF RUSSIA	341
INDEX	345

LIST OF ILLUSTRATIONS

Michael L. Ravitch, M.D.	*Frontispiece*
	Facing page
Peter the Great	77
Catherine the Great, *La Grande Amoreuse*	100
Thomas Dimsdale	115
Nicolai Lenin	158
Scene in a Modern Clinic	171
Hospital for Government Employees, at Moscow	182
Joseph Stalin	190
Professor Ivan P. Pavlov	199
An Operation Being Performed in the Laboratory of Academician Pavlov	204
Nicolai Ivanovich Pirogov	221
Venzeslav Leontovistch Gruber	229
Peter Ivanovich Diyakanov	233
Sergei Petrovich Botkin	240

List of Illustrations

	Facing page
Fedor Feodorovitch Erisman	266
Nil Fiodorovich Filatov	278
Elie Metchnikov, Nobel Prize Winner	288
Formerly Palaces of the Czar, These Buildings Are Now Rest Homes for Consumptive Workers	300
N. A. Semashko	314
Working Mothers Coming To Suckle Their Infants at the Crèche	317
M. F. Vladimirsky	320
Dr. Kaminsky, with Doctors Ogorodnikova and Nogina	322
Vaccination of Mountaineers by Red Cross Nurses	327
Red Cross Clinic, at Odessa	328

INTRODUCTION

IN gathering material for my book on the history of medicine in Russia, I was disappointed to find that most of the eminent compilers of the history of medicine seldom mentioned the development of Russian medicine. The names of Pirogov, Mendeleiev, Metchnikov and Pavlov are referred to only occasionally, in spite of the fact that the history of Russian medicine is just as rich and colorful as that of the literature or music of Russia.

The history of medicine is not a barren, uninteresting chronicle of royal imbeciles, but one of unselfish human beings whose sole aim was to change and ameliorate the pitiful and heartrending condition of plain people who were kept in slavery and imposed upon by the cruel régime of the last four centuries. The latent genius of these people manifested itself in the great men who appeared every now and then, like stars in the heavens, in spite of the dark clouds.

The history of Russia is an ever-shifting array of events. The origins of the early inhabitants of the country, and the level of material civilization they ob-

tained, are rather obscure. According to the Arabian writer, Abn-Dasta, a Slavonic principality existed as far back as the sixth century. The Arabs visited Russia even before the Greeks came. Rus or Russia, according to the Arabian description, was a prosperous and civilized land. The eminent Russian historian, Pokrovsky, says that one school of thought held that the Slavs were utterly uncivilized; the opposing school maintained that they had already achieved a high degree of civilization in the sixth century.

The formation of the Russian nation, according to the chronicles of Nestor, began with a settlement by a body of Scandinavians or Swedes under the leadership of one Rurik. His rule is said to have been severe, and native uprisings were vigorously suppressed. Rurik became the Grand Prince or "Kniaz" of Russia and the founder of a dynasty which terminated on the death of Czar Fedor in 1598. Rurik brought no medical men with him. In the art of healing, first the Arabs and then the Greek monks were the masters. Zagoskin claims that Russian popular medicine existed even before Rurik's time and persisted in popularity in spite of Arabian and Greek influences. Popular medicine was unorganized, but it grew in favor after Zemskaya or State Medicine was thoroughly organized. Even with the advent of modern scientific medicine, popular medicine still had an undeniable hold on the people and, as Botkin said, "We owe a great deal of our most valuable and potent drugs to popular medicine."

Authentic information is lacking concerning the origin of medicine in Russia. L. F. Zmeiev, in his manuscript in the Russian *Vrachebniki* for 1896, claimed that

the Russians had books on the art of healing before the Tartar invasion, but his assertions were never verified. The few books which had any reference to popular medicine were perhaps brought in by Greek monks who were pioneers in the art of healing. If there existed Russian medical manuscripts they probably were destroyed by the invading Tartars. The first medical publication is known to have been printed by Buturtin at the end of the sixteenth century, and it was followed by another book on hydrotherapy (Vodnik) and by some anatomical matter.

With Peter the Great a new era of medicine was established in Russia. The country developed in medicine as she did in literature. Even before the great Pirogov, that world-famed medical genius, many brilliant men could have been found in Russia, but unfortunately they died in obscurity, owing to the tyrannical and obstructive policy of the Romanovs. Yet, in spite of all these impediments, the names of Pirogov, Sechenov, Botkin, Zakharin, Mendeleiev, Tarkhanov, Speranski, Minkovsky, Metchnikov, Pavlov, Besredka, Orbelli and many others stand out as medical men of note.

In the present Soviet régime a long array of praiseworthy medical scientists is being developed, and we look to them to help solve many of the problems that have long baffled us. They are given a free hand, unhandicapped by the teachings of cults based on sheer ignorance which so often obstruct the progress of scientific medicine. Doctors Arthur Newsholme and John Adams Kingsbury aptly remarked in their book, *Red Medicine,* "What Russia has accomplished in its courageously original scheme for the health and social

well-being of its people constitutes a challenge to other countries."

I fully expect Russia to become the Mecca of practical science, particularly in the domain of medicine. Russia is solving the medical problem.

M. L. R.

POPULAR MEDICINE IN RUSSIA

POPULAR MEDICINE IN RUSSIA

MYTHOLOGY tells us that there existed a Golden Age when people did not know hardship, illness and suffering; they died of ripe old age. But history contradicts this and other myths. In prehistoric times the people had a hard and bitter struggle to extract a living from nature, and they suffered from numerous diseases. Many museums, in the Old World as well as in the New, possess skeletons of these people, which plainly show traces of a variety of diseases. In Russia, in the Museum of Pathology at the University of Kazan, there are many specimens of skeletons which clearly indicate that the people of earliest times were afflicted with diseases that are known in our day.

It is to be regretted that few men delve into this subject; it is also to be regretted that the medical profession has paid little attention to popular medicine, since this is too interesting a subject to be neglected. Even prehistoric popular medicine deserves consideration, notwithstanding the fact that it was mainly based on instinctive attempts at self-preservation. Russian popular medicine, while in a great many phases similar to

that of other nations, is richer in traditions and discoveries than the others. Based on the instinct of self-preservation at the beginning of the earliest known medicine, Russian popular medicine later widened its scope by observation and increased knowledge. No great changes occurred until religion made its ingress, and even then secular popular medicine adhered to its traditions and beliefs.

It seems to the writer that a survey of the popular conception of the causes of disease, measures of prevention and treatment is worthy of considerable effort. Botkin, Manassein and other well known Russian authorities claimed that we owe much to popular medicine for many valuable drugs.

During the early historical ages of all peoples, medicine was intimately related to religion. This is clearly illustrated among the American Indians where the high priest is termed the "medicine man." Similarly, in ancient pre-Christian Rus, the religious leaders also possessed the secrets of primitive medical art. This rôle of intermediary between the people and the mystic powers of nature was played by those few who had gained wisdom through worldly experience—the venerable old men of the clan, gray magi, enchanters, magicians, sorceresses and wizards. In their hands, water, herbs, roots and other substances became magical remedies. Theirs was the power to cause disease as well as to relieve it.

Idolizing the forces of nature, the early Russians attributed disease either to the curse of evil spirits or to the displeasure of the gods. Sacrifices were made to appease the enraged deities. Charms and ghostly conjura-

tions, purifications by fire and water, whisperings and spells were employed to drive out malign spirits.

Until a comparatively recent period, popular medicine played an important part in Russia. It was not until the introduction of Zemstvo medicine, in the latter years of the nineteenth century, that the Russian masses were given the benefit of scientific medical knowledge. Up to that time they were born, lived and died with the aid of only their own simple remedies. As a result, popular medicine in Russia, more than in any other European country, has preserved its primitive originality. For this reason, Russian popular medicine has long attracted the attention of physicians, ethnographers, folklorists, historians and other investigators interested in the life of the common people.

This interest has borne fruit in the form of a diverse and ample literature. The people themselves provided oral sources, giving information concerning the names of plants, numerous charms, conjurations and prayers. They related the superstitions, mystical rites and legends which are closely associated with popular medicine. The former Imperial Public Library at Leningrad contains an excellent collection of manuscripts, herbariums, floriculture, medical books and household recipes.

First Scientific Information Concerning Russian Medicine

The first scientific information concerning Russian medicine is to be found in the notes of Russian travelers, among whom are Lepekhin, Gmelin, Fellas and Falk. In 1813 Richter devoted an entire chapter in the

first volume of his work, *History of Medicine in Russia,* to the investigation of some popular medical remedies. This stimulated many physicians to further intensive study. Prominent among these are Lutze, V. Dal'Krebel, Vashin, Deriker and Manassein. Many Russian medical periodicals, particularly *Friends of Health* (1833-1869), *Journal of Military Medicine, Medizinische-Zeitung Russland,* and *Doctor* have devoted a great deal of space to discussions of the uses and expediency of some popular methods and the harmful effects of others. The best experimental studies of the methods of Russian popular medicine were furnished by the clinics of S. P. Botkin. In 1870 there were published two dissertations in German and a series of essays by Dr. Demich, who devoted himself to the study of midwifery, gynecology, pediatrics and other phases of popular medicine among the Russian people.

Botanists, among them Augustinovich, Krylov, Kholovsky, Puparev and Taraklov, have studied and written about the herbs used in different parts of Russia for curative purposes. Popov, Berzenev, Pantzukov, Shidlovski and others concentrated upon the remedies of the Caucasian mountaineers. The medicine of other foreign peoples living in Old Russia has received similar attention. Every nationality (and there are many in Russia) has contributed something to the national treasure of Russian popular medicine.

Development of Popular Medicine

Popular medicine developed as a result of observation, common experience, prejudice, ignorance and

pure chance. A combination of empirical and mystical practices, it was transmitted by tradition from generation to generation. It is to be expected, therefore, that a study of popular medicine should reveal the predominance of harmful negative methods—those based on the ignorance and superstition of the masses. Nevertheless, we encounter many positive, helpful methods—those founded on the collective observation and experience of the people. These are considered valuable subjects for study by the physician today. Professor Manassein once observed in one of his lectures, with great truth, that doctors only partially discovered medicine by themselves, since in many cases they were taught remedies and modes of treatment by the people.

Prisnitz, a German peasant who settled in Russia, is the father of modern hydrotherapy. The Caucasian mountaineers contributed treatment by koumiss and kefir. Several years ago acidophilous milk, based principally on the same theory as koumiss and kefir, was employed and is still used to some extent in intestinal troubles and malnutrition. Metchnikov was a firm believer in, and an ardent advocate of, the efficacy of acidified milk for intestinal disorders. Massage, used from time immemorial by the people, is now an important practical treatment. Quinine, for which we are indebted to the American Indians, is still our best means of reducing malarial fever. Its use was due to the primitive method of treating fever with repulsive and bitter substances. It may be said in general that the plants chosen for treatment were redolent, sharp and unpleasant to the taste as well as irritating to the skin.

An examination, from the historical and pharmaco-

therapeutic points of view, of the plants used by the Russian masses reveals a strong resemblance to those employed in ancient Greek and Roman medicine. There are two alternatives which may account for this strange coincidence. It may be that the first Christian missionaries in Russia possessed more medical knowledge than they have been credited with. On the other hand, the Russian people through independent observation and experience may have arrived at the same conclusions concerning certain plants. Bartels, defending the latter hypothesis in his remarkable book on primitive medicine, *Die Medizin der Naturvoelkger* (Leipzig, 1893), says, "We came across a surprising occurrence everywhere among the savages. In similar life-situations they resort to the same methods regardless of whether they inhabit the distant north or the Equator."

Those who regard popular medicine with contempt are either biased or ignorant of the fact that our modern medicine is its legitimate child. Under the thick shell of superstition, ignorance, prejudice and religious beliefs are to be found curative methods which are tributes to the observation, common sense and centuries old experience of the masses. We owe many of our important diuretics to the Russian people.

In this connection, the history of the introduction of lychnis, or Adonis vernalis, and its principle, Adonidin, into scientific medicine is instructive. The common people of Russia and Siberia used this plant long ago as a diuretic in the treatment of dropsy, convulsions, cramps and fever. Dr. Noss, of Chernigov, described its use among the Ukranians. Twenty years later Doctor Bubnov, requested by Professor Botkin to investigate

lychnis, proved beyond doubt that it is a diuretic and, furthermore, may be substituted for digitalis in some diseases of the heart. In 1881 Chervelle separated an active substance called Adonidin from the new heart remedy. This was later studied by Professors Cobert and Thompson. Another principle, called Pikradonin, was recently discovered in the same plant in Kazan by V. Podvysotzky. Lychnis is even yet used by many physicians.

Such diuretics as cloudberry (Baccae Rubi chamaemori), watermelon (Cneumis sativa) and black beetle (Blatta orientalis) are likewise of popular origin. Lily of the valley, another excellent diuretic and heart remedy, has also been borrowed from the common people. In Kaluga it was said to be garnered "against sneezing, noise and feminine naggings." Pumpkin seeds (Semina cucurbitae maximae), the popular vermifuge, is also being adopted by scientific medicine. Kuble found that the people were not only aware of night-blindness or hemeralopia, but discovered an excellent remedy for it—boiled liver. Having used it in hundreds of cases, Kuble maintained that no other remedy could equal it. Perhaps the people who were afflicted with hemeralopia suffered from pernicious anemia. In any event, it proves that liver treatment was known long ago and only lately was given the importance it deserves.

Unfortunately, to counterbalance all these remarkable remedies, numerous treatments were devised which were of doubtful value if not downright harmful. There are many popular so-called cures for hydrophobia, consisting for the most part of plants. Several of them,

water plants for example, have been defended as "true remedies against rabies." The likelihood is, however, that the natural immunity of some persons to rabies is mistakenly attributed to the curative power of these treatments. It is interesting to note that the common people have devised a remedy which is somewhat similar to Pasteur's inoculation. In some Russian villages, in accordance with the proverb that "one wedge will drive out another," a tuft of the mad dog's hair is given to the patient. This principle, which is quite similar to the teachings of Hahneman's *Similia similibus curantur,* occurs frequently in popular medicine.

Until recently it was possible to find, in rural districts, sorcerers and witches who claimed to be specialists in curing syphilis and eye diseases. Various herb concoctions and smoking by mercury apparatuses were prescribed for syphilis. This therapy, however, often did more harm than good. Popular ophthalmology was generally the source of more irritation than relief from pain. The patient, whose diseased eyes were "licked up" by the village women, ran the risk of contracting a syphilitic infection as a result of the treatment. The unfortunate belief that drops placed into sick eyes, and powders blown into them, would prove efficacious also caused a great deal of damage to the disordered organs.

Accurate Observation of the Common People Concerning Diseases

Investigations have provided undeniable evidence that the common people have made keen and accurate observations concerning diseases. In many parts of

Russia the villagers have long understood the contagious character of certain maladies such as smallpox, consumption, leprosy and fevers. Though unable to explain the phenomenon scientifically, they have, nevertheless, developed crude but effective means of combating the menace of epidemics by isolation.

In his book, *The History of Medicine in Russia,* Skorokhodov relates that an Arab who visited the Volga district in the tenth century and saw a tribe of Russians, said that if one of their number became ill they built him a tent and supplied him with bread and water. They kept away from him, and his isolation continued until he recovered. This was the case only with a poor man; exceptions were made for the rich when they became sick.

The Khirgis of Central Asia change their nomadic abode as soon as a large number contract fever, leaving the sick behind them and thus escaping an epidemic. Georgians fear delirium tremens more than they do cholera, since, according to the "karabadem," a Georgian handbook of popular medical advice, this illness develops into a poisonous disease. If one of the members of a household becomes ill, the entire family frequently moves away, leaving the patient in the care of an old woman. In other sections of the country the remedy is of uncertain value to the patient, as he is left entirely to himself. The ethics of this treatment may be questioned, but there is no doubt that it saves the community a great deal of distress.

In later years, when Christianity dominated the Russians, sanitation was mixed with religious ceremonies. When a plague appeared in a certain locality, ikons

were placed in the districts where the pestilence broke out. When these measures did not help, the people were forbidden to transport goods from the stricken section. Goods were often burned, and with them even the merchants who were caught transporting them. A drastic and sure prevention! Life was cheap in those days.

The branches of popular medicine dealing with dietetics and care of the sick have unfortunately contributed little that is useful. Popular conclusions concerning the necessary conditions for a healthy life and the care of the sick were very different from those arrived at by scientific methods. Economic limitations forced the Russian people to live in the midst of squalor and accustomed them to dirt, with the distressing result that they did not appreciate the values of cleanliness and fresh air. Going to the other extreme, they hermetically sealed their huts against every breath of air and regarded draughts with superstitious horror. In the care of the sick this disregard for sanitation had disastrous results.

Avoidance of the Aid of Doctors in Confinement Cases

Due to the lack of means of education, the common people cannot guard against nonsensical, superstitious and harmful modes of treatment and their impecunious condition forces them to accept the care which is most inexpensive. Numberless years of unenlightened prejudice and ignorance have made them mistrustful of scientific methods. All this is especially evident in childbirth. Until recently, the lower classes avoided the aid

of learned doctors because of the belief that the care of confinements belonged to the village women. As a result, births took place under indescribably unsanitary circumstances. The force used by the midwives on the mother in the turning and stretching would frequently affect adversely both the mother and the newborn baby. If by some lucky chance the infant remained intact, he was put through a vast amount of unnecessary handling. He was steamed with hot broths, his limbs were fixed, he was shaken with his head down so that no hernia might appear, his body was rubbed with salt and other substances and he was filled with daisy liquor and carrot and fruit juices which were supposed to be good for his stomach. In the matter of carrot and fruit juices for newborn babes, our ancestors knew from experience that such juices are useful, although they had no knowledge of vitamins.

After these initial excesses, the child was left almost entirely to his own devices. He was brought up in the midst of dirt, with an unclean, sour feeding bottle and other squalid equipment. And the outcome was an amazingly high death rate among children in Russia. It is apparent that the weapons used in combating these conditions had, of necessity, to be economic.

The Use of Metals and Minerals

Besides herbs, roots and leaves, metallic substances of every known kind and combination were used. Remedies composed of various metals and minerals were employed by the Russian healers. Among the most popular minerals were copper in pure state and in

different mixtures. They had a preference for copper derived from buried firearms and utensils, copper sulphate and copper acetate being used for various external ailments. Iron was also a favorite remedy, both internally and externally. A magnet was regarded as a sovereign, all-important remedy; it was believed that as a magnet has the power to attract metals, it should not fail to attract or extract the things which cause internal diseases. Although regarded by the healers as a most excellent means of expelling diseases, a magnet was oftentimes a troublemaker. If one placed under the head of a sleeping married woman did not interfere with her sleep, she was true to her husband; if she were untrue she would become restless, jump out of bed and be unable to fall asleep.

Of other metals used, mention may be made of gold, silver and mercury. The last named was regarded as a valuable remedy and was employed to a great extent in various skin diseases, particularly in syphilis, which malady was extremely prevalent in Russia. Mercury vapor was an important and favorite agent in the treatment of syphilis and was used by physicians all over the world until the discovery of salvarsan. Even at the present time mercury is favored by some doctors. Gold was considered a reliable remedy. It was used in the treatment of scurvy, and several times a week a small piece of goldleaf was given with bread. Although banned by the medical profession, preparations of gold have been and are still used by dermatologists, but their virtue is not so well established as in olden times.

In general, it may be said that the common people have a better understanding of surgery and of the treat-

ment of external disease than of internal disorders. Of more obvious origin, the former need not be explained by magic or evil spirits. External diseases are accessible and the success of the remedies is more apparent.

It is interesting to observe that the development of surgical knowledge is closely connected with the general mode of life of a particular community. The Caucasian mountaineers, who make extensive use of firearms, are especially experienced in the care of wounds caused by such weapons. They grease the injuries with a special ointment containing the plant Echium rubrum. This salve supposedly decreases fever and alleviates pain.

Bartels calls phlebotomy, or blood-letting, the common property of all humanity. Russian peasants from time immemorial practiced it so often and on such a large scale that it caused noticeable harm. Pots and horns were also frequently applied. One of the cheap prints by Rovinsky indicated that Russian women use hot pots in bath-houses. Sometimes the hot pots were so large that they left marks which lasted a lifetime.

Various methods were devised for the treatment of wounds. All sorts of cataplasms were placed in them and covered with varnish. In some vicinities the wounds were bathed with the warm urine of a child. Urine was extensively used externally during the time of popular medicine and was applied to burns and sometimes to skin eruptions. The medicinal value in the therapeutic use of urine was demonstrated by dermatologists for intense pruritus and other dermatoses. It may be classified under the name of auto-urotherapy. Cow manure was frequently applied as a remedy for abscesses.

In lesser surgical operations the Russian people are

most adept. Many skillful bonesetters who work on dislocations and breakages are to be found in rural settlements. When the writer was practicing in Marion County, Western Kansas, among the Mennonites who emigrated from southern Russia, the elders supervised and advised in all matters pertaining to medicine. He witnessed work admirably performed by bonesetters.

Russian women are familiar with the use of gudgeons in dislocation of the uterus, and doctors have sometimes come across foreign bodies in the vagina which have been there for years. Large abdominal operations, however, take place very rarely among the common people. Ivanchenko described an operation performed on a peasant woman by another peasant who made an abdominal cut in an extra-uterine pregnancy, extracted the dead offspring and saved the mother. He also reported skull operations which occurred among the peasantry.

The Russian people from earliest times were great believers in baths which they took not only for cleanliness but also for the comfort and pleasurable sensations the hot dips gave them. Later they regarded baths as a panacea for many diseases, especially for colds. They rubbed themselves with bunches of brush and shrub, first immersed in hot and then in cold water, and believed in massage. As they had to work hard, in dust and dirt, the baths gave them pleasure and relaxation. Hot baths appealed particularly to those who had to travel long distances in cold weather, when it was often below zero. When the "Drevlianye" came to Kiev to propose marriage of their "kniaz" Malom to great "kniazhna" Olga, her first act was to beg them to take

a hot bath after their long and tiresome journey. They accepted the offer, and history tells us that she also accepted the offer of marriage.

Snegirev states that the ancients did not have separate baths for men and women. Both sexes were accustomed to bathing in the same water at the same time, and sometimes they would stand back to back. Little attention was paid to the special decrees of the Empress Elizabeth in 1743 and of Catherine the Second in 1783 that men and women should not be allowed to bathe at the same time. And why, indeed, should there have been? It was incongruous for these two libertines to issue such an edict when they themselves were so lewd and brazen that their palaces and royal bedrooms were given up to venery of the worst kind. In Archangel, and in Finland when the latter belonged to Russia, the custom of promiscuous bathing had not ceased up to recent years. The baths were of practically the same construction for the nobility and for the commoners. They were called "Mylenki" or "Soapers," and ablutions were usually taken on Saturday or on the eve of a great holiday. Brides bathed a day before the wedding, and were accompanied to the baths by the matchmakers and friends. The grooms also brought their friends, and every one sang and danced. The morning after the wedding the bride and groom went to the baths. This custom was in existence for a long time.

It was even the practice for confinements to take place in bath-houses. Baths were recommended for many ailments, but were often followed by fatal results. Bloodletting was practiced in baths. When King Fedorovitch had a bad swelling in the groin—perhaps a hernia—he

was advised to take a bath, and while there a pint of blood was taken from his vein.

Most of the blood-letting of that period was done by barbers. A hernia was treated by taking the patient to a bath-house and placing him on a wooden bench. A wet rag was then applied to the abdomen over the hernia. A ball of some fiber was ignited, thrust into a pot, and hastily placed over the wet cloth, which expanded and drove the hernia back to its place. The patient was often severely burned, sometimes fatally. Most of these operations were performed by women.

Glandular Therapy

Animal therapy, widely used by the Chinese in the treatment of diseases, was also extensively employed in the Middle Ages, and almost up to the nineteenth century, by Russian folk healers. Professor N. F. Vysotzky, who made thorough investigations of remedies used by pre- and post-historic Russian healers, found that animal therapy was greatly in vogue and that the Russians used it in a more rational way than did the Chinese. Though they applied it unscientifically, Russian healers found animal therapy useful in many cases, and were as enthusiastic about it as modern physicians are about liver therapy and glandular extracts. Professor Vysotzky claims that the use of blood, powdered organs and tissues of animals was favored by Russian healers, apparently with great success.

It is interesting to note that the blood of animals was employed as a sovereign remedy, especially for patients who had lost blood in accidents. It is not known whether

it was used subcutaneously or intravenously. Doctor Demich says in his *Legends and Faiths of Popular Russian Medicine* that Esthonian girls, to attract the man with whom they were in love, treated the lover to beer and other beverages into which they had dropped a little of their menstrual blood. It was thought that this would make the man more passionate and that he would soon fall in love.

Impotence was greatly feared by the ancient Russians and hence many nostrums were offered by healers, as large families were desired. In some parts of Russia, says Afanasiev, the boiled testicles of bears were given to the bride and groom. Testicles of many other animals, or the kidneys of fowls in powdered form, preferably mixed with wine, made a popular remedy for impotentia, and was regarded highly by the boyars (nobility), who had nothing to do but eat and drink and amuse themselves. Drinking was general and heavy among both sexes.

The Russian masses have developed another interesting mode of treatment—a psychological one—which at present is of real value to physicians. It cannot be doubted that the nervous system of the peasant who has unlimited faith in prayer or witchcraft undergoes extraordinary changes at the moment when his beliefs are being played upon. The lower classes of Russia have always had boundless and blind faith in the potency of medicine and the power of sorcerers. According to common belief, these sorcerers cured not only diseases, but curses by individuals who implanted hernias, cast the evil eye and caused injuries, especially to women, by making them possessed of the devil. The charms and

whisperings which have been used the world over by sorcerers are merely treatment by persuasion which influences the nervous system of the impressionable patient to such an extent that toothaches diminish, hiccoughs disappear, fevers abate and slight bleeding stops. The quieting effect of the treatment reacts favorably on the patient.

Apart from this psychological and ethnographic significance, popular Russian prayers against illnesses present an accurate, picturesque and poetic representation of various symptoms. This is especially true of the fever illnesses which are prevalent in Russia. The intermittent fever, for example, is visualized in the image of a bareheaded woman, such as a daughter of Irod, and is given many expressive names.

As soon as Christianity was introduced into Russia during the *"udelnyi vecherom"* era of Russian life—a period when independent princes ruled over various sections with the aid of the old Slavonic popular assemblies—a struggle began against pagan medicine. With the coming of Christianity, folk-medicine received its first challenge; the new Church entered into a fierce persecution of the entire race of sages and wizards, and the use of simples was made a crime. Equipped with medical knowledge brought from Byzantium, the clergy undertook the supervision of the medicine of the masses.

St. Vladimir played an important rôle in this attempt to govern church medicine. In his *Rules of Church Court* he condemned the use of herbs; witchcraft and magic were made offenses against the Christian faith; magi were persecuted and burned. His Church Regulations raised doctors to the status of ecclesiastical per-

sonages under the jurisdiction of the bishop. In the same decree he declared hospitals to be institutions under the authority of the Episcopate; he not only decreed, but made some attempts to put his theory into practice. He built churches, opened hospitals at the monasteries and established a tithe consisting of one-tenth of a man's total income to be used for paupers, the sick, the old and orphans. According to the testimony of a Rostov chronicler, he at one time ordered that bread, meat, fish, all sorts of vegetables and mead and cider be carried throughout the city to the sick, the needy and the disabled.

It is to be doubted that St. Vladimir was a kind ruler. If history credits him with humane deeds, they were possibly done in atonement for his sins. *Saint* Vladimir is a misnomer, and for him to have been called a saint is historical irony. Even Nestor speaks of him as a man who was infamous for his love of war, heathen acts, brutality and sensuality. Beasely, quoting Nestor, says that St. Vladimir had two wives, three concubines and three mistresses and that he maintained eight hundred concubines in three great harems. He favored Islamism because it permitted polygamy and concubinism, but he did not adopt that faith because Moslems are total abstainers and he was loath to forego the quantities of hard cider he drank. Suffering from oversensuality, and feeling that his virile power was leaving him, he decided to reform and finally adopted the Greek Catholic faith, which allows its priests to drink, marry and propagate. John Smera, the imaginary physician, had great influence over St. Vladimir before the latter embraced Christianity. As soon as Vladimir began to lose

his virility and found that his great doctor could no longer help him, he sent this body-physician to Alexandria to investigate and report on the validity of Christianity. Doctor Smera went to Alexandria, and refused to return.

The Kiev-Pichersky Abbey, situated in Kiev, was perhaps the first monastery in Russia to practice medicine successfully among the masses. Its founder, Holy Anthony (992-1073), upon returning from the Greek monastery at Athos, settled near Kiev and treated the sick with herbs. His reputation as a physician spread far and wide, and the Kievcherski monastery grew up about him.

His pupil, Holy Agapit (1095), who was called the "gratis physician," carried on the work of Holy Anthony, treating the clergy and the laity in the monastery hospital. An interesting story is related by Pichersky Paterik about Holy Agapit. During the illness of Prince Vladimir Monomakh of Chernigov he was treated for a long time without favorable results, by a famous Armenian doctor who was supposed to be able to determine the day and hour of the patient's decease by simply holding his hands. The prince was finally restored to health by curative herbs sent by the Holy Agapit. A short time later, the "gratis physician" healed the first boyar of this prince, for whom the Armenian doctor had forecast death in eight days. Jealous of his rival, the Armenian made several attempts to defame him, but without success. When the Holy Agapit became ill, the Armenian visited him, and holding him by the hand, predicted that he would die in three days. The monk objected, insisting that he would not die in three days

but in three months. The fulfillment of Agapit's prediction so awed the Armenian that he became a monk.

The same Paterik mentions Damian, the curer (1701); the blessed Fiodosi (1074); Pimen Postnik (1113); and the Holy Olympus, the ikon painter who cured a citizen of Kiev of leprosy of the face after he had been unsuccessfully treated by physicians, sorcerers and exponents of various religions. In 1101 Yefrem, the Metropolitan of Kiev, erected a free bath-house and hospital in Pereyaslav. This hospital resembled a poorhouse and was attached to the monastery.

Monastic medicine served the masses primarily. The princes, the boyars and the rich resorted to secular medicine. It is evident that during the early period church medicine did not have a monopoly. The anonymous Armenian rival of Holy Agapit was not the only doctor of foreign descent in Russia. In Russian writings mention is made of a physician to St. Vladimir, Ivan Smera-Polovchanin, a Polovetzian. He was sent abroad by the prince, with a group of ten men, to acquaint himself with the various religions. The ten men returned, but Smera, as previously mentioned, did not come back and instead sent a letter to St. Vladimir which, the historian Karamazin declared, was for the purpose of discrediting and abusing the Christian faith.

In the twelfth century a Syrian doctor named Peter Sirianin attended Prince Nicholas Davydovich of Chernigov, who later became his friend and entered a monastery with him in 1106. Sirianin is reported to have taken his patient by the hand when examining him, probably to feel his pulse. Prince Svyatopolk Yaroslavich died after a surgical operation on a swollen

gland, an operation which was probably performed by a foreign doctor.

It is known that there were foreign private doctors in Yaroslav's time. The first collection of Russian laws, "Russkaya Pravda," which confirmed this fact, also recognized the right of the physician to receive compensation for treating a sick person: "The injured person is to get three *grivny* and the *lekar* is to be compensated." This additional compensation later came to be known as "medicinal." In general, it may be said that not until Yaroslav's time did learned doctors appear in Russia and their influx at that period was due to his daughter's marriage to the French King, Henry I, in 1051.

With the death of Vladimir Monomakh, Russia entered an epoch of misfortune, during which she was oppressed by the Tartars for three and a half centuries. The Tartar yoke dragged down Russian culture, which had begun to make rapid advance, and offered an equally stunning blow to medicine. Secular medicine was stifled and almost entirely disrupted, and even the doctors in the monasteries disappeared. Hard times prevailed and the Russian people suffered intensely. When misfortune strikes a community its inhabitants become humiliated and bewildered and resort to religion and meditation about the future life. In national disasters religion is often the only remaining comfort and it sometimes happens that the conquerors make an exception of matters pertaining to religion. At this time the Russian clergy were not molested and as a result the religious body became powerful and ruled the people with an iron hand.

The Tartar rule lasted until about 1480. As the Russian nobility and their families were forced by promises, bribes and other inducements into closer relationship with the Tartars, frequent marriages occurred between the Mongols and the Russians, and it is thus that the Tartar strain is prominent among the Russian nobility. Many names and a considerable number of Russian words may be traced to the Tartars.

COURT MEDICINE

COURT MEDICINE

THE period of the great oppression ended with the reign of Ivan III. The marriage of the Grand Duke to the Greek Princess, Sophia Paleolog, in 1472, laid the foundation for future relations between Russia and Western Europe, and stimulated the regrowth of Russian civilization. The overthrow of the Mongolian rule in 1480 in a large measure removed the remaining obstacles to the resurrection of the inner life of the state. At the request of the Czar, there now began an influx into the country of skilled workers and professional men. Foreign architects, artillerymen, founders, silversmiths, money specialists and physicians all came to serve the Russian Czar.

Secular medicine reared its head anew. The first mention of a doctor during the reign of Ivan III occurs in 1485. A German doctor, Anton Nemchin, arrived in Moscow at that time, and was in great favor with the Grand Duke until he failed to cure a Tartar Czarevich, Prince Karakech. Having made the mistake of promising a cure, he was summarily turned over to the Tartars, who took him to the Mos-

cow River and had his throat "cut with a knife like a sheep."

Another who met a tragic fate under the same Czar was the Venetian *lekar,* Leon Zhidovin, or "Leon the Jew," as he was called. He was brought from Venice in 1490, by Andrei Paleolog, a brother of the Grand Duchess, and by the Grand Ducal Ambassador, Palevy. Leon was ordered to treat Ivan Ivanovitch, the thirty-two-year-old eldest son of the Grand Duke and his first wife, Marie Tverskaya. The young man had become ill with rheumatic pains in his legs—possibly a bad case of arthritis—and Leon staked his life upon the success of his treatment. The medication consisted of internal remedies, aided by the application of hot-water bottles all over the body, but it failed to cure the prince's son, and Leon was captured and imprisoned. On the fortieth day after the death of Ivan Ivanovitch, the *lekar* was publicly executed by having his head chopped off.

At the court of the Czars all the medical men were foreigners and were treated with great favor, but if their efforts failed, they were liable to persecution; sometimes even the death penalty was exacted if they were suspected of spying or conspiracy. The punishment inflicted on the two doctors, Anton and Leon, was frequently duplicated during this period, not only in Russia but in other European states.

The chronicles give us no information by which we can determine whether Anton and Leon were fakes. It is not improbable that prior to their arrival in Russia they belonged to certain groups which at that time were wandering about Western Europe disguised as *lekars.* When the outcome of their treatment was

adverse, they would attempt to hide before their quackery would find them out. In any event, there is good reason to believe that the execution of Anton and Leon was in a large part due to political considerations. In the case of Anton it was necessary for the Czar to preserve good relations with the Tartar prince, Danyar. It was incumbent on Palevy to refute the accusation, voiced by several boyars, that he and the Grand Duchess Sophia had intentionally poisoned the successor to the Moscow throne in order to give it to the youngest son, Vasili (the issue from the marriage with Princess Sophia) who was abundantly provided with the energy which the male Romanovs curiously lacked.

The tragic end of Anton and Leon did not, however, prevent doctors from entering Russian service. Indeed, it served to raise the standard of competency. Shortly afterwards the Russian Ambassador, at the request of the Grank Duke, asked Emperor Maximilian I to send him a good physician who was well versed in internal diseases and the treatment of wounds. Thus George Delator, the German Ambassador, brought with him to Moscow, Nicolo of Lübeck, a really learned doctor for those times. The people of Lübeck called him Nicholas Luyev, Bulev, or simply Nicholas Luybchanin. After a visit to Moscow in 1518, the Imperial Ambassador, Francisco di Collo, expressed himself as follows concerning Luyev: *"Maestro Nicolo Lubacense, professore di medicine et di astrologia et di tutto scienza fordatissimo."* Luyev enjoyed great favor and success, participating in the political and ecclesiastical life of the country. He was so outspoken with the monarch that he even dared to predict his death and the sovereign

accepted this pronouncement stoically and without punishing the doctor.

The reign of Vasili Ivanovitch could boast of two prominent doctors—Teofil of Lübeck, and Marcos, a Greek who came from Constantinople. Teofil, a Prussian doctor, had been taken prisoner by Governor Saburov during the war with Lithuania and brought to Moscow. The Greek, Marcos, was mentioned by the same Francisco di Collo who praised Luyev so highly. Judging from information which has been preserved, these doctors treated high officials, boyars and their children. They were so highly esteemed by the sovereign that, despite persistent requests of the foreign ambassador, he would not let them return to their native lands. When he was asked to discharge Teofil, he answered, "He is treating one of our good people and we cannot let him go now. As for the future, with God's help we hope to let him go."

Upon receiving a second request in 1518 for the dismissal of the doctor, the ruler answered that Teofil was treating many boyar children whom he could not leave and that, furthermore, he had married in Moscow. Foreign physicians were evidently so well treated in Moscow that they had no desire to depart. According to the Russian chronicle, both Luyev and Teofil took part in treating the illness of Vasili Ivanovitch, which terminated fatally.

The commercial relations which began with England in 1553 by water route through the White Sea and the friendly correspondence between the Czar and Queen Elizabeth opened Moscow to foreign artists, physicians, pharmacists, ore-seekers, watchmakers and many other

artisans. With the arrival in Moscow in 1553 of Richard Chancellor and his suite there begins the story of the friendly intercourse between England and Russia which continued without interruption for three centuries. The part played in Russia by British physicians is an interesting chapter in that recital from the point of view of both general and medical history.

Many of the early physicians at the Russian court, including Robert Jacob, Mark Ridley and Elisaeus Bomel, were in the position of diplomatic agents who carried on important and delicate negotiations between the two countries. "In those days," says Bishop, "when there were no resident ambassadors of one court or another, but only occasional missions for some special purpose, it was obviously of great advantage to an English statesman to have an intelligent, educated and observant person, such as a physician would be, residing at the Russian Court, and ready and able to keep him in touch with all that was passing there."

The part played at different periods by Englishmen in the introduction and improvement of medical art in Russia can scarcely be overestimated. Many eminent medical men of other nations have entered the service of the Czars, but there is no doubt that the English and Scotch have always held a leading, and for a long time quite the first, position. In this connection it is only necessary to mention the names of Robert Erskine, James Mounsey, Sir James Wylie, Sir Alexander Crichton and Baron Dimsdale. Russian medicine felt this influence strongly until the execution of Charles I. After this event, Alexey Mikhailovitch refused to recognize the newly established republican government.

Alexey, who was more intelligent than his father Mikhail, was greatly alarmed at the turn of affairs at home. Russia was bankrupt, and there is no necessity to wonder at this when one considers the corrupt methods of the higher-ups. The Czar's father-in-law was implicated, and stealing was rampant. The populace was in an ugly mood, and a mob marched to the Czar's summer home near Moscow and demanded that he give up the culprits. Only the Streltzy, or Sharpshooters, saved the day; they fired on the mob. Rebellion after rebellion followed.

While repeated obstacles were put in the way of Western science, Western influence succeeded in penetrating to the homes of the better classes in Moscow. The liberals began to reflect that Moscow was lacking in education, and the brilliant minds of Russia, the majority of which came from Kiev, realized the intellectual poverty of the Russians. Schools began to appear in many towns and soon Alexey could not stop the ingress of civilization.

During the reign of Ivan the Terrible there were as many as ten physicians and four pharmacists in Moscow, some of whom were English. Old Teofil still enjoyed the confidence of his monarch and it is said that he was sent to examine the Czar's uncle, Prince Andrei Ivanovich, in 1537. Another physician entrusted with the Czar's special favor was Arnold Lenzey, a well educated Italian physician and mathematician who died in 1571 when the Crimean Khan, Devlet-Giry, burned Moscow. With the arrival of Lenzey, the practice of medicine in Russia became more rational. Ivan the Terrible appreciated medicine, notwithstanding his

belief in superstition, and he was not even afraid to take Lenzey's remedies.

Robert Jacob, an English physician called Roman Elizarovich, next came to Russia. When Elizabeth sent Jacob, who was her personal physician, to Moscow she wrote to Ivan: "I am sending you a very skillful curer of diseases, not because I have no need of him but because you need him. With him I am sending you pharmacists, barbers and male nurses." So great was Ivan Vasilyevich's confidence in Doctor Jacob that he entrusted to him his diplomatic correspondence with the Queen.

One would hardly expect to find a pro-English enthusiast in Ivan the Terrible; yet it is a fact that even while living with his seventh wife he was aspiring to marry an English princess, and it was only because of the diplomatic intercession of the skeptical Queen Elizabeth that he failed to carry off the comely Mary Hastings. In spite of Queen Elizabeth's refusal, Ivan did not relinquish his hopes to persuade Mary Hastings to marry him. It was Doctor Jacob who recommended Mary Hastings to the Czar as his eighth wife. Happily for the lady, Czar Ivan died before the negotiations, which were opened in 1583 with the sanction of Queen Elizabeth, were finally concluded. It is probable that Doctor Jacob, the first obstetrician, would not have been allowed to practice obstetrics had it not been for Ivan's desire to wed Mary Hastings.

Had Ivan not died he would undoubtedly have done away with his seventh wife, Marya Nagaya, who bore him a son in 1583. Life was not highly valued in those days and murder meant little to Ivan the Terrible. His-

tory might well have recorded his name as Ivan the Murderer. Historical documents do not tell us what became of his first six wives. Ivan's first wife was Anasthasia Romanova, who bore him two sons, Ivan and Theodor. Ivan was twenty and Theodor thirty when they died. Theodor was married and his wife was expecting a child. Ivan's cruelty is almost inconceivable; Beasley tells us that "one day when the Czar entered a room where Theodor and his wife were, he was offended by what he considered the scanty costume of his daughter-in-law and hit her; whereupon her husband came forward in her defense. Ivan habitually carried an iron staff, the heavy weight and point of which were painfully known to his courtiers and attendants. Incensed by his son's interference, Ivan struck him on the head with it and naturally killed him." The beautiful Mary Hastings was indeed fortunate that Ivan died before he could murder his seventh wife.

There were six Russian czars named Ivan. Ivan II was called "the Good," and Ivan III was called "the Great," but history fails to tell us what they did to deserve these titles. Each of them ruled Russia with an iron hand, and most of them were cruel, merciless and homicidal.

Among the foreign physicians were some who took advantage of the czar's trust and pursued mercenary and political ends. The chronicle speaks of Doctor Elisaeus Bomel, who "was liked by the Czar and was very close to him." Bomel, a Hollander by birth, went to Russia from England, where he had been incarcerated for practicing medicine without a license. While Bomel was in prison, Savin, the Russian ambassador to Eng-

land, sent him an invitation to go to Russia where he would receive good pay. Bomel decided to accept the offer and wrote to Sir Cecil, Secretary of State, begging him not to throw any obstacle in the way of this project and at the same time promising to supply him with political and other news and to send "annually such small presents of the produce of that extensive region as are proofs of a grateful mind." Far from hindering him, the government was only too glad to get rid of the doctor, and late in 1570 he accompanied Ambassador Savin to Russia.

The subsequent career of the unfortunate adventurer Bomel is preserved in the *Travels* of Sir Jerome Horsey, who went to Russia in 1572. Sir Jerome met Bomel frequently in Moscow, and he writes that the doctor was living in great pomp at the Court of Ivan Vasilievich (IV), was in high favor as a magician, and held an official position in the household of the Czar's son. Bomel is said by Horsey to have amassed great wealth, which he transmitted by way of England to his native town of Wessel, and to have encouraged the Czar by means of his astrological mystifications and calculations to persist in an absurd project to marry Queen Elizabeth, having made him believe "the Queen of England was young and that it was very favorable for him to marry her." According to Horsey, he was "an anymie alwaies to our nation" and a "practiser of much mischief," and he seems to have exercised an evil influence over Ivan.

After a few years of fame and prosperity, Bomel was charged (about 1574) with intriguing with the kings of Poland and Sweden against the Czar. He was arrested

with others, and a confession extorted from him by the rack. "The Emperor sent word they should roast him." This was done. Having survived the most diabolical tortures, he was finally cast into a dungeon and died there. His widow, Anne Richards, returned to England with Sir Jerome Bowes in 1584.

Among the pharmacists who were sent from England with Doctor Jacob was James Frenchnam, called in Russian Jacob Astafev. The first czarist pharmacy was established in Russia during his sojourn. This was the starting point of the Aptekarsky Prikaz or Board of Pharmacy, and the duty of the head of that apothecary was to study, obtain and distribute drugs. After a two years' stay Frenchnam was permitted to go home to visit his sick father, but he returned to Russia within a short time.

Ivan made an unsuccessful attempt to spread medical care in Russia. In the "Stoglav" decree of 1551 he ordered hospitals built in the cities, but neither during the reign of Ivan IV nor that of his immediate successor was the decree enforced. The entire burden of caring for the medical needs of the Russian masses fell upon the monasteries whose facilities were woefully inadequate; the leisure classes had the best of medical attention.

Invitations to foreign physicians continued during subsequent reigns. There were three foreign doctors at the Court of Fiodor Ivanovich. One of these was Pavel Tzitadini, a Milanese, who probably came to Moscow in the reign of Ivan the Terrible, as referred to in a letter from the French King, Henry IV, dated April 7, 1595. In this epistle the King asked the Czar to per-

mit Doctor Tzitadini to leave Russia in order to see his parents. He is also mentioned in the papers of the Florentine Embassy in 1600, wherein it is said that Czar Boris Fiodorovich "likes him very much; he married in Moscow; he cannot return home because of old age."

Another prominent physician in the reign of Fiodor Ivanovich was the Robert Jacob previously referred to, who came from England for the second time in 1585 but did not remain long in Russia. The third was Mark Ridley, a learned doctor who was a Cambridge graduate. He was court physician to Queen Elizabeth and was sent by her to Russia in 1594 at the request of Fiodor Ivanovich and remained there until the accession of Boris Godunov, when he was released at the request of the Queen. Later he became very famous in England.

Boris Fiodorovich Godunov, who came of a family of Tartar origin, appreciated the great value of medicine and attempted to attract doctors of good reputation to Moscow. Queen Elizabeth sent Timothy Willis in 1599, in exchange for Mark Ridley. When Willis arrived in Russia, he was asked, "How do you treat diseases—by feeling the pulse or by the urine?"

Boris Godunov undoubtedly read the book, *Blagoprokhodni Vertograd,* which gave the opinions of forty-five ancient philosophers and was in three parts. In the first portion there was a description of sundry grasses, roots and stones, which were arranged in alphabetical order and described the diseases for which they were useful. In the second and third parts was set forth knowledge of the findings of the urine and also

the art of bleeding. Physicians were classified as those who treated disease by feeling the pulse and who were regarded as first-class, and those who ministered to diseases by means of urinary findings and who were considered as of a lower order.

Boris Godunov was greatly pleased when he learned that Doctor Willis treated diseases by feeling the pulse. Willis had no more than arrived, however, when he was sent out of the country on suspicion of political intrigues. The very plausible excuse given for the dismissal was that "Although he came to practice medicine he brought no medical books with him or any medicines." This summary action was the occasion of an exchange of sharp correspondence between Elizabeth and the usurper, Boris Godunov, in which the Queen warmly defended the doctor. The experience led the Czar to realize that English physicians were being sent to Russia for diplomatic reasons and aims, and he turned to nearer states for medical representatives.

In October, 1600, the Czar sent Rheingold Beckman, interpreter of the Ministry of Foreign Affairs, abroad to scout for promising medical men. As a result the Czar invited five doctors: Johannes Gilke of Riga, Kaspar Fidler of Koenigsberg, David Vasmer and Hendrick Schreder of Lübeck, and Erasm Bekov of Prague, all of whom passed his state board examinations. At the solicitation of the English ambassador, Richard Lee, the Czar rewarded the Hungarian doctor, Christopher Reitlinger, who previously had been in Lee's service, with the title of Doctor of Medicine.

Frenchnam, the pharmacist, returned from England in 1602, bearing a letter of recommendation from

Queen Elizabeth. He also brought with him a score of medicaments and organized the earlier pharmacy on a firmer basis. His pharmacy contained many medical substances which are in use in our time. These included orange peel, opium, aloe, manna, senna, flower of brimstone, bitters, gum, mustard and dill seeds, borax, alcoholic liquors such as gin, and ether fats such as cinnamon, aniset, clove and others.

The first known attempt to give aid to the medical forces was made in the reign of Boris Fiodorovich. Doctors and medicines were sent from Moscow to combat dysentery epidemic which was raging among the troops who had seized the city of Kromy. According to the chronicler, this measure proved efficacious.

Boris Godunov valued his doctors and treated them well. "The foreigner," says Bussov in his *Chronicles,* "has left some very interesting details concerning the material treatment of foreign physicians." After describing the terrible poverty prevalent in Russia during this period, he proceeds to testify that court physicians received, in addition to their yearly salaries of two hundred rubles, enough food each month for themselves, families and their attendants, sixteen wagons of wood and four barrels of mead and four of beer; furthermore, they were daily given a quart and a half of vodka and vinegar, a pud of ham (equivalent to thirty-six pounds), and three or four courses from the Czar's menu, with the dishes filled to capacity. Twelve to fourteen rubles were allotted monthly for additional provisions. The Czar not only presented every doctor with five horses, but supplied abundant quantities of oats and hay for their maintenance. A special horse was

provided for the doctor's daily trip to the pharmacy in Kreml. A work-horse was used to bring water. The doctor's wife was given two horses so that she might go to church for confession. In addition to this the Czar presented each doctor with an estate of thirty to forty serfs. When a remedy prescribed by one of the doctors reacted favorably on the sovereign, the fortunate physician received a gift of a piece of velvet or silk material or sable. Presents were also given for the successful treatment of well known boyars and princes. Salaries and privileges were awarded by the Great Court, although the doctors were appointed and dismissed by the Ministry of Foreign Affairs.

Boris Godunov exhibited an unusual degree of religious toleration in permitting foreign doctors to build their own church in the German suburb. Nevertheless, being influenced by the old conceptions of medical art, the Czar subjected the medical men to great severity when their treatment miscarried. When Duke Ivan, the bridegroom of Princess Kdeniya, died of typhoid fever, all six doctors who had prescribed for him were forbidden to approach the Czar for a long time.

Though he had confidence in the knowledge possessed by doctors, the superstitious and suspicious Czar continued to fear poisoning and witchcraft. To safeguard his life, soon after his accession to the throne, he instituted an oath of fidelity. Doctors and pharmacists, as well as others in the Czar's service, were compelled to take a vow which included: "I swear that I will not harm my sovereign by thought, action or wish. I swear that I will not harm my sovereign by food, drink, dress, nor by anything else. I also swear not to

give him poisonous herbs or roots or to wend my employees to him with witchcraft or with poisonous herbs or roots. I swear not to persuade witches or wizards to do harm to my Czar, etc." This mistrust was not peculiar to Godunov.

Boris was less fortunate as a czar than he had been as a regent. He was unpopular with the ruling class of Moscow and was always afraid of being poisoned or killed. He established an efficient police and spy system, but was at all times under a terrific strain and constantly expected a violent death. He fell ill from fear and anxiety, and one day, after dinner, died suddenly. The rumor was circulated that he had been murdered.

Though treating doctors well and trusting their art, the czars rarely took their internal remedies. If they did, it was only from the hands of a trusted boyar. They resorted more readily to medical aid in external illnesses. According to the testimony of Prince Kurbski, Ivan IV showed great affection for his physician, Arnold, but did not take medicine from him. It is known, however, that Vasili III and Ivan IV were treated by foreign doctors when they became seriously ill. These court doctors were not permitted to treat the czarina or her children, who were cared for by the boyars and wet-nurses who served them in the royal chamber.

Before the appearance of pharmacists and the establishment of pharmacies, the doctors prepared their own medicines from the stores of chemicals which they brought from abroad. When this stock became exhausted, it is probable that they obtained the necessary chemicals from Moscow, where they had been known

and sold from the earliest times. However, after the establishment of the czarist pharmacy by James Frenchnam, their difficulties were largely solved, at least as far as procuring supplies were concerned.

A brief examination of some of the principal methods of treatment used by the early doctors is interesting. The period was one in which the court indulged in hearty meals, with consequent plethoric tendency. The favorite remedy for this condition was phlebotomy, both venous and hypodermic. Phlebotomy and internal medicinal remedies could not be administered on all days, and so a distinction was made between difficult days and easy days, depending on the constitution of the patient. Patients were placed in three categories according to their constitutions: the "pituitary," the "choleric," and the "melancholic." After phlebotomy the doctor prescribed a diet: "After the veins are open it is beneficial to eat fresh fish; perch, pike and crawfish are especially so. The fish should be cooked in fish soup, or fried. Fried fish should be spiced with lemon juice. Radishes and horseradish are not to be eaten. Good Rhine wine, good beer and good grain cider are healthful beverages. Hot wine, vodka and mead are not to be drunk."

With the murder of Boris Godunov in 1615 by the false Dimitri, who was succeeded by Vasili Shuisky, Russia became a land of chaos and anarchy. Bishop, in his valuable pamphlet on English physicians in Russia in the sixteenth and seventeenth centuries, says that after the assassination of Boris Godunov, "for some years Muscovy would seem to have lost its charms for English doctors. But during the reign of Mikhail

Fiodorovich (1613-1645) English physicians became again in favor, but as the number of foreign physicians entering Russia was so great as to necessitate legislative measures for their control, a board of examiners was instituted for testing their qualifications."

Whether due to diplomatic reasons or other causes, English physicians were preferred. In 1621, armed with a letter of introduction from King James, Doctor Dee accompanied Ambassador Isaac Ivanovich Pogoshell to Moscow, and became physician-in-ordinary to Czar Mikhail Fiodorovich. In 1626 he paid a visit to England, but in 1627 he returned to Russia with recommendations from Charles I. He was given a house near the Ilgin Gate in Moscow and a country seat not far from town, and for twelve years enjoyed high favor as the body physician of the Czar and of his father, the Patriarch. His salary of fourteen hundred rubles a year (to which was added seventy-two rubles monthly for provisions, besides rations of flour, wine, mead, and oats and hay for the horses), if not comparable to that offered to his father, was at least sufficient to maintain his wife and twelve children in comfort. He particularly distinguished himself by performing an operation on Czar Mikhail Fiodorovich, for which he was generously rewarded. He was given a gilded silver cup with a cover, two yards of Kizl-Bash green velvet, ten yards of scarlet caffart damask and forty sables.

Powders were usually prescribed for headaches. These consisted of "ten grains each of dew incense and white amber, half a dram of plain incense and one dram of nutmeg." The powder was placed on the fire, in half a nutshell, before going to bed, and the vapor arising

from the mixture effected the cure. The steam was also considered beneficial for ears afflicted with noise. The ear was first cleaned and then held over the infusion.

A laxative powder (which more properly might be called gun powder) was sometimes administered. The medication consisted of "half a dram of Mexican black, five grains of roots, one-third of a dram of cream of tartar, three drops of oil." This was taken as a light laxative in order to "drive off water and slime from the blood." After the treatment the patient was advised to eat sugar, which was supposed to strengthen and cleanse the stomach, liver and spleen, and drive out the gases.

During this period the common people received medical treatment from so-called *lekars,* sorcerers, magi, wizards, and the like. Such *lekars* could be found among the peddlers in the "herb lane," selling ointments, medicines for external use, liquors, and a variety of drugs. Anyone who had tested the action of a remedy could apply it to others. Professional native lekars who practiced medicine were called "artisans." They took pupils privately and it was probably thus that the serf doctors of the boyars originated. These home-bred doctors preferred to do surgical work and treated patients on the basis of an agreement, receiving compensation chiefly in food and but rarely in money.

Foreign doctors were not held in favor by the boyars and were hated by the lower classes. Muscovite Russia resisted the intrusion of foreigners. The populace viewed the strangers with distrust, chiefly because they did not belong to the Greek Orthodox Church and were inimical to the common people, while flattering

the ruling powers and helping them in many intrigues. The Westphalian physician, Elisaeus Bomel, was regarded by the masses as a heretic and a wild schemer. During the "political troubles" after the killing of Fiodor Borisovich, the property of the doctors was the first to be plundered by the people. This was repeated when Dimitri "the Alleged" was killed. It can easily be seen how deeply and strongly entrenched were Russian customs, prejudices and superstitions.

It is surprising that the rulers of Moscow, while possessing learned doctors who came to them through the recommendations of friendly monarchs, continued to resort to herb *lekars,* wizards and sorcerers. A self-educated *lekar* treated Boris Godunov by setons for a wound which he had received from Ivan the Terrible while defending Prince Ivan from the Czar's blows. The Czar, impressed by the *lekar* Stroganov's skill, rewarded him with the title of an eminent personage; that is, he could be called by his full middle name.

There is available only scattered material concerning medical aid in the army. Gerberstein says that those wounded when hunting with Czar Vasili III were treated by his *lekars.* Czar Ivan Vasilievich Groznyi ordered the governor of Novgorod to give the wounded to "a good *lekar* artisan." In Pskov, during the siege of 1582, the sick and wounded were cared for at the expense of the public treasury. Czar Boris Fiodorovich sent *lekars* with gin, vinegar and lemons to the army seizing the city of Kromy. And this exhausts the information concerning medical aid to the army prior to the seventeenth century. The same obscurity exists regarding the position of army medicine in the periods

of Dimitri the Alleged and Vasili Ivanovich Shuiski, a lineal descendant of Rurik, who soon got rid of Dmitri. Shuiski was ambitious, miserly, crafty and narrow-minded and as a ruler was not popular.

Since with the exception of the Spasski School of Moscow, founded by Czar Boris Fiodorovich, even elementary schools did not exist, the percentage of literacy was very low. As a result, the intelligentsia of the period was able to get its medical knowledge only from translations of manuscripts and printed works. Save for Svyatoslav's *Izbornik* (1073), the contemporary Christmas carols and other bits containing original conceptions of medicine—*gromnik* and *molniyannik*—the only other well known works were translations of the following: *Calendars of the 14th Century; Galinovo na Vpokrata,* which discussed the body and soul of man; *Blagoprokhodnyi Vertograd,* which is mentioned in a previous chapter; Aristotle's *Problems,* a compilation of information concerning anatomy and physiology; and *Lechebnik Stroganovskikh Lekarstv,* which was probably translated from the English by a doctor who lived in Stroganov's settlement.

For a century and a half semi-scientific medicine in Russia had existed as the private property of the czar and his boyars. The beginning of the seventeenth century was marked by an outstanding event in the history of Russian medicine in so far as it constituted an opening wedge in the development of a broader State Medicine. The Apothecary Department, one of the first attempts to establish Russian medicine as a state enterprise, came into existence. The exact time of its establishment has not been ascertained, but the general

consensus of opinion places the date early in the seventeenth century. There are some, however, who think that it was already existent in the reign of Boris Godunov and perhaps even earlier.

The Apothecary Department was headed by a boyar who had the special confidence of the ruler. The position was later held by some of the most prominent statesmen of the seventeenth century, such as Fiodor Sheremetev (1642), Boris Morozov (1646), and Artamon Matveyev (1673). The staff of the department consisted of court doctors, and meetings were held daily. There were clerks to take care of correspondence and so important was this department considered that Duma clerks sometimes worked for it. The Apothecary Department supervised the activities of doctors (those physicians who treated internal diseases, as well as *lekars*), surgeons with less education than doctors; pharmacists, alchemists, distillers, pharmacy students, herbalists who collected medical plants for the czar's pharmacy, barbers, phlebotomists, bonesetters, assistant *lekars* and watchmakers. In addition to this long list, interpreters and gardeners came under its jurisdiction.

The duties of the department included supervision of the Czar's pharmacies; safeguarding Moscow against contagion; invitations to, and examinations and placements of, foreign doctors; issuance of permits for the importation of foreign medicine and drugs; keeping the Czar's pharmacies supplied; establishing pharmacy gardens; gathering native medical plants in places of their growth; organizing field pharmacies; supervising visits of doctors to the sick and wounded; carrying out of medical police measures; assigning of salaries to physi-

cians and other employees; examination of disagreements arising among them; and dealing with numerous other matters.

According to the testimony of contemporaries, one of the principal reasons for the great importance of the Apothecary Department was the fact that it supervised the pharmacy in which the medicines for the sovereign were prepared. Toward the end of the seventeenth century, when physicians and the pharmacy began to serve the state, the activities of the department were considerably broadened. In 1682 the budget rose to an amount which was high for the times—ten thousand rubles.

In this epoch there were two pharmacies in Moscow; the old (Staraya), founded in 1581 in the reign of Ivan IV by the pharmacist Frenchnam, and the new (Novaya), which was created not earlier than 1672. Both pharmacies were under the jurisdiction of the Apothecary Department.

The Old Pharmacy, also called the Highest of Chief Pharmacies, was situated in the Kreml. At first it served the Czar's court exclusively, in the narrowest sense of the word—namely, the Czar himself and his family. Later, however, eminent boyars and foreigners were able to get medicines from it by making special petitions to the Czar. A favorable response was esteemed as a mark of the Czar's favor and consideration. In the second half of the seventeenth century its scope broadened somewhat, and medicines were sent to the regiments. Later the sale of medicines even to private individuals was permitted, but only after petition to the Czar. It is of interest to note that in the reign of Fiodor

Alekseyevich, the *"banki"*—cups—of this pharmacy were made of "polished crystal in a silver setting with gilding."

The New and Lower Pharmacy was located in the new Russian business center, and was established for the free sale, on the basis of medical prescriptions only, of all kinds of medicines to people of every station. The luxury and modernity of its construction made it one of the finest institutions of its kind. Its staff was numerous, consisting of one Russian and three German pharmacists, one alchemist, and many cashiers and accountants.

Pharmacists and their assistants managed both drug stores. One of the duties of the pharmacist was to keep an account of incoming and outgoing substances. Tapsters had charge of incoming money as well as of the issuing of money for the purchase of pharmacy materials and the turning over to the Apothecary Department of any funds remaining. The account books have been preserved, and are curious mementoes of the learning and finances of that period. Correspondence was in the care of scribes. In order that medicines might be sold continuously from morning until night, the pharmacists were divided into shifts. The prices to be paid for drugs were determined by the "price book." The annual transactions of the Old Pharmacy were insignificant, but the returns of the New Pharmacy reached as high as five thousand rubles a year.

There was in existence a third pharmacy, the Czar's field pharmacy. This consisted of a casket which was divided into four drawers and contained various oils, elixirs, essences, sugars, syrups, salts, plasters, prepared

powders for tapeworm, running nose and coughs, laxatives and other substances. In addition there were two cases which held herbs, liquors and pharmacy dishes and also a set of foreign weights and measures. The Czar carried this pharmacy with him on his campaigns and travels.

Medical substances and even ready-made medicines were imported from England, Holland and Germany, and the prices paid for these medicaments were very high. In 1655 three monoceros or "unicorn" horns, which were used as a remedy for ague, burning fevers, plagues, snake bites and the black illness, cost more than five thousand rubles. Genuine popular medicine was also considered important, and many medicinal herbs and roots were obtained in Russia. Expeditions were sent as far distant as the Polar regions of Siberia beyond Yakutske and into other remote lands in order to get rare grasses, juices, roots and information concerning their use from local dealers. In this way rhubarb was obtained from Siberia, through the assistance of the Siberian Department.

With the object of reducing the cost of medicines and procuring them more conveniently, attention was given to the growth of medicinal grasses in Russia and apothecary gardens were established for this purpose. There were three gardens in the reign of Alexei Mikhailovich. The first, in the Kreml, was a beautiful quay garden containing rare medicinal plants; the second was located at the Myasnitzki Gates; while the third was in the German suburbs. A "kitchen" was maintained in the chief garden. Distillers in the gardens were ordered to supervise at all times the preparation

of various kinds of vodka, syrups, plasters, ointments, and medicines which were stored there. These experts also had to prepare simples from fresh plants in order that their reaction might be favorable. During Lent the distillers were not to include in the medicines anything forbidden during the fast. Russians were hard drinkers, particularly prior to and following Peter's time, when the ruling class consisted of bold and brutal adventurers and vagabonds.

Invitations to foreign doctors continued to be extended throughout the seventeenth century. These professional men were chosen with great care, however, and had to be recommended by royal personages, ambassadors, Russian diplomatists, and doctors previously employed in Russia. The length of service and amount of salary were determined by agreement. Among the physicians invited were learned men who had received their education at universities famous at that time.

In the reign of Mikhail Fiodorovich, eight foreign doctors, five lekars and four pharmacists were employed. They included Artemy Dee, who was educated at Westminster and Oxford Universities and was physician to the English King, James I. Among other physicians who went to Russia were Vandeline Sibelist, who received his doctor's degree at the Gaelic University and was recommended by the Golshtinsk Duke, and Artman Graman, educated at Jeba, Leipzig and Wittenberg and recommended by the well known traveler Clearinus, who twice visited Russia.

Under Alexei Mikhailovich, there were eleven doctors, six pharmacists and one head physician. The outstanding doctors were Andrew Engelhardt, who was

educated at Leyden and Koenigsberg, Samuel Collins of Cambridge and Oxford, Ivan Osenburg of Koenigsberg University, and the famous doctor, Lavrenti Blumentrost. Doctor Gregory Carbonari went to Moscow in 1689 on the recommendation of Emperor Leopold. In 1690 Jacob Pellarino, noted for his advocacy of the necessity of smallpox vaccination, entered the service of Russia.

Since foreign doctors without good credentials were not employed, those lacking this essential qualification were turned back before reaching the Russian border. On the other hand, every doctor who was invited was given a "safety certificate" which assured free transportation to Moscow, an allowance for the journey, horses and wagons for himself and family, and sometimes even guides were supplied. Upon arrival in Moscow, the doctor had first to report to the Department of Foreign Affairs and then to the Apothecary Department. After the necessary questioning and examination of his documents, he was sworn into service. If the candidate did not possess an acceptable diploma, he was subjected to a formal examination by a council of doctors of the Apothecary Department. After taking the oath of loyalty, the doctor was introduced to the sovereign. According to the customs of the period, "welcome gifts" consisting of money, material things and food were presented by the royal court to the newcomer, his wife and even their servants.

On the day of his arrival, Vandeline Sibelist was given forty rubles in money, fifty minks worth forty rubles, velvet, satin and two pieces of silk. His wife received a piece of silk, taffeta, English cloth and forty

minks worth twenty-five rubles. The doctor's servant was given English cloth and money. Besides his salary, the doctor was daily given three loaves of bread, a quarter of beef, a goose, two ducks, a hare, two black grouse, a lamb with its wool, five chickens, two hams, three pounds of butter, eight eggs, a large cup of boyar wine, two cups of Roman and Rhine wine, two cups each of cherry mead, raspberry mead and boiled mead, one pail of molasses mead, four pails of princely beer, one pail of artificial beer and two pails of ordinary beer. All in all, this was a bill of fare not to be scoffed at, and it is not surprising that foreign doctors counted themselves fortunate when enabled to enter the Russian service.

The salaries of medical men were not equitably proportioned. Court doctors received salaries, monetary rewards and presents. Sibelist, for example, was given a salary of two hundred and fifty rubles a year and fifty rubles monthly for food. In 1936 this would have amounted to over five thousand rubles, or two thousand dollars. *Lekars* and pharmacists received from one hundred and eighty to three hundred and sixty rubles, assistants to pharmacists were paid from one hundred to one hundred and twelve rubles, assistant *lekars,* Russian *lekars,* phlebotomists and barbers from twenty-eight to thirty rubles, pharmacist students thirty-six rubles, and herbalists eight rubles a year.

It is evident that a foreign doctor was well taken care of materially. If he were successful in treating the Czar, or applied phlebotomy safely, he was generously rewarded with gifts. For a satisfactory phlebotomy performed on Czar Mikhail Fiodorovich, Doctor Sibelist

received a silver cup, ten yards of silk, ten yards of velvet and forty minks. Similar presents were given to those *lekars,* pharmacists and interpreters who assisted at the phlebotomy. If the ministrations to the Czar or his favorites were unsuccessful, however, the physician was discharged and sent back to his native land. Some private practice was permitted during this period, through the favor of the Apothecary Department. The doctors' compensation was in money, or more often, in furs, velvet and other objects.

In prescribing for any illness of the Czar, all the outstanding physicians took part, usually according to an established procedure. Each one had to observe the symptoms, and a remedy was offered on the basis of the diagnosis. This was recorded by a clerk, in the form of a protocol, and was given a Russian translation under the name of "tales." If, after the report of the boyar in charge of the Apothecary Department, the Czar agreed to the treatment offered by the doctors, the prescription was sent to the pharmacy. The medicine was prepared under the direct supervision of the boyar, tasted by the doctor, sealed, and, with a translation of the prescription, was conveyed to the royal chambers by messengers sent from there for the purpose. The names were entered in a special book. Before the medicine was served to the Czar, it was usually tasted by the head of the Apothecary Department or by the attending physician, as royal persons were ever in fear of being poisoned.

During the second half of the seventeenth century, the task of supervising the health of the Czarina and her children was added to the duties of the foreign doctors.

Medicines prepared for the Czarina were tested by a trusted maid. At first this was done at the instance of the foreign doctors because of their mistrust, but later it became a form of etiquette. Well known boyars, foreign guests, and military persons were now often treated by the court physician. Doctors voluntarily returning to their own country from Russia valued the recommendation of the Russian government to such an extent that they considered it necessary to secure a certificate which enumerated all their deeds.

During this period scientific medicine remained inaccessible to the masses, with the sole exception of the army. Dissemination of medical knowledge in Russia was primarily a result of the recognized needs of the army. The first czar to lay a sound and broad foundation for the development of medical aid in the army was young Mikhail Fiodorovich, who sent *lekars* to the regiment. In the calculation of expenses in 1615 it was said that the doctors attached to the army were maintained by the public treasury. In 1616 the regiment doctors were enumerated in the records, and by the end of the seventeenth century most of the regiments had attending physicians. But the masses, who were burdened with heavy taxes, were deprived of medical assistance.

THE REBIRTH OF RUSSIAN MEDICINE

THE REBIRTH OF RUSSIAN MEDICINE

AS the cost of foreign medical attendance was high, it was obviously impossible to send doctors to the regiments, and some means had to be devised for further medical education. As there were neither schools nor hospitals for this purpose, it was necessary to place medical students under more skilled physicians in order that they might acquire experience in the use of surgical instruments and ordinary prescriptions. After this training they were appointed to the regiments, where their pay was eight rubles a year and six kopeks daily for meals, although *lekars* formerly received no less than ten rubles a month.

Fiodor Alexeyevich, the third Romanov, was frequently in need of medical attention and therefore valued it highly. Fiodor was gentle in manner, just and lenient, with more character and intelligence than his father. He was fond of his friend, T. M. Rtytschev, who was remarkable as a man and scholar, and cared more for learning than for wealth and position. Rtytschev had great influence over Czar Fiodor, who, realizing that Russia was in need of native doctors, established a

public hospital with an attending physician, three or four surgeons and many students, who were required to take a five-year course. Students were obliged to study anatomy, physiology, therapeutics, pharmacy, languages, particularly Latin, and the art of prescribing. At the end of five years they underwent an examination. It is refreshing to know that students were paid while studying. In pre- and post-Fiodor's time, Russian medical students were treated harshly and some, as mentioned in another chapter, ran away to other towns.

Young men were sent abroad to study medicine for the first time in the reign of Fiodor. At first it was the children, born in Moscow of foreign parents, who were so favored. Peter Vasilievich Postnikov was one of the earliest to study medicine abroad, and in 1692 he went to Padua and received a doctor's degree from that university. Other Russian-born foreigners who sojourned in another country for the purpose of study were Kellerman and the Blumentrost brothers.

Czar Fiodor was followed by Czaritza Sophia, who did not like her stepmother and was in favor of Peter's becoming czar. She was energetic and liberal-minded, but was cruel and unscrupulous and would not stop at any means of attaining her object.

Interests of Peter the Great in Medicine

Peter the Great was the first to lay a sound foundation for the development of science and medicine in Russia. He encouraged any branch of science which could be turned to immediate material profit, for his subjects and armies of writers were engaged in translating

Peter the Great evinced an early interest in medicine. He was the first ruler to send Russian students abroad to study and to import foreigners to teach in Russia.

scientific works into Russian and other languages. Russians were sent away to other countries to be educated, and foreign savants were imported by the wholesale into Russia. His importation of foreign physicians—twenty-five came in 1695 and fifty in 1697—having proved insufficient, Peter established a course of training for physicians in his own country. He reorganized the Apothecary Department, changing its name to the "Office of the Highest Apothecary," and he established a new position, that of head of the medical branch, to which Erskine, former physician to the king, was appointed. In 1706, desiring a sufficient supply of native Russian doctors, Peter ordered the founding of a hospital in Moscow with a medical school as part "in order to enroll fifty pupils for the Apothecary Science from foreigners and natives of all ranks." Nicholas Bidloo, a man of great fame, was appointed as its head. Both school and hospital were under the jurisdiction of the Holy Synod.

Peter the Great was as profoundly interested in medicine as he was in science. While in Amsterdam he purchased Ruysch's Anatomical Museum and the secret of embalming cadavers. Arsenic was undoubtedly used for embalming. On one occasion the monarch was so charmed with the embalmed cadaver of a child that he wanted to kiss it but was not allowed to do so. Peter paid an enormous sum for both the Anatomical Museum and the secret of embalming, which secret he revealed to his physician and friend, Doctor Blumentrost.

Peter liked to witness operations and was so interested in surgery that he purchased a set of surgical instruments and always carried the outfit with him.

He proved to be a good pupil of his court surgeon, Tormont, and soon began to perform minor operations, such as opening abscesses and tapping dropsies, and once performed a real abdominal operation on the wife of a merchant named Beret. Later on he undertook a few serious operations, but history fails to enlighten us as to the results, and dead people tell no tales.

He was a better carpenter than surgeon and was so cruel that he felt no anxiety as to the consequences. As previously remarked, life was a cheap possession during the régime of the Romanovs. Even in his youth Peter thought but lightly of doing the work of an executioner. Poliakov, in his book *When Lovers Ruled Russia,* tells us, "His enemies, the Streltzy, were hanged, quartered and beheaded without mercy. To give an example to his generals and courtiers, the Czar, taking the ax himself, struck off the heads of the wretches, who, with their hands behind their backs, had been forced to kneel in a row, laying their heads on a block of wood. On one occasion, among the victims was a full-necked giant, who refused to be cowed. Just as the terrible Czar had hewed off the head of the next man, the Streletz looked up with blazing eyes and flung at Peter the words: 'You brutish swine, if only my hands were free.' The Czar shook with anger and his ax swept up. Then he laughed, bent down and seizing the man by his mop of hair, yanked him away from the block. 'Take him,' he ordered, 'he will make a good grenadier.' In this way the Guards gained a recruit, who did so well that he was promoted to be an officer and served with distinction in several campaigns. His name was Orlov. Five of his sons became officers in

the Guards." Gregory Orlov, one of five brothers, was one of the chief lovers of the great though amorous queen, Catherine II.

Peter the Great was particularly interested in diseases of the eye, and sometimes removed cataracts, usually with disastrous results, though these did not cause him to cease. He was thoroughly versed in Bidloo's *Anatomy* and used it as a surgical guide. The late Doctor F. H. Garrison was correct when he said in a lecture delivered at the Institute of the History of Medicine on March 26, 1931, that Peter the Great can be regarded as the creator of Russian medicine, however cruel his methods. History tells us that Russian medical men were kind and had no resort to Peter's methods of operating.

Russian Non-medical Men's Interest in Medicine

Besides Peter the Great's deep interest in medicine, other non-medical men, better educated and more cultured than he, were deeply engrossed in the subject. Among them may be named Lomonossov, Baron Cherkasov and Morozov. Lomonossov, known as a brilliant physicist and chemist, made a concentrated effort to develop science in Russia. He was a true patriot and looked with disfavor on the influence and usurpation of power by the German element in scientific fields. He wrote a telling letter to the liberally inclined Prince E. I. Shuvalov on the importance of hygienic measures and the development of Russian medical talent. "We have not enough Russian doctors to preserve the health of the Russian people. People are needlessly dying for want of doctors," he stated. His earnest pleadings were

without result, and apparently the Russian female court found love intrigues more important than the health of the masses.

Lomonossov, however, did not give up his efforts for the cause of Russian medicine which was so essential to the masses who were dying for the lack of physicians. Knowing that Catherine II always posed as a patroness of literature, art and science, he wrote an ode glorifying her greatness. She was highly flattered and made him Councilor of State. He hoped that his new position and the good will of the gracious Empress might influence Shuvalov to do something for the betterment of Russian medicine, but Lomonossov's endeavors were not appreciated and nothing was accomplished. Catherine, the pseudo-liberal queen, busy with her love affairs, let the matter rest and did nothing to help.

Michael Vasilievitch Lomonossov (1711-1765) was a truly remarkable man. Realizing, while still a boy, that he could not acquire schooling at home because his father, a poor fisherman, was unable to send him to school, the youngster hid himself in a fish wagon, and without a kopek in his pocket, managed to arrive in Moscow. He had the good fortune to meet an old monk who became interested in him and sent him to school. It did not take long for this genius to make his way in the educational world. His ability as a scholar and organizer was soon recognized, and somewhat later he became a leader in science and literature.

Lomonossov has been referred to as Father of Russian History and Literature. An able chemist, he also devoted much of his time to literature and educational projects. His whole ambition in life was to help his

people who were oppressed and mistreated. His letter to Shuvalov, pleading for physicians and pharmacists and stressing the dire need in these words, ".... of which there are none, so that many that should be alive are dead," is one of the most pathetic documents ever written. Shuvalov could do but little. The supposedly generous Catherine was busy with political intrigues and was influenced by her courtiers, who claimed that the commoners were healthy and happy, and that Lomonossov's statements were exaggerated. The matter was dropped, as were many other pleas which were brought to her royal attention. Her great display of spurious revolutionary and liberal tendencies in the first few years of her reign proved to be but a mirage. Her French memoirs are shallow and meaningless, yet she imagined herself as accomplished as Von Vizin, Dershavin, Cherkasov, Khemnitz, and Novikow, the brilliant journalist, whom she later banished to Siberia.

Alexander Ivanovich Cherkasov was devoted to the study of medicine, stimulated this art to a high degree, and was imbued with a passion for it. While in England he never failed to attend medical lectures by the best English professors, and, in 1762, wrote a splendid article on *How to Handle the Medical Question.* Russian physicians owe him great appreciation for furthering the study of medicine, and he was responsible for interesting the Russian people in that important field and in the development of native talent. His devotion to medicine was so great that he established a hospital medical colony at the University of Moscow. He was an ardent advocate of vaccination. The foreign physicians dis-

liked him, most particularly the German doctors who were planning to be dictators in medical science.

Morozov, a boyar, strongly desired Western civilization. He was a constant companion of Czar Alexis, who was perhaps the most normal ruler Russia ever had. After Alexis and his companion Morozov had married two sisters, their friendship became even closer. The reign of Alexis was not a tranquil one; yet Morozov, who had a passion for learning, went far toward improving the health of the Russian people. He succeeded in founding a medical library, which contained a considerable number of books in Latin, German, French and Russian.

Novikov, another liberal who assisted in the much needed development, introduced the Masonic Order into Russia and induced the famous Doctor Mudrov to become a member. In collaboration with Professor Schwartz, he established "The Friendly Scientific Society." Both he and Mudrov did everything possible to improve the status of medicine. Through Novikov *The Moscow News* became celebrated. He was instrumental in organizing the Academy of Science, of which the president, Princess Dashkova, was the friend of Catherine II. When liberal ideas began to filter into Russia too rapidly, Catherine, who had boasted of her liberality, became thoroughly reactionary. Novikov was imprisoned and his friend Radichev was sent to Siberia. Doctor Mudrov, however, managed to escape imprisonment.

Alexander the First's promises of liberalism and his patronage of science lasted but a short time. True, a liberal decree was issued to improve the Medical

Academy by establishing branches in anatomy, surgery, physiology, otology, legal medicine, therapy, midwifery, medical literature, and veterinary surgery, but, as with all the Romanovs, liberal promises ended in promises only.

It is strange that Ivan IV, who caused the Russians to fear him and who did infinitely more harm to the nation than the Tartars who preceded him, had, in his intervals of good temper and fair fortune, genuine respect and admiration for the family of Stroganovs, who put Russia on a firm commercial basis. They conquered the unruly Tartar tribes by sheer diplomacy and established trading posts in Eastern and Asiatic Russia. This finally became rich and powerful, and the elder Stroganov was given the title of Count. It is also curious that the Stroganovs became interested in medicine and imported a number of European physicians under whom they themselves studied medicine. With the aid of Kabyschev, a native doctor, English medical books were translated into Russian, and later some of the German medical works were also translated into that language. The majority of these books dealt with mineral remedies and medicinal plants.

The success of the first medical school, which furnished a large number of Russian regimental physicians, indicated the necessity for more doctors, and also proved the facility with which schools could be organized in hospitals already existing in many cities. The head of the medical branch, Arkhiyater Fisher, was prevailed upon in 1733 to open schools at hospitals in St. Petersburg and Kronstadt. Forty-eight students were admitted, and the instruction and medical aspects of the schools

were left in the hands of the medical authorities, although their support and administration were undertaken by the organizations which supported the hospitals. Quarrels resulting between the different departments and the medical board caused a movement to be launched for the unification of administration of all the schools, with control vested in one person.

Since the professors of the new Moscow schools were all Hollanders, the students were expected to know not only Latin but also Dutch, a requirement which kept away many Russian students. In order to attract young men, not only complete upkeep but a small salary was also offered. Nevertheless, the response was so small that the first group of fifty students was not organized until 1712. Shortly afterwards some of the difficulties were removed by the Synod's permitting students from the Slavonic Greek-Latin schools to enroll. In 1719, as there was still a shortage of educated persons in the medical field, the authorities permitted only those who desired to study medicine to receive a preliminary education in the religious schools.

Students were lodged in small rooms on the second floor and were given twenty-four rubles yearly. They were furnished with cloth of an inferior quality and had to partake of the hospital food, which was very poor. Life was difficult in the hospital schools, and students were frequently unable to endure it and fled from its rigors. Of Bidloo's first fifty pupils, eight deserted.

When Anton De Teils succeeded Doctor Bidloo, he became the head of the Moscow Apothecary and at once began to undo most of the good work of his predecessor.

He despised the Russian physicians and did everything he could to impede their development. He treated the students with cruelty and, as in the régime of Doctor Bidloo, many of them ran away from school. He favored foreign physicians, and Arkhiyater Fisher was forced to dismiss him, both for his anti-Russian propaganda and for his inhuman behavior toward the students. These had been beaten with sticks, placed in irons, and made to serve as privates for minor offenses; the major infractions were drunkenness, rowdyism, debauchery and squealing on their fellows. After De Teils' dismissal, conditions improved to some extent.

Czar Peter sent a number of students abroad to study medicine at royal expense, and among them were Peter Postnikov, who went to Padua in 1694 and Gregory Volkov, who also went to Padua. In 1739 the most gifted *lekars,* assistant *lekars* and students were ordered to St. Petersburg, so that they might be tested and then sent to France for further improvement. Most of the *lekars* were poorly versed in medical arts, as the method of teaching was largely one of demonstration. Only the most necessary subjects were taught, for the students were being prepared exclusively as *lekars* for the regiments.

Under the flaming impatience of Peter, medicine began to advance rapidly. With the consent of the ruler, Doctor Blumentrost was instrumental in checking the invasion of foreign quacks by introducing a drastic law against them. Peter uprooted the old order and literally hurled the nation into new forms and reforms. Nevill Forbes, in the second part of his history of Russia, as co-author with Beasley, says: "Peter the Great in forty

years hammered into the Russian intelligentsia the fact that foreigners in general and the Germans in particular, however unpleasant they may be, were the symbols of reform and the sole guaranty of efficiency, wholesome though distasteful, and he endowed them with an unmistakable, if unpopular, halo. In ten years, Anne and her disreputable favorites succeeded in dispelling this uncomfortable illusion, and proving that Germans could be just as lawless and unprofitable as Russians."

The slowly moving boyars resented too rapid progress, and preferred to adhere to their sluggish movements. The Russian bear resented being Europeanized. The death of Peter the Great proved a heavy loss for future rapid development of education. After Peter's passing, the old type of Russian nobility who objected to reforms had a breathing spell. While all school leaders did not believe in, and would not approve of Peter's innovations, claiming that he was a dangerous revolutionist who had done more harm than good by tampering with the primitive, beautiful simplicity of Russian home life, Soloviev, the really scientific and analytical historian of the nineteenth century, extolled Peter's lifework as veritably indispensable and unprecedented. But we must not forget that the sciences which Peter the Great protected and the schools which he founded were such as promised to give him good officers, engineers, administrators and military medical men; the industries he most favored were those which provided for the needs of his army and navy and contributed largely to the revenue of the state. He cared but little for the comforts of the common people.

In his early youth Peter was married to Eudoxia

Lopuknina, who was a pure Russian. She was a healthy, buxom woman, slow and slovenly, an ardent churchwoman, and almost devoid of sense or humor. She was not the right companion for the restless and fiery Peter. She bore him a son, but Peter soon divorced her and sent her away with the child to a monastery. Alexis, who was brought up by the stupid Eudoxia, was not in sympathy with his father and did everything to displease him. Peter's reproaches and terrible chastisements had no effect upon the lad. Doctor Tormont was consulted but could do nothing with the stubborn youth. Peter intended that Doctor Tormont should help him to do away with the refractory Alexis, and was greatly disappointed when the physician advised him to leave the young man alone. Shortly thereafter, Alexis' wife died, and the relations between Peter and his son became too strained. Peter could no longer endure Alexis and plainly told him to abandon any hope of becoming Czar. Alexis' life was then increasingly intolerable and in danger. He escaped to Austria and begged the Emperor to protect him from his father's wrath. Peter asked the Emperor to send his son back, but the ruler disregarded Peter's threats. Later, however, through the fraud of Peter's emissaries, Alexis was forced to return to Russia. No sooner had he arrived than he was sent to Peter and Paul Fortress. Foreign authorities claimed that Peter himself beheaded his son. In any event, he was quite expert with an ax!

The reign of Peter the Great was influenced by two women. Poliakov, in his interesting book, *When Lovers Ruled Russia,* tells us of these two women; one, the daughter of a wine merchant from the Rhine, the other

an Esthonian slave girl. The German woman was the mistress of Peter's youth and completed his separation from the Muscovite past. The slave girl, after having been the plaything of his generals, became Peter's companion, and he finally married and then crowned her. She was his great love, but because of her love affair with the brother of his former German mistress, she hastened his death. As a result of her influence, the succession to the throne was made insecure for a full century afterwards. After Peter's death, the slave girl became Empress Catherine I, and opened a new period in Russian history, during which time fate seems to have ordained that the land should be governed only by women and their lovers.

History tells but little of Peter's love life previous to these two women, yet they must have had many predecessors. Peter inherited his passionate nature from his father, Alexis. The women who pleased him had better health than brains, their morals were lax and they talked loudly and loved vigorously. Peter's father, Czar Alexis, had, in his youth, married a girl selected for him, according to ancient custom, because of her beauty and apparent good health. She was chosen from among hundreds of candidates brought to Moscow from all over the land.

"This parade of handsome girls," Poliakov tells us, "richly and diversely attired, was a picturesque sight; the young czar accompanied by gray-headed advisers, walked slowly past the agitated ranks. Girls who attracted his attention, were then separated from the lot. They were subjected to a medical investigation by competent women and their pedigrees were closely examined

by a committee of courtiers. Those who survived this inquisition were given rooms in a special building, communicating with the palace, so arranged that the czar, himself unseen, could watch them during all hours of the day and night. It is said that the rooms were heated to an extent which obliged the girls to remain in the slightest attire, so that their charms might be displayed and the future Czaritza was made."

A significant change in medical education may be observed during the time of Pavel Zakharovich Kondoidi, a Greek born in Corfu, who gave careful attention to the most minute details of teaching, took energetic measures to fill the needs of students, and invited many new professors to Russia. He also introduced legal medicine as a branch of medical study. Kondoidi often sent young Russian doctors abroad for postgraduate work and thereby succeeded in not having to depend entirely on outside talent. Although a large amount of money was supposed to have been expended on medical education, most of it was actually squandered by corrupt officials.

Fitinhof, who belonged to the German party (German influence was very strong), was appointed president of the Moscow Apothecary. He was stubborn, rude, and did as he pleased, but was an able administrator. His successor, Vasiliev, proved to be the best man for the post, for his whole aim was to improve the status of the medical schools.

The Kalinsky Medical Surgical Institute was established in 1783. It gave courses not only in medicine but also in literature, logic, mathematics, metaphysics, history and other subjects. Instruction was given by

German professors in their mother tongue in all of these subjects. The school did not prove successful, however, and was closed in 1802. The Russians finally wearied of German domination and even made a law that no German physician could practice medicine in Russia without passing a strict examination. The well known Doctor Orreus had difficulty in passing the examination, although he was efficient and learned. His diploma was delayed again and again, and he had to complain to Catherine the Second before he was allowed to practice.

In the eighteenth century a medical education could be secured only at the University of Moscow. In the beginning of the nineteenth century, with the opening of several universities and a sufficient number of "gymnasiums," (corresponding to our junior colleges), the teaching of medicine grew broader and became accessible to a larger number of students. From the earliest establishment of the schools, pupils were divided into students and assistant *lekars*. After several years of instruction, the student was given an examination, and, if he passed it successfully, he was promoted to assistant *lekar* and received an increase in salary. He could not practice independently, however. During the reign of Anna Ivanovna, assistant *lekars* were placed in regiments to help the *lekars,* but they had the privilege of returning to school in order to continue their studies and receive their degrees.

Doctor L. Blumentrost, a Russian, and the successor of Arkhiyater Areskin, proposed the establishment of a medical board which would be responsible both for the supervision and inspection of the pharmacies and for the examination of foreign doctors and *lekars*. The chief

function of the board was to provide the army with medical care. In 1725 the board was renamed the Medical Office, which in turn was later reorganized into a broad organization called the Medical Assembly. The latter was abolished in 1772 and the Arkhiyater re-established.

LA RÉGNE DE LES FEMMES DÉBAUCHÉES

LA RÉGNE DE LES FEMMES DÉBAUCHÉES

CATHERINE I was dominated and influenced by Menshikov, Anna Ivanova (daughter of the short-lived Ivan the Fifth) and Anna Leopoldovna, both of whom were swayed by Germans, and later by Elizabeth, daughter of Peter the Great. These three women accomplished nothing of value, and gave more attention to their amours than to their royal duties. The period may be called one of decadence—an era of rule by indolent, immoral, licentious women.

Catherine I was Peter's third wife. As mentioned before, she was an Esthonian slave girl who had previously been the mistress of Peter's generals. She had dark eyes, full lips, a vivacious face and a well-rounded figure. Peter was immediately attracted, and it did not take him long to make her his mistress. A child was born, but history does not inform us whether it was sired by Menshikov or by the Czar. Peter became so attached to Catherine that he made her his wife. She was young and healthy, and Peter, who had led a riotous and lecherous life, did not satisfy her voluptuous cravings. When he discovered that she was having a love affair with a

brother of one of his mistresses, he became despondent and very nearly insane.

Anna Ivanovna was no more virtuous than Catherine and, in addition to her lack of morals, she soon became thoroughly autocratic. She appointed her lover, Ernest Buyron, to the post of advisor. He became the richest and most powerful man at court, but it was soon discovered that the supposed French nobleman was a plebeian named Buehren, who was in reality the son of a groom of unknown origin. When the truth leaked out, Buyron was condemned to be executed, but through the influence of the fickle Anna he was sent to Siberia. Anna was unattractive and repulsive and so indolent that she refused to be bothered with state affairs. She recognized her own ignorance in matters of state and left their conduct to grafters and schemers. It is questionable whether Ivan V, who was an invalid and semi-idiot, was her father. The stupid and ugly Anna was first married to the Duke of Courland, who was either poisoned or died from an acute attack of alcoholism. When Anna became Empress of Russia, she was merciless and revengeful and hated the Russian nobility. She was in reality a cruel Teuton and excluded the Russian ruling class from holding office. The well known Galitzin and Dolgorukov families were frequently persecuted and lived in fear of their lives. Anna's régime is the darkest chapter in Russian history outside of the Tartar invasion and domination.

During Anna's reign, and soon after Doctor Bidloo's death, Doctor Anton De Teils became Chief Physician. After De Teils' dismissal due to his prejudice against Russian students, Arkhiyater Fisher appointed Doctor

Lavrenti Blumentrost, brother of the famous Ivan Blumentrost, as curator of the University of Moscow. Empress Anna was too witless and lazy to interfere in De Teils' behalf.

Elizabeth was far more clever than Anna, and it was obvious that she had inherited her father's energy and boldness. She, too, had many lovers, and became infatuated with Shubin, whom Anna exiled to Siberia. Elizabeth soon consoled herself and replaced Shubin with Razumovsky, a chorister of the Imperial Chapel, to whom she was faithful as far as a passionate woman could control herself. She was a beautiful woman, despite the fact that she was corpulent and slothful, and at times was good-natured and forgiving. She was fond of horses and low company, and was jealous and cruel toward other women, especially when they happened to be pretty.

The sarcastic and witty remark of Frederick the Great in regard to Elizabeth, "L'enfant catin du Nord," proved to be unfortunate for him. Carlyle gives us Frederick's description of Elizabeth: "An indolent, orthodox, plump creature. . . . Not an ounce of nun's flesh in her composition, mainly a mass of asurient, with alkali in the back of alkali poured in . . . till by pouring and stirring, they got her to a state of soap froth." Notwithstanding the fact that the Russian court was a notorious hotbed of German espionage, Frederick, by his observation in regard to Elizabeth, made of her a formidable and implacable enemy. The result was a seven-year war with Prussia—and its outcome was none too successful, due largely to the treachery of the pro-German party within Russia.

It required little time for the shrewd, keen Elizabeth to do away with her cousin, Anna Leopoldovna, when the latter, with the aid of the schemers Ostermann and Munnich, attempted to rule Russia. Elizabeth was never fond of the Germans, and that made her popular with the Russian nobility, who were kept in the background during the reigns of Anna Ivanovna and Anna Leopoldovna, the latter an ardent German who was led by Munnich and Ostermann. The two men planned to send Elizabeth to a convent so that, with the consent of Anna Leopoldovna, they could rule Russia. They were too slow for the astute Elizabeth, who learned of the plot, and, with the aid of her Russian friends, caused Anna and her two confederates to be arrested. Anna and her husband were sent to Kholmogory, near Archangel, Munnich and Ostermann were shipped to Siberia, and little Ivan V was placed in Schlüsselburg, where he was eventually put out of the way. After a lapse of a few years Anna died.

Empress Elizabeth hated the German physicians and sent ten young Russians abroad to study medicine. They were to study in Holland, not in Germany. Four of this number, Podgoretzki, Yagelski, Timowsky and Fialkovski, distinguished themselves. The famous doctors Shafonsky, Erasmus and Skidon invited the above-mentioned four to help them fight the terrible plague that appeared in Russia immediately after the Turkish war. All of them did noble work, and the epidemic soon subsided. The other physicians selected by Elizabeth to study in Holland also distinguished themselves on their return to Russia.

Elizabeth had a friend and co-worker in Doctor L'Es-

tocq, who managed to be made court physician in the reigns of Peter the Great and Catherine I. History does not reveal why Peter caused this man to be disgraced and banished to Kazan, but it was rumored that he became too intimate with Catherine. When Peter died, Catherine had L'Estocq brought back, and when Catherine died and Elizabeth became Empress, the latter appointed L'Estocq as her body physician and made him Chief Director of all the medical schools in Russia. Doctor L'Estocq, through his machinations and intrigues, was largely responsible for Elizabeth's being proclaimed Empress. He was an astute politician, whatever his qualifications as a physician.

Elizabeth must be credited with having been true to a lover at least once. When she became empress, her first thought was of her former sweetheart, Shubin, who had been banished to Siberia by Empress Anna. She became frantic on his return when she beheld the broken-down man who had been her handsome, charming lover. She honored him with titles and showered gifts upon him, but the poor, disabled man wanted only quiet and retired to the country. It did not take Elizabeth long to find another lover. She was clever and discerning, despite her ignorance, and was energetic and extremely passionate, having inherited both of the latter traits from her father. Elizabeth accomplished nothing with her energy and cleverness, however, beyond having an uncurbed and bacchanalian time. As previously stated, she was at one time madly in love with a young cossack from Malorossia or Little Russia, who was originally a choir-boy in the Chapel of the Empress Anna. Elizabeth could not keep her eyes off

the rosy-cheeked, stalwart boy, and became so infatuated with him that she made him her favorite lover. She made him extravagant gifts and gave him great sums of money. He was her night lover, and someone at Court nicknamed him "Emperor Nocturne."

While there was a cessation of medical activity during the regency of the meddlesome Doctor De Teils, there was some improvement in the situation when Elizabeth reigned. The improvement did not come from L'Estocq, who was more interested in politics, but from Doctor Kondoidi, who, like his predecessor Bidloo, hated the Germans and gave the Russian youths ample opportunity to study.

Catherine II, the *"Grande Amoreuse"* who usurped the throne by stepping to it across the corpse of her husband, Peter III, grandson of Peter the Great, was a capable woman. Peter, though supposedly impotent, paid marked attention to Mademoiselle Voronzov and increased his devotional attitude toward her whenever Catherine was present. His desire was to send Catherine to Germany and thus be free of her, and he resorted to many hateful tricks to embarrass and insult her. Catherine never pretended to be in love with him, and even his ambitious Aunt Elizabeth became disgusted with him. Elizabeth had tried to protect and make a virile man of him and for that purpose had asked Saltykov to bring Doctor Boerhave and another surgeon to operate on him for impotence. Elizabeth was anxious for her nephew Peter to impregnate Catherine so that he would be accepted as the father of her child. However, the affair did not turn out as Aunt Elizabeth desired, and Peter remained the same flippant, shallow,

CATHERINE II, (1729-1796).

"La Grande Amoreuse," who was also attracted to medicine and doctors.

ignorant and mischievous imbecile as before. Whether he was murdered or died a natural death, it was a relief to Catherine when her husband passed away.

"It is rather peculiar," said the late Doctor Garrison, "that Catherine II, a Prussian princess bred in the straitened court of the 18th century Lutheranism, became more Russian in spirit, more Asiatic in morals, than the daughter of Peter the Great. Catherine very shrewdly gained popularity with the Russians. She abandoned Protestantism and became an ardent follower of Greek Catholic faith. She pretended she hated the Germans; she even went so far as to ask her Scotch physician, Rogerson, to bleed her of every drop of German blood that might be in her veins, but that was a bluff. Catherine suffered from hot flushes of the face and Doctor Rogerson told her that bleeding was good for it. She was notoriously sensual, with a ready passion for large, handsome men, and she was liberal with her lovers. When she became tired of one, she gave him a title and a large sum of money.

Catherine had several children by Orlov and two by Potemkin. She was deeply in love with Potemkin, who was uncouth, but whom she preferred to all the rest. Saltykov was next in line, and her son Paul was the product of her union with him. It seems strange for a mother to have such an intense dislike for a child as Catherine had for Paul. He became melancholic as a result of Catherine's attempts to humiliate him. He was gentle, kind, and fond of study, but Catherine kept him in complete isolation and would not even permit him to see his children. Fortunately for him, his infamous mother died before she succeeded in killing him. He

was weak but humane. When he learned of the shocking condition of the Moscow Hospital he ordered it reconstructed, and in 1802 established a new one for twelve hundred and eighty patients. In the last year of his reign, Peter became entirely reactionary and extremely religious. He was then opposed to education, went to the extent of recalling Russians who were studying abroad, and even prohibited foreign books to be brought into Russia.

Returning to Catherine, we find that when an epidemic of black death broke out in Moscow after the Turkish War, she sent her lover, Gregory Orlov, there with a staff of competent physicians. The medical men worked hard, and the epidemic soon subsided. Not one of them was given any praise, but Gregory, on his return was received like a hero and was proclaimed the savior of Russia. Catherine's parade of liberalism was like the clapboard phantom villages which Potemkin had constructed along the Dnieper to the Crimea to keep from his ruler knowledge of the pitiable condition of her people and the miserable, slave-like lives they led.

Russia had two famous physicians in Catherine's régime—Shafonsky, who distinguished himself during the plague in 1769 and wrote a vivid account of it, and the renowned obstetrician, Ambodik, who introduced the use of obstetric forceps. Not a word of praise did Catherine give them, though she did exalt her foreign physicians. She did not even mention the name of the Russianized German physician Caspar Frederick Wolf. He lived in Russia for more than thirty years, did excellent experimental work on intestines and was re-

garded as the founder of embryology. The son of a poor Berlin tailor, Wolf could not get recognition in Germany. Russia profited by mothering this great man, and Germany was the loser. Even the narrow, semi-idiotic Paul, kept in slavery and fear by his mother, was more favorable to the Russian medical men than Catherine was.

Catherine's love affairs were partly the fault of her husband. In Anthony's *Memoirs of Catherine the Great,* a letter she wrote in bed just after her wedding describes the humiliation and loneliness of the bride. "I remained alone more than two hours, not knowing what I ought to do. Should I get up? Should I stay in bed? I knew nothing. At last, my waiting-woman . . . came in and reported with great merriment that the Grand Duke was waiting for his supper. . . . After his Imperial Highness supped, he came to bed and when he lay down, he began to talk about how it would amuse his servants to see us both in bed. He then fell asleep and slept very soundly until the next morning. The folds of the linen, on which I was lying, were certainly uncomfortable in summer weather and consequently I slept badly, all the more as the daylight, when the morning came, disturbed me greatly. . . . In this state matters remained during the following nine years, without the least alteration."

Poliakov writes, "The doctors had advised the Empress Elizabeth to defer the marriage until the Grand Duke was older, or at least until a slight operation had been performed to free him of a congenital defect. Elizabeth did not listen to the views of the medical profession."

Gina Kaus, in her magnificently written book on Catherine, adds, "Peter's perverse fantasies, which were always based on a desire to humiliate everyone (they served the same end as the tactless stories he told of his passions for other women) and in which lackeys and onlookers always played a part, did not, however, stop short of his own wife. They aspired even to the sacred person of his imperial Aunt Elizabeth. One day, discovering that his bedroom adjoined one of her private apartments, he bored holes in the communicating door and saw Elizabeth with her favorite Razumovsky. He immediately called his ladies and gentlemen and ordered chairs and benches to be placed before the perforated door, so they could all enjoy comfortably the spectacle of their monarch's private intimacy with her lover in his brocaded nightshirt. These were not the actions of an unerotic man. His impotence, where Catherine was concerned, must have had other reasons."

The Grand Duke was often treated for other diseases than impotence. Doctors Blumentrost, father and son, Horne and Azzariti were frequently consulted, and these four physicians were constantly quarreling about the diagnosis and methods of treatment.

In Catherine's reign the Arkhiyater was again established, and was once more supplanted by a medical board consisting of two departments—the board of medical and *lekar* arts, and the chancery which administered the economic functions of the medical faculty. The board, in accordance with the new law, was composed of eight voting members. They consisted of the president, whose post could be filled by any educated person, three medical directors, one surgeon of the

regiment, one *lekar,* one surgeon and one pharmacist. There was rarely an office of the board in Moscow headed by the municipal pharmacists. The chief tasks of the board were the custody of the medical care of the people of the empire, the preparation of Russian doctors, surgeons, *lekars* and pharmacists, and the maintenance of a large number of pharmacies.

In the second half of the reign, a head director of the medical board was appointed and the position of the president was reduced to second rank. In 1799 the last head director of the board, Baron Vasiliev, proposed a reorganization which would cause the body to consist of five departments covering all aspects of medical work in Russia.

Popularity of English Physicians

While Dutch physicians were welcomed and even preferred in the time of Peter the Great, there was an influx of German doctors under Catherine II, who was German and bred in German culture. But, as has always been the case, English diplomacy was superior to German, and English doctors became more popular than their German colleagues.

The description of the arrival of Doctor Thomas Dimsdale, in which Mr. Bishop gives an enlightening account of the inoculation of Catherine the Second, is especially interesting and will be quoted verbatim, as some passages are amusing and semi-theatrical, if not actually melodramatic:

"In Russia at the close of the eighteenth century the ravages of the smallpox were greater than in any other

country; it is said that in one year the number of persons who perished from the disease approached two million. It was entirely owing to the Empress Catherine that the practice of inoculation came to be introduced. *The Semiramis of the North*, who with all her faults, really seems to have had the welfare of the country at heart, had always taken the greatest interest in the disease. It has been suggested that Catherine decided to introduce inoculation under the influence of Voltaire, who was always an ardent supporter of the practice. This may be so, but the first reference to inoculation in the correspondence is in a letter from Catherine to Voltaire, dated September 6-17, 1768, in which she tells him of inoculation by Dimsdale. The immediate reason of Catherine's determination to undergo the operation is thus related by Dimsdale:

" 'A young lady, daughter of a nobleman of distinguished quality and fortune, extremely beautiful in her person, and not less amiable for the accomplishments of her mind was contracted to a nobleman of the highest rank and station in the Russian court. A few days before the time appointed for the nuptials, she was unfortunately seized with the smallpox, which proving malignant, soon terminated in a loss that was universally lamented.'

"This melancholy event brought home to the entire court the danger to which the empress and her son were exposed. Once the decision to be inoculated was taken, the choice of an English doctor was inevitable. The reputation of the Suttons if not of Dimsdale must have reached Catherine. Besides, the Russian monarchs had always shown a strong predilection for British doctors;

and ever since 1557, in which year Doctor Ralph Standish, an M.D. of Cambridge, had gone to Moscow as physician to the Czar, Ivan the Terrible, they had regularly imported their court physicians from England.

"The Russian Ambassador in London, M. Pouschin, was directed to secure the services of an able physician who was experienced in the operation to go to St. Petersburg. When this order arrived, the ambassador consulted Dr. John Fethergill, under whose care he then was, to whom he related the particulars of the imperial message and requested his advice. The doctor immediately mentioned his friend, Thomas Dimsdale, whose celebrity as a writer and success as an inoculator were amply established.

"In the beginning of July 1768, a courier was dispatched to Dimsdale's house in Hartford, and as a result Dimsdale met M. Pouschin at Fethergill's house in Harpur Street, London. Although the ambassador used every blandishment to engage him in the service of the Empress, the idea of going to Russia did not at first commend itself to Dimsdale. Being then fifty-six years of age, of an established reputation, possessed of an ample fortune, and moreover deeply attached to his large family, he thought that the task was more acceptable to a younger man. He accordingly declined the undertaking and undertook to find a suitable substitute. While he was endeavoring to do this, he received a second invitation from M. Pouschin, who informed him that another courier had arrived from St. Petersburg.

" ' . . . that he was an officer of distinction, employed only on extraordinary occasions, and had performed

the journey with such uncommon expedition as to have been only sixteen days on his journey to London; from *whence it was evident* that the Empress and Grand Duke were immediately interested in this application. I therefore embraced the proposal, and assured M. Pouschin that I would prepare for my journey with all possible expedition.'

"The question of remuneration he left entirely to the 'gracious pleasure of Her Imperial Majesty.' Thereupon the Ambassador at once handed him an order for £1000 for traveling expenses; and being allowed to take a traveling companion, his choice fell on his son Nathaniel, who was then a medical student at Edinburgh and well instructed in his father's method of inoculation.

"The Dimsdales set out on July 28, 1768. After crossing to Amsterdam they traveled rapidly, day and night, in a comfortable chaise, under escort, by way of Berlin, Danzig and Riga. They accomplished the journey from Amsterdam to St. Petersburg in exactly one month and arrived before the house which was being prepared for them was ready. A handsome apartment was therefore provided in the Millyonnaya (The Millionaires' Street) near the palace, together with an elegant carriage and everything they could wish for at their command.

"On the second day after his arrival Dimsdale waited on Count Panin, the Prime Minister, and the gracious reception accorded him by this statesman left a lasting impression on the mind of the simple Quaker. On the following day the Dimsdales were presented to the Grand Duke Paul, who received them with the utmost

politeness and affability; they remained to dinner. That evening the Empress returned from Peterhof to the city and Dimsdale was invited to attend Her Majesty at ten o'clock on the day following, at her summer palace. He was introduced to the Empress in the presence of Count Panin and Baron Cherkasov, President of the College of Medicine in St. Petersburg, who had studied at Cambridge and spoke English perfectly. On that day Dimsdale dined with the Empress and about twelve of the nobility, and was greatly impressed by the 'understanding and politeness of Her Majesty, her extreme penetration, and the propriety of the questions she asked, relative to the practice and success of inoculation.' 'She is,' he writes, 'of all that I ever saw of her sex the most engaging. She has a way of pleasing, without appearing to have an art.'

"A large house, sumptuously appointed, was now set apart for him and his son, and was protected by soldiery for the sake of secrecy and isolation. For some time the Dimsdales were free to taste the life of the court and to observe the barbaric splendor of the palaces. He dined sometimes with the Empress and had a general invitation to the Grand Duke's court at all hours and meals, 'the oftener the better.' But all this time the words of Count Panin were burning in his brain: 'To your skill and integrity will probably be submitted no less than the precious lives of two of the greatest personages in the world . . .' He was a prey to doubts and fears: 'Many corroding cares disturb me, and embitter all this greatness which I am not able to enjoy.'

"At a second private interview the Empress informed

him that she had decided to be inoculated with as little delay as possible. The conscientious Englishman requested to be allowed to have the assistance of the court physician, to whom he proposed to communicate every detail of the operation and of his plan of treatment, but the Empress would not hear of such a consultation and gave her reasons as follows:

" 'You are come well recommended to me; the conversation I have had with you on this subject has been very satisfactory, and my confidence in you is increased; I have not the least doubt of your abilities and knowledge in this practice; it is impossible that my physicians can have such skill in this operation; they want experience; their interposition may tend to embarrass you, without the least possibility of giving any useful assistance. My life is my own, and I shall with the utmost cheerfulness and confidence rely on your care alone. With regard to my constitution, you could receive no information from them. I have had, I thank God, so good a share of health that their advice has never been required; and you shall, from myself, receive every information that can be necessary. I have also to acquaint you that it is my determination to be inoculated before the Grand Duke, and as soon as you judge it convenient; at the same time I desire that this may remain a secret business, and I enjoin you to let it be supposed that, for the present, all thoughts of my own inoculation be laid aside. The preparation of this great experiment on the Grand Duke will countenance your visits to the palace, and I desire to see you as often as it may be necessary that you may become still better acquainted with what relates to my constitution, and

also for adjusting the time, and other circumstances, of my own inoculation.'

"Dimsdale promised to obey Her Majesty's wishes, but suggested that some experiments might first be made by inoculating several persons of her own sex, age and constitution. The Empress replied that if the practice had been novel, or the least doubt of the general success had remained, that precaution might be necessary; but as she was well satisfied in both particulars there could be no occasion for delay.

"Measures were now taken for the introduction of inoculation into the Empire. A large house that had belonged to Baron Wolff, a famous banker, was purchased by the Empress and turned into a hospital. Doctor Schulenius, a physician of Livonia, who had successfully inoculated many persons in that province, was engaged as a resident superintendent and had a Doctor Strenge as his assistant.

"At the command of the Empress, Dimsdale drew up 'A Description of the Methods proposed for extending the Salutary Practice of Inoculation through the whole Russian Empire,' in which he gave a circumstantial account of the Inoculation House he had built for his patients in England and of his method of conducting the operation. This tract was published in Russian at St. Petersburg in 1768, together with his account of the inoculation of the Empress and the Grand Duke.

"As Dimsdale decided to remain at the court in order to study the constitution of the Empress and Grand Duke, his son Nathaniel was placed in charge of his work at Wolff House and was entrusted with the pre-

liminary operations which it had been decided after all to perform. Two cadets, named Basov and Svetin, aged about fourteen years, were inoculated by Nathaniel Dimsdale, the matter being taken from the child of a poor man in the suburbs of St. Petersburg, who was 'pretty full of a distinct kind of smallpox, which was then near the crisis.' The anxiety with which Dimsdale awaited the result of this operation may well be imagined.

" 'A journal of every material appearance was transmitted to me from my son, twice a day, and translated for the Empress's perusal. It was with great concern I received an account that Basov, on the second day after the inoculation, was seized with a great sickness and vomitings, attended with other symptoms of fever; and, upon strict inquiry, it was discovered that he had improperly overcharged his stomach with a quantity of dried fruits, which it was hoped might be the sole occasion of that disorder; but, whatever might be the cause, he continued ill of high fever, accompanied with some alarming symptoms. . . . This accident in the present instance embarrassed me greatly. My son's accounts were clear, and I could depend on his judgment; but unfortunately the fever continued, attended with dejection, which were probably increased by the patient's apprehensions; for although both these young gentlemen behaved with proper resolution when the matter was inserted, yet the practice being novel, I was told afterwards they considered themselves as victims devoted to a dangerous experiment.'

"On the sixth day the report was very unfavorable and Dimsdale determined to go himself to Wolff House

to assist in the care of the patients; but first he was commanded to attend the Empress.

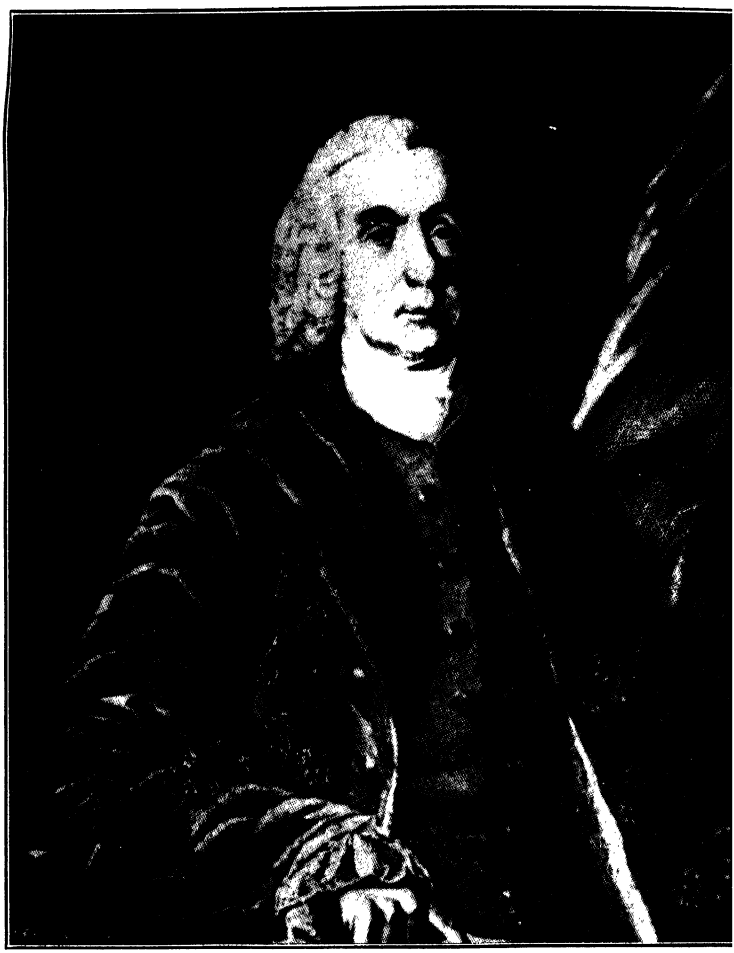
"She said: 'I do not like to see you so unhappy; tell me what is the matter.' The doctor answered that the unfavorable accounts received of the patients at Wolff House distressed him greatly. 'I am sorry for it,' she replied, 'but tell me truly, are you certain that the cadet's fever is not occasioned by the inoculation?' I said, 'most assuredly not; it began before the infection could disturb the habit, and continues with symptoms that never accompany inoculation at this period.' 'Then dismiss your fears,' replied the Empress. 'I make no doubt, with the blessing of God, he will be carried safe through his complaint, and all will end well . . . I am satisfied with your conduct, and you may depend upon my protection and support; and whatever may be the event with this boy, it shall not alter my resolution, provided you remain in the good opinion of the propriety of my being inoculated.'

"Although the Empress herself had such confidence in Dimsdale's skill and integrity, she could not answer for her subjects. It is said that when the time came for her inoculation she had relays of post-horses prepared for him all along the line from St. Petersburg to the extremity of her dominion, that his flight might be instant and rapid in case of disaster. In this Catherine showed greater tolerance than some of her predecessors, as mentioned in the previous chapters. Under Ivan the Third, in 1485, a German physician had his throat cut for failing to cure a Tartar prince; while in 1490, another court physician was publicly executed because the Czar's son inconsiderately died while under his care.

"On the same evening Dimsdale then inoculated four more cadets and a young maid servant, the matter being taken from a poor man's child that had the natural smallpox. He describes the terror and distress of the child's parents, and explains that it arose from the popular belief prevailing in Russia, that although the operation might be salutary to the inoculated, yet it produced certain death to the person from whom the matter was taken. This prejudice was finally overcome by the Empress and the Grand Duke, both permitting several persons to be inoculated from them.

"To Dimsdale's consternation, this experiment was wholly ineffectual, not one of the five cases developing in the usual way. 'The appearance on the arms was different from what I had ever experienced; for on the punctured part, almost immediately, arose a pimple, which soon became one large pustule, filled with yellow matter, very much resembling the smallpox completely matured. This continued to the seventh and eighth day, when the eruptive symptoms might in the common course be expected to appear. Not one of them, however, had any illness, nor did I then expect they would.'

"As Doctor Kingston Fox has pointed out, Dimsdale had he only known it, was on the eve of a discovery. 'The virus of the disease had become in some way attenuated, and the resulting disorder was closely akin to vaccinia.' Dimsdale eventually came to the conclusion that these five persons had passed through natural smallpox at some earlier period of their lives. He proposed that they should be inoculated a second time, in the old manner, with a long incision, in which lint was moist-



THOMAS DIMSDALE.

The English doctor who successfully inoculated Catherin against smallpox.

ened with matter, inserted and the wound covered with plaster. The result was that not the least symptom of infection was produced.

Inoculation of the Empress

"The patience of the resolute Catherine was now at an end and Dimsdale received orders to prepare for her inoculation without any further delay. As a first step he selected and inoculated three healthy children to provide matter for the operation. During eight days before the inoculation, the Empress was advised to abstain from animal food at supper, and at dinner to eat only of such as was of easy digestion. On Saturday, October 11, 1768, the day before the inoculation, she took five grains of the mercurial powder. About nine in the evening on October 12 orders arrived at Wolff House that Dimsdale and his son should immediately attend with some person from whom the infection might be taken.

" 'The child I had fixed upon as the most proper subject, and on whom the smallpox had just begun to appear, was then asleep; we wrapped him up in a pelisse, and conveyed him to the coach, into which we entered, and were immediately conveyed to the gate of the palace, next to Millione. We were conducted up a pair of back stairs, and were met by Baron Cherkasov, who accompanied me to the Empress. The inoculation was soon performed, after which my son returned to Wolff House, with the child, and intimated to the family there (who were anxious to know what had

been done) that I had inoculated the child of a nobleman.'

"It is said that the boy Markoff, from whom the virus was taken, was ennobled for his share in the operation, receiving the surname Ospennyi, ospa signifying smallpox.

" 'All this being done in the night, no one knew of it, and I returned to my lodgings; but next morning privately slipped into one of Her Majesty's coaches, and with eight horses and three postillions was brought hither (Czarskoye Selo), where Her Majesty had arrived a few hours earlier. A pretence had been found for her going to the palace, and the inoculation was not known until the fifth day. She has had the smallpox in the most desirable manner; a moderate number of pustules, and complete maturation, which now, thank God, is over, and I find an inexpressible load of concern removed from my breast.'

"Dimsdale wrote a most minute account of the Empress's case. He gave her his mercurial powder on the fifth day, and a dose of Glauber's salts on the sixth, ninth and seventeenth days. She had a sore throat from the twelfth to the fourteenth day, but derived great benefit from a gargle of black current jelly; she took solid food almost throughout. From the time of the inoculation to the commencement of the eruption, the Empress walked every day for two or three hours in the open air and during the whole period she was most cheerful and never betrayed the least anxiety. She returned well to St. Petersburg on the twenty-first day.

"The inoculation of the Grand Duke, which was to have been performed with the matter taken from the

Empress, had to be postponed on account of his contracting the chickenpox, and occasioned a great deal of anxiety. Dimdale requested the coöperation of Doctor Gruse and Mons. Fausadier, the Grand Duke's medical attendants, but they declined the responsibility, as did Doctor Vidor an Englishman, physician to the maids of honor. They put, however, every bit of information at his disposal and Dimsdale was enabled to draw up a detailed memorandum of the Grand Duke's medical history. He came to the conclusion that there was no reason why the patient should not be inoculated, but advised a careful preparatory regimen of restricted diet, fresh air, mild purgatives and bark. The inoculation was performed November 2, 1768, by one puncture on the right arm only; the matter was taken from the younger son of Mr. Biscorn, apothecary to the court. The Grand Duke had the disorder very favorably and by November 22nd was perfectly recovered.

"This day, the Empress and the Grand Duke with the nobility and gentry attended a great thanksgiving service at the court chapel, and the Empress took this occasion to announce that she had created Dimsdale a Baron of the Empire. At the same time he was made a Councilor of State and appointed body-physician to the Empress; he received a present of £10,000, £2000 for expenses, and miniatures of the Empress and the Grand Duke, with an annuity of £500 to be paid to him in England. He was also granted an augmentation of arms in the shape of a black wing of the Russian Eagle, in a gold shield, with the customary helmet, adorned with the Baron's coronet over the shield. Nathaniel Dimsdale was also created a Baron of the Em-

pire and received a gold snuff-box set with diamonds. Well might the worthy physician have exclaimed with Don Juan:

" 'Catherine was generous . . .'

"Dimsdale was invited to a shooting expedition in the country with Catherine and four of her noblemen. The day, he says, was spent most enchantingly. 'Her Majesty shot nine moorfowls and I shot four. . . . On these occasions,' he adds, 'the Empress commands all ceremony to be laid aside, and it pleases her to forget her greatness.' Nevertheless, one notices that the size of the prudent physician's 'bag' bears a very proper relation to that of the Empress.

" 'I thank God,' he writes, 'that I have sense enough to know that my consequence is like the fly on the chariot wheel. Everyone is mad to be inoculated. It will be impossible for me to avoid more business than I can execute properly. Our patients consist of the first nobility. I have been slaving all day; all the patients go on well.'

"Dimsdale inoculated about 140 of the aristocracy in St. Petersburg, including the 'favorite' Gregory Orlov and one of the archbishops. One old count, whose children Dimsdale's son had inoculated, gave him £500 in gold coin, with which, he says, he went limping out of the house.

"At the desire of the Empress, Dimsdale and his son now set out for Moscow, where a number of the nobility were anxious to have their families inoculated. They traveled in one of the Empress's coaches, taking with them a little girl to furnish the material. They traveled in the wake of the army, then marching against the

Turks and, owing to delays on the terrible winter roads, the journey took a week.

"Having successfully inoculated more than fifty patients at Moscow and established the Inoculation Hospital, Dimsdale was ready to return to St. Petersburg when he contracted a severe pleurisy. He was attended by Baron Ashe and Doctor Dahl. He was soon recovered sufficiently to be able to return to the capital by sledge. His business now being finished, Dimsdale received permission to return to the palace, to find the Empress stricken with pleuritic fever. He again took up his residence at the palace and was entrusted with complete charge.

" 'Her symptoms increased, and the pulse became now such as I was convinced made it necessary that she should be bled; the Empress consented, and Mons. Rousselin, a very able, ingenious surgeon, in whom she reposed great confidence, was directed to take away eight ounces of blood; but before the operation the Empress desired to see me again, and informed me that Mons. Rousselin had refused to bleed her, representing that, as she was then in sweat, the taking away of blood would interrupt the perspiration, and be attended with danger. I thought, on the contrary, there was a necessity for instant bleeding, and she was pleased to determine on being bled, from which she received immediate relief.' Dimsdale confesses that this illness gave him the greatest anxiety, but the symptoms gradually abated and in about three weeks all danger was past.

"Resisting all invitations to remain in Russia as body-physician to the Empress, Dimsdale and his son took their leave and started on their return. As a further

proof of her gratitude the Empress presented him with a priceless muff of Siberian blue fox, and he was attended to Riga by an officer commissioned to see that everything was provided for his accommodation and comfort."

Doctor Samuel Collins is another English physician whom Gebden, a high Russian official, met in Holland when he was traveling in Europe to recruit men of talent for the service of the Czar. He persuaded Collins to go to Russia and gave him a letter of introduction. When Collins arrived in Russia, he was appointed Court Physician. He stayed in that country nine years and then left for London. His book on Russia, published in London, *The Present State of Russia,* does not disguise his contempt for the Russian people, who, he claims, were little better than barbarians. He could not and would not understand the deep religious feeling of the Russians, and was irked by their refusal to partake of food or medicine that would interfere with the observance of Fast days. He was also shocked at the prevalence of venereal diseases in Russia and Poland and satirically called the latter "My Lady Lues Venerea."

It is remarkable that none of the English physicians remained in Russia permanently. Whether it was due to their longing for England or their objection to the gross immorality of court life, history does not disclose. The case of the Scottish doctors was different, for they remained in Russia as long as they could make a living. Sir James Wyllie, an Aberdeen graduate, settled in Russia and became quite famous. He was Surgeon and

Inspector General of the Russian Army Medical Board of Health, and did excellent work in the campaign against Napoleon. He accumulated a fortune but left all his wealth to the Clinical Hospital which was named in his honor. Doctor Clemow, who reported the proceedings of the International Medical Congress at St. Petersburg in 1896, and who wrote a concise and interesting account of the history of Russian medicine, tells of Doctor John Rogerson, a Scottish physician to the Court of Catherine II. Doctor Rogerson remained in Russia more than fifty years, and for most of that time was Leib-Medic to the Empress and her successors. He was with the Empress during her memorable progress throughout her realm in 1787. The famous De Segur, the French Ambassador who also shared in the progress, has left a lively description of this journey in his *Souvenirs et Anecdotes.* Doctor Rogerson was apparently lacking in a sense of humor, for, according to De Segur, he was seriously offended on one occasion by a very harmless and ancient jest on the part of the Frenchman.

At one part of the progress Catherine presented Doctor Rogerson with a magnificent sword in recognition of his services. The opportunity for sally was too obvious to be missed by the vitriolic ambassador. *"Docteur,"* he said, *"je vous en felicité; vous avez la reine novelle resette, sure et expéditi."* Doctor Rogerson's name is also enshrined in a couplet written by the Empress on the death of her favorite dog:

"Ci gît la Duchesse Anderson,
Qui mendit Monsieur Rogerson."

Each candidate for Catherine's love was forced to undergo a rigid examination by Doctor Rogerson as to his health in general and masculine ability in particular. The prospective suitor was then prepared for his new office by Catherine's friends, Countess Bruce and Mademoiselle Protasov, a function which earned these two ladies the familiar name of *"Les épreuve usés."* "The medical examination," says Poliakov, "may have been a necessary precaution, but the method of subjecting the prospective candidate to a test of his (virile) powers, indicates not only a profound contempt, but a desire to express that contempt openly to degrade the chosen man to the status of a robot, to make him ridiculous." Catherine died following a night of excessive love.

Some historians claim that Catherine's reign was a great epoch in Russian history and give her entire credit for it; yet the facts do not bear out the contention that Catherine made the epoch, as Peter the Great made his. She was regarded as a highly cultured woman of liberal ideas; yet Nevill Forbes states, "Her reign was extremely imposing and so was she herself, but it was also something of an imposition and she herself was something of a humbug. In her self-advertisement there was a good deal of bluff. She was one of those persons who are made responsible for a number of nice things which they do not do." In the last years of her reign she became ultra-reactionary, and newspapers and periodicals were censored, books were confiscated, and liberal-minded men and those prominent in literature were imprisoned and even sent to Siberia. Novikov, the famous editor of the *Moscow News,* was imprisoned,

and Radichev, a brilliant and liberal writer, was sent to Siberia.

Catherine should, however, be credited with having established several foundling hospitals in St. Petersburg; having had a number of illegitimate children, she realized that there should be a place in which to care for such offspring. She also established a Secret Hospital for Venereal Diseases in St. Petersburg in 1763. Why the institution should have been called "secret" is not known, for there was no secret about the nature of the diseases treated there. "The tree planted by Peter the Great," says Beasley, "had indeed flowered and borne fruit, not exactly of the quality of which he had dreamt."

It is not to be doubted that Doctor Dimsdale did splendid work in Russia, but a fee of sixty thousand dollars and a pension of twenty-five hundred dollars a year, together with the most expensive gifts, was extremely lavish for that period. The dignified Englishman was not anxious to remain in Russia, however, for he did not want his son to be caught in the net of the Empress. He knew Catherine. He knew of the Empress' correspondence with Voltaire, Diderot and other less prominent erotic Frenchmen. He loathed them and their foul letters, while Catherine admired them. She particularly enjoyed Voltaire's letters in which he boasted of his visits to certain brothels at Porte de Roule, for the cultivation of pornography. She admired Diderot's letter in which he told her that when he was younger he frequently visited the brothels in company with Buffon, Montesquieu and de Brosses.

With the establishment of ministry under Alexander

I, the medical board was abolished. The administration of civil medicine was taken over by the Medical Department and Medical Soviet in the Ministry of the Interior. Corresponding departments took charge of the medical care of the army and the navy. While foreign physicians were preferred up to the time of Alexander I, there were a number of Russian physicians who had gained prominence for their ability and scientific attainments although they were not given the same opportunity as foreigners. The first part of the reign of Alexander I proved liberal and helpful to the development of Russian medicine. This was due to the influence of his young friends,—Prince Czartozyski, a man of brilliant mind, who was passionately devoted to science; Stroganov, who also leaned to liberal reforms, having been a member of the Jacobin Club of Paris; Stroganov's cousin, Navosiltzev, and Kochubey, the latter a graduate of an English university. These men formed a "secret circle" and tried to introduce liberal measures in Russia, realizing that the nation must adopt a more liberal form of government and that science and medicine should be subsidized. These liberals had great influence over Alexander, but, as was the case with all the Romanovs, he was weaned away from his liberal friends.

According to Alexander Ulav, Alexander I, whose father and mother were German, often suffered from amnesia and peculiar mysticism in addition to megalomania inherited from his grandmother Catherine. His reign was not so glorious as recorded by some historians. A member of the above-mentioned "secret circle" stated that Alexander, at the age of forty, became afflicted with

senile decay; he had never been able to beget a legitimate heir; at fifty he became a despot. The members of the "secret circle" and other literary lights were in constant dread of being exiled. Even the great Russian poet, Pushkin, upon the publication of the *Ode of Liberty* was exiled because Alexander feared that the the young writer was filling Russia was seditious verse. Stroganov, Kochubey and the eminent historian Karanizin, pleaded with Alexander not to send the frail nineteen-year-old poet to Solovetzk in the Arctic Islands; they insisted that Pushkin would die before he reached Solovetzk. The Emperor exiled Pushkin to Kishinev. Towards sectarian and other religious faiths Alexander did not show a liberal policy of tolerance. When Leo Nevahovitch, grandfather of Metchnikov, a most cultured and learned Jew, was harassed and often threatened by ruffians, and his house was set on fire at the instigation of petty officials, Alexander sent word to Nevahovitch that persecution would cease just as soon as he would embrace Christianity.

Notwithstanding the fact that later the ruler became reactionary, Russian medicine continued to advance and make such progress that soon native Russian doctors superseded their foreign competitors.

The earliest attempt to provide the civil population with medical aid took place toward the end of the first half of the eighteenth century when the cities were obligated to provide lodgings and upkeep of not less than twelve rubles a month for physicians who had left the military service. City magistrates, complaining of poverty, received the doctors unwillingly and refused them both upkeep and lodgings. In any case the old

and decrepit foreign physicians, not knowing the Russian language, were of no use to the cities; even native-born doctors had a hard struggle.

It was not until the nineteenth century that a Minister of the Interior, by appointing city physicians to the larger cities, laid the foundation of a broader guarantee of medical aid to the city population. Although almost all the districts were thus provided with physicians, they were so burdened with medical-legal and medical-police duties that there was practically no time left to attend to the sick peasants. The Ministry of Government Property, however, had its own circuit doctors and frequently even infirmaries and male nurses. With the introduction of the Zemstvo institutions, the task of providing the masses with medical care was developed on a large scale. Some of the Russian physicians who were sent to study under the best known European physicians did fine work, especially during the Black Plague which broke out in 1770 after the Russian-Turkish war.

Moscow and Kiev were hard hit. The well known Russian doctors, Shafonsky, Erisman, Skidian, Podgoretsky and Yagelski, toiled nobly in the face of many handicaps. The liberal party in Russia was always in sympathy with the medical profession and did everything to aid its cause. When the news came of the sudden death of Alexander I, the liberals, among them many army men, encouraged by the American and French Revolutions, seized the opportunity to start a revolution, but the young liberal officers could not count on the support of the ignorant army, though the latter were willing to assist. When the officers urged

the soldiers to shout for *la constitution,* the poor soldiers wanted to know what was the name of her royal husband. Of course the uprising was nipped in the bud and most of the liberals were either executed or sent to Siberia.

Nicholas I was reactionary and used every possible repressive measure to curtail freedom of speech and various liberal movements. Physicians had a hard time during this régime, but they advanced in spite of all obstacles. In the beginning of the reign of Alexander II a brighter period dawned. Unlike his father, Nicholas, Alexander began to relieve the people of the most oppressive burdens put upon them by the previous rulers. Hopes for the future were bright, censorship was relaxed, educational advantages increased, newspapers and periodicals were allowed to express their views. The universities were permitted to enroll as many students as applied for admission, the judicial court was more lenient and a desire for education was evident in all parts of Russia. Even philosophical books on liberal and social questions were tolerated.

Alexander II was regarded as broad-minded and humanitarian, and was erroneously compared to Lincoln, particularly in his liberation of the serfs. A liberal constitutional form of government was to be expected, but he also gradually became reactionary, and all plans for a free constitutional form of government and freedom of speech were abandoned. Students and liberal writers were persecuted and imprisoned, and one had only to be caught reading the works of Belinsky, Herzen, Oksakov, Bakunin, Katkov, Gravonsky, Samarin, or even Turgeniev, to be arrested for conspiracy against

the government. Education and cultural aims were neglected by the state. The Russians, however, retained their confidence in the Zemstvos, which were helpful in the development of education, medical aid and other cultural ideals.

ZEMSTVO MEDICINE

ZEMSTVO MEDICINE

NOTWITHSTANDING the ultra-reactionary reign of Nicholas I, the pseudo-liberal tendencies of Alexander II, the reactionary rule of Alexander III and the *laissez-faire* methods of his weak and vacillating son, Nicholas II, there was a ray of hope when the Zemstvos came into existence as local government organizations. The inception took place in 1859, before the Emancipation Act was proclaimed, but there was in reality no law until 1864, after which a hard struggle was made for its preservation. The conservative element would not yield to any progressive ideas.

During the first part of the reign of Alexander II, when liberal reform movements were allowed to exist, the Zemstvos, under the tutelage of Russian liberals, began to assert power and influence. The later reactionary tendencies of the Emperor were due to the influence of Count Dimitri Tolstoi, procurator of the Holy Synod, following the attempt on the Czar's life by Karakozov. Liberal ministers of the state, including Golovin, were removed, the famous Chernishevsky was exiled to hard labor in Siberia on a trumped-up techni-

cality, the renowned journalist, Pisarev, editor of the liberal organ, *Russkoye Slovo* (Russian Word), was ordered to cease editing the journal, and the entire press was muzzled with the exception of the reactionary *Novoya Vremiya.* The universities and medical schools were honeycombed with spies and even the technical and commercial schools were told to omit from their courses everything pertaining to liberal government ideas.

The heads of the Zemstvos were arrested and sent to Siberia if they showed or expressed sympathy for the poor people, or even if they were suspected of liberal ideas. Physicians were often arrested if they sympathized with the poor, and a priest was usually made to testify against them "as evil-intended and suspect" if they neglected their patients of noble birth and sympathized with and showed devotion to their humbler patients. The clergy, whose bigotry was exceeded only by their ignorance, did not content themselves with conducting public worship and attending to the strict duties of their priestly calling. Like the odor of rancid oil, they penetrated everywhere, soiling all they touched to bless. Not satisfied with these harsh decrees, the reactionary officials, at the behest of Count Dimitri Tolstoi, even closed the women's medical schools. But Tolstoi's plan to subject the elementary schools to reactionary bureaucrats failed.

The people appreciated the aim and good will of the Zemstvos. They coöperated with them, and no reactionary laws were sufficient to stop their influence. Social revolution was in the air, due largely to the activities of Herzen and Bakunin. The rise of Nihilists

was a rebuke to Alexander's abandonment of liberal reforms. Literature, music and medical science rose to great heights. Turgeniev's novels were exceedingly popular because of their socialistic tendencies, and Leo Tolstoi's works were read eagerly. Such composers as Glinka, Moussorgsky and Rubinstein raised music to a high level.

Medicine began to flourish. Ossipov, Jbankov, Molesson and Erisman were firm believers in the Zemstvos, as the latter tried to do everything possible to improve medical service. It was a difficult task, but they battled constantly for improvement in the science and art of medicine. The Zemstvos made provision for the treatment of the insane who had formerly been treated as either criminals or animals. Nevertheless, the brilliant and earnest medical men, who had tried their utmost to better the health and sanitary conditions of Russia, were handicapped in their work by corrupt and reactionary officials who meddled in the Zemstvos' affairs. The people believed in the Zemstvos for their earnest efforts to advance education and pursue cultural aims, and for their interest in public health. In spite of the government's objections, the Zemstvos took over the management of public health. It was a bad heritage; yet, in spite of many hindrances, they succeeded in their endeavors. The number of doctors, medical centers and hospitals was increased, and improvement was apparent in the efficiency of the physicians and in hospital management. Thanks to the support of the Zemstvos, the doctors regained the confidence of the populace.

Zemstvo medicine consisted of medico-sanitary organizations which cared chiefly for the health of the

rural population. It began its development in 1864 as the result of a decree pertaining to Zemstvo institutions, but did not really function until the end of the nineteenth century. The medical care of the people, prior to the founding of the new institutions, was inefficient. To be sure, there were large hospitals in the charity institutions of all the *guberniyas* or states (and particularly in state capitals, where there were special sections for mental diseases) and there were smaller hospitals in the district towns, and homes for foundlings, invalids, and the aged—but all these were supervised through ordinances relating to public charity. In the state capitals, one physician was given charge of every fifty beds, and an assistant surgeon served every twenty beds. This order was not put into practice everywhere, however. Provincial town hospitals were supervised by municipal physicians, and were in bad condition. The state peasants were the only members of the provincial population to receive medical care.

The states were split up into medical districts consisting of from three to five provinces, and each district was managed by the district physician. Each county had its assistant surgeon, and it was sometimes necessary for one assistant surgeon to take care of two or even three counties. At certain places where assistant surgeons were situated, surgery rooms containing two to five beds were established. The head physician, who supervised the medical affairs of the entire state, lived in the capital city. Medical aid was unavailable for the former serfs, and these poor creatures had to resort to their home remedies, most of which were useless.

Zemstvos' institutions were founded at first in thirty-

four states. After their establishment, the provincial Zemstvos invited physicians to care for the rural population. In the course of a few years, a new Zemstvos medical institution was established, with the definite aim of bettering rural medical conditions to the limits of local possibilities and Zemstvo resources. This development created new problems which required joint discussion by the various Zemstvo physicians. In the beginning, the Zemstvo town council conferred with the nearest physician, but soon discovered that it was necessary to call general periodic conferences of all Zemstvo physicians.

The Tverskoy Zemstvo was the first to assemble a conference of all the physicians in Russia, and the doctors of the Tverskoy Guberniya met in Tver in 1871. The idea of having periodic sessions spread quickly among the other states. One of the underlying principles of the Zemstvo institutions was that tax burdens should be equalized, and another aim was to have all taxpayers participate in Zemstvo benefits, which, of course, included medical aid. This involved, at the very start, the establishment of the so-called traveling system. Under this system a physician who lived in a provincial town would, at a definite time (on a market day, for example), travel through villages and visit patients. Assistant surgeons were placed in various village districts, and the doctor had to appear at these points, at stated times, to inspect the work of the assistant surgeon and to see and examine the patients. In certain of these villages, surgery rooms, containing one or two beds, were established. In case of an epidemic it was necessary for the doctor to visit all the affected areas.

The traveling system was so fatiguing and accomplished its purpose so inadequately that it encouraged the development of assistant surgery, in which the lower ranks of the medical staff, for the most part poorly educated, carried on independent medical activity. By the "lower ranks" was meant old, pre-war *feldshers,* a combination of male trained nurse and pharmacist's helper. The former Zemstvo physician, Professor Kapustin, said of this practice, "Independent medical activity in the Zemstvos by assistant surgeons or *feldshers* is an evil which hampers the development of Zemstvo medicine." His criticism was not heeded, as the government did whatever it could to curb and restrain Zemstvo development.

The inadequacy of the traveling system soon became obvious, and in the 'seventies certain of the provinces were already evolving another and more suitable system. The stationary system, as it was called, was based on the principle that the treatment of illness was solely within the sphere of the physician. The assistant surgeons were merely the executors of the physician's orders. Under this new arrangement, a province was divided into medical sections. In a central place, which was chosen as the result of geographical and cultural considerations, hospitals were built which contained fifteen to twenty beds, a dispensary for day patients and a delivery room. In some of the better organized Zemstvos, such as the one in Moscow, special barracks were established in order to isolate patients ill with contagious diseases.

This innovation was important, since it prevented epidemics from spreading in the villages. The doctors

concentrated their activities chiefly in these hospitals. They had to examine the day patients at a definite time each day, place those in need of special care in the hospital, and visit the seriously ill in their district as, for example, premature confinement cases or serious traumatic injuries. If the doctor was unable to visit the patient, he sent the assistant surgeon or the midwife.

When minor epidemics appeared, the physician had to inspect the affected places and then revisit them from time to time in proportion to their menacing condition. An assistant surgeon, moreover, was assigned to remain on the spot to care for patients and to take the necessary measures to check the epidemic. In the event of major epidemics, the state Zemstvo sent to the affected place a special medical commission headed by physicians who remained until the disease disappeared. These doctors also took charge of vaccinations and saw that they were performed.

Both the traveling and the stationary systems caused considerable argument at Zemstvo meetings and doctors' conferences. Many of the members of the town council defended the traveling method, for it was cheaper and, therefore, did not require high taxes. Gradually, however, the members of the town council were convinced of the superiority of the stationary system through the evidence afforded by those towns which were so fortunate as to have hospitals. A greater number of patients received medical help from the established places than was possible under the traveling service.

In 1878 the Zemstvo of Moscow Guberniya, which had adopted the stationary system as the most effective way of providing medical care for the district popula-

tion, began to organize hospitals in different parts of the states. It is evident, from information given at that time by Doctor Jbankov, that the stationary method gained the majority of supporters. At the beginning, the living conditions of Zemstvo physicians were poor, and it was not until the Zemstvo established hospitals that the mode of life was improved for physicians as well as for the rest of the medical personnel.

In certain of the Zemstvos, saving banks were established for all employees and doctors. The latter were granted leaves of absence when they were in need of rest, and were, furthermore, sent to university cities (chiefly Moscow and St. Petersburg) every three or four months in order to refresh and advance their knowledge. The physicians' aides, assistant surgeons or *feldshers,* midwives and obstetricians were important in Zemstvo medical service. Since it was manifestly impossible for the doctors to be everywhere, other members of the staff were permitted to help the visiting patients, prepare medicine, nurse in the hospitals, vaccinate at the order of the physician, work in localities infected with epidemics (the doctor in charge of the district directed the activities) and attend to the bookkeeping.

Zemstvo midwives accomplished little, especially under the traveling system when there were no hospitals. The peasants preferred their own midwives, who could also serve as housekeepers. It was only as a last resort that they would call in a more scientifically prepared assistant, and by that time a doctor's care was necessary. In order to increase the number of midwives, some Zemstvos sent peasant women away to study at public expense. This experiment proved unsuccessful,

however, as the women returned to the village with less knowledge than regularly trained obstetricians, having acquired only a feeling of vast superiority.

Zemstvo hospitals were examples of properly organized institutions. Both the medical and household aspects of the hospital were administered by the physician. Such patients as were admitted to the hospital could not have been cared for at home, and they benefited obviously from the medical treatment. Hospitalization was free. Patients suffering from contagious diseases or syphilis were isolated and attended by special people.

The purchasing of medicines was a serious problem from an academic point of view and because of the corruption of the officials. Czarist Russia only blinked at corruption, and, as cheating and substituting were not regarded as crimes by Russian officials, the abuse occurred often. At certain Zemstvos, the cost of medicine exceeded one-fourth of the entire medical budget, and it was therefore necessary to purchase drugs at the lowest possible price. Some of the Zemstvos appealed directly to the principal pharmacists. It was found that twenty to twenty-five per cent could be saved by purchasing directly from abroad.

Statistical data show that the majority of patients who received medical help were visiting patients. Exact information does not exist concerning the medical work of all Zemstvos, but after examining the figures which exist for the medical branch of the Moscow Zemstvo, we may infer that the same relation was true of other branches.

There remain a few words to be said concerning the treatment of mental diseases under the Zemstvos. Be-

cause of the miserable living conditions of the poor people, insanity was prevalent. Hospitals for mental cases had previously been under the supervision of charity boards. The buildings were decrepit, damp and cold, as well as filthy and completely lacking in ventilation, and patients were kept locked up without proper care. During the latter part of the nineteenth century, a committee of Zemstvo members was organized to improve the care given mental cases, and it was suggested that eight district hospitals be founded in European Russia.

The first of these was opened in Kazan in 1869 by Doctor Freze. The cost of erecting the hospital was so great that the government confined itself to the one. All care of the institution was relegated to the Zemstvos, which were energetic in keeping it in good condition. They began to reform the psychiatric sections, invited psychiatrists and sent their own physicians to other psychiatric establishments to examine the structure. The data collected indicated that the number of mental patients was enormous and that their satisfactory care would require a great outlay of money. Despite all difficulties, however, the Zemstvos succeeded in reforming the hospitals so that they might really be called psychiatric institutions. They were directed by physician-psychiatrists. The buildings, equipped with all the modern scientific improvements of the time, were erected outside the cities.

The Zemstvos and physicians won the confidence and sympathy of all classes. Their work flourished, and it was realized that under the Zemstvos' administration conditions were beginning to brighten. The govern-

ment's antagonism only increased the popularity of the work of the Zemstvos. Thus it is shown that the Zemstvos, as has been related, were the most important of all the institutions which aided in the development of medical care. The chief aim of the Zemstvos was to bring medical supervision not only to towns but also to the agricultural population. The support for Zemstvo medicine was taken from local taxes, the money being transferred by the central authority to the Zemstvos.

Early in 1890 there was seemingly rapid progress toward medical help, not only for the peasants, but also for small towns and villages. The number of doctors, medical outposts and small hospitals increased, and there was a marked improvement in the quality of the attention given. Hospitals for the insane and sanitary stations were established to combat epidemics which occurred frequently. The Zemstvos wanted most of all to be left alone to proceed with their work, but the reactionary government soon began to interfere. A number of liberals hoped that the influence of the Zemstvos would eventually lead to a more democratic régime.

In the uphill task of supplying medical assistance to provincial towns and villages, the doctors performed remarkable feats, and toiled assiduously with Zemstvo officials in relieving the needs of small towns and rural districts. The farmers suffered most from the lack of medical aid, and the efforts made by a number of well known physicians were truly inspiring. Among the pioneers the name of Ossipov stands in the foreground. He devoted all of his time to the Zemstvo program, became director of the Sanitary Bureau and worked

out a thorough system. Through his efforts many new hospitals and dispensaries were created, and he stimulated and promoted their organization in an outstanding manner. The rural population, however, was still in dire need of medical assistance.

Dimitri Nicholaevich Jbankov was another of the physicians who helped the development of Zemstvo medicine in other parts than the Moscow district. He founded clinics and small hospitals in Kursk, Smolensk, Kostroma and Riazan.

Ivan Ivanovich Mollison established medical cells in the East. His first sanitary community was created in Perm, and he became its first health officer. He was not satisfied until he had organized additional medical dispensaries in Novgorod, Astrakhan, Saartov, Tambov, Kaluga and Voronezh.

Fedor Erisman, a Swiss who came to St. Petersburg and practiced ophthalmology successfully, became an ardent Slavophile, and, realizing the pitiful condition of public health service, gave up his practice and devoted himself to it and to school hygiene. In the Turkish-Russian War he became Director of Disinfections. When he returned from the war, he gave all of his time and energy to the inspection of factories, lodgings and food products, and established the first hygienic laboratory in Moscow.

A. V. Molkov became a medical missionary, disseminated medical literature and lectured to the people on sanitation and the preservation of health. Molkov had a difficult task before him. The government tried to prevent the Zemstvos and their workers from publishing manuals for use in the schools, and country reading

rooms; the Zemstvos' medical pamphlets were censored and physicians who showed the slightest tendency toward liberalism were closely watched. Statistics pertaining to the state of health and living conditions of the laboring classes were either entirely prohibited or altered according to the views of the reactionary officials. Appointments to the Zemstvos had to be approved by the reactionary state governors, and no one was appointed unless he was particularly sound. Liberals were kept away from the Zemstvos offices. When, in 1902 and 1903, sanitary and veterinary measures were introduced, they were vetoed by the state governors. The government knew that the great majority of the Zemstvos leaned toward liberalism, and frequently the most ardent ones, more especially physicians, were exiled or imprisoned. Yet, in spite of all these handicaps, the Zemstvos continued to do good.

The Zemstvos had a "holy doctor" in Fedor P. Haas, who may be called the John Howard of Russia. He did competent work among prisoners, but was greatly hampered by the reactionary officials. He pleaded with the government to dispense with cruel chaining of prisoners, both men and women, on the way to Siberia. He cited many instances of intolerable suffering and even death, but his pleadings fell on deaf ears. He could not remain silent when cultured men and women were knouted before his eyes. When no mercy was shown to political prisoners and they became insane, they were not sent to asylums, but were placed in filthy cells and kept under control by whip and scourge. Even from a distance could be heard the heartrending shrieks, cries and groans of wretched lunatics who were being flogged into

obedience. Doctor Haas never gave up his fight toward amelioration of conditions for the many poor and insane prisoners, though often he was threatened with imprisonment.

Doctor A. V. Petrov, with the aid of the medical society of Kazan, also produced remarkable results and was instrumental in organizing the Pirogov Medical Society. Pirogov, while busy with his surgical work and teaching, sympathized with the Zemstvos' medical ambitions and did everything possible to help promote them. During the famine of 1899, the noble work of physicians stood out prominently. Many doctors left their practices to go to the famine-stricken districts and establish dispensaries and food-distributing stations.

Before the end of the nineteenth century, medical affairs were seemingly advancing smoothly, as was related in an earlier chapter, but at the end of the century the opposition movement of the government grew stronger and many of the earnest members of the Zemstvos were supplanted by reactionaries. The good work accomplished by former members of the Zemstvos began to crumble. The character of the staff of councilors and their political loyalties soon left no doubt as to their class nature. The ruling class managed to secure a majority in Zemstvo self-government, which usually protected the interests of land owners and Kulaks. Zemstvo Medicine had definitely become a landowner's organization.

The benefits which the peasants could derive from Zemstvo Medicine were given only if they were not contrary to the interests of landowners and the growth of capitalism. The means of support of Zemstvo Medi-

cine were derived from taxation of the ruined peasants, who at that time were loaded with levies, for they had not yet paid for the land which they received after the so-called liberation of the serfs in 1861.

The standard of culture, especially in the field of sanitation, was very low throughout Czarist Russia. The country was repeatedly plagued with epidemics, and the rate of mortality was high among both children and adults. It is thus evident that the need for popular medical aid was great and urgent and that the medical network needed enlargement and extension. Disorganization of the work made the situation considerably worse, and here also the class nature of its organizers was exposed. Medical sections were not established at locations equally accessible to all the villagers, but instead were near the houses of the landowners, which meant that medical aid was available to the property owners rather than to the villagers.

The large Zemstvo hospitals which were able to provide regular medical help were situated either in the capital or in provincial cities or state capitals. The aim of these institutions was to render aid to the peasantry of the entire province or state. The large majority of the peasants were poor and their lack of horses made it impossible for them to go not only to the *guberniya* or *uyezd,* but even to their own sections. Distances from the sections to the villages were twenty or thirty, and sometimes even forty or more, versts. In 1913 a small number of Zemstvos, the one at Moscow for example, possessed sections whose average radii were seven to ten versts. Investigations have shown that a distance of even ten versts drastically reduced attendance at medical

sections. As a result of the bad roads and lack of transportation for the poorer classes, the wealthy benefited most from Zemstvo medical branches.

Municipal Medicine

At the fifth Pirogov Medical Congress, Doctor Jbankov gave a pointed speech in regard to the organization of municipal medicine in the same manner and spirit as that of the Zemstvos, and called special attention to the need of sanitary-hygienic measures. He was assisted by some of the best known physicians, and partially succeeded in his effort.

In 1903 Doctor Chertov published a journal called *Municipal Medicine in European Russia.* It must be said that the cities lagged behind the work of the Zemstvos in the improvement of sanitary conditions, and possibly the reason for this inactivity can be traced to the merchants and government officials, who were powerful opponents of the movement. Physicians who had large private practices would not coöperate with the progressives because they were afraid of losing their practices, and their disinterest increased when the Zemstvos suffered interference from government officials.

Municipal medicine was organized in the form of medico-sanitary institutions under the supervision of the municipality of one of its members, with the aim of providing medical aid for cities. Its development began at the end of the nineteenth century, but it was still weak and its progress slow at the beginning of the imperialistic conflict. In some cities medico-sanitary councils, deliberative organs, were established. Their

functions were to secure medical aid for the poor inhabitants, to help fight epidemics, and so forth. As they had an insufficient number of branches and too little money, their activity was negligible.

According to Doctor Jbankov, of two hundred and twenty-four cities which were investigated, one hundred and thirty-eight had no sanitary organizations whatsoever. In forty-one cities there was an embryo form only, and but forty-five possessed their own sanitary physician. The struggle against epidemics was not so much concerned with their prevention as with stopping them when they occurred. There was no sanitary inspection of factories or mills, and school inspection was carried on in only forty-nine cities, and then in an unorganized manner. There was practically no food or medical inspection. Of two hundred and twenty-four cities investigated, only one hundred and seventeen had their own dispensaries. Certain large cities, such as Moscow, St. Petersburg, Odessa, Rostov, Orel, Vitebsk, Tula and Kharkov, possessed one hospital bed for every one hundred and forty to two hundred inhabitants. Other cities had one hospital bed for every four hundred to fifty-six hundred persons, and one hundred and forty-nine cities used beds at Zemstvo and other hospitals.

Medical aid was given at home in only thirty-four cities, which did not include Moscow, Rostov and others. It was rendered by council doctors, the so-called physicians for the poor, in certain cities, while in others it was taken care of by sanitary doctors. Municipal expenditures for public health were small, the average varying from four and two-tenths per cent in small cities,

to twelve and eight-tenths per cent of the municipal budget in the larger cities. No attempt was made by the medical institutions of Czarist Russia to combat tuberculosis or venereal diseases. There were no preventive sanitary organizations, and no steps were taken for infant and maternity welfare. It was under such conditions that the Soviet State began to develop its medical institutions, the progress of which will be told in ensuing chapters.

Yet, in spite of disadvantages, obstacles, persecutions and even exile to Siberia, Russian physicians succeeded in developing medical science. Even in pre-Zemstvo times we find medical men who became famous not only in Russia but also abroad, notwithstanding the preference of Russian male and female rulers for foreign doctors over the native ones. As a matter of fact, we find brilliant men in every branch of medical science. Up to the nineteenth century, the Universities of Moscow and St. Petersburg offered studies in almost all of the departments of scientific medicine. Later on, Kharkov, Dorpat, Odessa, Kazan and Tomsk had well developed sections in the various departments of scientific medicine.

Labor Legislation Concerning Factory and Mill Medicine

The gruesome picture of the condition of the laboring classes drawn by Terziakov and Shingarov at the Pirogov Medical Society depicted the most heartrending sanitary situation in factories and mills. Shingarov cited cases where epidemics wiped out almost the total popu-

lation of villages. Yet, while very little help was given by the corrupt government officials, Zemstvo and municipal physicians did everything they could to help the deplorable situation.

Conditions were particularly black in the 'seventies, when a business boom was followed by depression. Large numbers of factory and mill workers were discharged, and those who remained at work received pitifully inadequate compensation. A movement was started for the state control of labor, but, as with other innovations in Czarist Russia, it was abandoned, and the position of the workers became unbearable. At last, in 1882, the government, realizing the dangerous state of affairs, took some action toward improving the status of working men and prohibiting the employment of child-labor in factories and mills. However, it soon ceased to enforce this or even protest against reducing the workingman's status almost to slavery. The government, practically controlled by the industrialists, issued a decree against strikes, which became a criminal offense. When Russian statesmen needed capital, they always called attention to the fact that cheap labor was so easily obtained, with the result that labor was kept in its state of slavery and famine was prevalent. The conscience of the educated and liberal classes was awakened, and they soon joined hands with the energetic Zemstvo liberals.

Improvement was evident after the foundation of the liberal movement in which the liberals in the Zemstvos joined with those in the city government, and labor agitation was planned under the leadership of Shidlovsky. The aim of the legislation was to improve the distressing condition of the laboring class by short-

ening their hours, bettering their sanitary state, diminishing the frequency of accidents and establishing compensation when these occurred. So-called labor legislation developed late in Czarist Russia, and it was not until 1903 that compensation for accidents was decreed, and then only as the result of pressure from the labor movement. A social insurance law was enacted only five years before the revolution.

The two decrees were so inadequate that in 1912 they embraced only a small number of the proletariat. The actual coverage of social insurance, up to the moment of the October Revolution, concerned only one million, six hundred ninety thousand, seven hundred and fifty-nine persons. The sick-benefit compensation bureau spent negligible amounts for medical help to the beneficiaries and only large sick-benefit compensation bureaus, such as those in Moscow, St. Petersburg and Kharkov, had their own medical institutions. In addition to sick-benefit compensation bureaus, there were a small number of medical institutions, organized by manufacturers in compliance with the decree of accident compensation which the workers wrested from the capitalists.

Medical Societies

Russia had few scientific groups. The most famous was Pirogov's Society, which was established in his memory in 1887. Medical societies were not looked upon with favor by the reactionary régime, despite the fact that the principal aim of these societies was to take measures to fight the epidemics with which Russia was

so often visited. The best organized medical society was founded in Kazan, with A. V. Petrov as its first president. Other towns followed Kazan's example.

Doctor Fedor Erisman, who originally practiced ophthalmology, gave up his private patients and joined the Society for the Prevention of Epidemics. Doctor Fedor Haas, who, as mentioned in an earlier chapter, was called the John Howard of Russia, was also a pioneer in the movement. Coming in contact with the many epidemics which swept Russia, and witnessing the havoc they caused among prisoners, he became a prison physician, and did everything possible to relieve the prisoners' plight. Gabrichevsky was known for his work in the study of malaria epidemics. Shervinsky was another physician who became interested in the study and prevention of malaria. The famine of 1889 was unusually severe, and the leading physicians assisted in an extraordinary measure by providing the children and the sick with food.

The reactionary element hindered instead of helped in the good work because of their fear of propaganda. The Zemstvos always allied themselves with the physicians, and assisted them as far as they were able. In spite of all impediments, medical societies continued to grow and expand and meet frequently in different parts of the empire. The International Medical Congress, held in 1896, was a memorable one. An excellent report of this meeting, and also of the status of medicine in Russia, was given by Doctor F. G. Clemov, eminent English physician and writer, in the *Lancet* in 1897. It is far more than a report; it is a fine and re-

markably condensed history of Russian medicine up to the time of the Congress.

Clemov describes the peculiar attitude of the ruling classes toward medicine, and speaks admiringly of the pioneer physicians, who, with terrible obstacles in their way, refused to abandon their efforts until they had reached their goal. He believed in Russian physicians, and predicted that great medical discoveries would come out of the land where opportunities for advancement were so limited. His predictions came true, for the Soviet Government accomplished what he had foreseen.

Garrison, in his lecture, delivered at the Institute of the History of Medicine in Baltimore on March 26, 1931, paid this tribute to the march of Russian medicine: "Where formerly Russian medicine was mainly an offspring or tributary of Western European medicine, it now began to exert a definite, sometimes a decisive influence upon the world at large. Like Von Baer, such expatriates as the Berlin surgeons, Ernest von Bergmann, Alexander Schmidt (fibrin ferment, 1862), Elie von Cyon, Oscar Minkovski (pancreatic diabetes, 1889) and Constantin von Monako (cerebral localization, 1891-2; red nucleus, 1910), were all born within the territory of Old Russia; yet the barriers of language and distance were overcome in the case of such important findings as the Eck fistula, the Wedensky effect, the Kernig test, and the Stroganov method. The anesthetic effect of cocaine was noted by Vasili Konstantinovich Anrep, before Koller; the 'fourth disease' was described by Filatov before Dukes, and Pirogov

was almost as forward in the use of ether as were the physicians in Massachusetts General Hospital.

"There is a Russian byword to the effect that Russians are always a few minutes too late. But mere questions of priority dwindle into insignificance before the work of such men as Metchnikov, Pavlov, Haffkine or Besredka, who have been very real benefactors of mankind at large."

It is almost inconceivable that Russia should have produced so many brilliant writers, scientists and physicians, in spite of obstructive measures put in their way. With the accession of Alexander II, some hope was felt that Russia would enter upon an era of liberalism, but this optimistic feeling vanished shortly. Russian liberals soon found that Alexander was weak and that his liberal ideas and promises were never realized. He later paid with his life for these false promises. For a short time the liberalism of the gentry appealed to the people, but it was quickly discovered that the gentry were working for their own interests. The followers of the teachings of Belinsky, Bakunin and Herzen were the educated classes, who were strongly antagonistic to the existing political and social order.

The full force of reaction was directed against schools and universities. All students were under police serveillance, students affiliated with fraternities of whatever nature were expelled, and able and independent leaders of thought were dismissed. One of the shining lights of modern chemistry, Professor Mendeleyev, was transferred from a university to the Department of Weights and Measures in the government bureau. The cause of science was not furthered, and the study of political

economy was omitted from the curriculum, the study of Slavonic languages being substituted for it. Some of the teachers were spies. Medicine, as was true of other branches of science, was deprived of the opportunities necessary for advancement.

Alexander III, surrounded by such reactionaries as Pobiedonoszev, Dimitri Tolstoi and Pazukhin, was convinced by them that indiscriminate application of repressive measures was the only plan to save Russia from Socialism. His reign was not a happy one. Nicholas II, his weakling son, dominated by his wife and by Rasputin, lost his life because of his failure to realize that he was not living in the Middle Ages. Exhausted by the war and disgusted with the régime, the people demanded representation in state affairs. It was refused them, and this refusal led to the end of the Romanov dynasty.

SOVIET MEDICINE

SOVIET MEDICINE

THORNY and hard as was the life of Russian medicine, it kept advancing, regardless of the fact that the ruling classes, with few exceptions, imported and patronized foreign doctors and cared little for the promotion of the latent talent of Russian medical men. Native doctors had the necessary ability but were not encouraged.

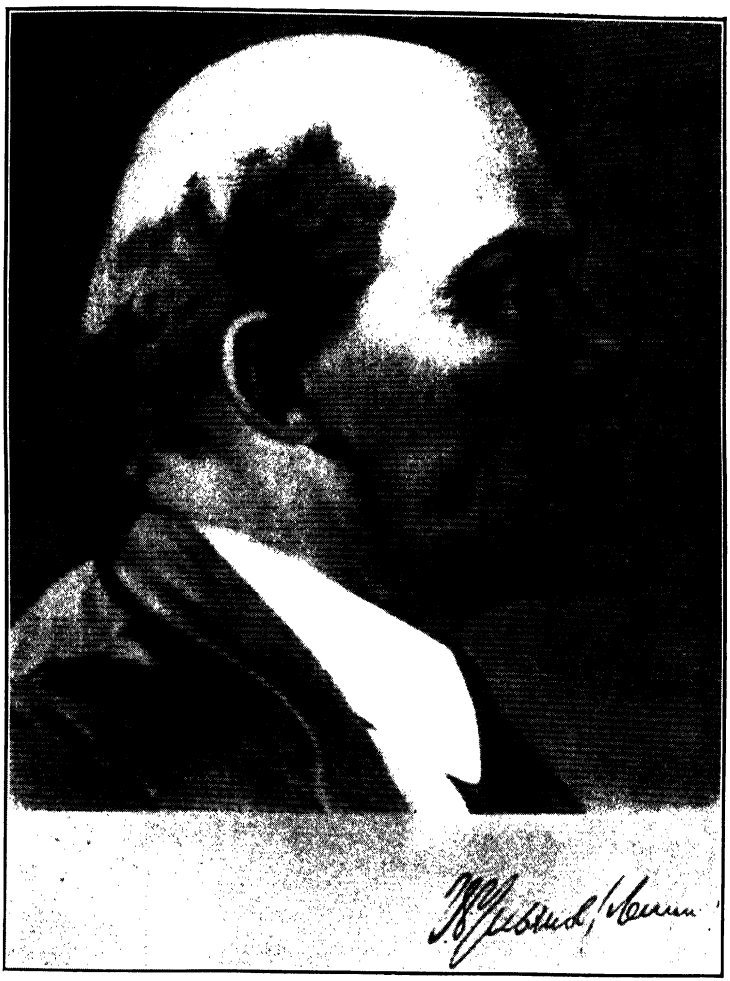
An ineffectual revolution occurred in 1564, during the reign of Ivan IV, who is said to have done more material and moral harm to his country in twenty years than the Tartars did in two centuries. In the reign of Boris Godunov there were many outbreaks; in 1648, in the rule of Alexis, serious popular disorders broke out in Moscow and other towns because of undue oppression by the boyars. The Cossacks of Little Russia or Malorossya made an attempt, under Mazeppa, to fight Peter the Great. In the time of Catherine the Second, the nobility renounced Ivan the Sixth, whom they had crowned only a few months previously, although this revolution was of a mild type. A great rebellion, due to the social and economic condition of

the peasants and landowners, occurred in 1773 under the leadership of Pugachev.

The December uprising of 1825, in the time of Nicholas I, and the 1905 revolution marked the entry of the workingman into the movement. The most memorable one was the march of 1917; real revolution was needed and a genuine upheaval came.

A provisionary government was established under Kerensky, but Russia was too ill to be healed by mild measures. He was influenced by domestic and foreign capitalists. A foreign capitalist agent once told Kerensky that he could easily succeed if he would kill off Lenin, Trotzky and the rest of the Bolshevists. Kerensky was vacillating and Russia realized that wavering methods would not solve her problems. She needed a Lenin in order to succeed—a man with vision, an extraordinary mind and courage; a man who could see ahead and who could uproot centuries' old corruptions; a man who could establish a new and proper order. Lenin, as a great diagnostician, realized that Russia's body and mind were in serious condition, and that extra-radical methods had to be adopted. "No wonder," wrote Doctor Semashko, his bosom friend and coöperator, "that Lenin should become the most famous personality in the modern folklore of the national minorities, the favorite hero of popular tales, songs and epic poetry; the hero whose name is becoming a legend."

The obstacles and hardships Lenin had to overcome are almost unbelievable. He had enemies inside and outside of Russia. The capitalistic countries could not accept the Bolshevists' crusading spirit and did everything to prevent their rapid progress. "In 1918 and



NICOLAI LENIN.

Under Lenin's patronage science and medicine made great strides forward.

1919," says Professor E. A. Ross in his remarkable book, *The Russian Soviet Republic,* "a systematic attempt was made to blacken the Communists by flooding the world with false reports of the cruel treatment of the clergy in Russia. In the United States—even some of our well known papers did not hesitate to print lies. The fount of malicious lies has certainly not run dry.... On April 22, 1920," says Professor Ross, "the *London Times* published the experiences of an Englishman recently returned from Russia. Among other things he relates that human fingers were swimming in the broth served in one of the communal kitchens in Petrograd. This drew an indignant letter from Gorki to H. G. Wells, in which after branding the story false, he says, 'Believe me, dear Wells, we Russians have not yet reached the stage of cannibalism and it is my belief that we shall not reach it despite the endeavors of the highly-civilized Western Powers to bring about conditions which would force the Russians to savagery and degeneration.' In February, 1922, Sir Philip Gibbs, after surveying the famine-stricken districts along the Volga, declared indignantly: 'In Riga and Helsingfors and other places near the Russian frontier there are factories of lies and the liars are busy with cables accusing the Soviet Government of seizing food sent for the relief of famine, inventing lies about food ships raided at St. Petersburg, poisoning public opinion with the belief that its charity will be wasted because red armies and not the starving peasants will get the food sent for rescue. Those are lies of political propagandists paid by Russians of the old régime and by their friends. The truth is exactly opposite.' " Then Professor Ross goes

on: "Some of the American press became weary and learned to sift the news from Russia." But, he says further, there is a yellow press "which comprises the bulk of our larger and rich newspapers, which did not object to becoming channels of obvious propaganda stuff. Their prime concern was not to get the truth to the readers, but to cater to the prejudices of the business class whose advertising furnishes about 70 per cent of the total incomes of American newspapers. The émigré cock-and-bull stories, eagerly caught up and gratuitously circulated [by this yellow press] produced immense effect. Tens of millions of good people came so to hate and execrate the Russian Communists that they can never be undeceived. For the most of their lives their minds will be closed to the facts regarding Soviet Russia. Never will they get the poison out of their systems."

But the meanest and the most cruel trick that was ever perpetrated may be cited from Professor Ross's book previously mentioned. "In the winter of 1918-1919," says Ross, "the Soviet Government bought in Denmark forty million rubles' worth of seeds. It was not permitted to receive them. Efforts to buy in Sweden fishing-nets to aid the Russian masses in their dire struggle against hunger were frustrated by English machinations with the Swedish Government, which intervened to prevent the deal. Early in 1919 a shipload of medical supplies bought by the Russian Government in Scandinavia was seized by the British naval forces while on the way to Petrograd. So Russian hospitals went without such common things as disinfectants, quinine, castor-oil, magnesium salts, etc., while Russian surgeons were forced to amputate diseased limbs with a carpenter's

saw, without anesthetics, and to remove infected eyes with a rusty razor blade. The Russian people were treated as if they were quite outside the human race. There are no finer people on the face of the earth than the English, yet members of Parliament were so class-warped that they jested at the needless sufferings which made Russian hospitals abodes of horrors." The motto of Professor Ross's book on Russia is well worth repeating: "To my fellow Americans who have become weary of being fed lies and propaganda about Russia, this book is dedicated." . . . "In Russia Soviet Republic," says Ross, "the reign that overtook the possessing classes was not brought upon them by a handful of Bolshevist agitators; they brought it on themselves, they and their forefathers, by their iniquitous treatment of toilers. And in this squaring of accounts the individual had to suffer for the sins of others. . . . Recipients of an income from ownership, who loaf through life, will never again be tolerated and looked up to as they were in the 'Golden Age' of capitalists, which was closed by the World War."

J. N. Darling in his book, *Ding Goes to Russia,* while poking fun at and criticizing Russia, unwillingly remarks, "Every American ought to make a trip to Russia, at least once, to see what happens when the upper crust of society gets too heavy and overbearing and the proletariat rises up and gives it the ax. They have done a complete job of it over there and the evidence is most plentiful and convincing. Russia is being run today by the 160,000,000 that are left after the house-cleaning and it is surprising to note how little the old overlords are missed by the populace. I don't think

you would like it, but the object lesson would be good for whatever ails you. There is a great deal to be learned from Russia and if we are wise we will learn our lesson from their revolution instead of having one ourselves."

Professor Ross's keen observations were verified by Sherwood Eddy and other unprejudiced travelers who have been astonished at the progress Russia has made in the last few years; they witnessed a new Russia, a country of enterprise, of culture, of education; the esthetic side has been developed and fostered among the common people; no country can offer a parallel to the transformation that has been created in the educational system of Russia. One of the most brilliant achievements in Soviet Russia is in the sphere of rearing healthy and happy children; children must be considered first in every respect; a happy and healthy childhood produces a happy and healthy nation.

Lenin's particular stress on health protection has created and is still producing a new and healthy nation. With the beginning of the Soviet form of government, science and medicine began to make enormous strides. Practical medicine, in particular, has made great achievements. World-wide attention has been attracted to the progress of research work in the Soviet Union, which is now one of the outstanding countries of the world in the support given by its government to the development of its sciences. Extensive financial provision for research in all kinds of work is an integral part of its policy.

Many of the foremost Soviet scientists are already known by reputation. The scope of scientific activity, employing the full time of over two hundred and fifty

thousand research workers, is truly remarkable. Russia is solving the medical problem which, at the present time, is in a critical state in other countries because of economic conditions. She is searching for talent and is doing everything possible to develop it.

Although Soviet Russia was cautious in regard to persons who belonged to the old régime, she no longer, as in the first decade of her existence, discriminates against scientists who were connected with the former rule but who are not opposed to the new system of government. This was illustrated in the case of the renowned academician, Pavlov. Reared under the old régime, and, at the beginning of the new, out of sympathy with the Soviet system, Pavlov, the keen observer, soon realized that the Soviet government was the people's government and not that of the privileged classes. He wholeheartedly joined the well-wishers of Russia. At the last International Physiological Congress, held in Leningrad in 1935, Pavlov was asked about various experiments being tried out by Russian leaders. He replied, "I am an experimenter from head to foot. All my life has been consecrated to experimenting. Our government is also experimenting, but in an incomparably higher category. I passionately wish to see the successful achievement of the social, historic experiments." The Soviet Government built a fifty thousand dollar laboratory for his experiments and allotted him and his assistants a large amount of money for research work.

There were political opponents among the professions who regarded the Soviet system with distrust; yet the younger generation of physicians of pre-Soviet government realized that the ultra-reactionary rule of the

Romanovs could not last, and, when the Revolution came, they unhesitatingly joined the new order. The famous proletarian writer, the late Maxim Gorki, called upon the intellectual classes to join the new régime, *describing the decay* of the capitalist government in the following words:

"The capitalistic world dies, rots. It has no energy left for a revival. Its powers are exhausted. This world keeps itself together only mechanically, by inertia, by relying upon the brutal might of the police, the army—and this is no very certain support, since the majority of the soldiers are proletarians, whose minds may be clogged with philistine prejudices, but whose political consciousness, whose revolutionary class-consciousness must develop under these conditions. The world-wide social revolution is no fantasy; it is an inevitable event which has become timely."

The above sentences coming from Gorki, the idol of the people, had immense influence. The Soviet Government had many new supporters among outstanding physicians who previously had been passive, if not actually opposed to the new system. Among them we find the renowned Professor Tarashevitch, who will be mentioned in a subsequent chapter.

During the course of the International Medical Congress held in honor of Pirogov, Doctor A. L. Eberman suggested the establishment of a Ministry of Public Health. The same question was raised by Professor D. E. Rein during an epidemic of cholera and typhus which had been raging in various parts of Russia. Nothing was done about it, as in the case of all the useful reforms advocated by the Zemstvos, and the real solu-

tion of medical problems of preservation and amelioration of public health did not come until 1918, when the People's Commissariat of Health was established with headquarters in Moscow. The tireless and energetic Doctor Semashko became the head, and his findings in regard to public health are best set forth in his introduction to the book, *Health Protection in the New USSR:*

"The Czarist Government left to the Soviet power a terrible heritage of unsanitary conditions. The exceptionally bad material condition of the working masses of town and country, the police oppression, which stifled public activity, the merciless exploitation of the workers and poorer peasants, the low cultural level of the population and the consequent low sanitary culture, all combined to create a favorable soil for epidemic diseases among the population. The medical organization was totally incapable of combating epidemic diseases; in 1913, 34 provinces with a rural population of some 80 millions had only 2,700 medical stations. The medical service was divided among eleven departments (the Departments of War, Means of Communication, Crown Domains, Education, Agriculture, Zemstvos, Municipalities, etc.). Impotent and primitive in quality, the medical service was also miserably inadequate in extent. Large territories (which now form the autonomous regions and republics of Kirghizia, Chuvashia, Uzbekistan, etc.) were almost totally destitute of medical aid. Sorcery and superstition were widespread. All this made favorable ground for disease, especially for infectious diseases, which took an annual toll of millions of lives.

"Statistical data for the Czarist period must be regarded very critically since the medical system, as has been told, was entirely inadequate and the registration of diseases very far from complete. But even according to these incomplete data there were registered in Russia in 1914—22,843,988 patients; 25 per cent of the population suffered from some infectious epidemic disease. They included 11,843,088 cases of acute infections; 7,277,577 cases of typhus and 2,831,955 cases of tuberculosis and syphilis. In other words, one-fourth of all diseases were due directly to bad economic and living conditions.

"Typhus and typhoid fever were responsible for about 500,000 deaths in the ten years ending in 1912. In the ten years ending 1910 smallpox accounts for 414,143 cases, despite the existence of such a powerful preventative as vaccination. Plague epidemics used to break out every year, carrying away about 3,500 people in ten years ending 1914 (always taking into account the incompleteness of the registrations of that period). Rash, that disease of low culture, filth and ignorance, accounted in 1914 for about five and a half million registered cases; the number of patients was of course much larger, as the peasants would not bother to see a doctor about a trifle, especially as the nearest medical station was often some twenty miles away.

"Trachoma, another disease largely due to a low cultural level, was particularly widespread in the non-Russian districts. In 1914, 896,318 cases of trachoma were registered. It was chiefly on account of trachoma that Czarist Russia came first in the world for the number of blind persons. The following figures are elo-

quent: In Russia there were 19.7 cases of trachoma per 10,000 inhabitants; in England—7.8; in Sweden—6.6; in Belgium—4.8, etc.

"A characteristic peculiarity of syphilis in Czarist Russia was its spread through non-sexual contact, such as kissing, eating from a common dish, nursing children, etc. Whole villages and districts were affected by this disease. Many villages in Czarist Russia were known as Kurnosovka (snub-nosed) with allusion to the appearance of the nose in the tertiary period, to such an extent did syphilis deform the appearance of whole villages. It is characteristic that so many of the venereal patients should have reached the tertiary stage, which shows that they had received improper treatment, or no treatment at all. Even in the towns, tertiary syphilis constituted 35 per cent of all syphilis cases, while in the country it reached 65 per cent.

"The sanitary condition of the children was still worse. Child mortality reached a dreadful figure; 260 per 1,000 in 1896-1901; 253 in 1902, and 244 in 1907-11. Children's infections were the scourge of the little ones. In 1914 there were 1,902,479 cases of disease (according to an incomplete registration), including 419,409 cases of diphtheria; 365,959 cases of scarlet fever; 391,232 cases of measles; 480,000 cases of whooping cough, and 245,209 cases of mumps.

"It is obvious from what has been said that the general rate of mortality among the population must have been exceptionally high. During the last decade before the war, it was 28.4 to 30 per 1,000.

"With the outbreak of the war the picture became even more gloomy. The general economic conditions,

and consequently the sanitary conditions, of the population, became still worse. Mass migrations (war refugees, war prisoners, soldiers on leave) promoted the spread of infections to which the weakened human organism became particularly susceptible. Terrible war losses (it has been calculated that Russia had nearly 20 million killed and disabled during the last war) in turn dealt a staggering blow to the country. On the other hand, the medical service, poor as it was, was finally disorganized, the great majority of the doctors having been mobilized for the war. Owing to food, fuel and other difficulties, the lack of necessary medicines for the patients, even the hospitals which remained intact dragged on a miserable existence, while some were forced to close down.

"It is hardly necessary to say that no medical statistics of any value were kept at that time. One thing is clear, that the war completely undermined both the health of the population and the medical organization. The breakdown was complete.

"It was under such conditions that the Soviet power took over the health services. It was necessary to carry out a radical revolution in these services and to bring order out of chaos. It was necessary to reorganize the entire public health system both in the principles on which it was based, in its organization and in its principal aspects along entirely new lines."

Semashko's radical ideas and measures were first greeted by opposition. The well known physicians, Zvetaiyev and Viacheslavov, were strong opponents, although Soloviev was in sympathy with Semashko. The minority opposed the *Narkomzdrav* or People's Com-

missariat of Health, of which Semashko was the head, but the majority approved of it. Doctor Soloviev was in favor of it, and his example was followed by the eminent Professor L. A. Tarashevitch, whose reputation was known both at home and abroad. Realizing what earnest and excellent work was being done by the People's Commissariat of Health, Tarashevitch joined and took a great interest in it. He later became chairman of the Scientific Council of the Commissariat of Health, and held the post until he died. By his death, the Commissariat lost one of its most learned and devoted workers. Although medical men in pre-Commissariat of Health days gave attention almost exclusively to pathological and clinical work, under the present system they are giving more consideration to bacteriology, hygiene, biology and other subjects that may prove of great practical value.

Even a partial list of medical and scientific institutions is amazing: the All-Union Institute of Experimental Medicine in Leningrad, with its branches, the Moscow Micro-Biological Institute in Moscow and Kharkov, the Tubercular Institutes, the Venerological Institutes in Moscow and Kharkov, the Institute of Pathological Anatomy, the Labor Protection Institute, the Institute for the Study of Industrial Diseases in Moscow and Leningrad, the Institute of Social Diseases in Moscow, the Institute of Social Hygiene in Moscow, the Institute for the Study of Health Resorts, and the Leningrad Institute of Physical Therapy. The last named Institute has a department, established last year, for the study of the influence of the Arctic climate on man. On the Imandra Shore of Lake Imandra (latitude

67°) an Aero-Solarium was erected, which could be provided with more than one thousand sun and air baths. The Institute will later have an enclosed solarium for air baths. Preliminary studies indicate that aero-heliotherapy in extremely northern latitudes has great curative value, with a marked biologic activity of the northern air and sun. For this purpose, the Institute plans to build sanitariums and health resorts in many districts of the Kola Peninsula.

Additional institutions of note include the Tropical Institute, the Physiological and Psychological Institute, and the newly established Artificial Climate Pavilion. The latter is to be a one-story structure, in which the central space will be assigned to a room equipped with an intricate mechanical system, which will make it possible to obtain an Arctic as well as a tropical climate with ease and rapidity. For patients with kidney diseases it will be possible to create the dry, hot climatic conditions of the desert; for those who suffer with a dry catarrh of the respiratory tracts the mild, moist climate of the Black Sea coast will be provided; and rare mountain air will be available for those with lung diseases.

In this room it will be possible, during any time of the year, to change the temperature from ten degrees of cold to thirty degrees of heat, to obtain a fifteen and one hundred per cent humidity, and to increase the barometric pressure from seven hundred and sixty *mm* of the mercury column (the normal seashore pressure) to four hundred and fifty *mm* (the atmospheric pressure at the height of three thousand meters above sea level). The Pavilion of Artificial Climate will have a beach seventy meters long, covered with finest seashore sand.

Scene in a modern clinic showing the check-up examination usually given to expectant mothers.

The temperature of the sand will be regulated by special heating appliances, and the beach will be enclosed in glass which will allow ultra-violet rays to enter. The place will be equipped with projectors, which will emit rays similar to the sun spectrum, and will have three wards for the climatic treatment of patients.

A Leprosarium is being built in Holmsk, in the Crimean district, which, when completed, will be one of the most up-to-date hospitals in the world. The Soviet Government has spent several million dollars for its scientific equipment.

Not satisfied with the introduction of scientific medicine in European and Asiatic Russia, the Soviet Government has also established a Polar Sanitarium in the Arctics for the study of the beneficial effects of ultra-violet rays, pure air and the influence of cold. The Imperial Medical Library has been enriched by the addition of many precious medical books, old and new, from every country in the world. The Medical Library Society boasts of over thirty-two thousand readers, and books are being sent to every part of the world.

Probably the most admirable feature of the work of the Soviet Government is the protection of motherhood and childhood. This forms one of the most important problems of the Commissariat of Public Health. According to Doctor Esther Conus, Chief Physician of the Dispensary of the Institute for the Protection of Motherhood and Childhood in the Soviet Union, the Institute occupies a special place in the social functions of the Soviet State as a whole. The importance of the problem is immediately connected with the rôle and place which working women occupy in state construction, in social

life and in industry in all stages and forms, as participants with perfect equality of rights. The pitiable position of a peasant woman before the October Revolution was described in Leo Tolstoi's play, *The Power of Darkness:*

"What is a peasant woman? Nothing but trash. They are all as blind as moles. They know nothing. A peasant woman (a *baba*) has neither seen nor heard anything. A man may learn as he meets others casually in a tavern or, perchance, in jail, or if he serves in the army. But what can you expect of a woman? Does anyone teach her? The only one who ever teaches her is a drunken *moujik,* when he lashes her with the reins—that is all the teaching she gets."

And what a change has come in the life of the drunken, dirty, half-starved, tattered peasant (*moujik*)! Writers like Tolstoi, Turgeniev, Gorki and others wrote of them with pity and despair. Physicians often left good practices, to go to the villages to help these poor wretches improve their condition. However, it was a lost cause. The Revolution has changed the whole life of the downtrodden, ignorant, unkempt *moujik.* He is now a different man. What a transformation! He has abandoned his vodka, his *lapti* (half-shoes made of tough, fibrous bark), and his rough homespun garments; he both acts and looks different; he has more respect for his wife and children; he goes to lectures and is compelled to learn to read and write; he listens to the radio and gramophone, and on holy days wears a collar and tie; he and his wife have learned to ride a bicycle. He is told that now he is a human being and does not have to be pitied or ridiculed. For centuries,

no one could make a free man out of him; but the Revolution has accomplished it.

In the first month of its existence, the Soviet Government effected a drastic change in legislation regarding women. They were literally freed, and not a trace has been left of the laws which made women dependent creatures. The protection of motherhood and childhood is one of the most vital problems of public health and occupies a special place in the social policy of the Soviet State. The network of institutions for the protection of mothers and children began to develop from the earliest days of the Revolution.

The world war, the civil war, the blockade, the intervention and the years of collapse have left great numbers of orphans and homeless children in the U.S.S.R. Thus it is easy to understand why the Department for the Protection of Motherhood and Childhood of the Commissariat of Health directed its chief efforts to the organizing of the shelter (boarding) type of institution, such as orphan asylums and infant homes. From 1922 to 1923 a system of organizations of the part-day type, such as crèches (day nurseries), began to grow rapidly. The fact that millions of women were involved in the industrial work of the country produced a tremendous development of the nursery type of home.

Starting with fourteen crèches inherited from the pre-revolutionary period, the Commissariat of Health now counts them by the tens of thousands and thus cares for millions of children. The purpose of crèches is to improve the environment so that a family can bring up its children in the modern way.

The method of obtaining this object is not very

complicated. First of all, the nurse (educator sister) visits the home of a child and in her talks with the relatives points out what is lacking in its education and advises how to improve its environment and what to do in the existing surroundings for its favorable development. Secondly, in carrying out the work of parental education, meetings take place regularly in the crèches. At these sessions reports are made by the attending physician or manager regarding education, care of children and the work of the crèche. Problems of nursery work are discussed with parents and decisions are made with regard to measures for improvement.

The conservative writer, Sherwood Eddy who visited Russia almost every year, says in his latest book, *Russia To-day*,—"One of the most brilliant achievements of the Soviet Union is in the sphere of childhood and its attainment of free, compulsory, universal primary education. This is surprising to the newcomer in Russia, who would perhaps have expected in a revolutionary government a concentration upon material things and a more spartan rigor and even neglect in dealing with childhood. Instead, it is as if the Revolution had taken a little child and set him in the midst of the whole system to occupy the first place of regard and almost of reverence. Children must be considered first in every law and plan. They must have the best milk, the most humane and scientific care, the chief consideration in everything. This is both instinctive and reflective. No people in the world have a greater natural wealth of affection for their children than the Russians, and no system gives more recognition to their importance. This

is one evidence of the farsighted and enduring nature of the whole movement."

M. Vladimirsky, in his pamphlet *Socialist Reconstruction and the Work of Protection of Motherhood and Infancy,* says, "To organize the life of millions of women, who participate more and more in production and socialist construction—such is the problem at present which faces the organs of the Commissariat of Health in that particular section of the work. This new problem changes also the methods of work. The work of protection of motherhood and infancy must be built as a mass work, which must satisfy the needs not of hundreds but of hundreds of thousands of working women." The same applies to the most distant parts of Russia, where people live in a state of semi-civilization.

One of the most valuable features of the Soviet Union's work for health protection is that great numbers of the working people, as well as the medical personnel, participate intimately in the activities of the medical institutions and consider their tasks in the light of a social duty. Each medical institution has a social organization made up of representatives of the working population, who are directly interested in the work of their own special institutions, which form a part of the whole. Thus the health center of a plant is closely connected with, and finds support every day in, the group for sanitary help existing in every factory and plant, as well as in each section of a large factory. The members of these groups are selected by the plant committees of workers.

As medicine is allied and interrelated with other departments of science, biology is given a prominent place

among the branches of medical science. "The science of biology," says Professor A. Pinkevich, "has developed largely in the spheres of the applied sciences of medicine and agriculture. There are a number of very notable achievements in 'pure botany,' 'pure biology,' 'pure genetics,' and so on. Several world-renowned scientists are carrying out researches in these fields. But even more notable is the work of the biologists in the application of their sciences to medicine and agriculture."

A far-flung network of medical research institutes, headed by the Institute of Experimental Medicine which worked under the direction of the celebrated Academician, Pavlov, has carried on important scientific work. There have been noteworthy achievements in all divisions of medicine, and even the younger scientists have made interesting discoveries. In 1929, L. V. Velikanov, a young professor of microbiology and a former working man, discovered, independently of foreign scientists, an anti-gangrene serum which enjoys fame among Soviet surgeons. Velikanov is also the discoverer of an anti-food poisoning serum.

Selkov and Vasiliev, young employees of the Leningrad Traumatic Institute, have produced, along with Masksutov, of the Optical Institute, a "microscopical needle" which makes it possible to penetrate into living organisms and study the cells of the kidneys, liver and other organs without resorting to surgical operations. Kalmykov, another young scientist, has devised a special bacterial paste which rapidly heals wounds caused by gunshot and industrial accidents.

Professor A. D. Speranski has advanced a theory he

calls "nerve tropism" which concerns the physico-chemical changes that take place in the cells and tissues depending on the state of the nervous system. In 1928 Speranski showed the effects of freezing upon the brain at the parts of ingress of antitoxins. A number of interesting researches have also been made into the methods of combating goiter and typhus.

It is scarcely necessary to mention the name of Pavlov, for his work is known all over the world. It need only be said that Pavlov, whose work until shortly before his death was confined to the study of animal reflexes, did begin the observation of conditioned reflexes of human beings. The first results of this work have been made public, and no doubt the application of his methodology and principles to the psycho-physiology and psycho-pathology of human beings will yield weighty results. It is characteristic of Pavlov that he began his studies with abnormal human beings.

It is not irrelevant to mention here that the Institute of Experimental Medicine, in which Pavlov worked for many years, is developing rapidly and has branches all over the country. Pavlov's pre-revolutionary laboratory was wretchedly amateurish in comparison with the facilities placed at his disposal by the Soviet Government. From its very first days, when the young republic was fighting against counter-revolution and foreign intervention, funds were found to maintain and develop scientific work, and Pavlov's laboratory was encouraged in this way from the beginning.

During the years of the First and Second Five-year Plans, the expansion of facilities for research work, the establishment of new scientific institutions and the de-

velopment of existing laboratories went on at an even more rapid pace. Pavlov found himself at the head of a group of laboratories, staffed by assistants and research workers, whom he trained to carry on those fundamental investigations which made his "school" one of the most fruitful in the science of physiology.

The new laboratories at Koltushi, near Leningrad, aroused the admiration of foreign scientists, who went as delegates to the Physiology Congress last year. The facilities put at Pavlov's disposal by the Soviet Government, the unlimited funds and material resources, and the opportunity to train assistants and laboratory workers encouraged and promoted some of the great scientist's best work. How far solicitude for him went is demonstrated by the fact that street-car lines, which ran near his laboratory, were removed to another location so that their noise might not interfere with the experiments being carried on.

Kharkov has another fine institute of Experimental Medicine. The institute consists of a number of different departments: sanitary and clinical, physical and pathophysical, biological, biochemical and biophysical, morphological and pathomorphological, and hygienic and epidemological. The biological department is making intensive studies of rays emanating from the human body, which were recently discovered by Professor Gurvich. This remarkable discovery, which was first made in the course of experiments on the growth of plants, is being studied at the present time on a large scale in England, Holland, France, Spain and Germany. According to Professor Gurvich's experiments, the nerves, when in state of rest or excitement, serve as a powerful

source of these rays and in turn may be excited by them.

Realizing the importance of the health of the nation, the Commissariat of Health began to socialize the entire practice of medicine, both institutional and domiciliary. He had a heartbreaking struggle, but worked tirelessly at strengthening, improving and spreading the system of medical and prophylactic institutions, and at reënforcing the foundations of Soviet medicine. The result is that Soviet medicine has succeeded in improving the health and living conditions of the people to an amazing degree. The sick workingman is very likely to be sent to the Obukh Institute of Industrial Diseases, where a thorough examination is made to determine the cause of his illness, and a proper remedy prescribed. If his occupation has caused his breakdown, he is given other work after he has been restored to health.

It took considerable time for medical men, who clung to the idea of the old order, to realize the advantages of Soviet socialized medicine, but later they enthusiastically joined the ranks of the Soviet system. It is a pity that the Russian medical émigrés failed to see the great future of Soviet medicine, and it is doubtful if they are happy seeing their fatherland advancing in the domain of scientific medicine without sharing in the contribution.

Doctor Semashko, during his position as the Russian Commissariat of Health, accomplished a vast amount of work, and proved himself a man of extraordinary mental power and tact. It was Lenin who recognized his energy and ability and appointed him head

of the State Department of Health. The major part of the work of socializing the practice of medicine was his, and he saw that not a branch of public health service was without a scientific research institute to guide its practical work. Each research institute devoted itself chiefly to the study of those diseases peculiar to the given locality. When Semashko resigned his post, he undertook the tremendous task of compiling a *Cyclopedia of Medicine.* Thirty-nine volumes have already been completed, and every phase of medicine is incorporated within its scope.

Doctor G. N. Kaminsky, who succeeded Semashko as Commissar of Health, proved himself to be a worthy successor. In his short administration he established many new dispensaries and polyclinics, not only in large centers like Leningrad, Moscow and Kharkov, but also in smaller towns and villages in the remotest parts of Soviet Russia. He laid particular stress on Soviet insurance so that any enterprise, whether run by the government or by private employers, must insure its workers. There is no unemployment insurance now, for Soviet Russia does not need it, as there is work for everybody. The present system does not tolerate, and indeed puts out of existence, the quacks and cults found in other parts of the civilized world.

Medical colleges have increased in number. Because of the scarcity of doctors, colleges which at first had only a four-year course, have mostly increased it to five years. The authorities of present-day Russian medical schools soon realized that the medical education of the post-revolutionary period badly needed an overhauling, and that the majority of schools not only had no facili-

ties for special research, but were actually inferior to the few institutions of pre-revolutionary times. Medical schools of the old days were of high standard, although there were few of them.

Since the procedure of Soviet administration is based on practicability and usefulness, this policy was also adopted in the curriculum of medical schools. Each student must do a certain amount of practical work from the first to the last of the course. He must be efficient in every branch of medicine, and even in nursing, as some of the graduates are likely to be sent to country districts or to any part of the U.S.S.R.'s vast possessions. Each hospital has a school for training lay-workers in practical nursing, and such nurses make regular visits to homes where there are cases of tuberculosis and venereal or contagious diseases. There are schools of midwifery attached to nearly every hospital, as the Russians have traditional confidence in them.

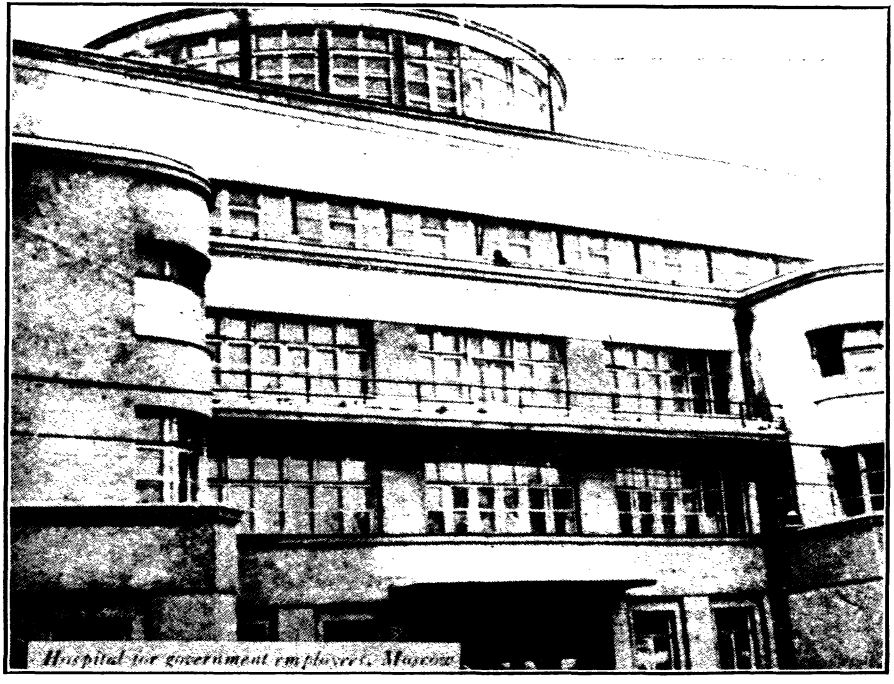
Post-graduate work is encouraged by the Council of Medical Education. Lately, due to the increasing numbers of medical schools, and the necessity of mastering certain specialties, Kaminsky, the Commissariat of Public Health, organized an aspirant group in medical institutes, which is really a post-graduate school. Physicians up to thirty-five years of age may be enrolled in the aspirant group, after they have passed examinations in special medical courses, foreign languages and the natural sciences. This course of study is for a three-year period. The first year and a half is devoted to theoretical science related to the specialty taken at the Institute. After examinations in practical and theoretical courses, the aspirant passes the second one and one-

half year in clinical study. When his thesis has been accepted, he receives the degree of Medical Science Candidate if the Supreme Qualification Committee of the People's Commissariat of Health approves him. The Aspirant Institute helps to supplement deficiencies in highly qualified specialists. Upon graduation their number in the different specialties will be markedly increased.

Moscow has excellent facilities for post-graduate medical work. Last October a new polyclinic for workers in heavy industry was opened in Moscow, with headquarters in a building specially reconstructed to serve two thousand patients a day. The walls of the X-ray room are covered with lead packing. The polyclinic is one of the best of the Moscow ambulatoriums, and the most famous of the specialists receive patients there.

The Roentgen Institute of Leningrad was established in 1920, with Professor M. Nemerov as its first director. Its efficient equipment for X-ray work caused Professor Roentgen to congratulate Professor Nemerov and send him a letter and plaque of himself. The X-ray institute is greatly improved, and considerable stress is laid upon the protection of the workers, Professor S. G. Shemerling, who is the director of the Leningrad Institute for the Labor Organization and Protection, reconstructed its roentgen department, with the result that the equipment necessary for producing partial vacuum and draining of the vacuum tubes is placed in special chambers made of Barite-ferro-concrete.

As the Soviet Government is interested in the welfare of all classes, doctors are employed by the state and



Hospital for government employees, at Moscow.

are assigned to medical, prophylactic and health protective institutions, according to their ability and experience. By the end of 1934, Russia had more than fifty-two thousand graduate physicians, both men and women. An active movement was started to improve the entire structure of medical education, and a more comprehensive curriculum was required. Physicians who had received a thorough course in medicine, surgery and other fields were allowed to take a second branch of medicine, for which they were especially fitted. Professor B. V. Gorfin was the moving spirit in promoting this type of work. He realized that four to six months of study would not make a physician a seasoned specialist, and yet was satisfied that even a short course would help to improve the urgent demand for specialists.

The Soviet pharmacy is also progressive, and Russia is beginning to manufacture her own pharmaceutical supplies. Great advances have been made in sanitation, and keen attention is paid to water supplies and milk and food inspection. Russia can now vie with any country in the world in the low rate of mother and child mortality.

Although she has made rapid progress in the domain of medicine, Russia is not stopping as she was wont to do in pre-Bolshevist times, and those watching the steady forward march of medicine are astounded at the strides which have been made in the last few years. Well known physicians of the Czarist rule who have remained in Russia are treated with respect by the Soviet government, and have proved a great stimulus to the younger members of the medical profession. Professor

P. P. Vreden, an outspoken anti-Sovietist, was not molested, and when he died, the *Narkomzdrav* named the Leningrad Traumatic Institute in his honor. It is to be regretted that the son of this eminent physician should have written a book inimical to Soviet Russia.

Prostitution and alcoholism are two major problems being studied by physicians. Prophylactorials for prostitution and hospitals for alcoholics have been established. Alcoholism was always a serious question in Russia, as was also prostitution, which was licensed under the old system. Drunkenness has been greatly reduced, and prostitution almost abolished. While both evils have been diminished, more especially the last-named, the Health Department is vigorously keeping up the work. The old method of round-ups by police has been abolished, and venerealogical institutions and homes for diseased prostitutes are being established where active treatment is given and the women are compelled to learn some trade such as dressmaking, designing, cooking, bookbinding, weaving and so forth. The serious problem of alcoholism in Russia is greatly decreased by means of education—books, pamphlets, lectures—and by depriving addicts of the wages to which they are entitled. Often these people must be given medical aid, and they are frequently put in hospitals for treatment. Doctor A. Rapoport, successor to Doctor Rosenstein, has done outstanding work with chronic drunkards.

Society has always had maladjusted people, and the Soviet Union is no exception; but one way of measuring the success of a social order is by the extent to which it is able to absorb its misfits into its normal life and to

provide opportunity for the social and economic adjustment of its people. In the Soviet Union every effort is being made to eradicate the social and economic factors which contribute to personal maladjustment and unsocial action. From both a preventive and a therapeutic point of view, this social approach to personal problems has met with success, because it tolerates none of the moralistic attitudes which tend to obscure the main issues.

Drastic reforms of the laws regulating marriage and divorce have recently been initiated by decrees reëstablishing the family as the pivotal social unit, and enforcing parental responsibility for the care of children. The reform of the divorce laws is an extension of the attempt to hold the family together and safeguard the lives of children. Good reasons have to be given by both parties seeking a divorce, and the government, urging the ideal of permanent marriage, has announced that the era of easy divorces has ended. Parents are not granted a divorce on any grounds, unless they can present to the state a satisfactory plan for caring for the children at their own expense.

The problem of the penal system has not been solved in capitalistic countries, where crimes are on the increase. In Soviet Russia, however, the criminal, whether real or political, is treated in a most humane manner. In the eighteenth century, Doctor Fedor P. Haas, in spite of his earnest efforts to improve the heartrending condition of prisoners, failed to bring about much alteration. In the present régime, prisoners, with the exception of those who have plotted against the govern-

ment, are treated with human understanding. Every illiterate prisoner is expected to learn to read and write. As a result, there has been an increase in the number of prisoners attending professional schools, and in 1931 seventy-seven thousand were pupils in polytechnic classes.

The fostering of a strong social sense is one of the chief aims of the penal system. There is no solitary confinement, and the prisoner is nearly always with his comrades. Each prison has a council of culture, elected and managed by the inmates themselves. All house offenses are judged by the comrades' court consisting solely of offenders. Criminals are not segregated, and as there are no uniforms, they wear their own clothing. Free speech is not forbidden, smoking and music are allowed, and prison life holds plenty of variety.

The success of these improvements is indicated by the decreasing number of places of incarceration. Out of four hundred and sixty-eight prisons in use under the Czarist supremacy, there were only two hundred and eighty-five left after the Revolution. According to the latest inquiry, only one hundred and twenty-three are in use. Nor does this mean that criminals are escaping punishment. Out of one hundred and sixty-seven murders committed in 1931, for instance, one hundred and sixty-three convictions were made. Most of the prisoners are political, convicted because of plots to overthrow the present government, either as pro-Czarists or believers in world revolution, who cannot agree with the established system.

As stated in the preface, Russia has solved the medi-

cal unemployment problem. In the Soviet Union the doctor and the dentist have security, prestige and opportunity for free development. The doctor is paid by the State to keep his patients well, and the preventive methods which are stressed are beneficial to the nation as a whole. With only a few exceptions, all physicians work for the State, and the hospitals, clinics, dispensaries and sanitariums are state owned and operated. A question often raised is whether the medical profession is permitted private practice. Yes, to a certain extent. A well known professor or a popular physician may be called in and even receive remuneration, in addition to his salary from the State. The energetic and genial Commissar, Gregory Kaminsky, has recently encouraged private practice. Semashko tells us that Lenin's slogan, "Mastering technique" is still used by the Soviet Government. A scientific scholarship, ranging from a trip to the government centers of science to similar centers abroad, is often awarded.

At the last International Neurological Congress in London, the writer talked with Russian delegates to the convention, and found the majority to be young, enthusiastic about their work and positions, and thoroughly conversant with all branches of medicine. They were well informed on the latest research work done outside of their country, and there was no discovery that was unfamiliar to them. They were human beings sympathizing with the welfare and happiness of all mankind, vigorous, creative, and secure in their knowledge that they are part of a great social reconstruction.

In comparing Russia with other countries, the late Doctor Frankwood Williams wrote, "Consider the pro-

fessions, the flower of our education. The legal profession is a humiliation; business is a disgrace; the medical profession tends towards being an unsocial trade union; the teaching profession, intimidated, cloistered, runners-away from life; the clergy, inconsequential.

"It is painful to say this, but the question is, is it true? As a physician, I rise at once in defense. Medical men must protect their science and their personal interests or they would be destroyed. It is not that men within these professions are not worthy, that they are not as good as any men in Russia or anywhere else in the world. We know that this is not true. It is not because we are as individuals unworthy, but because as individuals, and because as groups, we are caught in a net, and we are helpless.

"Has Russia anything to teach us?

"Russia has done more in fifteen years to raise the moral standards of her one hundred and sixty million people than American education has done in one hundred and fifty years or the Christian Church in 1933 years.

"In spite of all the efforts we have expended intellectually, emotionally and physically in studying our various so-called social problems, in spite of all the work of all of our communities and commissions, our social problems remain as serious as they were before our studies began.

"Crime, with all that we have done, is a serious major problem; alcoholism remains a serious problem; nervous and mental diseases take their annual ghastly toll; maladjusted school children and adolescents continue

to be a problem of great concern. In Russia, believe it or not, these things have ceased to be major social problems, or are rapidly diminishing as such. It is inconceivable, but there it is. The rate of incidence of nervous and mental diseases has risen in our country every year since statistics have been kept and the work of some of us who have been laboring in the field of mental hygiene for the past twenty years has not changed one-tenth of one per cent. And yet in Russia there is reason to believe that the rate of incidence of nervous and mental diseases is dropping.

"Has this been accomplished by some legerdemain? Is it by some trick that delinquency is not a serious major social problem; that alcoholism is steadily decreasing in social significance; that nervous and mental diseases are dropping not only surprisingly but unbelievably; that there aren't so many maladjusted school children; that adolescence in Russia is not a serious problem? This has not been accomplished by a trick that we can learn and apply here.

"Can Russia teach us? If we attempt to learn from Russia, it will be the hardest lesson we have ever attempted. And yet it is simple. What is it? Not tricks of education, not special methods in handling delinquents or nervous and mental conditions. It is merely this: that a civilization cannot be based upon the principles of exploitation but that a civilization *can* be based on the principles of no exploitation. Everything else, education and all, follows from this."

The late Doctor Pavlov said, "Science is now honored by the broad masses of the people of our country.... Science in former days was separated from life and was

alien to the population. Now I see that science is esteemed and appreciated by the entire nation. I raise my glass to the only government in the world which should have brought this to pass, which values science so highly and supports it so actively—to the government of my country!"

How can Russia, that rejuvenated giant, fail? How can a country, where life and science are so closely interwoven, fail? Stalin was right when he said, "The characteristic peculiarity of our Revolution consists in the fact that she gave the people not only liberty, but means for a livable and cultured life." Realizing that the health and prosperity of a people go hand in hand with science, Stalin, with the help of the brilliant People's Commissar, Molotov, recently ordered the Soviet Academy of the Science of Research, to formulate a plan for the development of natural resources to improve the well-being of the people. There are at present two hundred and fifty research laboratories in Soviet Russia, under the supervision of the Soviet Academy of Science. The latter has ordered a five-year plan for the development of natural resources. The famous Professor A. E. Joffe, founder of the Physico-Technical Institute, became the head, and is assisted by the well known scientists, Kvzhizhanovski, Vasilov, Edelstein, Samoilovitch, Semenev and Tianshanski.

Russia is showing the way to a real democracy, where riches and class distinctions are banished and where life is made happier and more satisfying. Twenty years ago the Russian was dubbed "the Russian bear," because of his lazy attitude, lack of enterprise, and lukewarm atti-

JOSEPH STALIN.

"We must bring up a new generation—healthy, joyous, capable of increasing the power of our Soviet land...."

tude toward work. *"Nichevo"* (What do I care?) was his motto. But this was not the real nature of the Russian people. The Soviet Government awakened the latent genius of the Russians, and Russia is marching on and on!

PIONEER AND PRESENT-DAY PHYSICIANS WHO BROUGHT RUSSIAN MEDICINE TO THE FOREGROUND

PIONEER AND PRESENT-DAY PHYSICIANS WHO BROUGHT RUSSIAN MEDICINE TO THE FOREGROUND

IN pre- and post-Peter's time, the study of medicine was practically denied to native Russians. The rulers preferred and imported foreign physicians, chiefly Germans, with a sprinkling of English and Dutch. English physicians did not linger long in the land, having lined their pockets with coin of the realm, would leave for "dear old England." German doctors came in droves.

Difficult as was the road of Russian medicine, the Russians undoubtedly had a passion for medical science. Many a Russian layman developed excellent surgical technique and thorough acquaintance with the properties of herbs and minerals. However crude was the method of treatment, the foreign physicians borrowed it. When the Dutch physician, Bidloo, opened the doors of the medical halls of learning to Russian youth, their innate though dormant talent was awakened, and soon the doctors of Russia began to make names for themselves. The progress made by Russian physicians in the eighteenth and nineteenth centuries

was nothing short of astonishing, and in spite of the almost insurmountable difficulties, Russia could boast of medical men who were an honor to any country.

The biographies of the pioneer medical men of Russia are particularly interesting. It is striking that Russian scientists were more interested in the study of biology, physiology, neurology and psychiatry than in any other branch and that those outside of anatomy and surgery were slow in gaining recognition. There is little doubt that oppression, fear and morbid living caused the aforementioned branches to develop earlier than others.

In physiology, biology, neurology and psychiatry Russia has gained world-wide fame, particularly so in the last decade, by reason of the complications and work of Pavlov and his able assistants. The first known work in physiology was done at the University of Moscow, in 1775, by Professor Kerstin, who performed many experiments on little animals. Modern physiology owes him great appreciation for his work which was followed up by physiologists who also made original researches. Among these were Zagorsky, Skidian and Barsouk-Moiseev. The first original book on physiology was written by A. M. Filamefitsky who also contributed an excellent treatise on the history of blood transfusion.

I. M. Setchenov (1829-1905)

One of the most earnest workers in physiology was Doctor I. M. Setchenov, who was known as one of the greatest scientists in the world and as the "Father of Russian Physiology." His father was a nobleman and his

mother a peasant—an excellent combination. He was graduated from the Military Engineering School in 1847, but left military service in 1850 to enter the University of Moscow as a volunteer student. He had shown little enthusiasm for the Military-Engineering School, and was such a poor student that he was sent to Kiev, where he met Olga Alexeevna, a young girl who had great influence over him. She made him read French and German literature, and persuaded him to study medicine. The majority of medical men, whom he found to be empiricists, disappointed him.

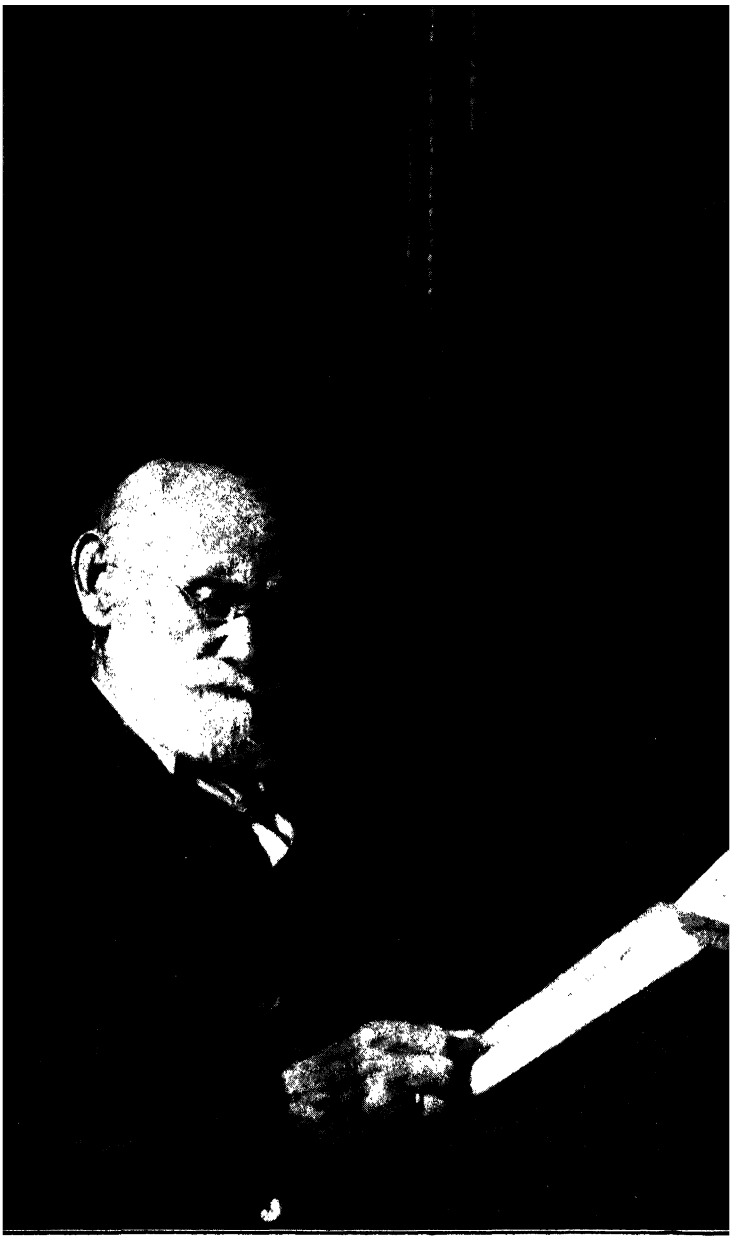
Professor Granovsky persuaded Setchenov to study physiology and psychology, and this branch of medicine made a strong appeal from the first time he read a German book on the subject. With the help of his famous friend, Botkin, he kept up his interest in physiology. He was sent abroad, and during his sojourn he studied physiology with Helmholtz, Claude Bernard, DuBois-Reymond and Hoppe-Zeiler. Upon his return to Russia he was made Adjunct-Professor of Physiology in the Military-Medical Academy. He left this position as a sign of protest against the Academy's failure to confirm Metchnikov as professor. He later became Professor of Physiology in the Universities of Odessa, St. Petersburg and Moscow.

His chief scientific works, which appeared in the 1860's, were devoted to an examination of respiration, and to the discovery of the inhibitory centers of the spinal reflexes in the medulla and cord, and particularly to the physiology of the central nervous system. His remarkable book, *Reflexes of the Head Brain,* which appeared in 1863, achieved outstanding success. This

work, which explained in physiological terms the psychological activities of man, was held up by the censors for a long time before it was reprinted. Setchenov made a brilliant attempt in this volume to expound the entire behavior of the human being as a complicated reflex act, and thus drew the first outline dealing with conditioned reflexes, which was later to be filled in by Cyon. Not only was Setchenov a scientific experimenter, but he was also a remarkable journalist. His *Physiological Essays* have not lost their significance up to the present time, and his *Essays on the Working Movements of the Human Being* still serve as a basis for study of this subject.

In personal appearance Setchenov was one of the finest representatives of the progressive intelligentsia, described by Turgenev in *Fathers and Children,* and by Chernishevsky in *What Is To Be Done.* He founded a school of Russian physiologists, which has brought forth a number of outstanding scientists—Kravkov, Tarkhanov and others. Greatly loved by his students, and barely tolerated by his superiors, he became one of the most authoritative professors of the Moscow medical faculty.

I. F. Cyon was Setchenov's successor, and was in turn the teacher of Pavlov. Cyon, although ultra-reactionary, was one of the outstanding physiologists of the time, not only in Russia but also in Europe. He was very practical; he enlarged the physiological department, and introduced new apparatus. His reactionary methods caused him much trouble with the medical students, and he unfortunately had to leave Russia and abandon his scientific investigations. Tarkhanov, who succeeded



PROFESSOR IVAN P. PAVLOV

Cyon, became known all over the world. Among his pupils we find the world-famous physiologist, Ivan Petrovich Pavlov.

Ivan Petrovich Pavlov (1849-1936)

Pavlov was a famous physiologist and founder of the theory of conditioned reflexes. Unknown outside of Russia until the first decade of this century, his name, as the *Lancet* says, has now become part of the vocabulary of physiology, inseparably linked with the classical experiments on the digestive tract and the nervous system. To him we owe our knowledge of the mechanism by which the digestive juices are secreted and adjusted in quantity and quality to the type of work they may be called upon to perform; and from him we received the first glimmerings of light which purely objective methods may throw upon the workings of the cerebral cortex. He was a member of the All-Union Academy of Sciences. He was born in the district of Ryazan in the family of a priest, and first studied in the theological school and then in the theological seminary. After finishing in the natural science division of the University of St. Petersburg, he studied in the Medical-Surgical Academy. After graduation from the Medical Department, he started work in physiology under Professor Cyon, and also worked in the clinic of the famous Doctor Botkin. He worked somewhat earlier in the laboratories of the leaders of physiological research in Germany—the workshops of Ludwig and Heidenhain. In the latter's laboratory, Pavlov received the stimulus for research into the function of the alimentary canal.

In 1890 he was appointed Professor of Pharmacology, and shortly afterwards was made Professor of Physiology at the Military Medical Academy in St. Petersburg. Up to the time of his death, he was Director of the Physiological Branch of the State Institute of Experimental Medicine in Leningrad, and of the Physiological Institute of the Academy of Sciences. His numerous brilliant experiments created a new era in the development of physiology.

The first works of Pavlov were concerned with the activity of the pancreas and the innervation of the heart. His second series of experiments clarified the importance of the liver as an organ for purging the blood of harmful substances which get into the portal vein from the alimentary canal. He also solved many other problems connected with the activity of the liver. Following this period, Pavlov investigated the functioning of the digestive glands (1893-1903), and succeeded in determining the significance of each one. He also clarified the function of the nerves in digestion. His contributions, especially in connection with the rôle of the nervous system in gastric and pancreatic functions, are of great significance. This latter work received the acknowledgment of the entire world, and he was awarded the Nobel Prize.

The latest experiments which brought Doctor Pavlov fame were concerned with the problem of associated reactions, namely, the sympathetic reflex. He proved by means of experiments that the higher activities of mankind—hitherto called "soul"—consist of a series of simple and sympathetic reflexes or responses of the nervous system to external stimulation. The life of a person is

composed of reflexes, and by explaining the laws governing these responses, the scientist can elucidate the mechanics of conduct of human beings and animals.

Asked to illustrate the theory of conditional reflexes, Pavlov cited as example the case of a woman sleeping in the same room with her sick child. A train roaring past her house would have no disturbing effect on her sleep, but let the child whimper ever so softly or turn restlessly in bed, and the mother would instantly awake. She would be so conditioned by her love for her child that she would be on the alert even when asleep. Another illustration was based on the question of an infant's recognizing a given person as its mother. The baby slowly begins to associate a certain face, a certain manner, as belonging to one who feeds it, pets it and provides for all its needs, and it becomes conditioned to these physical characteristics so that in this way there is built up the mother-child relationship.

The scientific approach of Doctor Pavlov was built on a strictly materialistic basis. It met with the approval of the supporters of materialism and with furious attacks from its opponents. However, despite the revolutionary character of his scientific work, Pavlov did not overcome his conservatism on social questions. The *Sovnarkom* (Council of People's Commissars), appreciating his merits, decreed, upon the occasion of his eightieth birthday, August 27, 1929, that special favorable conditions were to be created to make his work secure in the Physiological Division of the Governmental Institute of Experimental Medicine which he directed. The Soviet Government built a fifty thousand dollar laboratory for his work, and allowed him a large salary.

The Government also provided generously for the development of the work of Pavlov and his large scientific school in general. Up to the time of his death he was Director of three laboratories in Leningrad: the Physiological Institute of the Academy of Sciences, the Physiological Laboratory of the Institute of Experimental Medicine and the Biological Station at Koltushi, built by the Soviets. At the Biological Station he introduced the study of genetics and of the laws of inheritance of higher nervous activity. This is the first laboratory where the method of conditioned reflexes is used in the study of genetics. The work is conducted with dogs, and it is likely that the results will have positive significance in understanding these phenomena in man. The type of nervous system is transmitted by inheritance. Can the type be changed under the influence of education; and if so, in what manner? Such are the new scientific problems that stand before Pavlov's Biological Station.

The more important of Pavlov's works are: *Increasing the Nervousness of the Heart* (1888), *Eckovsky Fistula,* an artificially made communication between the portal vein and the vena cava inferior (1892), *Lectures on the Functions of the Main Alimentary Glands* (1897 and 1917), *Twelve Years Experience in the Objective Study of Higher Nervous Activity (behavior) of Animals, Conditioned Reflexes,* a collection of articles, reports, lectures and speeches, and *Lectures on the Work of the Cerebral Hemispheres of the Human Brain.* At the last International Congress held in London in 1935, Pavlov read a paper on *The Types of Higher*

Nervous Activity, Their Relation with the Neuroses and Psychoses, and *Psychotic Symptoms.*

On the basis of his experiments on conditional reflexes, it was possible to distinguish four types of dogs. According to the strength of the excitation processes, the dogs could be divided into two groups—the weak and the strong; the strong could be further subdivided according to the relationship between their excitation and inhibition processes into the balanced and the unbalanced; and, finally, the strong balanced type could be subdivided according to the liveliness and liability of the nerve processes into the slow and the quick.

The Greeks divided human nature into four sections: the phlegmatic, the choleric, the sanguine, and the melancholic, just as Pavlov divided dogs into four categories. "Think of that," remarked Pavlov at the meeting. "We have not so very much to be proud about, have we? I am of the choleric type; I cannot wait for things with patience. I must keep on, and on, and on. To have to wait for the results of experiments is almost torture to me. The next type, indeed the ideal type, is the sanguine, because the two qualities of stimulation and inhibition are evenly balanced."

Commenting on Pavlov and his work, the London *Lancet* remarked in an editorial, "But Pavlov's work, indeed, his whole life, means more than an addition of a few fresh facts to our store of knowledge. It is a corroboration of the faith of every scientist that forethought, tenacity of purpose and continued vigilance cannot fail to wrest from nature at least a few of her most closely guarded secrets. In particular, it is an inspiration to the biologist, who is often faced with a

seemingly uncontrollable environment for his experiments."

In spite of his early feeling about the Soviet system of medicine, Pavlov became less antagonistic in the last few years of the present régime. Like Tolstoi, Pavlov lived the life of an individualist, but he was not the ascetic type of the former. He was athletic, ambidextrous and had remarkable tenacity of purpose. At the age of fifteen he read G. H. Lewes' book on physiology, and made up his mind to be a physiologist. His success at operations was due to his extraordinary skill and to his ambidexterity. He was a keen observer and had a vivid personality and a keen sense of humor. Cushing relates the following incident concerning Pavlov's ready wit:

"During the physiological meeting at Rome it was not known that Mussolini was to open the Congress; but when he unexpectedly entered the Hall of Cæsar that Monday morning, there was a sudden burst of applause, at which Mussolini threw back his head, and, thrusting out his chin, strode forward with the Fascist salute. 'Unmistakably a conditioned reflex,' Pavlov remarked to his neighbor."

The Soviet Government sent Pavlov's brain to the Moscow Brain Institute for preservation with the brains of Lenin and other prominent Soviet dead. Academician N. N. Anichkov and the well known scholar and physician, M. E. Mandelshtam, reported that, notwithstanding Pavlov's age (eighty-six and a half years), his brain showed no visible sign of senile atrophy nor any pathological changes except hyperemia and effusion of blood due to an acute case of grippe. There were some arteriosclerotic changes but not to the amount usually found

An operation being performed in the laboratory of Academician Pavlov.

in the aged. A monument is soon to be erected to Pavlov in one of the central squares of Leningrad. H. G. Wells wrote in tribute, "A star which lights the world, shining down a vista hitherto unexplored."

Pavlov, who was as much a revolutionist in the domain of science as Karl Marx and Lenin in the world of affairs, will probably be regarded as the great pioneer who blazed a trail for the genius destined to reconcile matter and mind, and his able pupils and followers will carry on his classical work. It is not easy to predict what his disciples may accomplish, but it seems not impossible that they may find a solution to that mysterious, elusive entity—the mind.

In the April 4, 1936, issue of *Nature* it is stated that just a few weeks before his death, Pavlov addressed the academic youth of the Soviet Union, as follows:

"What shall I wish for the young students of my country? First of all, sequence, consequence, and again consequence. In gaining knowledge you must accustom yourself to the strictest sequence. You must be familiar with the very groundwork of science before you try to climb the heights. Never start on the 'next' before you have mastered the 'previous.' Do not try to conceal the shortcomings of your knowledge by guesses and hypotheses. Accustom yourself to the roughest and simplest scientific tools. Perfect as the wing of a bird may be, it will never enable the bird to fly if unsupported by the air. Facts are the air of science. Without them the man of science can never rise. Without them your theories are vain surmises. But while you are studying, observing and experimenting, do not remain content with the surface of things. Do not become a mere re-

corder of facts, but try to penetrate the mystery of them. Seek obstinately for the laws that govern them. And then—modesty. Never think you know all. Though others may flatter you, retain the courage to say 'I am ignorant.' Never be proud. And last, science must be your passion. Remember that science claims a man's whole life. Had he two lives they would not suffice. Science demands an undivided allegiance from its followers. In your work and in your research there must always be passion."

Among Pavlov's well known pupils who are pursuing his work is Boris Petrovich Babkin, who was Professor of Physiology in the University of Odessa. Unfortunately, Babkin, who did not agree with the present government, left Russia and is at present associated with McGill University, Canada. Another recognized assistant of Pavlov is Doctor W. H. Gannt, who worked with the great scientist for about ten years and translated into English Pavlov's book on conditional reflexes. He is now working in the same field at Johns Hopkins University.

Among the physiologists and psychologists who deserve mention are Marcel Nencki, C. C. Gurevitch, B. Slovtzov, Borodin, the composer, the brothers Vasili and Alexander Danilevski and A. N. Bach, all of whom belong to the group devoted to physiology chemistry. Doctor Bach devoted most of his time to work on blood ferments and was so thoroughly conversant with the subject that he devised a method of estimating them from a single millimeter of blood. Bach came from Geneva after the Revolution, and immediately became associated with the Institute of Biologic Chemistry. He

produced fine works on toxic products during various illnesses and has made a study of albuminosis.

Marcel Nencki (1847-1901) was born in Kalizh, Poland, which at that time belonged to Russia. He may be called a pioneer in physiological chemistry and biochemistry, and, with Pamin, he devoted many years to research in this line. After his graduation in Berlin, he continued his experiments in physiological chemistry and became well known all over Europe. He was offered the chair of physiological chemistry at the University of Bern, and shortly afterwards received a call to the chair of physiological chemistry at the University of St. Petersburg, where he did his major work, and where he established the Institute of Experimental Medicine.

Nencki devoted much time to the study of the function of the liver and the process of digestion. He made investigations in the physiological oxidation of benzine and its derivatives, demonstrated that lactic acid can be produced from sugar, studied the causes of putrefaction, isolated indol as a product of bacterial protein degradation in the intestine, and did outstanding work on blood ferments, purins and proteids. As a practical chemist he discovered salol, ororrhodin, a red pigment from uroxanthin, pyalin and parahemoglobin. It would require too much space to enumerate the discoveries of this great man, who was eccentric and explosive, but kind to his fellow-workers. He died of cancer.

Ivan Romanovich Tarkahanov (1846-1908)

Tarkahanov was born in Tiflis, of Georgian parentage. His ancestral name was originally Tarkhan-

Mouravovye, which was Russianized into Tarkahanov. His education was received chiefly at home. He matriculated at the University of St. Petersburg, and entered the Natural Science Department of the Physical-Mathematical Faculty of the University in 1863. In 1864 he was transferred to the Medical Surgical Academy, from which he was graduated in 1869. During his second year he began to study physiology in Professor I. M. Setchenov's laboratory, and continued these studies during his entire course at the academy. In 1870 he defended his thesis on *The Effect of Heat and Cold on Sensitive Nerves of the Spinal Cord and the Brain.* In 1872 Tarkahanov was sent abroad, and remained there for two years, working for the most part at Strassburg in the laboratories of Hoppe-Zeiler, Recklinghauzen, Holtz and Waldeir, and at Paris under Claude Bernard, Mared, Ranview, Charcot and others.

Upon his return to Russia in 1875, he became lecturer in the department of physiology of the Medical Surgical Academy. In 1876 he was made professor-extraordinary, and in 1877 professor-in-ordinary. He occupied this post until 1895, when he became a lecturer in physiology, dealing with various problems of biology and its relationship to general physiology.

The most important of his many scientific contributions include a series of works on the psycho-galvanic reflexes, on the ennervation of the heart, blood vessels and spleen, on the effect of condensed air on the irritability of the nervous system, on white blood corpuscles and the ciliary epithelium, on the psycho-motor centers in the newly-born and their development under different conditions, on physiology of normal sleep, on the

determination of the blood mass in a living person, on the formation of gall pigments from the coloring matter in the blood, on the contracting elements in the blood and lymphatic capillaries, on the automatic movements of beheaded animals, on the relationship between the blood and lymphatic capillaries, on the vibration of galvanic skin currents in a human being under the influence of stimulated sense organs and various psychical influences, on the influence of music in animal organism, on the effect of X-rays on animals, and on the mechanism of the lighting apparatus of the glow-worm. He wrote an excellent treatise of hypnotism and venoms, and a book on organotherapy.

Tarkahanov made use of the telephone in electrophysiology, and this was extensively employed by Vyedensky, who also worked on nerve-blocking. He emphasized to his students the importance of physiological phenomena. Believing in the value of popularizing scientific knowledge, he delivered numerous public lectures, a number of which were published in *Vestnik Evropy*.

The French psychiatrist, Pinel, was responsible for the introduction of psychiatry into Russia. The first original work on the subject was Gromov's book on legal medicine, in which he devoted a considerable portion to mental diseases. It was not until 1867 that this branch of medicine was actually established in Russia by I. M. Balinsky. In 1872 Professor Freze of Kazan gave a thorough course and wrote a good textbook on psychiatry. Professor I. T. Merjevsky contributed a great deal to psychiatric literature, partly in Russian and partly in French. P. I. Kovalevsky, editor

of *Archives of Psychiatry, Neurology and Legal Psychopathology,* was also a prolific writer. In 1885 V. N. Beckhterev wrote widely on psychiatry, as did the Moscow psychiatrist C. C. Korshov, pupil of the famous psychiatrist, A. Kojevnik. V. F. Cheez was also well known. Kiev and Warsaw had splendid psychiatric clinics. In the 'eighties Russia was as well known in the realm of psychiatry as other countries of Europe. V. X. Kandinsky, who died in 1889, left two noted works, *Pseudo-Hallucinations* and *Irresponsibilities.* Doctor P. Y. Rosenbach wrote numerous interesting articles on psychiatry, and A. A. Korinov won recognition for his book, *Methods of Investigation of Diseases of the Nervous System.* I. L. Sikorsky was another prolific contributor to psychiatric literature.

Beginning in 1891, psychiatric societies were established in many cities. V. A. Muratov wrote an excellent book on nervous diseases in children, and A. F. Erlitzky, C. Canillo and Orshansky also did much for Russian psychiatry. Soviet medicine has revamped this branch and put it in a more scientific foundation. Doctor George Hassin, a graduate of the University of Kazan, is doing splendid work at the University of Illinois Medical Department, and his book, *Histopathology of the Central Nervous System,* is acknowledged as a valuable contribution to psychiatric literature.

Among other physiologists and neurologists may be mentioned:

Aleksei Yakovlevich Kozhevnikov (1836-1902)

Kozhevnikov was born in Ryazan, the son of a civil servant. In 1859 he was graduated from the medical

faculty of the University of Moscow, and in 1865 he received the degree of M.D. from the University, after defending a thesis on the ataxia locomotria progressiva. For the next three years he studied mental and nervous diseases abroad. In 1869 he was appointed lecturer on these subjects at the University of Moscow, and later became full professor. From 1871 to 1874 he lectured on neuro-pathology and therapy. His scientific investigations were chiefly concerned with the casuistry and pathological anatomy of nervous diseases, and were printed in Russian in special neuro-pathological journals and also in French and German. Those deserving special notice are his studies of the structure of nervous cells (1869) and his clinical works devoted to "amiotrophic sclerosis" (1895), ophthalmos-plegia (1887), and lathyrism. His chief merit consists in having organized an entire school of neuro-pathologists and psychiatrists in Moscow. In 1890 he founded a special scientific society at the University of Moscow, the large majority of whose members were his immediate pupils. Under him the Moscow medical faculty was supplied for the first time with separate clinics for mental disorders (1887) and for nervous diseases (1890).

Two other eminent Russian psychologists and psychiatrists were Korsakov and Bekhterev.

Sergei Sergeievich Korsakov (1858-1900)

Korsakov, like Pirogov, was a prodigy; the former entered the University at the age of fourteen, the latter at sixteen. In 1892 Korsakov became Professor of Psychiatry. He made outstanding contributions on alco-

holic paralysis and on polyneurotic psychosis or alcoholic paraplegia, known as Korsakov's insanity. In 1893 he wrote a classical book on psychiatry, and he also contributed vastly on diseases of the memory, on questions of the psychology of microcephalics and on disorders of the will. He worked hard for the welfare of the people.

Vladimir Mikhailovich Bekhterev (1857-1934)

Bekhterev contributed valuable data concerning the microscopical anatomy of the central nervous system. He was President of the Psycho-Neurological Academy and Director of Reflexological Institute for the Study of the Brain. His claim was that reflexology should have an independent place among the sciences. Bekhterev taught psychiatry at the University of Kazan until 1885, and in 1893 was called to St. Petersburg, where he did remarkable work on the semicircular canal and cortical localization of motor functions. He classified mental diseases, and his treatment of suspension in diseases of the spinal cord was adopted by many physicians. His neurological anatomy is a fine piece of work. He was associated with Pavlov in St. Petersburg. His last book is *General Principles of Human Reflexology,* an introduction to *The Objective Study of Personality.*

Professor Vladimir Roth, of the writer's native town, Orel, was one of Bekhterev's most brilliant pupils. He was an excellent diagnostician and lecturer and a prolific writer. His treatise on glioma of the spinal cord and his meritorious work on muscular atrophy deserve special praise. He also invented an esthesiometer, an

instrument for determining the degree of tactile sensibility.

Ivan Mikhailovich Balinsky (1827-1902)

Balinsky entered St. Petersburg Medical-Surgical Academy in 1842, and was awarded a gold medal when he was graduated in 1846. He may be called the "Father of Russian Psychiatry." His lectures on mental diseases were so interesting that they were attended not only by students, but also by great numbers of physicians. Due to his efforts, departments of mental diseases were established in numerous hospitals.

Among other Russian psychiatrists we may mention J. P. Merezhevsky (1836-1908), who was much influenced by the well known psychiatrists, Krepelin and Kraft-Ebbing. Merezhevsky made a special study of idiocy, alcoholism and progressive paralysis. He laid stress on legal medicine, and was a prolific contributor to Russian and European medical journals. Like Bekhterev, he published valuable data concerning the microscopic anatomy of the central nervous system.

Mention of the remarkable work of Erlitzky, Danillo and Rosenbach must not be omitted. Sikorsky and Bashenov also added materially to the study of mental diseases, especially the former with his book on the physiognomy of the insane. N. Bashenov's illustrated history of the Moscow Insane Asylum gives a particularly vivid picture of insanity. Anton Pavlovich Chekov (1860-1904) also deserves mention. This famous Russian writer and dramatist was graduated from the medical department of the University of Moscow in 1884. He

practiced medicine for a few years, with special attention to psychiatry. The poverty and wretched condition of the workingmen and peasants made a deep impression upon him, and he soon gave up his practice and devoted himself to literature. He became one of the best known writers and dramatists of his time. A melancholy strain runs through all his works. In *Peasants, Ward Number Six,* and even in *Cherry Orchard* one senses the gloom, pessimism and dreary vision of unsympathetic humanity.

Anatomy was a favorite subject of Russian physicians. When Peter the Great invited Nicholas Bidloo, of Holland, to the chair of anatomy at the Medico-Chirurgical School in Moscow in 1703, Bidloo taught anatomy from his own book on the subject. He wearied of having so little to do, and insisted that he would return to Holland unless a hospital was built in which he could teach anatomy. An institution was given him, and he further insisted that Russians be admitted to the study of medicine. Although the life of a Russian student at that period was so difficult that some fled in order to escape the rigors of medical discipline, many withstood the hardships, and became efficient in anatomy and surgery. The School also trained efficient male nurses who were useful assistants to the doctors.

During the presidency of Arkhiyater, many of the graduate male nurses of assistant *lekars* were sent to other city hospitals where they were allowed to perform minor operations. The most efficient graduate surgeons were given the degree of docent, and the most famous of the docents was Doctor Konstantin Ivanovich Schtepin.

Konstantin Ivanovich Schtepin (1728-1800)

Schtepin, who was born in Vyatki, was the worthy successor of Bidloo, and was justly famed as teacher and lecturer on anatomy, surgery, physiology and pharmacology. He also gained considerable reputation as a botanist, a subject of great help to him in the study of pharmacy. Before studying medicine, he entered Kiev, and from there went to Constantinople, where he studied English and modern Greek. He translated many scientific works on subjects other than medicine.

Sent abroad by the government to study science, he was so enthralled by the subject of medicine that he abandoned other pursuits, and devoted himself exclusively to medical interests. He studied first in Leyden, and then in Paris, where he admired the French methods of medicine and pharmacy. On his return to Russia, he served in the army for some years. He became famous after practicing medicine for only a few years. Among other innovations, he introduced the use of mineral waters. Of a kind and sympathetic nature, he could not endure witnessing the mistreatment of Russian children, and advocated the abolishment of punishment in the public schools, thereby making himself unpopular with the authorities. The latter caused him grave trouble, and in desperation he began to drink, and died in poverty.

Schtepin had an able assistant in A. Von Mallen, who lectured in German. After Schtepin's retirement, Engel was appointed successor to Von Mallen, and his lectures were delivered in Latin. (It was necessary for Russian medical students to know Dutch, German and

Latin.) Doctor M. M. Terekhovsky, a Russian, succeeded Engel, who died in 1779.

In 1780 the heads of the various medical departments were advanced to the position and title of professors and assistant professors. Doctor J. Rinder was the first professor of anatomy, surgery and physiology in the Moscow Medical Chirurgical School. M. K. Karpinsky was head professor in the St. Petersburg Medical Chirurgical School, with the widely known D. A. Zagorski as his assistant. The medical schools in Moscow and St. Petersburg improved considerably, and the curriculum was enlarged through the influence of both Shumliansky and Terekhovsky. When the noted surgeon, A. I. Vasiliev, became Director of the Medical Chirurgical School, the names of the medical schools in both Moscow and St. Petersburg were changed to Medical Chirurgical Academies. Besides the Academy of St. Petersburg, there was a Medical Chirurgical School connected with the Kalinsky Hospital, which was renamed Institute in 1783. The celebrated Doctor I. Forstein became Professor of Anatomy at the Institute.

With the foundation of the Medical Chirurgical Academies in Moscow and St. Petersburg, there arose a number of famous lecturers on anatomy and surgery, among whom may be mentioned P. A. Zagorski, I. B. Byialski, F. P. Landzert, N. I. Pirogov, V. Gruber, and also a few gifted students, as for example, A. N. Parenski, P. F. Lesgaft and Doctor D. S. Yermolayev. Professor Zagorski (1764-1846) was a prolific writer on medical subjects, particularly anatomy, and his textbook on anatomy was used in all the Russian universities. He took great interest in the Anatomical Museum, and

enriched it with his own as well as with foreign anatomical material.

I. G. Buyalski, a professor at the Medical Chirurgical Academy, was a writer on anatomy, surgery and legal medicine, and was an expert in the preservation of cadavers. Professor F. E. Landskert was noted for his pencil drawings of anatomical subjects, which were marvels of perfection. The great and genial Pirogov, famous not only in Russia but all over Europe, was an anatomist, surgeon and teacher. He wrote copiously on medical subjects, as well as on literature and philosophy. A full biography of this remarkable man is given later in the chapter.

Professor V. L. Gruber, another noted anatomist, was invited to come to Russia, where he remained from 1855 until 1887. Among his well known students were P. F. Lesgaft, A. I. Terenzki, D. C. Yermolaiev, Schmidt, Rauver and D. Zernov. Credit must be given to Alexander Christian Loder, who gathered a complete collection of pathological and anatomical specimens. Christian Loder was an anatomist of high repute, and his atlas and treatises on anthropology are known throughout Europe. He founded the Moscow Anatomical Institute, which possesses a fine bust of its distinguished founder.

Matvei Yakovelvitch Mudrov (1770-1831)

Even several decades before the genial and far-sighted Mukhin introduced the renowned surgeon, Pirogov, Russia could boast of a prominent surgeon and humanitarian in the person of Matvei Yakovelvitch

Mudrov (1770-1831). Although not of the scientific eminence of Pirogov, Mudrov was thorough and competent. He was a Russian willing to make every sacrifice for the good of his country, and the people idolized him. He was depicted in Tolstoi's novel, *War and Peace.*

Mudrov was even poorer and had fewer opportunities than Pirogov. The latter was born in Moscow, the center of medical activity, and had the backing of Professor Mukhin; the former came of an entirely humble family. His father, a priest in a nunnery in Vologdon, was unable to have his ambitious boy educated. Young Mudrov, eager to become a doctor, contrived to get a high school education while working at odd times for a bookbinder. He also made church candles, the proceeds from which enabled him to buy books. He later managed to become tutor to the son of the local military physician. Most of the Russian doctors who were not practicing for the royal and aristocratic families were kind, generous and self-sacrificing men. Seeing that the boy Mudrov was so talented and devoted to medicine (he read every medical book he could find at the local surgeon's), his kindly employer gave him a letter to Professor Kerastov of the University of Moscow.

A pathetic scene took place when the young man's father, who also was interested in medicine, bid him good-by. "You know, my son, I am very poor; I cannot give anything but my blessing," and the father, with tears in his eyes, handed him a leaden cross and a broken cup. Young Mudrov walked the entire way to Moscow. The University, only weakly supported by the government, was not very prominent, and the govern-

ment officials were more anxious for the students to become proficient in military drills than in science. Mudrov succeeded in getting a good medical foundation through the efforts of Kerestin, Zibelin, Skidian and Politkovski, and after his graduation from the University, was commanded to go to the St. Petersburg Marine Hospital. While working there, he attended the lectures of Professors Bush, Zagorsky and Ringenwald.

In 1802 Mudrov went abroad, and attended all the best clinics in Europe. When Murayov, dean of the University of Moscow, realized that the medical department must be improved, he called a number of well known physicians to the several chairs, and among them was Mudrov, who soon became celebrated for his remarkable work. His accomplishments at the University were so thorough and distinguished that he was shortly appointed Dean of the Medical Department. It was Professor Mudrov who taught Pirogov the principles of surgery and insisted on his studying pathological anatomy, and it was Mudrov who really discovered the latent talent in Pirogov.

After a short visit in Europe, Mudrov decided to go to Vilna, where he took up military surgery with the aid of his friend, Professor Joseph Frank, son of the famous Johan Frank. He returned to Moscow where he took charge of military surgery during Napoleon's invasion in 1812. His lectures on military surgery were masterpieces. He always maintained that preventive measures and hygiene are the most important features in military surgery, and insisted that every soldier should be taught the principles of first aid. He visited nearly every district that became affected with cholera,

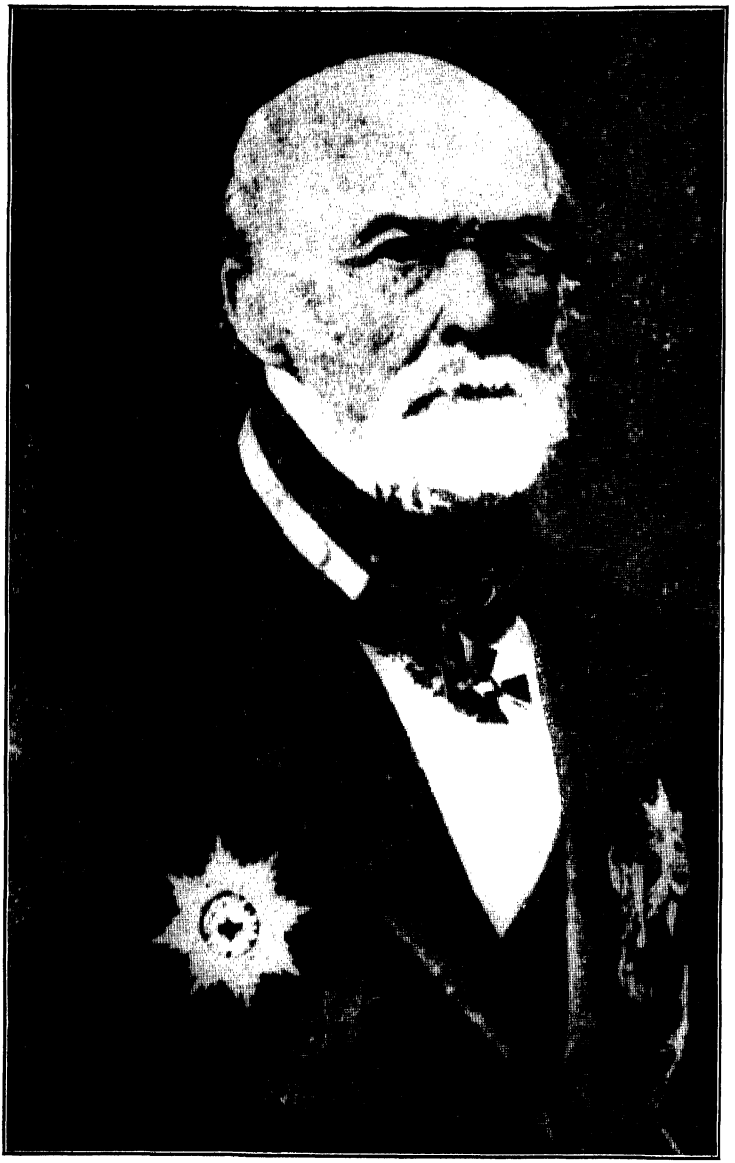
and performed noble work until he himself fell a victim to the dread disease.

Michael Matveievtev Rudnev (1837-1988)

Michael Matveievtev Rudnev (1837-1898) may be regarded as the founder of Pathological Anatomy in Russia. He maintained that good surgery was impossible without a knowledge of pathology. He was influenced by Virchow, with whom he worked for some time. On his return to Russia, he devoted himself to the teaching of anatomy and pathology at St. Petersburg Military Academy. He wrote widely, his scientific articles in the *Virchow Archives* were well received, and he was as well known abroad as in Russia. His research studies in amylolysis, or conversion of starch into sugar, and amyloidosis, or amyloid degeneration, pathology of the bones and hepatic neoplasms, were generally recognized as valuable contributions, as were his works on various reagents, transplantation of bone and the pathology of frog's epithelium. His greatest work was on the pathologic anatomy of cholera.

N. M. Lubimov, Professor of Pathology at the University of Kazan, and V. P. Krilov, of the University of Kharko, continued to carry on Rudnev's work, and their investigations covered numerous pathologic conditions.

Many of the Russian anatomists were splendid surgeons, but the greatest of all was Pirogov.



NICOLAI IVANOVICH PIROGOV, (1810-1881).

He laid the foundations for modern Russian surgery, specializing in the field of military field surgery.

Nicolai Ivanovich Pirogov (1810-1881)

Pirogov was one of the greatest doctors and teachers of the nineteenth century. He was the founder of modern Russian surgery and an original scientist and practical worker in the sphere of military field surgery. His work is still regarded as authoritative in such surgery.

Pirogov, the thirteenth child of his parents, was born in Moscow, November 13, 1810. As a youngster he liked to play "doctor." He was impressed by Professor Mukhin, who was called in to treat an older brother. He would often make his brother lie in bed while he listened to his heart, felt his pulse, looked at his tongue, gave him instructions, and then haughtily left the room.

He received his preliminary education at home, and at the age of twelve was sent to a private boarding school for children of the nobility, but soon had to leave as his father became bankrupt. He continued his studies at home. When his father spoke to Professor Mukhin of his remarkable love for medicine, Mukhin took the young man into his household and gave him every opportunity to study. The boy turned out to be a prodigy. Although no students were accepted under sixteen years of age, Pirogov passed the entrance examinations to the University at fourteen and matriculated in the medical faculty. As a matter of fact, Pirogov's father forged his son's birth certificate, and young Pirogov was not quite fourteen, although the document gave his age as sixteen.

At the University Professor Mudrov, who suggested that Pirogov study pathological anatomy and work on

autopsies, had great influence over the young student. After graduation in 1828, Pirogov was sent, at the expense of the government, to the newly opened medical institute at the University of Dorpat. It consisted of twenty native Russians, who were intended to replace the professorial chairs in four Russian universities. Pirogov formed a close friendship with Professor Moyer, and undertook practical work in anatomy and surgery. Professor Moyer soon realized Pirogov's talents and assiduity and made him almost a member of his family. Pirogov worked at Dorpat for five years, and by the age of twenty-three had developed into a remarkable scientist. He worked, with fruitful results, on original problems in anatomy and surgery. Pirogov was one of the first scientists in Europe to make systematic experimentation on animals on a wide scale, with the purpose of solving problems in clinical surgery.

After passing his examinations for the M.D. degree, Pirogov was sent abroad for two years for additional study in his special field. In Berlin he worked and studied in the clinics of men famous at the time—Schleiden, Rust, Diffenbach and Graffe—who added much to his learning. From Rust he acquired a method of diagnosis based on objective symptoms rather than through questioning of the patient. Diffenbach taught him plastic surgery, and Graffe showed him methods of quick, clean operation. From Berlin Pirogov moved to Goettingen to study under Professor Langenbeck. According to Pirogov himself, Langenbeck more than all other specialists made him feel that he had finally completed his scientific education and practical preparation.

In 1835 Pirogov returned to Russia, expecting to take the chair of surgery in Moscow. A long and serious illness prevented this, however, and the post was filled by Inozemtzev, with the aid of Mr. Stronganov, curator of the Moscow educational district. Left without a position, Pirogov resided temporarily at Dorpat, studying at the clinic of his friend, Professor Moyer. By reason of a wonderful operation which Pirogov performed, and because of his broad knowledge, Moyer suggested to the faculty that they appoint him to the chair of surgery, which Moyer wished to leave.

The faculty unanimously chose Pirogov. The council hesitated for a time, as Pirogov was the first Russian to be elected and his religion was Greek Orthodox. The unanimous and insistent desire of the faculty surmounted that hesitation, and in 1836 Pirogov was confirmed as professor-extraordinary of surgery and chief of the surgical clinic. So outstanding were the talents and achievements of the twenty-six-year-old professor that in a year the council of the University of Dorpat elected him professor-in-ordinary.

Pirogov spent five years in Dorpat. During his stay there he undertook annual visits to Riga, Reval and other cities in the Baltic districts. On these occasions he attracted such a large number of sick people that, upon the initiative of the local doctors, the pastors in the village publicly announced the arrival of the Dorpat surgeon. His work became so celebrated throughout Europe that in 1838, when he went to Paris, the renowned surgeon, Velno, greeted him as a famous colleague. He also met Rue, Lisfranc and Amussa, who acclaimed him with admiration. Although he devoted

eight hours daily to the University and to several clinics and polyclinics which he supervised, he found time to publish in German his *Annals of the Surgical Clinics,* which soon acquired wide popularity. Between 1837 and 1839 Pirogov published his *Surgical Anatomy of the Arterial Trunks and Fascia* (in German and Latin), which was awarded the Demidov prize by the Academy. At this time he also brought out a monograph on the cross-cutting of the Achilles tendon.

In 1841 Pirogov was transferred to the Chair of Hospital Surgery at the St. Petersburg Medico-Chirurgical Academy, which had just been placed under the jurisdiction of the Ministry of War. In accordance with his request, the Chair of Hospital Surgery was especially created for him, and Professors Baer and Zeidlin were added to the staff, thus bringing about a great improvement in the teaching of anatomy. He also invited the famous Gruber to be his assistant. Pirogov, with the assistance of the above mentioned men, did remarkable work in the newly established anatomical institute. During his fourteen years of professorship in St. Petersburg, Pirogov performed over twelve thousand autopsies with detailed reports of each. He began to experiment with ether narcosis in operations, and, because of him, it soon became widely used in Russia.

The reorganization of the surgical department of the hospital was his major accomplishment in the field of social work. The department consisted of one thousand beds, in addition to the recently established wards for civilians and women. The latter had been opened to make more diversified material available to the instructors and students. Of the bad condition in which

Pirogov found the large institutions, his biographer, P. Malis, writes as follows:

"Immense, badly ventilated hospital wards, containing sixty to a hundred beds were filled to capacity with patients suffering from erysipelas, extremely purulent oedemas, typhoid, and venereal diseases. There was not a single room for operations, not even an ordinary one. Rags for dressings and compresses were transferred by the men nurses from the wounds of one patient to those of another without any compunction whatsoever. The medicine issued by the hospital pharmacy resembled anything but medicine. For quinine they frequently substituted ox-gall, and for cod-liver oil some foreign oil. All the food supplies, issued to the patients, were unquestionably bad. Stealing was rampant. Pirogov had to transform these stables into a model surgical clinic. Only the authority resulting from his great scientific renown and the influential acquaintances which he had acquired while practicing, enabled the young professor to emerge victorious from the struggle with the hospital administration and its routine."

In 1847 Pirogov went to the Caucasus, where the war was in full swing. There he was able to make a practical study of military field surgery and the administrative problems of military field medicine. In both these provinces his authority is unequaled at the present time. Upon his return to St. Petersburg in 1848, he devoted himself to the study of cholera, performing numerous autopsies on the corpses. He published an atlas in French and German on the subject, *The Pathologic Anatomy of Asiatic Cholera.* His most important scientific works during his fourteen years sojourn in St.

Petersburg were, *A Course in Practical Anatomy of the Human Body, Anatomical Representation of the External View and Position of the Organs Within the Three Cavities of the Human Body,* the world-famous *Topographical Anatomy According to Sawing Through Frozen Corpses* and *Clinical Surgery,* in which is described his "Pirogovskaya" operation on the floor with the use of gypsum dressing.

At the beginning of the war of 1854, Pirogov went to Sebastopol at the head of the *Krestovozdvizhenskaya,* Society of Nurses. After devoting entire days and nights for ten months to the sick and wounded, Pirogov was no longer blind to the social and scientific backwardness of Russian society. In 1870 he was invited by the Executive Committee of the Red Cross to inspect the military-sanitary organizations on the field of action in the Franco-Russian War. His tour through the German hospitals and infirmaries was a happy triumph, for he was greeted with every honor in official and medical circles. The views which he expressed in his *Origins of Military-Field Surgery* were widely disseminated. His gypsum dressing was used a great deal, and resectioning, which attempted to keep the largest possible number of parts uninjured, supplanted amputation. His plan to distract the patients was used to considerable extent by the Germans. His idea that the sick and wounded should not be placed in large hospitals but in camp tents and barracks was put into practice, and upon his recommendation at Sebastopol, the wounded were sorted at the nursing station. He believed that war is a traumatic epidemic and that the measures taken should be those usually employed in epidemics. It is almost

unbelievable that any man could do so much work as Pirogov.

Pirogov was kind, though outwardly gruff and dictatorial, he was tolerant, and he despised flattery. He diagnosed his own ailment from the initial symptoms: "My case is hopeless; nobody gets well from such an ailment," and wrote his own diagnosis on a piece of paper *"ulcus ozis cancerosum serpiginosum."* He died in agony. Like Hunter, he developed a mania in his later years. According to F. Von Winchell, Pirogov was afraid to go into a dark room, suffered from hallucinations, and at one time ran through the streets of the town, shieking that he was being pursued. In spite of everything, however, he was the possessor of a magnetic personality.

The fiftieth anniversary of Pirogov's medical activity was celebrated in Moscow in 1881. He died the same year, and Russian doctors honored the memory of their greatest representative by founding a surgical society in the form of recurrent "Pirogov Congresses," by establishing a museum bearing his name, and by placing a monument dedicated to him in Moscow. Pirogov occupies a universally outstanding position as surgeon and scientist. He was almost as popular abroad as in his own country, and in 1862, when leading European surgeons could not determine the position of the bullet in Garibaldi's body, after he had been wounded at Asptromant, Pirogov was asked to take the case. Not only did he remove the bullet, but he also supervised the treatment of the famous Italian until he recovered.

It would require too much space to enumerate fur-

ther the medical, philosophical and literary works this great man left.

As Pirogov's family belonged to the semi-nobility, the young man seldom came in contact with the common people and was not acquainted with the liberal movement in Russia; but later, with his student-teacher, Feoktistov, he often visited liberal circles and read liberal literature and forbidden books. He was much impressed with the works of Rilieiev, which were banned by the Russian government.

He was accused by his enemies of reactionary tendencies and of being opposed to Zemstvo medicine. However, he did believe in Zemstvo medicine. Seeing that the army alone was well equipped with physicians, and that the common people, especially the villagers, could hardly maintain the services of physicians, Pirogov believed that Zemstvo organization ought to be of great help to the masses. His work and actions speak for themselves. He believed in higher education for women, and in the face of bureaucratic opposition, preferred women nurses to male ones. A single individual, however, cannot perform miracles, and Pirogov's struggles against administrative abuses and routine proved too much for him. What had been possible in one hospital proved impossible to accomplish for an entire army. Pirogov did much, but was unable to complete his work. As a result he disappeared, not only from the scene of action, but from the Academy as well. The administrative world rose up in arms against the great scientist when he wished to become a reformer.

When Pirogov was asked to write his autobiography he replied, "I am not interested in it. My friends know

VENZESLAV LEONTOVISTCH GRUBER.

Born in Bohemia, of German parentage, he accomplished his finest work in Russia and became the director of the Academy at St. Petersburg. He distinguished himself as an anatomist and wrote extensively upon that subject.

what I am and what I have been doing. But if I write, my enemies will say that I am praising myself."

The body of Pirogov was embalmed and laid in a vault in a town at Chernigovskaya Gubernia, where it rests under a glass cupola, visible to those who go to pay tribute to one of the world's greatest men and surgeons. He was the most outstanding medical reformer the profession has ever known.

Venzeslav Leontovitch Gruber

In 1855 Pirogov invited Professor V. L. Gruber to come to Russia. Gruber was born in Bohemia, of German parentage; he studied at the University of Paris, and distinguished himself as an anatomist. He was so eminent in his line that the faculty of Paris decided to retain him; but Pirogov recognized his talent and insisted on his coming to Russia.

When Gruber arrived at St. Petersburg he found the school lacking in teaching facilities. He and Pirogov did their best to improve the status of the Academy, but succeeded only partially, because of the graft of the Academy officials. Both continued to work there, however, and when Pirogov retired, Gruber was made Director of the Academy. He constructed the Anatomical Theater and Museum according to his own plans, and his lectures on anatomy were so interesting and practical that both physicians and students listened to his discourses. He spent over forty-five years teaching and building up the Anatomical Museum. In 1871 a new Museum was established, also in accordance with his plans.

His fame spread over Europe. The renowned European anatomist, Lushko, once said, "Where Gruber worked on research work, there is nothing left for anybody to do." Although the majority of his lectures were given in German, he was Russian to the core. Gruber was one of the most liberal-minded men in Russia and, like Pirogov, he believed in equal rights for the sexes, and admitted women to his academy. He was a hard worker and would often become so engrossed in his labors that he would be in the anatomical museum from eight in the morning until three the next morning. He wrote extensively on anatomy and surgery, worked in Russia for over forty-five years, and died in his native land.

What Gruber failed to complete, Kiter, another of Pirogov's ardent pupils, succeeded in finishing. Kiter was the real founder of Pirogov's school, for unlike Pirogov, he stimulated his students to original work. He never failed to listen to new men, new ideas and new suggestions, and by his attitude succeeded in surrounding himself with brilliant surgeons. Kolomnin, Bogdanovsky and Pelekhin were his outstanding students.

Sergei Petrovich Kolomnin (1842-1880) was chief professor of the Military Medical Academy. He was a fine surgeon, who strove to advance the art of surgery. He was kind, conscientious and sympathetic. Kolomnin was a splendid therapeutist and became efficient in the use of ignipuncture for certain diseases. One day, when about to perform an operation for resection of the large intestine, he decided to use cocaine instead of chloroform. Before using the cocaine he consulted his

confrère, a professor of pharmacology, on its use and proper dosage. He used a smaller amount than ordinarily administered by other physicians, but the patient died of cocaine poisoning. Kolomnin was heart-broken, and unable to endure the dishonor of such a misfortune, he went home and shot himself.

E. I. Bogdanovski (1838-1888), another of Kiter's famous pupils, was an admirer of Pirogov's work, who realized the importance of pathology in surgery. He worked in the best clinical centers of Germany and France, and on his return to Russia became the head of the surgical department of the Academy. With the aid of Professor Rudnev, he put the surgical and pathological departments on as high a plane as Virchow, Bilroth and Volkman had done in Germany.

P. P. Pelekhin, the third of Kiter's most noted pupils, really introduced antisepsis into Russia. On his return from abroad, he published in the *Medical Bulletin* a series of articles on the successful usage of asepsis in surgery, in which he spoke of the work of Lister and its success. He was such an upholder of antiseptics that he insisted on surgeons shaving off their beards, mustaches and eyebrows, although some of the men refused to abide by such a rigid rule. During the Russian-Turkish War (1877-78), antisepsis was somewhat neglected, and as a result mortality among the soldiers was high and more died from sepsis than from bullets.

Theodore Ivanovich Inozemtzev (1802-1869)

This famous anatomist and surgeon, who preceded Pirogov, was the son of a Persian prisoner and was

brought to Russia by Count Buturlin. Having shown exceptional ability in high school, the young man was sent to the University of Kharkov for a course in belles-lettres. Suspecting that Inozemtzev's ideas and actions were too liberal, the government sent him to teach mathematics in a little town in Kurkskaya Guberniya. He did not remain there long, and soon entered the medical department of the University of Kharkov, from which he was graduated with highest honors. After the publication of a remarkable thesis which attracted the attention of the medical authorities, he was called to the chair of surgery at the University of Dorpat. Professor Ellinsky was greatly interested in him and admired his surgical technique.

From Dorpat Inozemtzev was called to St. Petersburg to take the place of Pirogov, who had become ill. He fully believed that a good surgeon must be a good anatomist and anthropologist. He founded the Moscow *Medical Journal,* and organized a society of Russian physicians. His lectures were always well attended, and Botkin and other well known Russian physicians became his pupils. Inozemtzev, who wrote many scientific articles and had one of the largest practices in Moscow, was well known abroad.

Among the celebrated pupils of Gruber was Peter Petrovich Lesgaft, who worked under Kiter. In 1878 he became assistant to Professor Gruber, and in 1884 was named Professor of Anatomy. He was a prolific writer, not only on medicine but on philosophy and anthropology as well. A. A. Bobrov was the first surgeon in Russia who performed an appendectomy, and

PETER IVANOVICH DIYAKANOV.

Editor of the journal *Chirurgia,* he published a fine treatise upon the treatment and prevention of blindness among the peasants.

the first to use an intradermic injection of normal salts solution during chloroform narcosis.

Peter Ivanovich Diyakanov of Orel, often thought of as the creator of scientific surgery, was Professor of Surgery at the University of Moscow. Unlike Veliyaminov of the bureaucratic St. Petersburg Medico-Chirurgical Academy, Diyakanov realized soon after graduation, that bureaucracy hampered the development of scientific medicine. While still a student at the Academy he had been arrested for his connection with nihilistic propaganda and sent North. During the Russian-Turkish War in 1877 he was ordered to the front and acted as a *feldsher,* or assistant surgeon. After the war he was ordered to finish his medical studies, but was again arrested; after a short time he was released and completed his studies. This was typical of the lives of many students, including the writer.

Diyakanov returned to his home city and through his exceptional skill acquired a large practice. Realizing the need of medical help for the masses, he became an ardent follower of the Zemstvos. He later became associated with the University of Moscow, where he taught topographical anatomy and surgery. He never relinquished his interest in Zemstvo medicine and many Zemstvo physicians came to his clinics in Moscow, where he was always ready and willing to assist them. It was due to his interest in their affairs that regular meetings of Zemstvo physicians took place in various localities. He called the attention of these physicians to the alarming prevalence of blindness among the Russian peasants, and published a fine treatise on the pre-

vention and treatment of the disease. He was also editor of the journal, *Chirurgia.*

In 1791 the Moscow Medical Chirurgical Academy began to use microscopes for the minute study of histological specimens. Professor Baer was appointed head of the department, and by 1840 brilliant work in histology was being done by Zablotzky, Velliansky and Klenke. Alexander I, during his short period of liberal reign, ordered the best microscopes that could be found, to be brought to Russia. These instruments were made in Vienna by the famous master, Plessel, and the study of histology then became a special branch.

M. Yakubovich of the Medical Chirurgical Academy was a brilliant histologist and his researches in the study became known all over Europe. Recognition came to him from the Parisian Academy of Science, and from such eminent histologists as Claude Bernard, Mueller and Helmholtz. Emperor Nicholas I, the most reactionary of the Russian rulers, recognized Yakubovich's genius and helped him financially to pursue his studies.

F. V. Ovsiannikov and Markuzen also did outstanding histological work. Histology and embryology became leading subjects in the Russian universities, and the students of the University of Moscow were soon known all over Europe. Most prominent among them were A. I. Babukhin of Moscow, L. Shtida of Dorpat and G. F. Goyer. Goyer's outstanding contribution concerned the anatomical structure and physiology of the spleen and the rôle it plays in human anatomy. P. I. Peremeshko was also well known for his work in histology, and Alexander Onufrievich Kovalevsky was one of the most original embryologists in Europe.

Some of the histologists did special work from other angles. Professor M. A. Khronchevsky proposed a method of impregnating certain organs with silver nitrate, which enabled him to study specimens in their minute structure. Professor Alexander Maximov (1874-1931), besides being a fine anatomist, did remarkable work in minute anatomy and histology of the human body. During the Revolution he was a strong adherent of the Czarist régime and emigrated to America where he became Professor of Anatomy and Histology at the University of Chicago. He contributed numerous articles on histology and embryology to the medical journals. His splendid book on histology and embryology, revised by his co-worker, William Bloom, has passed into its second edition.

A. S. Dogiel found a means by which he could inject methylene blue into the nervous system of living animals. With this procedure he was able to study the structures of the peripheral nerves in different organs and also the structure of the sympathetic and cerebral spinal nerves. This method is used all over the world. M. D. Ladovski did a vast amount of work in histology, using his own methods as well as those then in vogue. We owe a great deal to F. N. Zavarykin for his thorough and technically irreproachable studies in the histology of the kidneys. Strelzov was well thought of for his effective work in regard to the development of osseous tissue, and Ognev gave us data concerning the histological development of the reticular membrane.

The rapid development of anatomy and surgery, for which the Russian doctors were becoming widely recognized, was followed by progress in pathology and

therapeutics. Noted surgeons of the last part of the eighteenth century, and the entire nineteenth century, made great strides in pathology. Among these the best known are Uden, Dyadkovski, Shervinsky and Abrikosov. A Prussian by birth, Uden studied in Berlin in the Medical Surgical Collegium and in the University of Gaul, where he received his M.D. degree in 1776. He was a student of mining at the same time, and in 1783 received the rank of mining consultant in the Duchy of Saxe-Weimar. Invited into Russia by supreme order on June 13, 1786, he was placed in the Chernigov Province, and unlike his German compatriots, became thoroughly Russianized.

In 1792 he was given the rank of professor in the newly formed Imperial Surgical Institute. Before taking this position, however, he was made instructor of mathematics and physics in the St. Petersburg Medical School, which post he resigned in 1794. In 1799 he was chosen honorary member of the medical board (collegium), and in 1800 received the position of Professor of Pathology and Therapy in the St. Petersburg Imperial Surgical Institute. In 1802 he was made scientific secretary of the Medical Council. Uden was the first to attempt to edit a Russian medical periodical. In 1792 he asked the Medical Board for permission to edit a weekly magazine under the title of *Conversing Physicians or the Physicians' Correspondence of Universal Utility*. He presented to the board the first page of the magazine, which he had composed. He was not permitted to print it, however, since "according to the board's observations, it contains references to religious and church rites."

Two of his well known works were *Pharmacopoeia in Latin* (St. Petersburg, 1818), and *Academic Readings Concerning Chronic Diseases* (7 parts, St. Petersburg, 1816-1822). He was also a good veterinarian and published "An exhortation on cattle diseases to which the animals most susceptible are horses, horned cattle, pigs and sheep, with an indication of symptoms, attacks, and reasons for them, with an appendix containing the most reliable methods of prevention and treatment."

Nicholai Nicholaievitch Zinin (1812-1880)

Nicholai Nicholaievitch Zinin was one of the bright lights in science and scientific medicine in the middle of the nineteenth century. Soon after graduation from the University of Moscow, he became famous in the domain of physics and chemistry. After holding the chair of physics and chemistry for several years, he was ordered abroad. As most of his friends were physicians, Zinin decided to study medicine and soon excelled his colleagues, as he had also done in chemistry and physics.

Returning from abroad he again became Professor of Chemistry and Physics and in 1848 was called to the St. Petersburg Medical-Chirurgical Academy to take the chair of chemistry and physics as applied to scientific medicine. During his entire connection with the Academy he maintained that science and medicine are closely connected and insisted that physicians must study all branches if they intended to be real physicians. It was not until the reign of Alexander II that his advice was taken seriously, and the result was that scientific medicine began to make rapid advances, especially

when Alexander Dubovitzki, like Zinin, renewed his efforts to bring the teaching of medicine under scientific rather than theoretic men.

The name of Dimitri Nicholaiyevitch Zernov has a definite place in this recital, for he was regarded as an authority on pathological anatomy and his treatise on anatomy is a classic. He was beloved by his students at the University of Moscow, where he was known as the inventor of an encephalometer.

The study of histology was followed by bacteriology. The great Botkin, notwithstanding the opposition of Zakharin and others, was an ardent advocate of the importance of bacteriology. Of the bacteriologists who were recognized not only in Russia but throughout Europe, the names of Nicholai Gamaleia, Waldemar Hafkine and Alexander Besredka stand out.

As in the case of anatomy, physiology and histology, Russians became efficient also in general pathology and therapeutics. G. P. Sacharov, Vennsovich, V. Pashutin, Podvisotzky, Lavrov and Lukianov gave impetus to the work in which Pashutin and Lavrov excelled. The findings of these widely known and earnest workers have appeared in standard textbooks, as well as in scientific journals published in Russia and abroad. Sergei Michailovich Lukianov, of Warsaw, a pupil of Virchow, gave vivid and instructive lectures on pathology.

Another pathologist noted for his splendid work was Michael Nikifrov, whose atlas in pathology was a masterpiece. Valerian Podvisotzky and his son, Vladimir, did fundamental work on the pathology of the inner organs, and the names of Botkin, Zacharin, Manassein and Eichwald were likewise known abroad. Botkin,

like Osler, was an able diagnostician. He placed more reliance on laboratory and pathological findings, while Zacharin adhered to clinical observations rather than to laboratory results.

In the field of therapeutics, Russian medical investigators have done outstanding work. Even in pre-scientific medicine, Russian healers were well acquainted with the most potent roots, herbs, leaves and pharmaceutical concoctions for various diseases, and, as the physician and historian, Manassein, once said, physicians have only partially discovered medicine by themselves, for they were taught remedies and methods of treatment by the people. This fact gave Russian therapeutists the impetus to study pharmacy and other therapeutic measures more thoroughly.

Each medical school had a separate department of therapeutics. One of the earliest and most renowned therapeutists was Professor Johan Peter Frank, who was succeeded by the equally famous Gayevsky. Professor Chervonsky enriched the science by numberless books and essays, as did Professor G. I. Bazilevich. Vellinski, who was somewhat theoretical, was well known as a metaphysician, naturalist and philosopher. K. K. Zeidlitz, regarded as a master in the science of therapeutics, was followed by N. F. Zdekauer, Dubovitzky and Alexander Ivanovich Ower, who held the chair of therapeutics after Mudrov's death.

The younger and most famous generation brought forth Yakubovich, Setchenov, Yunge, Beckers and Botkin, all of whom were students and investigators in the realm of therapeutics. Botkin established a therapeutical school which won deserved fame, for the graduates

included the names of such men as D. I. Koshlikov, V. P. Pokrovsky, T. Chudnovsky and V. A. Manassein. The last named, like Botkin, formed a school of therapeutics, with Stolnikov, Sigerist, Rubnov, Kosturin and others as disciples of his theories. Botkin and his followers, far from limiting themselves to therapeutics, were deeply interested in mental and nervous diseases, skin and throat disorders and electrotherapy and hydrotherapy. Pavlov, Lukianov and Lashkevitch, the renowned physician and philosopher, were also devoted to the study of therapeutics.

Inozemtzev was the founder of the Moscow *Medical Gazette*. Koshlakov was a pioneer in popularizing the study of pathological and physiological chemistry, toxicology, pharmacology, pathological histology, physiology and the pathology of digestion. His pupils were Academicians L. V. Popov, T. I. Bogomolov and N. I. Simonovsky, who did a vast amount of research work in laryngology. G. Zakharin, who was celebrated for his method of the diagnosis of disease, claimed that observation and rational questioning of the patient were more important in diagnosing a case than were laboratory findings. His methods were followed by Ostroumov, Charikov, Pavlinov, Snegirev and Piltov.

Sergei Petrovich Botkin (1832-1889)

What Pirogov was to Russian surgery, Botkin was to Russian medicine, and Pirogov, the genius of surgery, recognized Botkin as a genius in medicine. Botkin was descended from a pure Russian family with no Tartar strain. His father and grandfather were well known tea

Sergei Petrovitch Botkin, (1832-1889).

After studying in Berlin and Vienna, Botkin organized the first clinical laboratory and dispensary in Russia along Western European lines.

merchants and organizers of the tea trade in China. The father was intelligent and eager for his children to have a good education. He was married twice, and at his death left nine sons and daughters. All of the children distinguished themselves. The Botkin family was in close contact with the scientific and literary world, especially as one of the sisters of Botkin married the poet, Fet, and another was wedded to P. L. Pikulin, a professor of the University of Moscow. Granovski, who resided in the Botkin house, was also close to the family.

Sergei Petrovich, the eleventh child, was born of the second marriage of his father, with A. I. Postnikova. Sergei was reared under the immediate care and influence of his brother Vasili, who made every effort to see that his upbringing should be firm and broad. Botkin's first tutor was Merchinski, a student of the University of Moscow, a brilliant youth and a great mathematician. Merchinski was so anxious for his young charge to take up the study of mathematics that Botkin almost decided to enter the mathematics department of the University of Moscow. As the department was limited to a certain number of students and was already filled, Botkin decided, against his tutor's advice, to enter the Medical Department, for there was an increasing demand for physicians. The teacher's influence continued to be strong, and Botkin retained friendly contact with him throughout his life.

The discipline at the University was extremely severe. The young man had a taste of it in his first month, when he was forced to sit for twenty-four hours in a detention room because of his failure to fasten the

hooks on the collar of his uniform. Although the student body of those days manifested little interest in scientific pursuits, Botkin was different from his circle of friends. He attended lectures conscientiously, took careful notes, and by devoting himself to scientific work, soon had a great liking for his chosen profession. He shone in this field by virtue of his brilliant talent and analytical mind, although the mode of instruction was unsatisfactory in many ways.

In 1881 Botkin characterized the educational handicaps as follows: "Having studied in Moscow University from 1850 to 1855, I witnessed the tendencies of the entire medical school. A large number of our professors had studied in Germany and the more or less able transferred to us the knowledge which they had acquired. We listened diligently and at the end of the course considered ourselves finished doctors with ready answers to every question which might arise in practical life. With such a training the graduates could hardly have been expected to become experimenters. Our future was destroyed by our school, which, by teaching us knowledge in the form of catechistic truths, did not arouse in us that inquisitiveness which determines future development."

Nevertheless, it must be admitted that among Botkin's instructors at the University were many who were distinguished for their talent, knowledge and conscientiousness. The most gifted and popular of these was the surgeon Inozemtzev, who exerted great influence over Botkin and his friends. A. I. Polunin, a young professor who returned from abroad in 1847 to teach pathological anatomy, general pathology and general therapy,

and who was also an able medical worker, had, according to Botkin, "undoubtedly the greatest influence on the development of the students." In the fifth year the study of internal diseases was satisfactory, for the clinic was headed by a capable, well-educated instructor, I. V. Varvinski. His young assistant, P. L. Pikulin, was also able, and under his guidance Botkin and the other students untiringly practiced tapping, oscultation and other diagnostic methods. By this time Botkin already had the reputation among his associates of being an expert tapper and oscultator.

During the fourth year the Crimean War had broken out, and the authorities had ordered students to be sent to the front immediately. They had refused to go, however, for they recognized the inadequacy of their scientific preparation. The next year, therefore, their graduation took place two months earlier than usual, and Botkin was the only one in his class who passed the examinations—not for the *lekar's,* but for the doctor's degree. Soon after graduation he went to the front in N. I. Pirogov's division, at the expense of the Grand Duchess Helena Pavlovna, and worked in the Grand Duchess's Bakchisaraiski Hospital under the guidance of Pirogov.

The war experience had a depressing effect on Botkin, and in his speech at Pirogov's Fiftieth Jubilee, Botkin spoke of the conditions in those days: "... to make certain that a piece of meat or bread intended for a patient would reach him safely and not be reduced to a minimum, was not an easy task in those times among social groups which treated government property as though it were public holiday pie offered to be de-

voured. Following Pirogov's orders, we weighed the meat when it was received in the kitchen and sealed the kettles in such a manner that no considerable contents could be removed. Nevertheless, our broth was miscarried. Despite strict supervision, ways and means were found to deprive the patients of their lawfully allotted portions."

Botkin's weak sight hindered him from undertaking surgery successfully, for it was necessary to work quickly, and his presence at the front was of short duration. For three and a half months he discharged the duties of a head physician ordinator at the Simferopol Hospital, and earned a praiseworthy recommendation from Pirogov. At the end of the war, armed with Pirogov's complimentary testimonial, Botkin went abroad to improve his education. He set out with no definite plan, but at Koenigsberg, following the advice of one of Hirsch's assistants, he decided to study under Virchow, who at that time still worked in Wurtzberg. In Wurtzberg Botkin feverishly studied normal and pathological histology, and attended the lectures of the famous instructor whose works gave a new direction to the entire field of contemporary medicine.

In the fall of 1856, Botkin, together with Virchow, moved to Berlin, where he spent whole days in the new pathological institute and in the laboratories of Hoppe-Zeiler. During the same period he frequented Traube's clinic. Traube's attraction lay in his extraordinary observation combined with sound scientific preparation and accurate, broad application of objective methods of examination. Botkin occasionally visited the clinics of the neuro-pathologist, Romberg,

and the syphilographer, Berensprung. He remained in Berlin two years, and studied under Virchow continuously, without missing a single autopsy. He mastered microscopic technique and the methods of chemical examination, and during this period wrote his first independent scientific works, which were published in Virchow's Archives. He also wrote the first article printed in the Russian language on Soleil's polarizing apparatus.

Botkin entered into close friendship with the learned Russians, Yunge and Beckerson, while in Berlin, and continued his friendly relationship with Setchenov throughout his life. This period of concentrated study, and of new friends striving to fulfill mutual spiritual needs, left Botkin with warm recollections which he cherished all his life. He spent his summer vacations in Moscow, where, about 1857, he first became ill with hepatic colic, and was subject to violent attacks.

In December, 1868, Botkin moved from Berlin to Vienna, where he continued microscopic examinations, attended Ludwig's lectures and studied in Oppoltzer's Clinic. He admired Ludwig, but found Oppoltzer's Clinic to be scientifically inadequate. While in Vienna he married the well-educated daughter of a Moscow official, A. A. Krylov. He disliked Vienna and its people, for he felt that they were servile, and he despised flattery.

Before leaving Moscow, Botkin had become connected with the head of the Medical-Surgical Academy, Shipulinski, who was in charge of the therapeutical clinic. In 1858, Shipulinski reported to a conference of the Academy that Doctor Sergei Petrovich Botkin had

offered to fill the vacancy left by the departure of Doctor Ivanovski, the post being that of assistant in the therapeutical clinic of the Academy. Considering Botkin's offer profitable for the Academy, Shipulinski requested the conference to keep him in mind as a possible candidate. After waiting a year and a half, as Botkin was still abroad increasing his knowledge, Shipulinski again reminded the Academy of Botkin, and asked that another doctor be appointed pending his return.

In 1857 Professor P. A. Dubovitzki was appointed president of the Academy. He invited Glebov to serve as vice president, and together they undertook a wholehearted, radical reorganization of the inner life of the institution, which was reflected in the choice of new instructors. Those invited to join their ranks in 1859 were Jakubovich, Botkin, Setchenov, Bekkers and Yunge, all of whom were still abroad. With the exception of Yakubovich, all were graduates of the University of Moscow and had completed their course there only three or four years before.

In 1860 Botkin was called by the St. Petersburg Medical-Surgical Academy (later named the Military-Medical Academy) to occupy the position of adjunct in the therapeutical clinic. After he defended his doctor's dissertation on the *Absorption of Fats by the Intestines,* he was promoted, in 1862, to the position of professor of the same clinic. He worked there until his death. From the very beginning of his activities, Botkin devoted himself zealously to the reorganization of the clinic along Western-European lines. He established the first clinical laboratory in Russia, and was the first to open a

clinical dispensary, which became the center of scientific work and attracted many young doctors, some of whom later became first-grade scientists, as, for example, N. A. Vinogradov, V. A. Mannassein, Y. P. Chudnovski, I. P. Pavlov, M. V. Yanovski, N. Y. Chistovich and N. M. Molkov.

In his scientific research and pedagogical activities, Botkin applied ideas which he had acquired from his Western-European teachers, chiefly Virchow and Claude Bernard. In agreement with them, he was opposed to a natural-scientific examination, considering it based on abstract theory unsupported by experiment. He also objected to the vulgar empiricism of his predecessors and of many of his contemporaries. Throughout his life Botkin developed the view that practical medicine was to be considered a natural science: "The methods employed in the practical examination, observation and treatment of the patient, must be the method of a natural scientist, who bases his conclusions on the largest possible number of carefully and scientifically observed facts." (1862—First Lecture.) Toward the end of his life he again said: "The knowledge of physics, chemistry, and the natural sciences, coupled with the widest possible general education, is the best preparation for the study of scientific practical medicine." To Botkin the ability to apply natural sciences to individual cases formed the art of curing. His greatest merit lies in his having been the first in the history of Russian medicine to define clearly the natural scientific bases of clinical medicine, and it was in this direction that his school progressed.

Aside from separate scientific articles, we find in all

his lectures new facts noted and explained prior to their discovery by other scientists. Those of greatest significance to the clinic for internal diseases were the solution of the problems dealing with gall colic, heart diseases, enteric fever, relapsing typhoid and typhus, floating kidney, changes in the spleen during various illnesses, and stomach and intestinal diseases. In 1865 he proved that recurring fever, which was long considered to have disappeared from Europe, still existed, and he made an elaborate study of its clinical rôle.

Botkin is remarkable for the constancy with which he pursued his scientific activity during his entire medical career. He continued it even in the last year of his life when he was working on a problem of natural and premature aging. In 1865 he wrote, "I have treated chronic cases for some time and I can see how helpless we are in getting results." He was elated by the discoveries of Koch and Pasteur. "Both of them," he said, "opened the gates of the causes of many diseases." He spent days with his microscope, for he felt that that instrument could solve many puzzling medical questions, and he established a bacteriological laboratory for the study of contagious diseases.

Botkin's scientific activity expressed itself in other ways. In 1866 he founded the *Epidemiological Newspaper* and an Epidemiological Society, the chairmanship of which he offered to E. V. Pelikan, who was considered the best epidemicist of his time. The immediate cause of the organization of the Society was the impending danger of cholera in St. Petersburg. The *Epidemiological Newspaper* was published for about two years under the editorship of Lovtzov, but the Society

existed only a short time, as epidemiology was insufficiently understood at that period and few doctors were interested. Botkin himself took an active part in the Society and in the editing of the newspaper.

In 1878 the Society of Russian Physicians unanimously elected Botkin chairman. The Society sent a special deputation to the new chairman, and arranged for his reception at a special meeting. Professor Pelikan, the vice-chairman, greeted him with a speech, and after mentioning the revolutionizing effect of Botkin's works, he concluded his discourse with these remarks:

"The proceedings of our society can almost serve as a reflection of these changes in the Russian student, doctor and professor. Therefore, Sergei Petrovich Botkin, you can understand the appreciation of our members that you are destined to head the society on that road on which are traveling all Russia and all the Slavs."

And in truth Botkin soon enlivened all the gatherings and had a healthful effect on the society. A number of meetings were devoted to the bubonic plague epidemic which had appeared in Vetlyanka, and, as a matter of fact, a case which developed as a result of this epidemic had a bad effect on Botkin's mental condition. In the beginning of 1879 he observed in many patients a swelling of the lymphatic glands throughout the body, accompanied by other symptoms which caused him to conclude that the black death (bubonic plague) had already been brought to St. Petersburg, though not yet in a clearly defined form. Soon after, he discovered in one of the visitors at his dispensary, a janitor named Naum Prokofyev, unmistakable symptoms of a light

form of bubonic plague. Examining the patient in the presence of his students, Botkin found indications of the disease in a mild form, and as a precaution advised isolation, although explaining that this was a mild case and undoubtedly would end favorably.

Rumors of the appearance of the black plague in St. Petersburg spread quickly and created a panic. Two commissions, one formed by the mayor and the other by the medical council, examined the patient and announced that he was not ill with black death but that it was a case of complicated syphilis. A foreign syphilographer also took issue with Botkin, who, on the basis of the indisputable symptoms of black plague, defended his diagnosis. The patient recovered, and Botkin became the target of vicious attacks by the press. He was accused of lack of patriotism and of agreement with the English. These cruel insults lasted for several weeks only, but to the end of his life Botkin retained his belief that his diagnosis had been correct. The same thing had happened before, even to the great Pirogov, who had been accused of misdiagnosis by the reactionary publicist, Bulgonin.

At the first meeting of the Society of Russian Physicians after this disputed case, two addresses were read to Botkin. One came from the members of the Society and the physicians of St. Petersburg; the other was signed by two hundred and twenty doctors; and great sympathy was expressed for him in both testimonials. The large audience greeted him with an ovation, and this hearty token of respect and friendship was consoling to Botkin in view of the humiliation he had suffered which had even had a bad effect on his health.

At this same meeting it was discovered that other doctors had observed in hospitals and private practice diseases similar to the black plague, and one of these cases, which was in the care of V. I. Afanasyev, ended in death.

Botkin's scientific work was well reflected by his students, many of whom by following the example and guidance of their teacher, had already made names for themselves in the scientific world. An independent medical school was soon established around Botkin, and many of the doctors who had served under him as house physicians and assistants received independent professorial chairs in government universities and in the Academy. Botkin took an active part in the struggle between the Russian and German doctors, not in a spirit of national enmity, but in an effort to help his colleagues of Russian origin. "This is why," says A. N. Belogolovyi, "we see among his students only Russian names. We find also that these students were not left without a chance as were their predecessors, but have been able to achieve independent positions. All acknowledge that to a large degree they owe their material betterment and their moral uplift to Botkin, both as an instructor and an energetic defender of their interests."

About 1881, when the supervision of hospitals and sanitation work was transferred to the St. Petersburg City Government, many members of the Duma expressed a desire to see Botkin in their midst. On March 21, 1881, he wrote to Likhacher, chairman of the Committee on Public Health, "I hesitated for a long time before I decided to accept my election as a member of the Duma. This new responsibility, in addition to the

numerous activities which are now on my hands, will be difficult for me to fulfill, especially since my health is not sufficiently strong. On the other hand I would feel conscience-stricken to refuse this position in which I might be of some use."

After his election to the Duma, Botkin became a member and acting chairman of the Committee on Public Health. In January, 1882, he participated actively, as its curator, in the establishment and working of the municipal barracks hospital for contagious diseases, which later became his favorite project. He spared neither time nor money, and as a result it became possible for the municipal hospital to be placed on a clinical basis. In 1886, following his election as honorary curator of all the municipal hospitals and poorhouses, Botkin made many radical improvements in them.

From 1870 on he worked hard as honorary physician to the Czar, and his reserve of free time became extremely limited. In 1871 he was called upon to treat a serious illness of the Czarina Maria Alexandrovna, and in the next few years he accompanied the Czarina abroad and to Southern Russia several times, being forced to suspend even his lectures at the Academy. In 1877 he accompanied Emperor Alexander II to the war, departing in May and returning in November. The letters which he sent to his second wife from the scene of action tell of his activity at the war and of his impressions, which were those of a doctor who loved his country dearly.

Private practice was always a secondary consideration with Botkin. He treated private patients with the same attention which he gave to clinical cases, although he

realized that they possessed less scientific value than the latter. It is not surprising that Botkin wrote as follows to A. M. Bologolovyi in 1863, "It is three weeks since lectures began. Of all my activities, this is the only one which absorbs and enlivens me. All the rest of my work is mere drudgery—the prescription of a great deal of medicine which brings no results. This will help you understand why I am so oppressed by the practical work in my polyclinic. The large number of chronic cases which I have, are developing in me the sad conviction that our therapeutical methods are powerless. It is but rare that a polyclinist will escape the bitter thoughts I have when I think of why I have taken money from more than half the population, making them spend it on medicine which relieves them for twenty-four hours without changing anything substantially. Excuse my hypochondria, but I have just had my home office hours and I still have a fresh impression of the fruitlessness of this labor."

This letter makes it evident that Botkin had attacks of that mental condition which Pirogov so aptly termed "eating himself up." However, the private practice which saddened Botkin so much was of great use, even though it did not produce the brilliant results of clinical work. In addition to home office hours, he carried on a consultant practice which was exceptionally valuable both to patients and to doctors. At the consultations his authoritative opinion decided many difficult and complicated cases, and in this way his popularity grew rapidly and continuously. A vast number of persons tried to become his patients, and, according to a statement of Bologolovyi, "Every new patient became his

unconditional admirer. . . . The skill with which the practical doctor-humanist battled for the lives entrusted to him was rewarded by the grateful thanks of the persons whose lives he saved and their relatives."

Botkin led a peaceful private life, and, a family man in the best sense of the word, he took good care of those close to him. His favorite recreation was the cello, to which he devoted his spare time. Botkin married twice. Although the death of his first wife, Anastasia Alexandrovna (born Krylova) in 1875 was a great misfortune for him, he later married Ekaterina Alexseevna Mordvinovna, born Princess Obolenskaya. Botkin indulged but little in social pleasures, for which he substituted scientific activities. Saturday was his day of entertainment, and friends and acquaintances would assemble at his home. At first the company consisted of a narrow circle of professors, but in the seventies the group attending on Saturdays grew until it became a large and noisy party, which was welcomed by the kind-hearted, hospitable host. Although Botkin earned a great deal, he was not avaricious; he lived plainly, and if he spent almost his entire income, it was due to his generous philanthropism.

In 1872 he was honored with the title of Academician, and at the same time was made an honorary member of the Universities of Kazan and Moscow. Thenceforward society and the scientific world frequently expressed their appreciation of him, and toward the end of his activities he was an honorary member of thirty-five Russian and nine foreign scientific medical societies. In 1882 his students and admirers celebrated the twenty-fifth anniversary of his scientific work. The

celebration, which took place in the hall of the municipal Duma, showed clearly the affection accorded him by Russian society. The St. Petersburg Medical Academy, all of the Russian universities and many Russian and foreign medical societies elected him an honorary member. The reading of salutatory addresses and telegrams took several hours. The Medical Academy characterized his merits in words which have become famous:

"Today marks the 25th anniversary of your famous activities. Creating a wide popularity for you as a talented teacher, a practical doctor and a scientist, this work has had an exceptionally favorable influence on the development and success of medicine in our fatherland."

Botkin's physical strength had already broken down and he needed rest. In 1882 he became ill with coronary thrombosis, which was destined to cause his death. Up to this time he had been suffering from gallstone colic, although in the last few years it had not been so annoying as usual. In the winter of 1881-82, immediately following an attack of hepatic colic, there appeared signs of the organic disease of the heart, and excruciating pains confined him to an armchair for three days without moving. Doctor Sokolov, who was treating him, attributed the beginnings of the disease to the cruel injustice accorded Botkin in 1879.

On recovery from the heart attack, Botkin immediately resumed his usual activities. Complying with the treatment prescribed, he tried to avoid sitting, walked a great deal and engaged in physical labor on his estate. After a few trips to watering places in Europe, he realized that his condition was hopeless, and foreseeing

the possibility of death, he called his relatives from St. Petersburg. He asked Lawson Tait, the English surgeon who had become prominent because of an operational removal of gallstones, to treat his gallstone colic. Tait observed a crowding of the gallstones, but declined to operate because of the weakened heart. After this attack Botkin consulted with the German therapeutist, Professor Kussmaul, but the illness proceeded uncontrollably to a fatal end. In the words of A. N. Bologolovyi, "Soon death removed from the earth its irreconcilable enemy."

During Botkin's time there was another great physician who had remarkable intuitive qualities and who was almost as well known as Botkin. The two men represented two schools—one relied on scientific findings, while the other paid closer attention to a study of the patient. Zakharin belonged to the latter school. The older methods, although crude (Our forefathers attained to an extraordinary degree of proficiency in the use of them), developed a remarkable acuteness of sight, sound, touch and smell, and Zakharin belonged to this school.

Gregory Antonovich Zakharin (1829-1897)

Zakharin was an outstanding Russian clinician, the founder of the so-called Moscow clinical school. He was graduated from the Medical Faculty of the University of Moscow in 1852. In 1858 and 1859 he worked in Berlin under Virchow and Traube, and in Paris under Claude Bernard and Trousseau. In 1862 he became professor-in-ordinary and director of the faculty thera-

peutical clinic of the University of Moscow. Zakharin's scientific-practical educational work falls into two periods. In his youth, during the era of liberalism and the "great reform" (1861-1865), he was a liberal and an innovator. During the period of political reaction (1880-1899), he became, in his middle age, a stubborn conservative. Because of his ill-temper, his relations with his assistants and even with his patients were not very pleasant.

Zakharin, as stated earlier, belonged to a different school than Botkin. While the latter believed in experimental and research work as the real method of treatment, Zakharin looked to past medical knowledge as the true foundation of medicine. On Zakharin's return from abroad, where he met Botkin, the ardent pupil of Virchow, he became chief of the University of Moscow medical clinic. There was little love wasted between the two scientists. Empiricism and a reactionary opposition to the latest scientific thoughts and methods of clinical examination, particularly bacteriology, caused Zakharin and his clinic to lag behind the contemporary level of science. Zakharin's political reaction and his stubbornness completely alienated him from the advanced elements of contemporary society, and in 1896, shortly before his death, the refusal of his students to attend his lectures forced him to resign his position.

Zakharin's *Clinical Lectures,* in four volumes, is his chief work and is of great importance even today. In these Lectures he reveals remarkably keen observation, and ably sets forth his methods of diagnosis and treatment. In 1860 he took seriously to reorganizing clinical

work, and established a school for practicing physicians. By separating a number of beds for the diseases of women and children, he paved the way for specialized clinics. Through his initiative, and with his aid, the first specialists in nervous diseases and diseases of the ear, nose and throat were trained. Zakharin developed an original method of examination, based on detailed questioning (anamnesis), thorough study of the subjective condition of the patient and careful observation of the symptoms of the disease. His school furnished a group of prominent clinicists—Snegirev, Filatov, Flerov, Chernov and others. Russia is indebted to Zakharin for the training of thousands of doctors, some of whom were very well known.

Zakharin was a talented empiricist, although in his period there were already signs of indifference toward laboratory and instrumental methods of examination and a negative attitude toward the study of theoretical problems of therapy. Neither in his teaching nor in his scientific work did Zakharin attempt to explain clinical phenomena: "I am ready to convey to you that which I consider factually correct, and will not touch upon theory . . . because there is no theory which cannot be challenged." Yet, with all his reactionary tendencies, he was a splendid therapeutist, known for his practical methods. So successful were his methods of treatment that foreign physicians often came to Russia to attend his lectures, and in 1888 the well known French clinician, Buchard, was sent to study with him. Having been so fortunate as to have been one of Zakharin's students, the writer was often awestruck at the almost uncanny diagnoses this great man made in obscure cases.

In 1884 Zakharin, together with Professor Leyden, attended Emperor Alexander III in Livadiva. Zakharin disagreed with Leyden, and after almost insulting him, left for Moscow. Alexander's relatives and high officials charged him with the ruler's death, the medical fraternity expelled him from the medical societies and his house and books were destroyed—an example of mob psychology. Credit must be given to Nicholas II, who not only forgave him for his bad behavior, but even presented him with a precious diamond snuffbox. Zakharin willed part of his tremendous fortune to social and educational agencies.

Notwithstanding his ill-temper, his school attracted, in addition to the aforementioned Snegirov and Filatov, such able men as N. F. Golubov and the eminent Vencheslav Avksentyevich Manassein.

Vencheslav Avksentyevich Manassein (1841-1901)

Manassein was a therapeutist who received his medical education at the Universities of Moscow and St. Petersburg. The renowned Doctor Botkin, recognizing the ability of the young physician, persuaded him to go abroad for postgraduate work. He was devoted to the study of pathology, histology and chemistry, and proved to be a brilliant clinician whose attainments were recognized both at home and abroad. He was the first physician in Russia to introduce rectal feeding, and he made investigations regarding gastric juices, nephritis and many other subjects. He was distinguished as a historian, and wrote numerous articles on medical history. He advocated hygiene and sanitation, and im-

pressed upon his students the relation of hygiene to disease. He was inimical to cults and unscientific modes of treatment, and criticized non-ethical physicians severely. He was so beloved and popular among both teachers and students that when he resigned in order to give the younger men a chance he was carried from the lecture room to his residence on their shoulders.

From 1866 to 1891 he was a full professor in the Medical-Surgical (Military-Medical) Academy. He edited the paper, *Vrach,* which under his leadership became the most authoritative medical organ in Russia. His major works include *Lectures on General Therapy* (1879) and *The Meaning of Psychical Influences* (1877). Through Metchnikov's influence, Manassein turned his attention to microbiology.

E. E. Eichwald (1838-1889)

Eichwald, one of the best known therapeutists in St. Petersburg, was a pupil of Botkin, and kept up the work of his master. It is rather strange that Botkin, while himself married to Princess Obolenskaya, disliked Eichwald for the latter's flattery of the royal clique. "Eichwald," said Botkin, "never lost his German traits of flattery and obedience." Eichwald was popular among students and physicians, and his lectures and clinics were well attended. Some books of his lectures have undergone as many as five editions. Like Zakharin, he was a fine diagnostician, but unlike the former, he depended on laboratory findings. In 1885, with the aid of Princess Elena Pavlovna, who admired him greatly, he established a clinical institute at St. Petersburg.

A. A. Ostroumov (1844-1908), also a leader in medicine, was professor of internal diseases (the post held by Zakharin), and did exceptional experimental work in internal medicine. He studied in Europe, made various innovations at the University and devoted years of study to pathological anatomy and physiology. Although an admirer of Zakharin, he leaned toward experimental work. His clinical lectures were so popular that his pupil and successor, A. A. Shingarev, published them. In these lectures Ostroumov, who considered biology an important branch, stressed the scientific basis of clinical study. Like Zakharin, he laid special emphasis on the fact that no two persons should be treated alike and that each patient must be studied from different angles, though he might have the same disease as another. While conceding the fact that quinine is a specific for malaria, he tried to find other remedies to conquer the disease, and claimed, through actual observation and tests, that arsenical preparations are also useful. Like Botkin, he was an inveterate experimenter who attached great importance to chemical and microscopical findings, and he admired Pasteur greatly.

Pharmacy was highly developed in Russia in the nineteenth century. The students in the schools of pharmacy had to be graduates of high schools; botany, chemistry and pharmacy were thoroughly taught; and prescription writing in Latin was obligatory. As students had to study from four to five years to obtain the title of professor, pharmacy was regarded almost as highly as the medical profession.

As previously related, pharmacy was established in Russia in 1583 by an English pharmacist, James

Frenchnam, and Zinin and Mendeleiev, both famous chemists, greatly enriched this branch of science. In 1798 the first pharmacopeia was published. Sherer founded the first pharmacological society, and in 1864 similar societies were organized in nearly every large city. A number of pharmaceutical journals appeared in the larger cities. While the study of pharmacy in the eighteenth and the beginning of the nineteenth centuries was not so well advanced as in other countries, by the nineteenth and twentieth centuries Russia had men who did excellent work in this domain. The following specialists deserve mention: Korkhof, who demonstrated the conversion of starch into sugar, Nelibin, K. Schmidt, Klaus, Bunge, Podvisotzki, Dragendorf, Trapp, Kobert and Timkomirov. Dorpat was famous for its pharmacological investigations, and Professor V. J. Skvortzov made a study of the principles of autointoxication.

Pharmacy advanced rapidly when chemistry was made an obligatory study at the medical schools. Mendeleiev, the "Father of Russian Chemistry," and his predecessor, Zinin, made Russia famous for the development of chemistry, and medicine is greatly indebted to Mendeleiev, who discovered and laid the groundwork for one of the fundamental laws of contemporary chemistry—the periodic table of the elements. On the basis of the relationships which he observed between the elements, he corrected the atomic weights of certain of them. While they were still unknown, he predicted the properties of scandium, gallium and geranium, and their discovery during the years 1875-1886 was brilliant confirmation of his conclusions.

Doctor Mendeleiev (1834-1907) conducted several

precise investigations in physics and physical chemistry on the specific gravity of solutions, on barometric leveling and on capillarity. He prepared a new smokeless powder, pyrocollodion, for guns of large caliber. He studied the problem of meteorology, the petroleum industry, the Ural iron industry, the coal and ore fields in Donbas, and many other practical questions. He published *The Foundation of Chemistry,* a classical and valuable series on industry and technique.

Doctor Mendeleiev next went to South America to study the condition of the oil fields there. In 1890 a more liberal tariff was proclaimed, which closely followed his advice. The next year he published a commentary, *The Sensible Tariff.* He concluded his work with *To the Knowledge of Russia,* which made its appearance during the last year of his life. None of the problems which he investigated has lost its importance even up to the present time. His work has been so notable and has gained such wide recognition by scientists and physicians that a Congress bearing his name has been established.

The reactionary government, suspecting that he might become a liberal while serving as a professor at the University of Moscow, transferred him to a minor position in the government service. This was a great loss to the medical department, for no other professor was so revered and admired for his genius and discoveries. His work served as a stimulus to the study of biology and microscopy and the cellular theory. He tried to have a census drawn up which would give an exact, concrete analysis of the national economy, and strove to prepare a new, accurate map of Russia, subdivided

into districts which would show the real economic centers of the country. Mendeleiev's works were published in three editions in the course of several months. They were republished by the Soviets. In all his economic works Mendeleiev revealed himself as an ideologist of the capitalist order.

Alexei Porphyrievich Borodin (1834-1887)

Alexei Porphyrievich Borodin was born in the same year as Mendeleiev. Besides being celebrated as a musician and composer, he was well known as a chemist and was Professor of Chemistry of the University of St. Petersburg. His mother was his first tutor. After being graduated from the Medical-Chirurgical Academy of St. Petersburg, he went abroad and studied under the most renowned men in Europe, and upon his return was made a full professor at his Alma Mater. Chemistry was always his chief interest, and he studied that subject and pathology under Professor Zinin.

Borodin was greatly interested in the education of women, and created departments for them in the medical courses at the University, which later became known as the Women's Medical Institute. After his death the women put a stone over his grave, on which appears the inscription: "The founder of medical education for women."

He wrote extensively on medical and chemical subjects, and took special interest in Zemstvo medicine. Besides being a physician, chemist and composer, he was known as an excellent painter. He wrote music while on vacation or when he was ill. "Other people,"

he said, "spend their summers in fishing, hunting or playing cards; I devote myself to music. Music is a fancy and one ought to devote himself to something when he is through with other work." Knowing that he composed music when he was ill, Rimsky-Korsakov used to say to him, "You must get sick and often, so we will get some new, interesting music."

Borodin died suddenly at a grand ball. The autopsy did not reveal the cause of his death. He was buried near Moussorgsky, another great musician, and a beautiful monument was erected by his musician and physician friends.

Hygiene was late in developing in Russia and it is no wonder that Russia was frequently visited by epidemics. The majority of the people lived in filth and fed upon inferior, often contaminated food. Very few cities had a system of waterworks and small towns and villages had none. Hunger spots were of common occurrence when crops failed or fire wiped out whole villages and towns for lack of fire protection. The Zemstvos did everything they could to alleviate or remove distress and, with the assistance of physicians, were partially successful. Although the government adopted a cool attitude towards the deplorable conditions, a few well known doctors joined the Zemstvos to aid in improvement. The Zemstvos were guided by such men as Erisman, Mollison, Petrov, Molkov, Shavronsky, Ossipov and Jbankov. Metchnikov and Pirogov did all they could toward helping to popularize sanitation and hygiene.

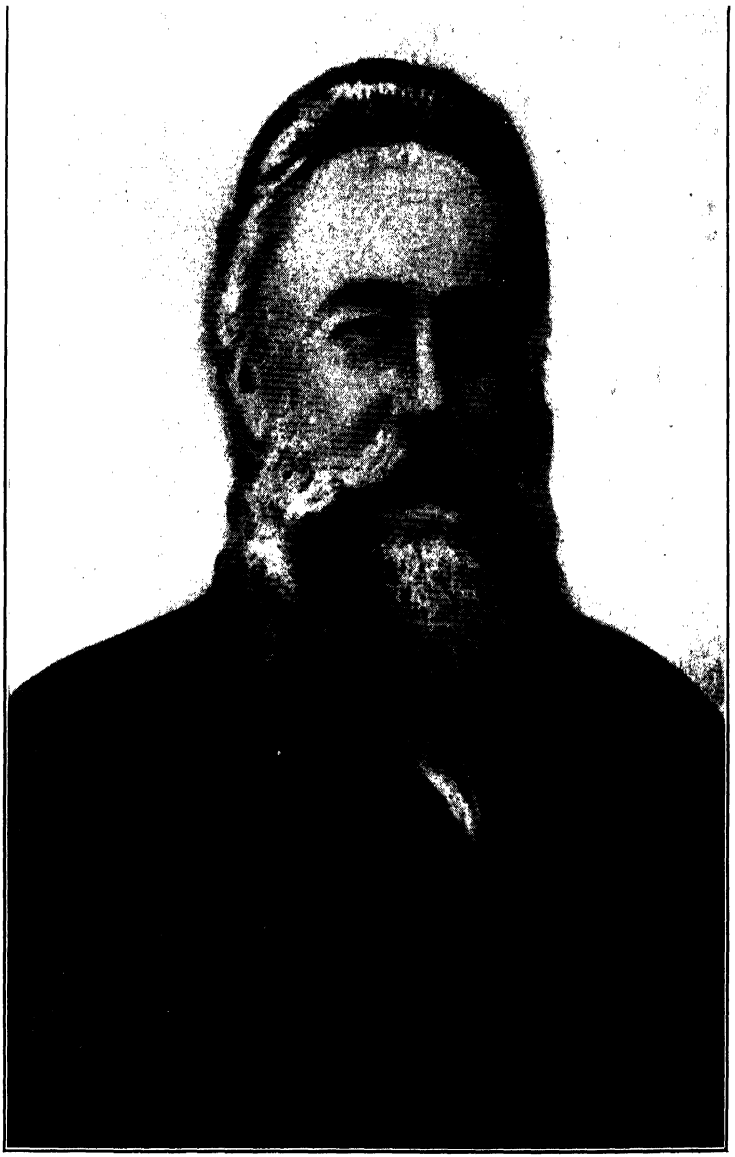
At that time affairs in Russia moved as slowly as

usual because of the weak coöperation of the corrupt and reactionary officials. In the present Soviet régime this branch of medicine (hygiene) is regarded as one of the most important and the Soviet system of medicine has accomplished in ten years what the Romanovs failed to do in many centuries.

Fedor Feodorovitch Erisman (1842-1915)

Among the best known of the Russian hygienists was Doctor Fedor Feodorovitch Erisman, who was born in Switzerland but who settled in St. Petersburg in 1869, to treat eye diseases. In Berlin he had been a pupil of Grefe, the famous ophthalmologist, but his mind was soon turned to the advancement of hygienic conditions in Russia. There is a romance connected with his interest in Russia. In Zurich he had become acquainted with a Russian girl, Nadejda Prokofievna Suslova, who was there to study medicine. She was one of the pioneer women who were anxious to study medicine, so that on her return to her native land she could go among the plain folk and use her knowledge of the arts and sciences and at the same time preach nihilism. Some time in the sixties she was permitted to go to the military Medico-Chirurgical Academy and listen to the lectures, but soon this privilege was denied her, as no women were allowed to enlist in the Academy to study medicine. She at once packed up and departed for Switzerland where women were given such permission.

In 1887 she was graduated from the University of Zurich, where she had met Professor Erisman. They became intimate friends, and she begged him to go to



Fedor Feodorovitch Erisman, (1842-1915).

An authority on Popular Hygiene, and on eye diseases, always prevalent in Russia.

Russia, where men of his type were sorely needed. They proceeded together to St. Petersburg. He passed the examination given by the Military Medico-Chirurgical Academy, and in the beginning of his career practiced ophthalmology. The Russian people were tormented with trachoma. He was appalled by the prevalence of nearsightedness among the school children, and soon drifted into the study of hygienic conditions of schools and factories.

Nadejda Suslova, who was his constant companion, converted him to nihilism and introduced him to "intelligentsia" circles. Suslova was under constant surveillance by the secret police because she belonged to the revolutionary circle, but somehow she managed to evade them. N. V. Chernishevsky, the famous novelist, described the spirit and doings of this widely known circle in his romance, *What To Do.* It is remarkable that Russia can take pride in the fact that in the latter part of the seventeenth century and in the eighteenth and nineteenth centuries she had over twelve hundred women known in literature, science and politics. Some of them became real martyrs for the cause of freedom. One must recall the names of Princesses Galytzin, Dolgoruki, Daskov and Gan, Jhadovski, Maria Vivechock, Perovskaya, Yevreinov, Konradi, Bryneov, Kovalevskaya, and others. Sophia Kovalevskaya was not only a distinguished writer, but one of the greatest Russian mathematicians. She became Professor of Mathematics at the University of Stockholm. The eminent writer Anna Lefler, said in her biography of Kovalevskaya that the latter had a "male mind and a woman's heart." In the struggle for emancipation, there have been more

heroines than heroes; women were more persistent and fearless and they were ready for all kinds of sacrifices.

Death meant nothing to these women. One cannot fail to admire the speech made by the twenty-two-year-old Sophia Bardin before the court that accused her and other conspirators of attempting to overthrow the government, religion and family. She said, "In regard to the family I do not know who it is that undermines it; whether that social order which compels a woman to leave her family in order to earn a scanty wage in the factory, where both she and her children are unavoidably corrupted; that order which compels a woman on account of poverty to take to prostitution, as a legal and necessary phenomenon in every well-ordered state,—or we who are striving to eradicate the misery, which has served as the chief cause of all social wretchedness, and with it, of destruction of the family. In regard to religion I can only say that I have always been faithful to the spirit and essential principles in that pure form in which it was preached by the founder of Christianity. Just as little am I guilty of an attempt to undermine the government. Indeed, I think that the efforts of separate individuals are unable to undermine a government. . . . Gentlemen, I belong to that category of people who are known under the name of peaceful propagandists. Their problem consists in rousing the conscience of the masses to ideals of a better, juster social order, or to make clear those ideals which unconsciously have already taken root in them; to show them the faults of the present order so that in the future the same faults may be avoided. But we do not determine when the future will arrive, nor is it possible for us to determine

it, because its realization is not dependent upon us.... I am convinced that the day will come when even our sleepy and indolent society will awaken, and when it will feel ashamed for having allowed itself so long to be trodden down, to be deprived of brothers, sisters and daughters, in order to be destroyed for the mere free confession of their convictions. And this society will avenge our ruin. Persecute us, gentlemen, for material force is on your side; but we have with us the moral force of historic progress, the force of the idea, and ideas cannot be destroyed by bayonets."

This brilliant young woman was sentenced to ten years of hard labor in Siberia.

As an outstanding hygienist, Erisman founded the first hygienic school in Russia, which produced scientific works in the fields of school and professional hygiene. Influenced by the social movement at the beginning of 1870, he left the confines of his narrow medical specialty, and became interested in the question of public health. He published his first book, *The Influence of the School on the Origin of Nearsightedness,* in 1870, and thereafter gave up his practice and devoted himself entirely to hygiene and sanitation. He studied basement and night-lodgings, and was astonished at the filth and unsanitary conditions of these places. Such investigation was the first of its kind in Russia. With the intention of specializing in hygiene, he went to Germany in 1872, to continue his studies under Doctors Pettenkoffer and Foit. After his return to Russia, he published, at short intervals, three volumes of *Textbook Hygiene* and *Popular Hygiene,* which was printed in six languages,

the first edition of which appeared in 1877. Then came *Textbook of Professional Hygiene.*

In 1878 the Moscow district Zemstvo commissioned him, together with Doctors Dementiev and Pogojev, to investigate the medico-sanitary conditions of the industrial establishments in Moscow and the physical health of over one hundred thousand laborers. The report of this survey covers seventeen large volumes, and the work stimulated many physicians to look into the sanitation of factories and similar workshops.

In 1882 Doctor Erisman was appointed Professor of Hygiene at the University of Moscow, where he created a chair of hygiene and built a Hygiene Institute. Well acquainted with social science and factory and shop life, his understanding of the laws of capitalistic development did not permit him to agree with the Narodnik views of his Zemstvo friends. During the student uprising of 1896, he was discharged from the University of Moscow, although he was in Swizerland at the time. He never returned to Russia, as was also the case with Metchnikov, who had to seek an asylum in Paris.

In Zurich Doctor Erisman was elected to the municipal council, and thereafter (from 1901) administered its sanitary division. He joined the Swiss Social Democratic Party, participated in scientific congresses and the preparation of journals, and worked actively in the field of social hygiene. His published works in Russian and German total over a hundred.

Doctor Erisman is famous for his determinant, which is used as a criterion of physical health, and which is named after him—the F. F. Erisman's Determinant. It is

computed by determining the difference between the half-length and the area of the chest. The area of the chest is measured in centimeters, at the level of the nipples among children, and at the level of the fourth rib during breathing among adults. Erisman's determinant also considers the extent to which the development of the chest proceeds parallel with growth in height.

As Russia had so many plagues and epidemics of chickenpox and smallpox, physicians of earlier times realized the importance of vaccination, particularly for the prevention of smallpox. Chief among the scientists who devoted themselves to the study of various plagues, is Doctor K. B. Zommer.

Karl Benjamin Zommer (1769-1815)

Zommer was born into the family of a merchant living in Shmigel, near Poznani, and became a well known physician and surgeon. After preparing independently for the University, Zommer entered the Vienna Medical-Surgical Academy in 1786. As his means were insufficient, he soon left Vienna, walked to Lübeck, and from there sailed for St. Petersburg, where he was hospitably received by the Reinegs family. Reinegs, who was a "kollegian Rat," helped him continue his studies in the Medical-Surgical Institute. After his graduation in 1790, Zommer was made a surgeon in the navy and took part in the campaign in Sweden. On June 29th he was taken prisoner in Shvenkzunde, and lived in Stockholm for three months as a prisoner of war. Returning to St. Petersburg when peace was declared, he was made a "staff surgeon." In February, 1791, he went to Riga

with a fleet division, and was soon transferred to the hospital of the city militia, and also began private practice. He received his M.D. and the degree of Doctor of Surgery, from the medical board, and the Universities of Koenigsberg and Dorpat later recognized his rank. From 1797 to 1804, Zommer was a member of the Board of Health, and later served as a doctor in various public organizations. In 1807 he supervised the evacuation of the wounded from Preisisch-Eilan to Riga, for which task he was promoted to the grade of aulic counselor. In 1812 he was placed at the head of one of the hospitals in Riga, where he did such excellent work that he was rewarded with the order of St. Vladimir, fourth degree. He died on January 26, 1815.

Zommer holds an honorable place in the history of Russian medicine as one of its first and most zealous popularizers of vaccination. In order to acquaint the local population with the uses and the safety of artificial vaccination, he compiled a popular pamphlet on the subject in 1804. It was printed in three languages—Russian, German and Lettish—in an edition of six thousand copies, which were given away to the people, and in 1811 three thousand additional copies of the pamphlet were printed and distributed.

Nicholai Vassilievich Sklifasovsky (1834-1904) belonged also to the pioneer workers in hygiene and antisepsis. He was an efficient surgeon, and was noted for his successful work in gastrostomy for oesophageal stenosis, ligation of the jugular vein in goiter, for performing a series of orthopedic operations, and for the invention of a clamp for suturing bones in operations for false joints. He was a true follower of Lister. While

in Moscow he coöperated with Diyakanov in editing the *Chirurgical Magazine,* but when he was transferred to St. Petersburg, he and the unfortunate Veliaminov edited the *Medico-Chirurgical Journal.* Sklifasovsky was the first Russian surgeon who performed ovariotomies. He was a great admirer of Pirogov, and, like him, complained of the inefficiency of sanitary measures in the army. He shares with Pirogov the honor of placing surgery on a high standard.

Although the study of hygiene was introduced into Russia in 1864, its actual recognition did not come until 1871, when Professor Dobroslavin became the head of the department. Dobroslavin was interested in the subject while still a student at the Medico-Chirurgical Academy under the headship of Zinin, Yakubovitch and Borodin. He studied pharmacy and physiology under Professor Zibelin, and was one of the pioneers in the study of suitable diet for certain diseases. In 1869 he went abroad to study under Pettenkoffer and Foit, and then proceeded to Paris, Vienna and other cities to study sanitation. On his return to Russia, he lectured on hygiene, and his discourses were highly popular. He established a small but very efficient laboratory, where he and his assistants did magnificent work in solving sanitary problems in regard to public health. As a member of the Sanitation of the War Department, he used influence in improving the sanitary condition of Russian cities, and went to all the plague-stricken districts to make a personal and thorough study of the nature and cause of the scourges. He contributed considerably to the subject of sanitation, and wrote several books which became popular. Not satisfied with

the study of hygiene alone, Dobroslavin was also an internist and an advocate of laboratory findings in treating diseases. After his return from the International Hygienic Conference in Brussels, he devoted himself entirely to hygiene, and became an ardent supporter of Zemstvo medicine. His periodical, *Hygiene,* was extremely popular in Russia. His pupils and coworkers, Nagovsky, Levashev, Shidlovski and Khlopin, continued to pursue the work of their famous teacher and benefactor.

Credit must be given to the work of N. M. Berestnev, assistant to Gabrichevski, who was much interested in tropical diseases, and who, in 1900, went to Batum and India to study the bubonic plague. While in Italy he devoted much of his time to the study of malaria, and on his return to Russia established a laboratory in Kronstadt, where he was mainly absorbed in the study of tropical diseases, malaria and cholera. Gabrichevski also did a vast amount of work on piroplasma, a genus of hematozon.

Among other well known Russian bacteriologists are V. I. Kedrovski, who is recognized for his work on leprosy, L. C. Rosenthal, who established the Moscow Institute for infectious diseases and named it for Metchnikov, and who is noted for his bacteriological work, particularly in the research field of bacilliary dysentery, and the internationally prominent E. I. Marzinovski, who is Director of the Tropical Institute in Moscow. Baryknin belongs to the younger generation, and is the present head of the Moscow Microbiological Institute of Narkomzdrav.

Another distinguished hygienist, C. B. Bubnov, who

worked with Erisman and who previous to that time had studied with Pettenkoffer and Emmerich, devoted a great amount of attention to the sanitary conditions of Moscow. His efforts were followed by Diatzopov, a tireless worker in the Zemstvo organization, who at present is Director of the Hygienic Institute of Narkomzdrav. Professor Subotin, in Kiev, Favor, in Kharkov, and Professor Kapustin, in Kazan, have taken great interest in combating malaria, and Kapustin has written several noteworthy books, *Essentials of Zemstvos' Medicine, Syphilis as a Curse of Modern Society,* and others. A. I. Shingarev and V. E. Kanel also devoted themselves to hygiene, and Shingarev paid special attention to public hygiene, while Kanel insisted that social hygiene offers the true solution of the problem. Semashko, however, solved the question when he established a chair of social hygiene at the University of Moscow, where he was the first lecturer on the subject and made it one of utmost importance.

Obstetrics and gynecology were later developments, for the Russian people had greater confidence in midwives. The first obstetrician came to Russia from England at the invitation of Ivan the Terrible, because the ruler thought the English physician could use his influence to help him persuade the beautiful Mary Hastings to marry him, although he was then living with his seventh wife.

In 1754 two schools of midwifery were established, one in St. Petersburg, the other in Moscow. The first book on obstetrics was the work of Erasmus in the seventeenth century. N. M. Ambodik and V. M. Richter are also credited with good textbooks on the subject.

In 1808 St. Petersburg had a splendid school of obstetrics and plenty of material was available. Professor Gromov was a well known obstetrician, as was also the brilliant Lazarevitch. Other schools were established in Kazan, Kiev, Kharkov and Odessa, and Florinsky taught obstetrics as well as pediatrics in the St. Petersburg Medico-Chirurgical Academy.

The first book on gynecology was written by A. A. Kueter, and A. G. Grassovsky, the well known obstetrician who performed the most radical operations in gynecology, wrote a valuable book on *Operative Obstetrics.* Other recognized gynecologists and obstetricians were V. V. Sutugin, I. F. Maslovsky, K. F. Slavyansky, A. I. Lebedev, and Rein. Lazarevitch, of Krakov, was a prolific writer, published numerous books on gynecology and obstetrics, and was also the inventor of several gynecological and obstetrical instruments. Mareyev, Snegirev, Tolochinov and Ott were also prominent among gynecologists and obstetricians.

The Great Mortality of Children

Throughout the centuries the poor children in Russia were woefully neglected, and child mortality was great. The government paid little attention to the desperate condition until Karl Andreevitch Rauchfus insisted that something be done to improve it. The first clinic and hospital for pediatrics was established in 1834, with N. A. Tolsky as director. Khotovitzky held a pediatric clinic in the St. Petersburg Medical Academy, and in the same building were gynecological and obstetrical clinics. Bistrov, Filatov, Sokolov, Gundobin, Yakubo-

vitch and Reitz did outstanding work and contributed extensive literature on the subjects.

Among the pediatricians who were known both in Russia and in Europe was Rauchfus. He was born in 1835 and was graduated from the St. Petersburg Medico-Chirurgical Academy in 1857. As a student he was interested in diseases of children, and, after graduation, devoted the greater part of his attention to this branch. He took up diseases of the throat somewhat later. Diphtheritic outbreaks occurred frequently in Russia, and Rauchfus, knowing the danger of contagion from diphtheria and allied diseases, constructed isolation wards for such cases.

From 1858 until 1868 Rauchfus was prosecutor and doctor at the Imperial St. Petersburg Asylum for Foundlings. At the request of Prince Piotor Gregorovitch Oldenburgski, he drew up a plan for the erection of a children's hospital, and in 1869 was made director and head physician of the newly established institution, which was called the Prince Piotor Oldenburgski Hospital for Children. From 1875 to 1883 Rauchfus supervised the clinic for children's diseases, which was attached to the hospital and used in the medical course for women. In 1876 he was appointed court pediatrician. Rauchfus, who occupies the most prominent place of any physician in the history of Russian pediatrics, claimed that croup is allied to diphtheria, and used the intubation tube in both diseases whenever breathing was impeded.

Nil Fiodorovich Filatov (1847-1902)

Filatov was professor of children's diseases at the University of Moscow. He was a pioneer in this branch, and enriched the literature of pediatrics with several original textbooks, as well as with numerous articles in Russian and foreign magazines. He received his medical education at the University of Moscow, from which he was graduated in 1869. He was first a zemski doctor, and later went abroad to study children's diseases. He received his M.D. degree in 1876 for a thesis on *The Relationship of Bronchitis to Acute Catarrhal Pneumonia,* and a year later became lecturer on diseases of children. Filatov worked in the Children's Hospital in Moscow, where he attracted many pupils, both students and doctors. He isolated several new forms of disease—scarlet fever rash, idiopathic inflammation of the lymphatic glands in the neck, myositis of the abdominal muscles because of their overexertion, malarial diarrhea, and, in his later years, chronic influenza, and discussed these subjects in a series of articles. He pointed out new pathogenic symptoms of diseases, for example the bran-like peeling of the mucous membrane of the mouth during the prodromic period of measles, which was later known as the Koplik symptom. From 1879 to 1891 he was professor of children's diseases, director of the children's clinic and President of the Society of Pediatrics.

Among well known pediatricians Dimitri Alexanderovitch Sokolov, Ivan Pissarovitch Troitzki and Nikolai Petrovitch Gundobin did outstanding work, and all three contributed meritorious articles and text-

Nil Fiodorovich Filatov, (1847-1902).

He isolated several new forms of disease, including scarlet fever rash, malarial diarrhea and chronic influenza. He was president of the Society of Pediatrics.

books on various pediatric subjects. Sokolov, whose work on pleurisy in children is a classical production, also published a remarkable album of diseases of children. Troitzki's history of pediatrics and Gundobin's contributions on infantile digestion deserve special attention.

The most notable physician in Filatov's children's clinics was Georgi Noebertovich Grabrichevski (1860-1907), who received his preliminary education under Professor Chernikov. He took postgraduate work under Koch, Erlich, Emmerich, Metchnikov and Pasteur, and on his return to Russia devoted himself to serotherapy and bacteriology. When he decided to manufacture antidiphtheria serum, he asked Professor Chernikov to establish a laboratory, and was given a large closet into which he put a thermostat and other home-made appliances for the manufacture of the projected serum. Skorokhodov tells us that Grabrichevski bought a discarded fire-engine horse, and so the good but crude work started. The beginning was inadequate, but soon a real laboratory was organized in the old anatomical theater connected with the Yekaterininsky Hospital.

Grabrichevski devoted most of his time to experimental work, and developed a serum for scarlet fever,—first a polyvalent one, and in 1903 a monovalent. He did remarkable work in current typhus, and his findings were published in the *Annales de l'Institut Pasteur.* While working with recurrent typhus, Grabrichevski accidentally cut his finger with the pipette containing the blood of a typhus patient, with the unfortunate result that he contracted a severe case of typhus. In the course of his travels abroad—in Cannes, France—he

ran across an epidemic of malaria, and decided to remain there and make a thorough study. His chief aim in life was to work for the benefit of humanity, and he was much revered at home and held in high esteem abroad. A few days before his death, he was preparing a serum for croupous pneumonia, from which disease he died.

Ophthalmology

Although history claims that Peter the Great was the creator of Russian Medicine, he was certainly not the first ophthalmologist. True, he did perform many operations on the eyes of his poor subjects, but the chronicles neglect to say that the majority of the attempts turned out disastrously. David Brun was the first man to introduce ophthalmology as a separate branch of medicine. Before Brun's time the majority of physicians treated diseases of the eye. Trachoma was prevalent and so was cataract. In the early history of Russia, during the latter part of the thirteenth century, the Metropolitan of the Greek Church, Alexi, was noted for his skill in the art of ophthalmology. His fame spread over the Eastern States, and on one occasion he was called on to treat the eyes of the Tartar Prince at Sarai, the seat of the Golden Horde. His treatment must have been successful, else he would have met the same fate as Leon, the Venetian Jew, and Anton, the German, both of whom were slaughtered like cattle.

In 1659 Johan Mangorn was known for his work in ophthalmology, which, in the beginning, was a branch of surgery. Norenheim and Carl Brandt (the latter an

obstetrician) were also specialists in ophthalmology. Fedor Erisman, a Swiss by birth, was a pioneer in the practice of ophthalmology, but after a few years he gave up his specialty, and, as has been previously stated, devoted himself to hygiene. Toward the end of the eighteenth century, the most prominent ophthalmologist was a Jewish girl named Rabinovitch, who was a medical graduate. At that time Moscow University only had a separate branch of ophthalmology, although nearly every medical school established one later.

I. F. Hildebrandt, Evenius, Voinov, Mitkovenov, Braun, Maklakov, Lubinsky, Lojetnikov, Volkov, Krukov, Darkshevitch, Golovin, Zernov, Larkh, Solomon, Blessing, Kalinsky, Kobat, Dubovitsky and Junge were all well known in this field, and their literature on the subject is extensive.

E. A. Junge was one of the most brilliant of the men in the domain of ophthalmology. Doctor Kavalaev, who had studied with Baer (one of the greatest authorities in ophthalmology), had established this branch on a scientific basis. Junge studied under Grefe, and on his return to Russia was made Professor of Ophthalmology at the St. Petersburg Academy of Medicine. In 1861 he was sent to Egypt by the Government to study a violent epidemic of eye disease, which was perhaps a virulent outbreak of trachoma. On his return to Russia he put this specialty on a more scientific basis, and his pupils became known all over Europe.

I. V. Ivanov was noted for his work on the normal and pathological anatomy of the eye. Khodin, Ivanov's pupil, was the first to edit an ophthalmological journal, *The Ophthalmological News.* R. A. Maranovitch and

L. Hirshman were full professors of ophthalmology at the University of Kharkov, and E. V. Adamic, of the University of Kazan, received recognition for his work all over Europe. A. N. Maklakov was prominent for his tonometer and for the introduction of vibratory massage in diseases of the eye.

Venereal Diseases

As early as 1671, Doctor Collins, the English physician who spent many years in Russia, complained in a letter to a friend in London of the filthy venereal diseases with which the barbarous Russians were afflicted. He claimed that the disorders were well distributed among the members of the Court, and hinted that Ivan the Terrible had syphilis. He blamed Poland for the introduction of venereal maladies into Russia, although a large percentage of Russians had venereal and skin diseases before Poland was conquered, and, as has been mentioned in a previous chapter, the Russians used mercury and sulphur several centuries before the conquest.

In the preceding and present centuries Russia has had well known genito-urinary physicians and dermatologists, among whom were Tarnovsky, Polotebnov, Pospelov, Strupovenkov, Zelenev and Merejevski. Pospelov's book on dermatology is a classical work. The study of dermatology was popular in Russia, for there was always an abundance of skin diseases as a result of poor living conditions, bad sanitation, and ignorance. Plototebnov, who developed an array of brilliant followers, always claimed that skin diseases have a close relationship to internal and nervous diseases. His pupils

became well known in Russia and other lands. The Soviet government, realizing the danger of venereal diseases, is applying effective measures to eradicate the evil.

Benjamin Mikhailovich Tarnovski (1837-1906)

Tarnovski, the greatest of the Russian syphilographers, laid the foundation for the study of venereal diseases in his country. He was of Jewish descent, was graduated from the medical faculty of the University of Moscow in 1859, and moved to St. Petersburg in 1860. He devoted himself to the subject of venereal diseases at Kalinskaya, the hospital for prostitutes, which has now been abolished. After the October Revolution, the place was renamed for Tarnovski, but was later closed.

Tarnovski's specialty did not exist at the beginning of his career, due mainly to the fact that French scientists had exploded the old theory that a single poison caused all venereal diseases. It had been established that syphilis, soft chancre and gonorrhea are three different diseases, caused by different viruses, but this knowledge had not yet reached the Russian scientists. There were no separate chairs for the study of such disorders in Russia, and the whole subject was being attached to surgery. As a result, Tarnovski, having no one to instruct him, had to make his own investigations. In 1861 and 1862 he had already published two works concerning the treatment of syphilis, one by "vaccination according to Elzin's method," and the other applying Boeck's method of scarification with negative inferences. In order to supplement his own knowledge, Tarnovski

went abroad in 1862, and repeated the visit in 1868.

He studied under Barensprung, Ricord, Rollet and Diday at various clinics and hospitals. The absence of books and appliances for teaching the subject of syphilis led Tarnovski to edit his lectures under the title of *The Discernment of Venereal Diseases in Females and Children.* This textbook was accepted in 1866 as his thesis for the M.D. degree, and in 1868, after delivering an address on "Gonorrhea and Syphilis" before the Conference of the St. Petersburg Medico-Surgical Academy, he was given the title of reader in the Academy, and began to lecture. He proved the necessity for creating a separate chair in his specialty, and in 1871 a department of venereal diseases was established and its supervision left to Tarnovski, who was given the title of adjunct professor. In 1873 he was chosen extraordinary professor. The chair and clinic for skin diseases in the Military-Medical Academy, however, had existed independently since 1871. Until 1876 lectures were read by the celebrated dermatologist, A. G. Polotebnov. After his resignation in 1894, the two chairs were combined, and Tarnovski taught both subjects. In 1897 he resigned, after having spent many years in scientific and educational service.

Thus Tarnovski was the first professor of venerology in Russia, and the founder of the venerealogical clinic, and Russian doctors of future generations are indebted to him primarily for the knowledge existing on the subject. Tarnovski published many works, including *A Course in Venereal Diseases, Gonorrhea* (the first contemporary Russian textbook on the subject), *The Perversion of Sex Feeling, Prostitution and How to Abolish*

it, The Curability of Syphilis and the *Syphilitic Family and its Descendant Generations.* The majority of his works have been translated into French and German. In 1855 Tarnovski founded the first specialized scientific society ever to be established either in Russia or abroad. It was called the Russian Syphilitic and Dermatologistic Society, and was renamed in honor of Tarnovski, after his death.

Realizing that venereal diseases are a social calamity, Tarnovski expended great effort in combating them. Knowing that syphilis ruins the health and leads to degeneration, not only in cities but even more so in villages, he organized the Suvorovskaya School for midwives at the Kalinskaya Hospital. Here, in addition to nursing and obstetrical education, midwives received two years of special training in syphilis and skin diseases. Tarnovski served as lecturer in these courses, where he taught for over twenty-five years and graduated more than a thousand midwives, who had acquired good knowledge of syphilis. At the Pirogovski Congresses, Tarnovski stressed the need of having all doctors participate in the struggle against syphilis, and on his initiative the first all-Russian Congress of Syphilis specialists and zemski doctors was called in 1897, for the purpose of discussing the necessary measures to be undertaken against the spread of syphilis in Russia.

Tarnovski's contribution to medical education for women must also be recognized, for as a result of his efforts, medical courses were opened for them in St. Petersburg. He participated in the courses, and always taught the subject of syphilis. When the courses were discontinued by the administration, he applied his

energies to the establishment of a medical institute for women, and finally reached his goal in 1899. He also gave large sums of money for the construction of a clinic for skin and venereal diseases at the Institute. His wife, Praskovia Nikolaevna, whose maiden name was Kozlova, was one of the first Russian women doctors, and is known for her research in psychiatry and craniology.

Ivan Andreevitch Poletika, one of the brightest lights of his country, was born in Little Russia. After graduation from the University of Kiev, he went abroad to study in Kiel and Leyden. On his return to Russia, he was disgusted with the corruption of Russian officials, and returned to Leyden, where he was appointed full professor at the University of Leyden. After teaching there for several years, he grew homesick and returned to Russia. In 1873 he was made chief of the Vasilevski quarantine department. Seeing corruption all around him, he remonstrated with the officials, but the fault was so deep-seated that they concocted a scheme and accused him of taking bribes. He was tried and acquitted.

Professor V. A. Tichomirov, to whom credit is due for applying therapeutics on a more rational basis, was so interested in pharmacy that he made a world cruise to study different plants. In China, Japan and Java he observed the cultivation of tea, and in Ceylon and Java he made a study of cinchona and cola. On his return he brought a large collection of rare plants (some of which he tried to cultivate in Russia), and this material helped improve the Fourth Edition of the Russian Encyclopedia. Tichomirov was a fine botanist and wrote a number of books on the subject.

Pharmacology

A. V. Van Poehl (1850-1898), who was a more advanced pharmacist than Tichomirov, raised pharmacology to a higher scientific basis. In 1886 he was appointed Professor of Chemistry at the Medico-Chirurgical Institute in St. Petersburg, where he lectured in medical and analytical chemistry, in addition to pharmacy. His works on atropine, calabar bean (physostigma venerosum) and pilocarpine are well known, as are his investigations in spurred or ergotized rye. In 1891 he extracted spermin from bovine testes, having been influenced by Brown-Séquard, who was devoted to the practice of rejuvenation. He wrote extensively on the subject, but the medical profession was skeptical about his alleged successful results in rejuvenation. He published an interesting medico-legal book and many other works on medical chemistry and pharmacology.

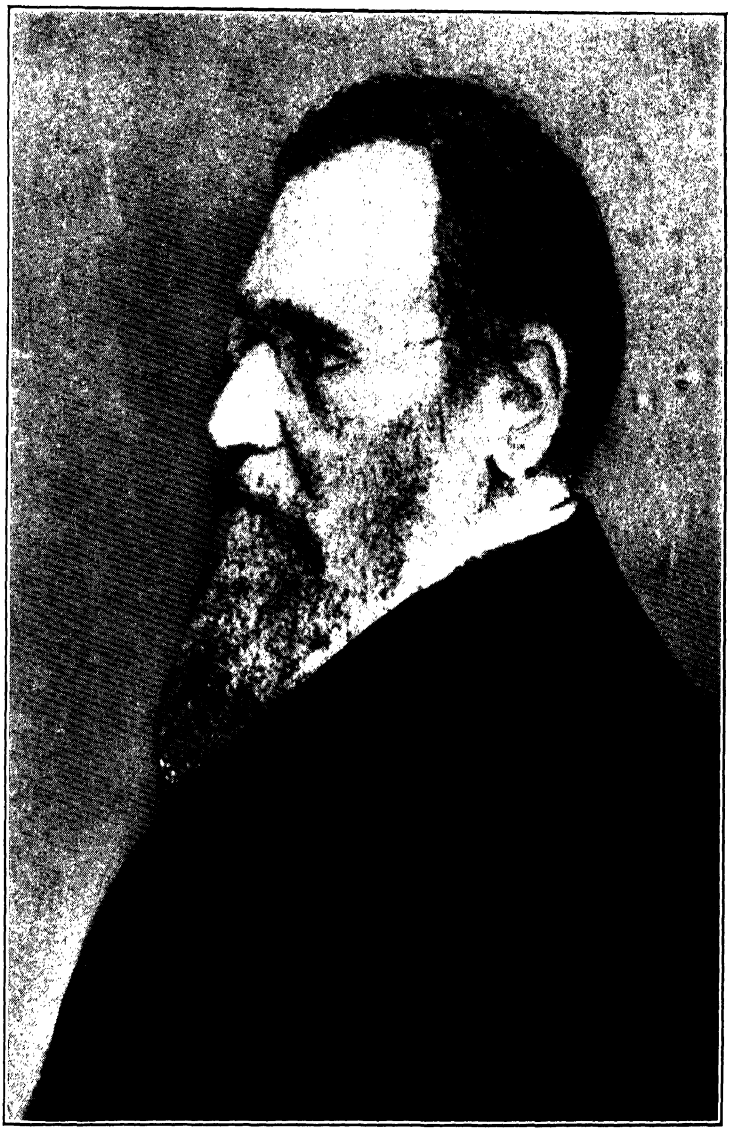
Nikolai Nikolaievitch Zinin (1812-1880), who preceded Mendeleiev, was a scientific physician as well as an excellent chemist. After graduation from the University of Kazan, he spent several years in Europe, where he studied with Liebich, Claude Bernard, Helmholtz and other renowned scientists. He did outstanding work at the University of Kazan, but soon was called to the St. Petersburg Medico-Chirurgical Academy, where he did excellent research work in chemistry and allied sciences. Zinin claimed that no physician can work understandingly unless he is acquainted with the allied sciences of medicine, such as chemistry, physics and other related branches. He had a remarkably retentive memory. He formed a triumvirate with the sur-

geon, Peter Alexandrovitch Dubovitzky (1855-1868), and the physiologist, Ivan Timofeievitch Glebov (1806-1884), which did more for the development of medicine than had been done by any men hitherto. The University flourished under their direction, and various physicians who were graduated from the School became known all over Europe.

With the exception of the great master-mind, Pirogov, Mendeleiev and Metchnikov were more famous than any other Russian physician or scientist. Metchnikov was as great in experimental medicine as Mendeleiev was in chemistry.

Elie Metchnikov (1845-1916)

Elie Metchnikov was born in Passanovka, in Krarkovskaya Guverniia. His father was a Gentile, his mother a Jewess. His father was a spendthrift and always lived beyond his means, while his mother had a hard time making both ends meet. Young Metchnikov had constant trouble with his eyes. As he was somewhat delicate, he was spoiled and was capricious and neurotic. His grandfather, Leon Nevahovitch, was an intelligent and highly cultured man. A Jew by race, he took to heart the persecutions directed against his co-religionists, and, with his facile style of writing, defended them in newspapers and magazines. Having received indirect advice from Czar Alexander I, he was persuaded to be baptized. During the Polish revolt, his house was ransacked while he was at the theater, and this occurrence caused him to abandon his business and start on a literary career, mostly philosophical writings. He knew



ELIE METCHNIKOV, (1845-1916).

He carned the Nobel Prize for researches into the causes, prevention and therapy of syphilis. For many years he was connected with the Pasteur Institute.

the great poets, Pushkin and Krylov, who was called the Russian LaFontaine.

After graduation from the Junior College (Gymnasium), Metchnikov entered the University of Kharkov. He became handy with the microscope in his youth and could not be torn away from it. He was also fond of reading the works of scientific writers such as Darwin, Buckley and Tindale. He lost faith in religion and preached atheism, for which he was nicknamed "God is not." He was a delightful companion, and although he neither drank nor smoked, he was hospitable and liked to see his friends smoke and drink. He was graduated from the University of Kharkov at the age of nineteen.

In 1864 he went to Germany, and thence to Italy, where he devoted his attention to zoölogy, biology and pathology. In 1869 he returned to Russia and took the chair of psychology under the famous Professor Setchenov. Soon afterwards he began to teach biology, and became one of the greatest biologists in the world. Having inherited his mother's nervous temperament, he was sensitive and worried over the mistreatment of his friends, many of whom were under the surveillance of the police, for political reasons. As he was imbued with liberal ideas, he could not stand the ultra-reactionary methods of the Russian Government, and became so depressed that he twice tried to commit suicide, once when he lost his wife, and again when he had to resign his professorship at the University of Odessa. In the first attempt, an overdose of morphine taken for suicidal purposes, fortunately did not take effect, and the second venture, inoculation with relapsing fever vaccine, also

failed. It seems as if fate had decreed that the wonderful man should live for the benefit of humanity.

Metchnikov married again, and his second wife, Madame Olga Metchnikova, wrote a splendid biography of the scientist and idealist. She was interested in his work and helped him in every possible way. In the biography she reveals her husband as a great biologist, chemist, bacteriologist, naturalist and humanitarian. Metchnikov had only one peer in the domain of science, particularly in chemistry—and that was Mendeleiev, although Metchnikov's field was much larger. A great chemist, he also developed into an outstanding bacteriologist, immunologist, biologist, histologist, zoölogist and anatomist.

During his most intensive and important research work, Metchnikov and a group of well known professors were forced to leave the University because of the extreme nationalism of the parties who controlled its administration. "I had to resign from the University of Odessa after March 1, 1881, because even if a man introduced a new idea, he was regarded as a 'revolutionary.' This was a good excuse for the reactionary press to kick any one out whom they disliked." Left without a position, and in dire distress, Metchnikov had to accept service as an entomologist with the Zemstvo organization in Poltavskaya Guberniya. He believed in Zemstvos because they were in sympathy with the common people, provided expert advice on cultivation of land, investigated the soil and climatic conditions, employed competent veterinary experts and founded laboratories for the study of numerous epidemic diseases to which human beings, horses and cattle are subject.

The new post gave him an excellent chance to study various groups of animals, and as a result he was able to lay the foundation of comparative embryology. His study of epidemics led to the realization of the importance of vaccine therapy, which in turn brought about the discovery of phagocytosis, which was derived from research on the amoeba and intercellular protozoa. While in Messina he observed phagocytosis in the larvae of Dophnia.

The happiest moment of Metchnikov's life came when he entered Pasteur Institute and could experiment to his heart's content. His salary was meager, barely enough to keep him from starvation, but luckily he received some income from his estate in Russia. Pasteur Institute did not flourish until Léon Osiris, a Jewish banker of Bordeaux, endowed it with a large fortune. He was a miser and would not even help his only niece who was struggling to make a living. He became very ill and Roux and Metchnikov were consulted and visited him every day. During this illness he was advised by his physicians to eat ice cream. "Ice cream," said he, "I cannot even afford to buy it." He used candles for lights, and nearly shivered to death because he was too stingy to buy coal. But later, under the influence of Metchnikov and Roux, he became more charitable and even aided his niece. He was a widower. Late in life he found an interest in archæology and went to Egypt with an archæological society. While there, he contracted Egyptian fever and was confined to his bed the greater part of the time.

Pasteur Institute, through the instrumentality of Metchnikov, came into a fortune of forty million francs,

left to it by the will of Osiris. "A Jew," said Metchnikov, "is more tolerant and charitable than the Gentiles, because the Jewish race has undergone innumerable persecutions. I ascribe my love for science to my descent from the Jewish race; the Russians have the mind, but the Jews have, in addition to that, vivacity and energy to a remarkable degree. Russia has lost many great talents by persecution of the Jews. Professor Minkovsky, the great mathematician, was a Russian Jew; the same was true of Oscar Minkovsky who described pancreatic diabetes in 1889;—my assistants—Besredka, Weinberg, Waldemar Khavkin were Jews and they were noted for their talent."

While still in Zemstvo service, and later at Pasteur Institute, he established his phagocytosis therapy through research on the amoeba and other intercellular protozoa. At the Institute, where he could pursue his work without interference, Metchnikov changed from an embittered pessimist to an extreme optimist. But his optimism carried him too far, and the poor man, who had imagined that he could prolong life indefinitely, died of angina pectoris on July 15, 1916.

His experiments and major work included a new view on immunity, vaccine therapy, studies in inflammation, a demonstration that bacteriolysis takes place in vitro, a demonstration that monkeys can be inoculated with syphilis, and an exemplification that lactic acid is a counteractant of autointoxication by changing the bacterial content of the intestine. This latter idea was probably acquired from the tribes of Eastern Russia, who used koumiss extensively, and who were noted for their longevity. But Metchnikov, in spite of his belief

in acidophilous milk as a food prolonger of life, died at the age of seventy-one. Both Metchnikov and Ehrlich shared the Nobel Prize for research into the causes, prevention and therapy of syphilis, and it has been claimed that both these great men died broken-hearted victims of the World War.

Herman Bernstein, the noted correspondent, in his short but very interesting book *With Master Minds,* tells about Metchnikov's visit to Russia after an absence of thirty years. His visit was kept secret. Even the newspapers did not know for three days, that Russia's greatest scientist was a visitor in his native land. Of course he was *persona non grata,* but the government dared not interfere. Only a few of his friends knew of his arrival among them. The liberal Count Witte was deeply impressed by the modesty, tenderness and simple life of this noted man. The Count (ex-Premier of Russia) commented upon the inadequate salary the great man received, remarking that if the latter had remained in Russia and kept his nihilistic ideas to himself, the government would have been glad to pay him tenfold what he received at the Pasteur Institute. "When you meet Metchnikov, do not speak to him about politics," a prominent Russian official commented. "He has strange views on the subject." What this official really meant was that Metchnikov was a nihilist. Bernstein tells us that when the newspapers learned of Metchnikov's arrival, all other news was relegated to the attic. When it became known that the great student of the human body had decided to make a pilgrimage to the great student of the human soul, Count Tolstoi, the press was almost exclusively absorbed with the two monarchs

of universal literature and science. These two remarkable men were forced out of their country: Tolstoi to the seclusion in Yasnaya Polaniya, and Metchnikov to seek and later adorn another country. Several days afterwards, Metchnikov read a paper before the St. Petersburg Academy of Medicine, and was astonished that the authorities did not ask him to submit a synopsis of his speech, as was their custom. "What is your opinion of the American scientists?" he was asked. "It seems to me that Americans are rather fond of sensationalism even in their science," he replied. "When my volume, *Studies in Optimism,* appeared in English, it was called *The Prolongation of Life.* I don't understand why they changed the title."

When Metchnikov left Russia, his ardent co-workers soon followed their master, and they also became famous and contributed greatly to the science of medicine. These included Gamaleia, Khavkin, Besredka, Tarashevitch and others. Nikolai Federovitch Gamaleia achieved recognition for his scientific work. When Metchnikov left Odessa, Gamaleia was made chief of the Bacteriological Department, having been elected to that office by the Medical Association, who appreciated his valuable work. He was asked to go to Paris to master Pasteur's technique of vaccination against rabies. In 1888 Gamaleia discovered the bacillus of chicken cholera, and later made studies on cholera in animals. He was the founder of the Odessa Bacteriological Physiological Institute, which was later transferred to St. Petersburg. When Russia was plagued with cholera epidemics, Gamaleia devoted much of his time to tracing the cause, and his work, *Etiology of Cholera from Pathological*

Standpoint of View, is a remarkable achievement. At St. Petersburg Institute he did research work in bacteriology, rabies, chickenpox and pathogenic microbes. He discovered a certain cholera-like micro-organism in water and called it "Metchnikov Bacillus." Like his illustrious master, he left spy-infested Russia to settle in Paris, and never returned to his homeland.

Valdemar Khavkin, another of Metchnikov's talented pupils, was also unable to pursue his calling in Russia, and went to Paris, where he did experimental work in bacteriology. He devoted himself to studies on preventive inoculation against cholera, and in 1897 he left for India, where he worked on the etiology of bubonic plague and a method of inoculation against it. He, like Gamaleia, never returned to Russia—the third expatriate.

Besredka, of Odessa, who followed Khavkin, was the discoverer of anti-anaphylaxis or dissensitization, a method of preventive inoculation against phthisis by virulent bovine bacillus vaccine. This method was sharply criticized, although he was an intensive research worker. Besredka regarded anaphylaxis as of a shock and found that it could be prevented by giving a small dose of curative agent shortly before the full dose, and that patients could be made tolerant of food for which they usually showed an anaphylactic idiosyncrasy, if they began with small quantities and the dose was gradually increased.

L. A. Tarashevitz, who died in 1935, was a co-worker with Metchnikov. He was Professor of Pathology at the University of Odessa, which, previously called Richelieu Lycée, was famed for its scientific work. When the en-

lightened curators were replaced by confirmed reactionaries, the best known scientific professors, those who were popular with the students, were superseded by mediocre and reactionary ones. The curriculum and spirit of the University was completely changed. When Levashev became president of the University, Tarashevitz had to abandon his post and so went to the University of Moscow. With Metchnikov he made frequent excursions into the steppes of Eastern Russia to study bacteriology and climatology. Metchnikov soon left for Paris, but Tarashevitz remained in Russia. Following the October Revolution, because of his prominence and scientific attainments, he was appointed director of the newly established Imperial Scientific Institute of Health Preservation (Narkomzdrav). Tarashevitz and Metchnikov's brilliant co-workers gave tremendous impetus to Russian medical men, and they advanced steadily, notwithstanding the many handicaps and hardships because of a deficiency of material and financial support.

It would take too long to enumerate the many brilliant men who have done original work in the past and present centuries, but we must not neglect to mention such men as Alexander Stanislavovich Dogiel, who made valuable contributions to the study of comparative histology of the central nervous system: Jan Digiel, who discovered the fact that the first heart sound is partly produced by cardiac muscle, and who added to the histology of the retina and ureter, and Minkovsky, an internist who found the relationship between beta-oxybutyric acid and diabetic coma. In 1889 Minkovsky and Mering produced diabetes by excision of the pan-

creas. Alexander Yerson, a collaborator of Roux, made noteworthy investigations in bubonic plague. Among the pro-Czarist scientists who would not recognize the Soviet Government was the previously mentioned Alexander Maximov, famous anatomist and histologist, who died in Chicago in 1931; Robert Robertovich Wreden, Professor of Otology and Aural Surgery, who was widely known for his research work on the ear, described Aspergillus-mucosis inflammation of the ear due to fungi, discovered the gelatinous substance in the interior canal, and published several books on military surgery. He was to a certain extent inimical to the Soviet Government; Vladimir Gregorovitch Korenchevsky, a pathologist and physiologist of notable attainments, also belonged to the old régime, and showed an unfriendly attitude toward the new system. He escaped to London, where he is at present connected with Lister Institute. The fate of the pro-Czarist physicians who showed resentment against the new order was not one to be envied. The life of the great court surgeon, Nikolai Alexandrovitch Veliaminov, was tragic. A great surgeon, Veliaminov was a prolific writer and was founder of the first Russian surgical journal. Among his best known contributions are *Hyper-Function and Disfunction of the Thyroid, Syphilis of the Joints and Hysteria as a Sequel of Endocrine Disorder.* He was the organizer of the Russian Red Cross. An aristocrat by birth, a friend of Grand Duke Nicholas and a great favorite at Court, he refused to recognize the new system, and having lost all his possessions, became a pauper and died of hunger.

The story of Pavlov was different. At the beginning

of the new régime, he also, showed an antagonistic spirit, but realizing that its aims were to help all people, he changed and heartily supported it. That his work is being carried on is well exemplified by the case of Professor Leon Orbelli, who has recently made investigations into the causes of the sensation of pain. He cut the sciatic nerve of animals for the purpose of observing how sensitiveness was destroyed and restored. Orbelli and Ginetzinsky demonstrated the effects of the sympathetic nerve fibers on skeletal muscle and also on spinal reflexes. A. A. Okhtomsky devoted his time to the study of the physiologic liability of inhibition. Professor J. N. Chukichev, of Moscow, made a comprehensive survey of the oligo-dynamic action of albumin on various systems, and Professor K. M. Bickov, of Leningrad, described chemical transmission of excitability in the central nervous system. Doctor N. J. Propper, of Moscow, studied the pathogenesis of epilepsy, and Professor Medvedeva, of Kiev, studied the specific hormone of the adrenal cortex, which calls forth a marked hyperglycemia. The name of Krasnogorsky, one of Pavlov's brilliant co-workers, must be especially mentioned, for he discovered conditional reflexes in infants, an experiment which has become basic in the psychology of behaviorism. A. D. Speransky, who made valuable contributions in physiology and its relationship to scientific medicine, is an outstanding figure throughout Europe because of his experimental work on the brain. He has shown the effects of freezing upon the brain and the way antitoxins gain their entrance into it. His research into the causes of diseases and the scientific methods of treating them is being continued through facilities

given him by the government. Although formerly an offshoot of Western European medicine, Russian medicine now exerts a decisive influence on the world in its scientific trends.

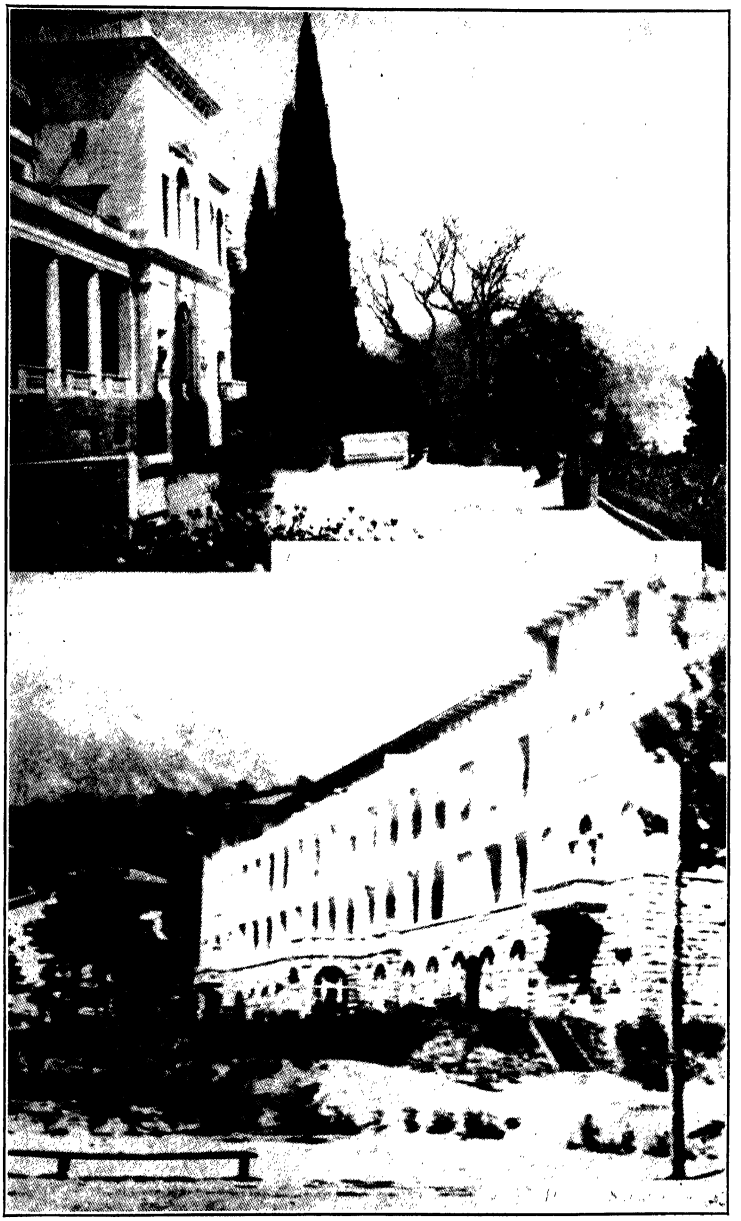
Russian medicine is indebted to Setchenov not only for his fine work (although most historians of medicine fail to mention him) but also for developing Russian medical talent. Nikolai Pavlovitch Kravkov (1865-1924) did outstanding work in physiological chemistry and pharmacy, and his book, *The Basis of Pharmacology,* was popular in Western Europe as well as in Russia. It is interesting to know that Kravkov isolated "pancreatoxin" (which was as effective as insulin) almost two decades before Banting discovered insulin. He made extensive studies in experimental medicine, of which the most widely known are those on arteriosclerosis, biochemistry of carbohydrates, experimental amyloidosis, endotoxin of cholera and basal metabolism in poisoning.

Of Kravkov's outstanding experiments the most noteworthy is that of the artificial growth of hair and nails. The manner of procedure was as follows: the excised fingers of recently dead persons were kept for several months in nutrient media and by raising the temperature or by influence of pilocarpine he produced excessive perspiration and in this way could demonstrate the growth of hair and nails. He produced normal endocrine secretion from excised ductless glands of recently dead subjects and found a method by which he could obtain endocrine extracts by perfusion or forcing a liquid through an organ by way of the blood vessels. The latter method is widely used in Europe. Kravkov

also studied the effect of various poisons upon isolated organs in maximal solutions, and found weak symptoms of reactions in the vessels of the excised ear of a rabbit profused in decinormal solutions.

Gleb Vasilievith Anrep, another famous pupil of Pavlov, has done outstanding work in coronary circulation, in modification of hemoglobin (methemoglobin), in antagonism of vasodilator and vasoconstrictor nerves and in the study of the anæsthetic effect of cocaine. S. V. Anichkov has shown that the ganglionarian poisons (the group of nicotine, lobeline and coneine) increase the discharge of adrenaline from the isolated suprarene in solutions of one for several million parts of water.

Mitogenetic rays, discovered by Gurvich, must inevitably enter clinical usage as a manifestation of physiologic life, for they promise a deeper understanding of normal and patho-biological processes. One of the current problems of clinical and experimental medicine of today and of the immediate future is that of the trophic rôle of the nervous system. Noted for the first time by Magendie and C. Bernard, it has lately been subjected to thorough scientific investigation by Speransky and his numerous assistants who have obtained the most valuable data which not only clarifies many heretofore hazy sides of pathology and therapy but also elucidates the problems of the future. Problems also in line for proper treatment, include geographic racial pathology, therapeutic tactics in clinics, coördinated action of omni-cellular therapy and organo-trophic and the adaptation of animal organisms to various conditions connected with the investigation of the strato-



Formerly palaces of the Czar, these two buildings are now being used as rest homes for consumptive workers.

sphere of the Arctic. Correlation with the social sphere in which the patient lives and is ill, comprises a special chapter of pathology which is at present receiving wide attention in the U.S.S.R.

Pletnev, in his recent short review on the progress of Russian scientific medicine, called attention to the study of heredity that has been undertaken by Russian physiologists. He invited notice of the earlier conception of the laws of heredity and cited cases of the laws and variants of hereditary transmission as outlined by Darwin in 1858 and by Mendel in 1865.

The anatomic trend has outlived itself and the best European clinicians began to realize this even at the time when the tendency seemed unshakable. One of the first to understand and to formulate this in the 1870-1880 era was S. P. Botkin. "The changes in the function of the heart will time and again not run proportional to the anatomic changes in the heart itself." Thus Botkin presented the question of functional reasoning in opposition to the anatomical reasoning which had predominated for a long time. At present, these are apparent truths but in the seventies Botkin was a pioneer. It is not surprising that his ideas received no recognition for a long time, for the history of science in Russia contains numerous examples of persons who went far ahead of their contemporaries and who found disciples only after death.

Two other scientists deserving mention are Ostroumov (1895), clinicist, and Setchenov, physiologist, the latter having been referred to in an earlier chapter.

Ostroumov looked upon the clinic not as a mere curative establishment, but as an integral medico-

biological discipline: "The progress of medicine will be made parallel to the successes in natural sciences, when it will utilize the same methods and will be guided by the same aims. The aim of clinical investigation is the same as the aim of all biologic sciences. Only when we realize this, will it be possible to effect an interchange and utilization of the results. . . . Pathology and physiology, which now became separate, independent sciences and attained remarkable results . . . even now did not lose its connection with the clinic. The progress of our knowledge of man is only possible when there is a mutual, general investigation of the questions which enter into medical science. . . . The progress of our science—clinic—is only possible when the work is done in the same direction and with the same aims as that in other branches of science. . . . The subject of our investigation is a sick man, whose normal life is disrupted by the conditions of his existence in an environment. . . . When analyzing a certain ailment, it is necessary to bear in mind that the organism is an entity and when there is disorder of the functions of one organ, the equilibrium of the entire organism must be studied."

Among Soviet physicians who have attained prominence was S. S. Udin, surgeon-in-chief of the Surgical Clinic of the Sklifasovski Institute. Most of the well known medical institutes bear the names of outstanding physicians of pre- and post-Soviet régime. Doctor Udin was in part responsible for using blood of cadavers. Such blood was previously so successfully employed by Doctor Shamov on dogs, that he started to use it on human beings, particularly in cases requiring immediate blood transfusion. Udin's assistants, M. G. Skun-

din and S. G. Barenbovin, studied the oxygen exchange in dogs (according to Bancroft) before bleeding, after partial exsanguination, and after transfusing these animals with blood taken from dogs killed a few hours before. They were able to show that cadaver blood, when transfused into animals dying of acute anemia, was capable of reviving them and that it immediately raised the oxygen contents of the blood and participated actively in the gaseous exchange. They further demonstrated that the cadaver blood preserved its living properties, in the blood vessels of dogs, from six to eight hours when the cadavers were kept at a temperature of one or two degrees above zero. In fatal accidents, the blood of the victim is withdrawn and preserved in sodium citrate solution, so that when blood transfusion is an immediate necessity there is always a ready supply on hand. A Wassermann test is made on all cadavers' blood, of course.

Professor V. J. Skvortzov, the famous pharmacologist, has lately demonstrated the principle of antitoxic action. A dog that is given a lethal dose of hydrocyanic acid will survive if, within four minutes, he is injected with thirty per cent dextrose or ten per cent sodium bicarbonate solution. Similar results have been obtained in the treatment of alcohol, arsenic and other poisons.

Professor Tuchnov (1879-1935) did interesting work in immunology. In 1930 he went to Leningrad and Moscow, where he worked in the All-Union Agricultural Academy, in the Kremlin laboratories and in other scientific establishments. In the course of his thirty-three years of scientific activity, Professor Tuchnov also made

tremendous investigations in the fields of bacteriology and biology. Professor R. M. Kagan of Kharkov, has spent many years studying methods of prevention of rheumatic diseases. As a result of his studies, a number of measures were taken to reduce the changes in temperature, eliminate drafts and cut down the humidity in mines. Proper protective clothing and boots are now supplied miners, without charge.

Doctor Kilijakov, a young Russian, is pursuing the same work as that of Sir Henry H. Dale, the Nobel Prize winner, in regard to recent and notable developments in physiology. Kilijakov, however, has discovered new angles in physiology, and his findings will soon be published.

In 1934 Russia lost the greatest of her physiotherapists, Professor A. E. Scherbak. He was the head of the Setchenov Institute in Sebastopol, with which he had been connected for twenty-seven years. He did remarkable work in physiotherapy, and his writings on the subject were known all over Europe. Scherbak did excellent work in ionic or cataphoretic medication of drugs.

During the turbulent and trying times at the beginning of the Soviet régime, when life was not too pleasant and when distinguished professional men were compelled to do hard manual labor, such as digging ditches, cleaning streets and shoveling snow, with hardly enough compensation to keep body and soul alive, everybody had to work—"no work, no food." With the exception of a few pro-Czarist physicians, the medical profession, recognizing the earnest aim of the Soviet Government to help everyone, became ardent advocates

of the new system. Some of them, as will be related later, had practiced medicine for many decades and were doing their share to put Russian medicine on a high plane.

As stated in previous chapters, Russia is creating a new standard in the science of medicine, and the government is not lagging behind, as was the case in prerevolutionary times. Banting, astonished on his visit to Russia at the progress in medicine and science, remarked, "The most outstanding thing about the Soviet Government is the high premium it places on science and scientific workers." Professor Cannon, of Harvard, expressed himself similarly, "In the Soviet Union the funds made available for the development and prosecution of scientific studies is greater than in any other country in the world." It is remarkable how much the older physicians, who helped the development of Russian medicine, are respected and honored by the Soviet Union. Jubilees are often held in their honor.

On January 6, 1935, the medical profession celebrated the fiftieth anniversary of Professor P. V. Nikolski's activity in medicine. He was graduated from the University of Kiev and studied with Professor Strupovenkov, who had one of the best-equipped skin and venereal clinics in the country. As already stated, Russia was severely afflicted with skin and venereal diseases, and because of unsanitary conditions and ignorance of the dangers of the latter disorder, one could find whole villages syphilized. Realizing the deplorable plight, Nikolski published a telling tract in 1887, *What is Syphilis and How to Fight It.* It was written in plain language so that everyone could understand it, but as the

peasants could neither read nor write, it fell short of its mark. Nikolski stressed the fact that fifty per cent of the prostitutes were afflicted with the disorder, and through his efforts ambulatoria for treating venereal diseases were established in many cities.

In 1900, Nikolski was called to the chair of dermatology in Warsaw. His dissertation, *The Ways and Means of Studying Pemphigus Foliaceus,* attracted the attention of the medical profession the world over. One of the symptoms of diagnosis, pemphigus, was called "Nikolski sign." He wrote numerous articles on skin diseases, in many languages. He and his assistant, Kojevnikov, pointed out that the reason why injections of mercury cause gangrene, is that physicians often inject mercury into the arteries instead of into the veins. When Professor Nikolski went to Rostov on the River Don, he had one of the largest clinics in Russia, and his laboratories and museum were reported to be the best in the land. In 1930 he resigned from actual practice, but never gave up interest in his specialty.

Professor Alexander Andreefitch Kisel was another widely recognized physician. He celebrated his fiftieth anniversary in medical practice in 1930. Kisel had studied with Bistrov and Botkin, and was deeply interested in pediatrics and sciences. He eventually settled in Moscow, and became the head of the Olginskii Infirmary. Later on, after he had done most of his work at the Moscow Medical Institute, he became head of the Children's Tuberculosis Dispensary. Despite his age, he was as much interested in his work as he had been in his younger days, and would not give it up, for he felt he was needed to treat the many cases of rickets, syphilis,

malaria, cerebrospinal meningitis, acute infections, diarrhea and other ailments which were prevalent. He organized societies to fight these diseases, he contributed extensively to pediatric literature, and his views on pathogenesis of tuberculosis and other diseases and the method of treatment were followed not only in Russia but all over the world. He was an advocate of physiotherapy, suitable climatic conditions and proper feeding. The Soviet régime, recognizing his talents, coöperated with him in his fight against the high infant mortality, for the Soviet Union's motto is that the future of the country depends on the health of the coming generation.

Professor V. I. Razumovski, who died January 7, 1935, was, with the exception of Pirogov, one of the best surgeons in Russia. After being graduated from the University of Kazan, he did special work with the famous surgeons, Bogdanovsky and Kolomnin, and took up postgraduate work with Botkin. At the University he was renowned for his surgical technique and contributions to medical literature, and he published numerous articles on surgery, both at home and abroad. As the editor of *Russian Chirurgy,* he made the journal celebrated, and was at one time President of the Pirogov Society. When the organization leaned toward reform and liberalism, the then ultra-reactionary minister, Pleve, dissolved it. After the Soviet system came into power, Razumovski succeeded in establishing universities in Baku, Tiflis and Saratov. At the celebration of the twenty-fifth anniversary of the University of Saratov, G. N. Kaminski, head of the Narkomzdrav, paid tribute to Professor Razumovski for the remarkable progress

the latter had made in the cause of medicine. He was proclaimed a hero for his promotion of medical science.

Professor N. N. Petrov is another outstanding physician of the pre- and post-Soviet régime, who has worked wholeheartedly for the new order. He is referred to as the father of the science of onkology, or tumors. Before taking up this branch, Professor Petrov devoted himself to pathology and histology, and this great interest gave impetus to his study of the morphology of tumors. Earlier in his career he worked with Metchnikov, where he acquired microscopical technique, and soon afterwards came under the guidance of I. P. Pavlov, through whom he gained the thorough knowledge of biology which helped him to make an exhaustive study of the etiology of tumors. His book, *General Study of Tumors,* is regarded as the most complete presentation that has ever been made. He aptly said that "theory without practical knowledge is dead." He is one of the best surgeons who began the gathering of statistics in regard to mortality from cancer in Russia. At the International Chirurgical Society, held at Brussels in 1913, the young professor surprised the meeting by his new work on onkology. He claimed that the statistical data of one investigator in regard to cancer is not sufficient and that there ought to be joint coöperation of all workers in cancer research. He spends most of his time in his onkological laboratory and never visits other cities. Many physicians, both Russian and foreign, go to Leningrad to study onkology with the tireless scientist. Professor Petrov is a quiet, unpretentious and lovable man, who is particularly kind and gentle with his patients and often tells them amusing stories to distract

their attention from their serious illness. The Soviet Government, aware of the valuable work Petrov is doing, does not fail to provide him with all the means necessary to pursue studies in this important branch.

Professor M. C. Maslov practiced medicine for over twenty-six years. After being graduated from the Military Medico-Chirurgical Academy, he went abroad where he became especially interested in diseases of children. The son of a poor peasant, his realization of the plight of the children of the poor was accentuated by his work in pediatric clinics in Vienna, Munich, Zurich and Berlin. Russian physicians seem to have had a special leaning toward biology, and Maslov is one of them, for he did a vast amount of research work in biology at Professor Furt's laboratory in Vienna. On his return to Russia, Maslov held many posts, but was shortly appointed professor of pediatrics at the Military Medico-Chirurgical School. His work on *The Biologic Importance of Phosphorus on the Organic Growth* is a classical exposition. Coming from peasant stock, and knowing full well the pitiable squalor of the plain folk, Maslov became an ardent supporter of the Soviet Government and an earnest worker at the institute for the protection of maternity and health of children. In 1930 he made pathological investigations in diseases of children, and at present his work is devoted to pathological studies of diseases of the liver, kidneys, lungs and heart, and to other problems in children.

Professor V. N. Dolganov, who has practiced nearly half a century, is a graduate of the Military Medico-Chirurgical School. He was much interested in ophthalmology, and because of his brilliant work at home, was

sent abroad to take a special course in ophthalmology, during which he visited all the clinical schools in Europe which were known for their abundant material on diseases of the eye. After returning to Russia, he continued to do splendid work in his special field.

In 1925 he became full professor of ophthalmology at the Military Medico-Chirurgical Academy, and organized many clinical eye centers. He is greatly concerned with improving facilities to help the blind. He writes extensively and his lectures are very popular. Notwithstanding his age (he is seventy), he keeps working; the Soviet régime affords him every possible facility and means to fight the still lamentable conditions, and his clinics are both valuable and popular. He has written, and continues to write, on the pathology of diseases of the eye.

We must not neglect to mention Academician Alexander Palladin, who was associated with Pavlov. He did splendid work in biochemistry and physiological chemistry. His treatises on food, biochemistry and physiological chemistry are widely known in Russia and on the Continent. An admirer of Lenin, he did everything possible to bring Russian medicine to the front.

In Professor E. I. Marzinovsky, who died in 1935, Russia lost one of the greatest of her research workers in tropical medicine. He was founder and director of the Royal Tropical Institute, where he worked until his last day. He dictated his last work while ill in bed. He was well-versed in the various branches of medicine, but was more interested in the study of malaria and subtropical diseases. When the Soviet Government recognized his remarkable ability, he was allowed to run the

Tropical Institute as he pleased, and it became known the world over. He fought hard against malaria, and for that purpose made many excursions to eastern provinces and the newly established republics. He had a charming personality and created friends from one end of Russia to the other. He was greatly interested in medical societies, was once an active worker in Pirogov's societies, and was president of Pirogov's Malaria Commission. After the Revolution, he became a member of all the scientific branches, president of the Microbiological Institute and editor of many scientific journals.

Of the older distinguished physicians who worked for the cause of bolshevism, V. A. Obukh, who died in 1935, takes place on the front page. He became a nihilist at high school in Pskov, was the ruling spirit among the younger element and engaged in heavy propaganda. The secret police informed the authorities of the high school of Obukh's nihilistic ideas, and he was expelled before he finished the sixth grade. A year later he succeeded in enrolling in the St. Petersburg Technical School, from which he was also expelled for his association in Marxist circles. He next went to the University of Kiev, where he took up medicine, and became more active than ever in fostering nihilism. After being caught spreading propaganda among the students, he went to Moscow, where he did brilliant work at Yekaterininski Hospital. He never ceased to work for the cause of Marxism and was an ardent admirer of Lenin. After the advent of the new régime, he labored unceasingly for the cause of public health, and, together with Semashko, helped to organize the present and most effi-

cient system of public health. He contributed extensively to medical literature, particularly on the subjects of hygiene and industrial diseases. Lenin appreciated his work and consulted him as his personal physician. He was deeply affected by the death of Lenin, and thereafter worked harder than ever until death sealed his active career.

Women have done exceptional work in Russia for the cause of bolshevism. Even in pre-revolutionary time they were sowing missionary seeds for the cause of liberty, and many left good homes and went among the poverty-stricken peasants and workingmen to spread the propaganda of freedom and education. It was a hard and hazardous life, but they never faltered in the task of disseminating the tenets of their faith. It is more than a romantic story of amazing deeds; it is a tragedy of women who, while suffering hunger, privation, persecution, exile to Siberia, torture and even fear of death, persevered in their organized efforts for the poor, downtrodden helpless people.

The Soviet Government, unlike the old rule, has always appreciated this work and given women equal opportunities in all branches of its work. Women have already distinguished themselves in various professions, and particularly so in the medical field, where they are not afraid to undertake anything or to go anywhere. As an example of their heroic aims we may cite the case of Doctor Anna Isofovna Gurina, who is doing noble work on the Island of Sakhaline, Siberia. Doctor Gurina is one of the pioneer workers for the preservation of motherhood and childhood, to which she has devoted nearly forty-four years, twenty of which were passed

among the various nationalities in the North, Far East, Siberia, Mongolia, Oiratin (Altea), Kazakstan and other distant places. All these people are more than just willing to praise her devotion and marvelous work. She was requested by the Imperial Scientific Institute to go to the Island of Sakhaline to do the same organization work she has so often done in the past, and, notwithstanding her age, she accepted the position with the same enthusiasm as she had hitherto manifested.

Doctors Ogorodnikova and Nogina are two other types of women who have been credited with meritorious activities in the present régime. Both have been doing work of which men might well be proud. They have been the leading spirits in organizing medical centers for the protection of motherhood and childhood, and have established medical centers in Moscow, Leningrad and other cities, where every phase of maternity and child hygiene is worked out.

Among other well known women physicians who devoted themselves to scientific medicine the name of Prof. Lina S. Stern, a Jewess, must be included. She was practically the founder of the Institute of Physiology at Moscow, in 1929. The late Prof. Pavlov expressed admiration upon her work on the oxidation process of living tissues. Her work was often quoted at the national and international conferences. In 1936, the famous Institute which she helped to found began to issue monthly bulletins on the progress being made upon the problems of oxidation, sleep and other questions of experimental biology and physiology. Prof. Stern is still the head of the Institute, which has recently published

a record of her work, extending over a period of thirty years.

Women in the medical profession have made epoch-making strides and obtained a rightful degree of prominence. They seem especially fitted for practical medical work, and it is claimed that about seventy-five per cent of students in the medical institutes are women.

Among Soviet physicians who have carried on the work for almost two decades is N. A. Semashko, the First Commissioner of Health of the Soviet Union. He was born in the province of Orel in 1874, and after graduation from the Gymnasium (Junior College) he entered the University of Moscow. So far as the writer can remember, being himself a student of the same province, its capital, Orel, became a hotbed of nihilism. No wonder, then, that Semashko, a student of the University of Moscow, carried on his revolutionary propaganda there, and that Marxian theory appealed to him. Lenin's pamphlet, *Who Are the Friends of the People and How They Fight for Social Democracy,* and a pamphlet by Plekhanov on another social-democratic question, made Semashko a devotee of the social revolutionary movement.

In 1893 he was arrested as a revolutionary, and was sent to Siberia for three years. After serving his term he was not allowed to enter the capital universities, and had to go to the University of Kazan to continue his studies. The latter university was then famous for its renowned professors, such as Ge, who was well known all over the world as a dermatologist, and the eminent ophthalmologist, Darkshevitch. Semashko also joined the social-democratic organization in Kazan, and met

N. A. SEMASHKO.
The first Commissioner of Health of the Soviet Union.

the prominent social democrat, A. I. Rykov. He also met his future wife at the secret meetings.

In 1901 he was arrested again, and the doors of the University were closed to him. He was not permitted to appear on the streets of Kazan, but managed to disguise himself and attend lectures and succeeded in passing the examinations. He was so brilliant that Professor Kapustin was anxious for Semashko to take his place, but Semashko was again arrested. Through Kapustin's influence, he was appointed to the post of Sanitation in Saratov. He had a promising career before him, but could not curb his sympathy for his downtrodden people and continued with his propaganda.

In 1911 he went to Paris with Lenin, and after his return to Russia in 1917, he laid plans for establishing a universal health department. Lenin gave his consent and coöperated with him. As the first Commissioner of Health, he distinguished himself as one of the most efficient and tireless reformers in putting this branch on a scientific and practical basis, and held the post for twelve years.

He is at present Editor-in-Chief of the *Russian Cyclopedia of Medicine,* a monumental work in thirty-five volumes. He was the first Professor of Social Hygiene, lectured in many cities and put hygiene and sanitation on a firm foundation. His books and pamphlets on popular medical subjects are numerous. Kaminsky, the present Commissar of Public Health, of whom we spoke previously, has proved a worthy successor of Semashko, and is improving all the branches concerning health. Medical resort specialists are being trained and sent to different resorts, thoroughly organized aid is given to

nomads, medical expeditions are being undertaken to backward countries and no branch of public health service is without a scientific institute to give it practical work.

The study of pediatrics has attained a prominent position in Russia. The fiftieth anniversary of pediatrics in Russia was celebrated in 1935. At the time of the founding of this society, in 1885, there were only sixty-three pediatricians in the entire country, and now Leningrad alone has six children's hospitals, seven clinics for children's diseases, twenty-six consultation centers and two institutions for the teaching of pediatrics. Moscow can boast of even more.

A special school for parents was recently opened in Leningrad, where popular lectures are devoted principally to the subject of "the care of children of pre-school age." Parents are also taught to acquaint themselves with the useful work given children of pre-school age and with the work allotted to children in the schools. Medical men specially competent to do the work are selected, and among these are Professors Griboyedov, Madovikov, Ivanov, Durnovo and others. The lectures are free.

As well as placing great stress on the upbringing of healthy children, the Government gives special attention to prospective mothers. Sixteen weeks' leave of absence with wages for mothers (eight weeks before and eight weeks after confinement) is given women engaged in physical labor, and twelve weeks to women doing mental labor. It is forbidden to discharge pregnant women and mothers except in exceptional cases and only with the permission of the inspector of labor.

Working mothers coming to suckle their infants at the creche every three hours. The mother sitting to the left is affected with a cold; therefore her face in order to preserve the child is covered with a veil.

Nursing mothers receive time off from work for feeding the child after every three and one-half hours at the expense of the working day. Free medical service is given for mother and child. Commissar Kaminsky, with the aid of well known obstetricians, such as Professors Luriye, Kvatter, Malinovski, Vishnevski, Feigel, Skrobanski, Kolosov, Braude, Blagovolin and others, is developing methods of painless childbirth. Many methods have been tried, and each prospective mother is studied with regard to the method to be applied. At the Moscow Clinical Institute, novocaine blocking has been used successfully, according to the method of Professors Vishnevski and Malinovski, and other methods and pharmaceutical preparations are being thoroughly investigated for relieving pain in childbirth.

Recently, Veviorovsky has been experimenting with syphilitic antigens. While years ago, Metchnikov was able to inoculate higher types of monkeys with syphilis, Veviorovsky successfully inoculated smaller animals and by administering syphilitic antigens was able to rid them of syphilitic manifestations. Application of vaccine therapy in many cases of dementia praecox and syphilis of the brain resulted in great improvement; intolerable headaches disappeared, faulty speech improved, and the entire behavior of such patients changed for the better.

Kuntz of Germany, and Crushé of France, have been experimenting with intravenous injections of the blood of small animals into human beings, after accident cases with a loss of blood, but the results have not been successful. Lately, Professor N. Bogovartz of the Rostov Clinic, in conjunction with Professor Halperin, has

been doing the same work. They have found that the blood of horned cattle, well diluted, can be successfully used, if human blood cannot be obtained. Professor Konchevalov of the Moscow Arthritis Clinic, reported great success in alleviating, and in some cases entirely relieving, the excruciating pains by intravenous autoserum injections of the patients, plus a salicylate derivative (alesal). Professor M. A. Usievitch of the Physiological Laboratory of Gorky Agricultural Institute, has been doing some creditable work on bile. He found that secretion of bile is a conditioned stimulus. This interesting study is still under discussion. Professor Remizov, of the Chemico-Pharmaceutical Institute, is doing research work in biochemistry and organo-therapy; he also discovered a synthetic camphor. Russia does not have to depend entirely on importation of foreign drugs now, for she is able to manufacture pharmaceuticals for domestic use.

In the previous chapters we have given prominence to the biographies of Russia's outstanding men who had national and international reputations. However, there are many medical women and men in the Soviet Republic, who, while belonging to the younger generation, are doing capable work and already deserve recognition. Moisei Grigorievitch Gurevitch, who has recently been appointed one of the People's Commissars of Health, was active in the revolutionary movement and distinguished himself as a surgeon in the Red Army. He was the founder of Social Hygiene, is full professor at the University of Kharkov and is now doing able work as Commissar of the Ukrainian Soviet Socialist Republic. Olga Borisovna Lepechinskaya, Pro-

fessor of Histology of the Communist Academy in Moscow, devotes her time to research work and to problems of marriage and divorce.

Doctor S. J. Jacobson is head of the Social Insurance organization and chief of the Sanitaria Rest Houses. Doctor Sokolova, a brilliant woman physician, is Commissariat of Health and also head of the Institute for Protection of Childhood and Motherhood in the Stalingrad region. Doctor Abraham Genss is Director of the Institute for Protection of Motherhood and Childhood. In 1914, prior to his connection with the Institute, there were only fourteen crèches; now there are over two thousand. In this Institute early diagnoses of pregnancy are made, and in certain cases legal abortion is permitted. Liquidation of abortions by prevention is instituted.

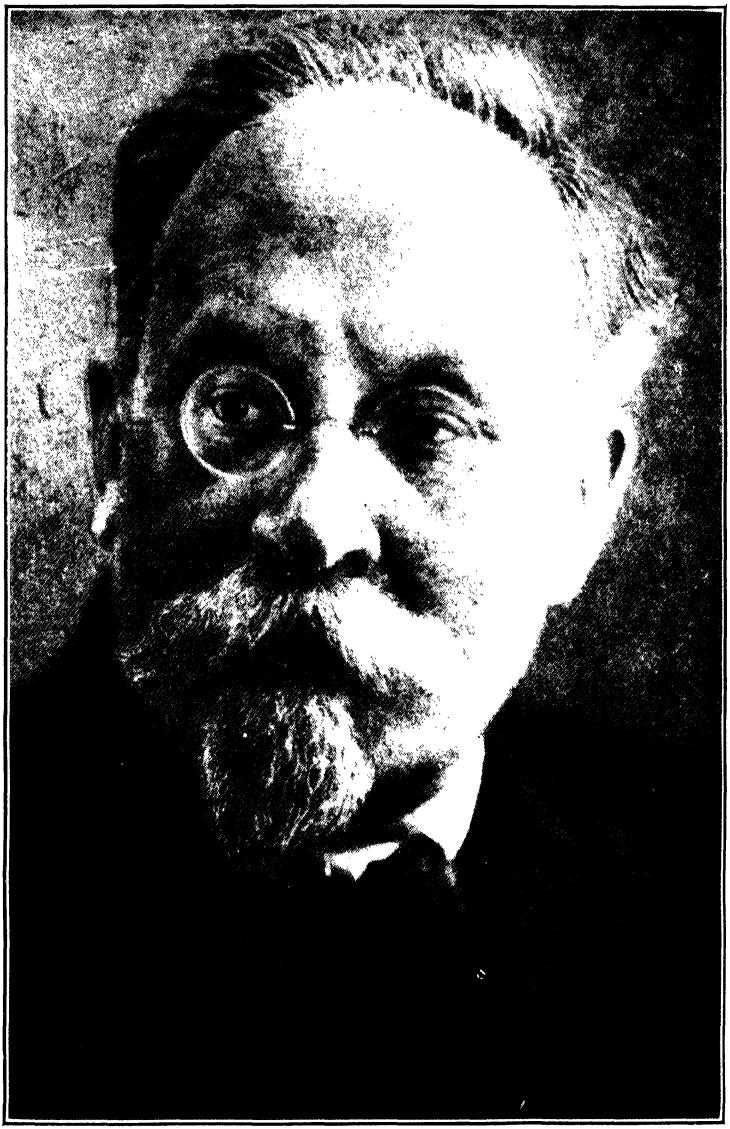
Doctor Kazanov is head of the Dermatological and Venereal Department of the Institute at Moscow. A "prophylactarium" for prostitutes is also under his supervision, and similar prophylactoria can be found in most of the large cities. Doctor G. L. Kouchaidze, a Georgian, and Commissar of Health in the District of Georgia, is doing creditable work. He is head of the Health Institute, where physicians are trained for special work. This interesting district, which has a heterogeneous population (Russians, Georgians, Armenians and Persians), is Stalin's own. Tiflis, the capital, has up-to-date hospitals, sanatoria and a splendid medical institute. Kouchaidze, in addition to his work in hygiene, is also the head of the Tuberculosis Sanitarium, which is regarded as a model institution.

Doctor Marcus, who is head of the health department

of the Don District, the industrial center of Russia, has done fine things for workingmen in the factories and is regarded as a genius in his line. Every shop is under the supervision of a woman physician, who assigns the prospective worker according to his temperament and health. All workers function under the most sanitary conditions. The polyclinic is equipped with the latest X-ray apparatus for the thorough diagnosis and treatment of accidents and diseases.

Doctor M. F. Vladimirsky is a distinguished hygienist and bacteriologist, who became Commissar of Public Health immediately after Semashko took up other important work. He and Semashko studied in Paris at the Pasteur Institute, which was a Mecca for Russian physicians. He took his post-graduate work in Germany. During the Revolution, he and Semashko planned a more efficient system of public health. Lenin gave Semashko full consent to do all he wished toward the improvement of sanitary conditions and public health, and both Semashko and Vladimirsky did praiseworthy work, as described in previous chapters.

Alexander Roubakine, Karpenko, Rubinstein and others have been and are doing creditable work. We must not omit Professor I. Pletnev, who has performed remarkable feats in internal medicine, and whose short contribution to the history of Russian medicine is an illuminating report of the men who helped to make Russia notable for her progress in scientific and practical medicine. In this paper, published in 1934 in *Organ Narkomzdrava,* he traces the history of medicine in the Soviet régime, and extols the heroism and martyrdom of the men who suffered from lack of food, inadequate



M. F. VLADIMIRSKY.

Distinguished hygienist and bacteriologist who succeeded Semashko as Commissioner of Public Health. Together with Semashko he did a great deal toward improving sanitary conditions and public health.

wearing apparel, unsuitable living quarters, intense cold and other intolerable conditions, and yet kept working for the welfare of their country, realizing that, without science, without culture and without vision, no country can succeed. He gives credit and praise to the *Journal of Clinical Medicine,* whose collaborators, V. V. Ivanov, A. V. Martinov, D. Pletnev, I. V. Popov, L. Tarasevitch, V. Khoroshko, N. E. Semashko and Z. P. Soloviev, have been giving excellent service in disseminating the doctrines of scientific yet popular medicine. The new generation of Soviet doctors have profited by their work and continue to spread the gospel of health and sanitation. The trees planted by the early workers, most of whom died, are now bearing fruit.

The Soviet Government is very liberal in regard to health preservation. Last May, the Central People's Health Committee published a draft of a new law prohibiting abortions except in the case of strict indications. The medical profession had an unusual opportunity to observe the harmful effects in both early and late artificial abortions. Professor G. A. Bakst, the head of the First Gynecologic and Obstetric Clinic of Leningrad Medical Institute, states: "The accumulated experience since 1920 furnishes abundant proof that artificial abortion is a serious evil and the operation performed, even when performed *lege artis,* leads to a number of injurious effects." Since the anti-abortion law has been enacted, the government has been very liberal in assisting large families. This law caused the creation of a large number of maternity homes and crèches to take care of the steady increase in the birth rate. Painless childbirth is being practiced on a large scale. According

to the statistics of the Public Health office this year (1936) over 350,000 mothers have given birth painlessly. Improvements have been set in motion and are being pursued in the operation of hospitals, in the installation of the most up-to-date apparatus and other equipment and in the training of medical and surgical nurses and other hospital assistants. Large sums of money have been appropriated for pre-medical schools and also for schools for dentists, pharmacologists and nurses. The entrance requirements for these students have been made more stringent. The Russian Government believes that scientific medicine must go hand in hand with practical medicine.

Improvement has been pushed in all branches of medicine. Epidemic diseases that were prevalent during the Czarist régime have been, to a great extent, checked. Smallpox, typhus, typhois malaria and trachoma have been materially reduced. Great stress has been placed on sanitation. When the French Minister of Public Health, Doctor Henry Sellier, on his recent visit to Russia, was asked his opinion of the present medical situation, he said, "You have taken for your motto the words of Charles Rivet, who said that the greatest people are those who can force death to retreat."

In 1936, according to the report of the Commissariat of Public Health of U.S.S.R., four hundred and twenty million dollars was appropriated for public health. All the public health agencies have been unified and are under the control of the People's Commissariat of Health. In line with the creation of unified control, Doctor Kaminsky, the present Commissariat of Health,

Dr. Kaminsky, (extreme right) Commissariat of Health, with Drs. Ogorodnikova and Nogina, specialists in maternity and child-hygiene cases.

has decided to proceed with improving the present status of medical education.*

Post-graduate work is being promoted so that the new generation of the medical profession will be more efficiently equipped for their work. The number of qualified physicians in 1913 was estimated at 19,800, whereas by the end of 1936 there were over 96,000. Women physicians have proved to be more earnest and efficient. On the whole, the standing of the medical profession is much higher than it was several years ago; their work is being appreciated, and the Soviet Government has given the members substantial increases in salaries. The pharmacological industry has also made wonderful strides. Russia has even caught up with the manufacture of medical appliances and surgical instruments. Dentistry is not lagging behind.

That Russia is becoming more prosperous can be judged by the fact that Russian men and women are now better dressed and groomed. Instead of the unsanitary beauty parlors found in other countries, conducted by incompetent men and women, an Institute of Cosmetics has been opened in Moscow with gymnasiums for reducing obesity. In this institute, scientific treatments of skin and hair, and facial massage, are given by nurses trained under the guidance of competent dermatologists and physical therapeutists.

* Doctor Kaminsky, by the decision of the All-Russian Central Executive Committee was succeeded March 15 this year by Peter Gregorovitch Sergeiev, a graduate of the famous University of Kazan. He is regarded as one of the best scientific men in Russia. He did splendid work at the Moscow Tropical Institute and in 1934 became its Director. Doctors S. T. Kantrovitch, former People's Commissar of Health of the Ukrainian Soviet Republic and Uekaterina Karamanova became his assistants.

Moscow and Leningrad are disturbed by street noises coming from street cars, automobiles and so forth. As noises have a bad effect on sick people who need quiet and rest, strict laws have been enacted to curtail all types of noises. Since these laws, no matter how strict they are, do not remove the evil, the government has found that trees planted along the streets considerably abate the noise. Other measures will undoubtedly be found to help reduce or solve this troublesome problem, for everything possible is being done for the health of the people. Stalin is conservative and is building a healthy Russia: putting courage and backbone within them, and making free men of those who for centuries had been slaves. Stalin is continuing the good work of Lenin and is making Russia a true democracy, not caring for Trotzky's talk about a world revolution.

RED CROSS AND RED CRESCENT

The far flung services of the Red Cross penetrate even into the mountains of Siberia. Vaccination of mountaineers by Red Cross nurses.

RED CROSS AND RED CRESCENT

MENTION must be made of the fine work being carried on by the Red Cross and Red Crescent. Whenever the Red Cross was not hampered by political reactionaries it was known for its good and noble work. Even members of the Royal Family realized its generous aims and credit must be given to the kind and liberal-minded Grand Duchess Helena Pavlovna of Pirogov's time. During the Russo-Turkish War, she insisted on Pirogov's taking charge of the Red Cross work in spite of the cool attitude of the government, and when Pirogov accepted the responsibility he would not permit interference by the corrupt officials.

Under the present order, the Red Cross and Red Crescent have done remarkable work, especially in disasters, famines and plagues. Traveling field hospitals, dispensaries, crèches, and even lying-in homes have been so thoroughly organized that they reach out to the nomadic population in the farthest Eastern Russian territories. The organizations have also done good service in foreign countries. The foreign Red Cross exists for the purpose of exchanging medical information

with the medical circles in various countries, and for assisting Russians to reëstablish contact in the U.S.S.R. with the families whom they had lost track of during the years of war and revolution.

Doctor Gregory L. Rabinovitch, the representative in the United States of the Red Cross and Red Crescent Societies of the U.S.S.R., is an efficient, earnest and highly cultured physician. As the Union of Soviet Socialist Republics contains not only Christian but Mohammedan nationalities as well, the emblem of mercy is not the cross but the crescent.

Children receiving sun-ray treatment at the Red Cross Clinic, in Odessa.

CONCLUSION

CONCLUSION

THE work that is being carried on in different parts of Russia in the province of science, particularly in medicine, is so immense, thorough and practical that it would require endless time and space to enumerate it; a brief account only has been given in the foregoing chapters. The present Soviet régime, as we have mentioned, has laid tremendous stress on the preservation of the health of the people. Pessimism, neuroses and *laissez-faire* have almost disappeared, except in a small number of individuals who could not adjust themselves to the spirit of the present order.

The pro-Czarist physicians undoubtedly suffered, although some, realizing the unselfish purpose of the new system, became ardent workers for the cause, believing that the aim of the new government is to create, as Lincoln said, a government "of the people, by the people and for the people."

Russian Medicine is marching on. Whereas in past histories of medicine the names of two or three celebrated Russian doctors were occasionally mentioned, future histories of medicine will have enrolled the names and works of many outstanding Russian medical savants.

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BIBLIOGRAPHY

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For some abstracts from the Russian Encyclopedias, the writer is much indebted to Mr. Murray Ross.

RULERS OF RUSSIA

RULERS OF RUSSIA

Year

850—Ruric or Rurik
879—Oleg
913—Igor I
945—Olga, widow of Igor I
955—Swiatoslaw I
973—Jaropalk I
980—Vladimir
1015—Swiatopalk I
1018—Jaraslaf I
1054—Isiaslaf I
1073—Swiatoslaw II
1078—Wsewolod I
1093—Swiatopalk II
1113—Vladimir II
1125—Mitislaf
1132—Jaropalk II
1138—Wiatschelaw, and Wsewolod II
1146—Isiaslaf II and Igor II
1149—Jurie, or George I, who built Moscow
1157—Andrew I
1175—Michael I
1177—Wsewolod III
1213—Jurie, or George II
1217—Constantin
1238—Jaraslaf II
1245—Alexander Nevski
1263—Jaraslaf III

Year

1270—Vasili, or Basil I
1275—Dmitri, or Demetrius I
1281—Andrew II
1294—Daniel-Alexandrovitz
1303—Jurie, or George III (deposed)
1305—Michael III
1320—Vasili, or Basil II
1325—George III (restored to the throne)
1327—Alexander II
1328—Ivan, or John I
1340—Simeon
1353—John II
1359—Demetrius II
1362—Demetrius III
1389—Basil III
1425—Basil IV
1462—Ivan, or John III (The first ruler to assume title of Czar.)
1505—Basil V
1533—Ivan the Terrible
1584—Feodor, or Theodor I
1598—Boris Godunov (usurper)
1605—Theodor II
1606—Demetrius (impostor)

Year

1610—Ladislaus, of Poland
1613—Michael
1645—Alexis
1676—Theodor III
1682—Ivan V
1682—Peter the Great (Assumed title of emperor. Founded city of St. Petersburg.)
1725—Catherine I, widow of Peter the Great
1727—Peter II (deposed)
1730—Anne I
1740—Ivan VI
1741—Elizabeth, daughter of Peter the Great
1762—Peter III (Deposed and succeeded by his wife, Catherine II, known as Catherine the Great.)

Year

1796—Paul, son of Catherine the Great
1810—Alexander I, son of Paul
1825—Nicholas I, brother of Alexander I
1855—Alexander II, son of Nicholas I (assassinated)
1881—Alexander III
1894—Nicholas II (assassinated, 1918)
1917—May 16. Formation of Duma (Parliament)
1917—November 10. Establishment of Soviet form of government.
1924—New Constitution adopted under name, Union of Soviet Socialist Republics.

INDEX

INDEX

A

Academy of Science, The, 82
Adamic, E. V., 282
Adonidin, 23
Afanasiev, 33
Alexander I, 124, 234
Alexander II, 127, 252
Alexander III, 154, 259
Alexi, Metropolitan of the Greek Church, 280
Alexey, Milhailovitch, 47
Alexis, son of Peter the Great, 87
All-Union Institute of Experimental Medicine, 169, 199
Ambodik, Dr. N. M., 102, 275
Anatomical Museum, 77, 216
Andrei, Ivanovitch, 48
Animal Therapy, 32
Anichkov, Academician, S. V., 300
Anna, Ivanovna, 95, 98
Anna, Leopoldovna, 95, 98
Anrep, Vasila Konstantantinovich, 152
Anthony's *Memoirs of Catherine the Great*, 103
Arabs visits to Russia, 25
Areskin, Arkhiyater, 90
Arnold, Dr., 57
Arthritic Clinic, Moscow, 318
Aspirant Institute, 181, 182
Astafev, Jacob, 52
Author, Impression of the Delegates to the International Neurologic Congress (in 1935), 180
Azzariti, Dr., 104

B

Babkin, Prof. B. P., 206
Babukhin, A. I., 234
Bach, A. N., 206
Baer, Prof., 224, 234
Bakst, Prof. G. A., 321
Bakunin, 127, 132
Balinsky, I. M., 209, 212
"Banki"-cups, 65
Banting, 299, 305
Bardin, Sophia, 268
Barenhovin, S. G., 303
Barensprung, 284
Barsouk-Moiseev, 196
Bashenov, 213
Basov, 112
Bartels, 22, 29
Bazilevich, Prof. G. I., 239
Beasley, 35, 85
Beckerson, 245
Bekhterev, V. M., 212
Bekov, Erasm, 54
Belogolovyi, A. N., 251
Berestnev, N. M., 274
Bernard, Claude, 196, 234, 246, 300
Bernstein, Herman, 293
Berzenev, 20
Besredka, 153, 238, 295
Bickov, Prof. K. M., 298
Bidloo, Nicholas, 84, 195, 214
Bigotry of the Clergy, 132
Bishop, 105
Bistrov, 276
Black Death Epidemic, 102, 126

Bloom, Wm., 235
Blumentrost, Dr. Lavrenti and brother Ivan, 68, 85, 90, 97, 104
Bobrov, A. A., 232
Boerhave, Dr., 100
Bogdanovsky, E. I., 230, 231, 307
Bogomolov, I. I., 240
Bomel, Dr. Elisaeus, 47, 50, 61
Borodin, A. P., 206, 264
Botkin, S. P., 18, 20, 197, 238, 239 240, 252
Brandt, Carl, 280
Braude, 316
Brothels at Porta de Roule, 122
Brown-Séquard, 287
Brun, David, 280
Bubnov, C. B., 22, 274
Buffon, 123
Bunge, 262
Buyron, Ernest, 96
Byialski, I. B., 216

C

Canillo, C., 210
Cannon, Prof., 305
Carbonari, Dr. Gregory, 68
Carlyle, 97
Catherine I, 88, 121
Catherine II, 31, 79
Cecil, Sir, 51
Chancellor, Richard, 47
Charles I, Execution of, 47
Cheez, V. F., 210
Chekov, Anton Pavlovich, 213
Cherkasov, A. I., 81, 108
Chernikov, Prof., 279
Chernishevsky, 131
Chervonsky, 239
Chertov, Dr., 146
Children, of Catherine II, 101
Chrichton, Sir Alexander, 47
Chudnovski, 246
Chukichev, Prof. J. N., 298
Clemov, Dr., 151, 152
Cobert, 23
Collins, Samuel, 68, 120, 282
Conus, Dr. Esther, 171
Crushé, 317
Cyclopedia of Medicine, 179
Cyon, I. F., 198
Czartozyski, Prince, 123

D

Dale, Sir Henry H., 304
Dal-Krebel, 20
Damian, The Curer, 37
Danilevski, Alexander and brother Vasili, 206
Danillo, 212
Darkshevitch, 281, 314
Darling, J. N., 161
Darwin, 301
Dashkova, Princess, 82
De Brosses, 123
Dee, Dr., 59, 67
Dementiev, Dr., 270
Demich, Dr., 20, 33
De Segur, 121
De Teils, Anton, 96, 100
Diatzopov, 275
Diday, 284
Diderot, 123
Diffenbach, 222
Dimsdale, Dr. Thomas, 47, 105
Dimsdale, Nathaniel, 108
"Ding Goes To Russia," 160
Diyakanov, P. I., 273
Dobroslavin, Prof., 273
Dogiel, A. S., 296
Dolganov, Prof. V. N., 309
Dolgoruki, Princess, 267
Dolgorukov, 96
Dragendorf, 262
Du Bois-Reymond, 197
Dubovitsky, P. A., 238, 246, 288
Durnovo, Prof., 315
Dyadkovski, 235

E

Eberman, Dr. A. L., 164
Eddy, Sherwood, 162, 174
Eichwald, E. E., 238, 260
Elena, Pavlovna, Princess, 260
Elizabeth, Empress, 31, 95
Elizabeth, Queen, 49, 51, 95
Emmerich, 275
"Emperor Nocturne," 100
Engel, 215
Erasmus, 98
Erlitzky, 210, 213
Erskine, 47
Erisman, Feodor F., 126, 133, 142, 266, 269, 279
Evenius, 281

F

Fiegel, Prof., 317
Fethergill, Dr. John, 107
Fialkovski, 98

Fidler, Kasper, 54
Filamefitsky, 196
Filatov, Nil F., 151, 258, 275, 278
Fiodor, Ivanovitch, 52
Fisher, Arkhiyater, 83, 85, 96
Fitinhof, 89
Florinsky, 276
Forbes, Nevill, 85, 121
Forstein, Dr. I., 215
Fox, Dr. Kingston, 113
Francisco di Collo, 45
Frank, Prof. J. P., 219, 239
Frederick III, 97
Frenchnam, James, 52, 58, 261
Furt, Prof., 309

G

Gabrichevski, G., 151, 274, 279
Galytzin, Princess, 267
Gamaleia, 238, 293
Gan, Princess, 267
Garibaldi, 227
Garrison, Dr. F. H., 79, 152
Gayevsky, 239
Genss, Dr. A., 319
Gerberstein, 61
Gibbs, Sir Philip, 159
Gilke, Johannes, 54
Glebov, I. J., 288
Glinka, 133
Godunov, Boris, 53, 156
Golovin, 131, 281
Golubov, N. F., 259
Gorfin, Prof. B. V., 183
Gorki. Maxim, 159, 164
Goyer, G. F., 234
Graffe, 222
Graman, Artman, 67
Granovsky, Prof., 127, 197, 241
Grassovsky, A. G., 275
Griboyedov, Prof., 315
Gromov, 276
Gruber, V., 216, 224, 229
Gruse, Dr., 117
Gundobin, M. P., 276
Gurevitch, M. G., 318
Gurina, Dr. Anna I., 312

H

Haas, Feodor P., 143, 185
Haffkine, W., 153, 238
Hahneman, 24
Hassin, Dr. George, 210
Hastings, Mary, 49, 275
Helmholtz, 197, 287
Henry I, 38
Herzen, 127, 132
Hildebrandt, 281
Hirshman, L., 282
Hoppe-Zeiler, 196, 244
Horne, 104
Horsey, Sir Jerome, 51
Hygienic Institute of Narkomzdrev, 275

I

Imperial Medical Library, 171
Importation of foreign physicians, 77
Inoculation of Catherine II, 106
Inoculation Hospital, 119
Inozemtzev, Theodore, 223, 232
Institute of Experimental Medicine, 176
Institute of Biological Chemistry, 206
Institute of Cosmetics, 323
Institute of Pathological Anatomy, 169
Institute of Physical Therapy—Leningrad, 169
Institute for Protection of Motherhood and Childhood, 319
Institute for the Study of Health Resorts, 169
Institute of Social Diseases in Moscow, 169
Institute of Social Hygiene in Moscow, 169
International Medical Congress at St Petersburg (1896), 121
Ivan IV, 83, 156
Ivan V, 96
Ivan Vasilyevich, 61
Ivanchenko, 30
Ivanov, Prof. I. V., 281, 316
Ivan Ivanovitch, 44
Ivan, The Terrible, 48, 275

J

Jacob, Dr. Robert, 47, 49
Jacobin Club of Paris, 124
Jacobson, Dr. S. J., 319
James, King, 59
Jbankov, Dr., 133, 138, 142, 146
Jhadovski, Princess, 266

K

Kagan, Prof. R. M., 304
Kalinsky Hospital for Venereal Diseases, 283
Kalinsky Medical Surgical Institute, 89
Kaminsky, Dr. G. N., 179, 306, 315
Kandinsky, 210
Kanel, 275
Kantrovitch, Dr. S. T., 323
Kapustin, Prof., 136, 275, 315
Karakech, Prince, 43
Karakozov, 131
Karamanova, Y., 323
Karpenko, 320
Katkov, 127
Kazanov, Dr., 318
Kaus, Gina, 104
Kdeniya, Princess, 56
Kerastov, 218
Kerensky, A., 158
Kerstin, Prof., 196, 218
Khavkin, 294
Khemnitz, 81
Khodin, 281
Kholovsky, 20
Khoroshko, V., 321
Khotovitzky, 276
Khronchevsky, 235
Kilijakov, 304
Kiter, 230
Klaus, 262
Klenke, 234
Kobat, 280
Kochubey, 124
Kolomnin, Sergei P., 230, 307
Kolosov, Prof., 317
Koltushi Laboratories, 178
Konchevalov, Prof., 318
Konradi, 267
Korinov, A. A., 210
Korshov, C. C., 210
Koshlakov, D. I., 240
Koslova, 286
Kosturin, 240
Kouchaidze, Dr. G. L., 319
Kovalevskaya, Sophia, 267
Kovalevsky, Dr. A., 209, 234
Kozhevnikov, A. Y., 210
Kraft-Ebbing, 213
Krasnogorsky, 298
Krakov, N. P., 198, 299
Krepelin, 213
Krukov, 281
Kuble, 23
Kurbski, Prince, 57
Kussmaul, Prof., 256
Kueter, A. A., 276
Kuntz, 317
Kvatter, Prof., 317

L

Ladovski, M. D., 235
Langenbeck, Prof., 222
Lavrov, 238
Lazarevitch, 276
Lee, Richard, English Ambassador, 54
L'Estocq, Dr., 99
Lefler, Anna, 267
Lenin, 158, 162, 310, 314
Lepechinskaya, Prof. O. B., 318
Lenzey, Dr. Arnold, 48
Lesgoft, P. P., 232
Lewes, G. H., 204
Levashev, 274, 296
Leyden, Prof., 259
Liebich, 287
Lisfranc, 223
Lister, 272, 297
Lojetnikov, 281
Lopukhina, Eudoxia, 87
Lovtzov, 248
Lubimov, Prof. N. M., 220
Lubinsky, 281
Ludwig, 199, 245
Lukiyanov, S. M., 238
Luriye, Prof., 317
Lushko, 230
Lutze, 20

M

Madovikov, Prof., 316
Maklakov, A. N., 281
Malinoviki, 316
Manassein, V. A., 18, 20, 21, 238, 259
Mandelshtam, M. E., 204
Mangorn, Johan, 280
Maranovitch, R. A., 281
Marcos, Dr., 46
Marcus, Dr., 319
Mareyev, 276
Markuzen, 234
Martinov, A. V., 321
Marzinovsky, Prof. E. I., 310
Masksutov, Dr., 176
Maslov, Prof. M. C., 309

Maslovsky, I. F., 276
Matveyev, Artamon, 63
Maximilian, Emperor, 45
Maximov, Prof. A., 235, 297
Medical Colleges, Increase of, 180
Medvedeva, Prof., 298
Mendel, 301
Mendeleiev, Prof., 298
Menshikov, 95
Merchinski, 241
Mering, 296
Merjevsky, Prof. I. T., 209, 213, 282
Metchnikov, Elie, 21, 124, 259, 269, 288, 291
Metchnikov Institute, 274
Metchnikova, Madam Olga, 290
Microbiological Institute, 311
Mikhail Feodorovitch, 58, 59
Military Medico-Chirurgical Academy, 267
Minkovsky, Prof., 152, 296
Mitkovenov, 281
Molkov, A. V., Medical Missionary, 142
Mollison, I. I., 133
Molotov, Commissar, 190
Morozov, Boris, 63, 82
Moscov Brain Institute, 170, 204
Moscow News, The, 82
Mounsey, James, 47
Moussorgsky, 133, 265
Moyer, 222
Mudrow, Matvei Yakovlevitch, 218, 222
Mukhin, Prof., 217, 221
Munnich, 98
Municipal Medicine, in European Russia, 146
Muratov, V. A., 210
Muravyov, 219
Mussolini-Pavlov's remarks, 204
"Mylenki," or Soapers, 31

N

Nagaya, Marya, 49
Nagovsky, 274
Nencki, Marcel, 206
Nemchin, Dr. Anton, 43
Nemerov, Prof. M., 182
Nestor, 35
Nevahovitch, Leo, 287, 288
Nicholas I, 127, 234
Nicholas II, 131, 259
Nicholo, Dr., 45
Nikifrov, M., 238
Nikolski, Prof. P. V., 305
Nogina, Dr., 313
Noss, Dr., 22
Novikow, 81, 122
Navosiltzev, 124

O

Oath of physicians, 56, 57
Obukh, V. A., 311
Obolenskaya, Princess, 256, 260
Odessa Bacteriological Physiological Institute, 295
Ogorodnikova, Dr., 313
Okhtomsky, A. A., 298
Oksakov, 127
Oldenburgski, Prince Piotor G., 277
Olga Alexeevna, 196
Ophthalmology, 280
Optical Institute, 176
Orbelli, Prof. Leon, 298
Orlov, Gregory, 78, 102
Osenburg, Ivan, 68
Osiris, Leon, 291
Ossipov, 133, 141
Ostermann, 98
Ostroumov, A. A., 240, 261, 301
Ott, 276
Ower, A. I., 239

P

Paleolog, Andrei, 44
Palevy, Ambassador, 44
Palladin, A. A., 310
Panin, Count, the Prime Minister, 109
Pantzukov, 20
Pavilion of Artificial Climate, 169
Pashutin, V., 238
Paterik, 35
Pavlov, 152, 177, 190, 199, 297
Paul, Catherine's Son, 101, 108
Pazukhin, 154
Pelekhin, Prof. P. P., 230, 231
Pelikan, E. V., 248
Pellarino, Jacob, 68
Perovskaya, 267
Peter the Great, 76, 78, 280
Pettenkoffer, Dr., 275
Peteov, A. V., 143, 307
Phlebotomy or blood-letting, 29, 58
Physicians' Compensation, 68

Physiological Congress at Rome, 204
Pikulin, 241, 243
Piltov, 240
Pinel, 209
Pinkevitch, Prof., 175
Pirogov, Medical Society, 150, 221
Plekhanov, 314
Plessel, 234
Pletnev, Prof. I., 320
Pleve, 307
Pobiedonoszev, 154
Podgoretzki, 98
Podvisotzki, V., 238, 262
Pogojev, Dr., 270
Pogoshell, I. I., 59
Pokrovsky, V. P., 240
Poliakov, 78, 87, 103
Politkovski, 219
Polotebnov, 283
Polunin, A. I., 242
Popov, L. V., 20, 240, 320
Popularity of English Physicians, 106
Pospelov, 283
Postnikova, A. I., 76, 241
Postnik, Peter, 37
Potemkin, 101
Pouschin, M., 107
Prescribing for the Czars, 70
Prophylactaria for Prostitutes, 183, 319
Propper, Dr. N. J., 298
Puparev, 20
Pushkin, Alexander, 24

R

Rabinovitch, Dr. G. L., 328
Rabinovitch, Female Ophthalmologist, 281
Rapoport, Dr. A., 184
Rasputin, 154
Rauchfuss, K. A., 276
Rauver, 218
Razumovski, Prof. V. I., 105, 307
Red Cross and Red Crescent, 327
Rein, Prof. D. E., 164, 276
Reinegs, 271
Reitlinger, Christopher, 54
Remizov, Prof., 318
Ricord, 284
Richards, Anne, 52
Richter, V. M., 275
Ridley, Dr. Mark, 47
Rimsky-Korsakov, 265
Rinder, Dr. J., 216
Roentgen Institute of Leningrad, 182
Rogerson, Dr. John, 102, 121
Rollet, 284
Romberg, 244
Rosenbach, Dr. P. Y., 210, 213
Rosenstein, Dr., 184, 274
Ross, Prof. E. A., 159
Roth, Prof. V., 212
Rouvakine, A., 320
Roux, 290
Rovinsky, 29
Royal Tropical Institute, 310
Rubinstein, 133, 320
Rudnev, Michael Matveievtev, Prof., 220, 231
Ruysch's Anatomical Museum, 77
Rykov, A. I., 315

S

Saltykov, 101
Samarin, 127
Schtepin, K. I., 215
Scherbak, Prof. A. E., 304
Schmidt, Alexander, 152, 217, 262
Schroeder, Hendrick, 54
Selection of a Bride, 88
Selkov, Dr., 176
Sellier, Dr. H., 322
Semashko, Dr. N. A., 165, 169, 179, 314, 321
Sergeiv, P. G., 323
Setchenov, I. M., Father of Russian Physiology, 196, 208, 240, 301
Shafonsky, Dr., 98, 103, 126
Shamov, Dr., 302
Shervinsky, 151
Shidlovski, 20
Shingrev, A. A., 149, 261
Shipulenski, 245
Shtida, L., 234
Shubin, 99
Shinsky, Vasili, 62
Shumliansky, 216
Shuvalov, Prince E. I., 81
Sibelist, Vandeline, 67, 68
Sigirist, 240
Sikorsky, I. L., 210, 213
Skidon, Dr., 98
Skidian, 196, 219
Sklifasovsky, N. V., 272
Skorokhadov, 25

Skundin, 302
Skvortzov, Prof. V. J., 262, 303
Slavyynsky, 276
Slovtzov, B., 206
Smera, Dr., 35
Snegirov, Dr., 259, 276
Socialization of Medical Practice, 178
Sokolov, Dr. D. A., 278
Sokolova, Dr., 276, 319
Solomon, 281
Soloview, historian, 86, 321
Soviet Academy of Science, 190
Soviet Pharmacy, 183
Spasski School of Moscow, 62
Speransky, Prof. A. D., 176, 298
Stalin, 190
Standish, Dr. Ralph, 107
Stern, Prof. Lina, 313
Stolnikov, 240
Strupovenkov, Prof., 282, 305
St. Vladimir, 34
Subotin, Prof., 275
Suslova, N. P., 266
Sutugin, V. V., 276
Suvorovskaya School, 286
Svetin, 112
Svytopolk, V., 37

T

Tait, Dr. Lawson, 254
Taraklov, 20
Tarashevitch, Prof. L. A., 164, 169, 294, 321
Tarkhanov, I. R., 198, 207
Tarnovsky, B. M., 282, 283, 286
Teofil of Lubeck, 46, 48
Terekhovsky, Dr. M. M., 216
Terziakov, 148
Testicles of Animals, 33
Tikhomirov, 262, 286
Timovsky, 98
Tolochinov, 276
Tolsky, N. A., 276
Tolstoi, Count D., 130, 153
Tolstoi, Leo, 132, 171, 294
Tormont, Dr., 78, 87
Troitzki, I. P., 278
Tropical Institute, 169, 274
Trotzky, 157
Trousseau, 256
Tuchnov, Prof., 303
Turgeniev, 126, 196
Tuevskay Zemotuo, 134
Tzitadini, Pavel, 52

U

Uden, 236
Ulav, Alexander, 123
Usievitch, Prof. M. A., 318

V

Van Poehl, A. V., 286
Varvinski, 244
Vashin, 20
Vasili, Ivanovitch, 45
Vasiliev, Baron, 105
Vasiliev, A. I., 175, 216
Vasmer, David, 54
Veliaminov, N. A., 263
Velikanov, Prof. L. V., 174, 297
Velliansky, 234
Velno, 223
Vennsovitch, 238
Veviorovsky, 317
Vladimir Monomakh, 35
Vidor, Dr., 116
Vinogradov, N. A., 247
Vishneoski, Prof., 317
Visotzky, Dr., 32
Vivechock, Maria Princess, 267
Vladimivsky, Dr., 174, 320
Voinov, 281
Volga, 158
Volkov, Gregory, 281
Von Bergmann, Ernest, 152
Von Cyon, Elie, 152
Von Mallen, 215
Von Vizin, 85
Von Winchell, F., 227
Voronzov, Mme., 100
Vreden, Prof. P. P., 184, 297

W

Welcome gifts to physicians, 68
Wells, H. G., 159, 205
Williams, Dr. Frankwood, 187
Willis, Timothy, 53, 54
Witte, Count, 293
Wolf, Dr. Caspar Frederick, 102
Women's Medical Institute, 264
Wylie, Sir James, 47, 119

Y

Yagelski, 98
Yakubovich, M., 234, 276
Yerson, A., 297

Yevreinov, 267
Yunge, 240, 245, 281

Z

Zablotzky, 234
Zagoskin, 216
Zagorsky, Dr., 196, 216
Zakharin, G. A., 240, 256
Zakharou, 238
Zavarykin, 235
Zdekauer, 239
Zeidlitz, K. K., 239
Zelenev, 282
Zeidlin, 224
Zemstuos, 127, 131
Zemstvo Institutions (Hospitalization Free), 138
Zernov, D., 217, 281
Zibelin, Prof., 219, 273
Zinin, Prof. N. M., 237, 262, 273, 287
Zommer, Dr. K. B., 271
Zyetaiyev and Viacheslav, 168

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