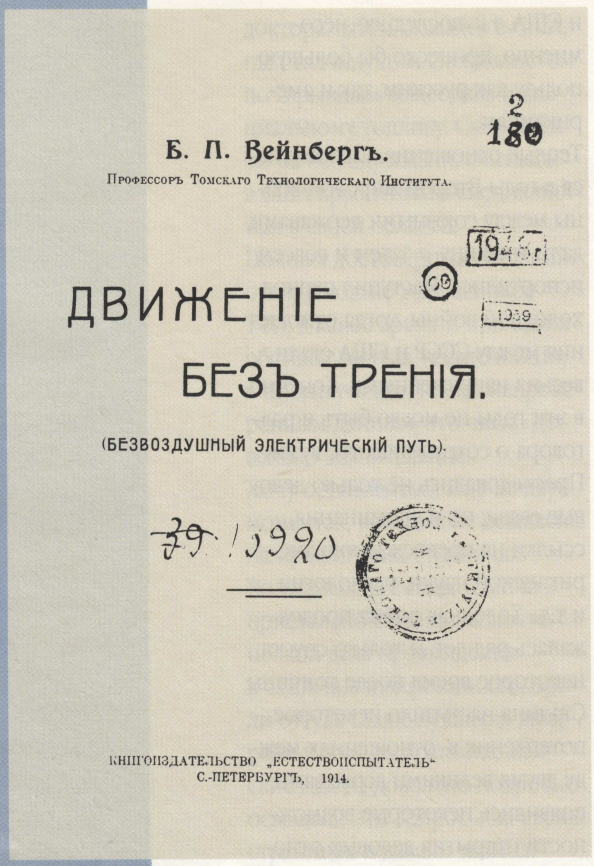

Б. П. Вейнбергъ.

Профессоръ Томскаго Технологическаго Института.

ДВИЖЕНІЕ БЕЗЪ ТРЕНІЯ.

(БЕЗВОЗДУШНЫЙ ЭЛЕКТРИЧЕСКІЙ ПУТЬ).

КНИГОИЗДАТЕЛЬСТВО „ЕСТЕСТВОИСПЫТАТЕЛЬ"
С.-ПЕТЕРБУРГЪ, 1914.

встретившихся в далеком Нью-Йорке.

Познакомившись с томским бетатроном, американцы весьма заинтересовались научными трудами томичей. Вскоре они запросили для библиотек Конгресса США , Калифорнийского и других видных университетов страны все номера "Известий Томского Политехнического института".

В 1969 году в научной командировке в США побывал директор НИЯФ при ТПИ Андрей Николаевич Диденко, однако эта поездка не привела тогда к прочным научным связям и сотрудничеству.

Более тесные научные связи ТПИ с вузами США установились лишь в конце восьмидесятых годов. В 1980 году старший научный сотрудник НИИ высоких напряжений при ТПИ Владимир Александрович Раков десять месяцев провел на стажировке в США, работая во Флориде и Аризоне.

В последующие годы дважды побывал в длительных научных командировках в США декан одного из факультетов доцент Борисов, работавший в области разработки нефти.

В свою очередь, в институте побывали профессора США Э. Баум и М. Беккер. Они подробно познакомились с системой и методами подготовки инженеров. Тогда же возник вопрос об организации при ТПИ русско-американского центра, о создании в Томске американских школ, об обмене научными работниками и учащимися.

Эти проекты вскоре начали воплощаться в жизнь. В 1991 году в США в научной командировке побывали директор НИИ ядерной физики при ТПИ профессор Юрий Петрович Усов и некоторые другие сотрудники института. В том же году в научной командировке в США и Канаде длительное время провел проректор ТПИ по научной работе профессор В.П. Вавилов.

В это же время ТПИ посетили многие ученые и бизнесмены США. Весьма результативным был визит старшего вице-президента Американско-Советского торгово-экономического Совета Питера Фишера.

Последовал ряд попыток установить более прочные связи томских политехников с рядом ученых и университетов США, в том числе с фондом Рокфеллера и самим главой рода Рокфеллеров- Дэвидом Рокфеллером.

И. Т. Лозовский

Relations between TPU and the USA have been laid since the early years of activity of Tomsk technological

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Relations between TPU and the USA have been laid since the early years of Tomsk technological institute (TTI), founded in 1896. The prime cause of these relations was gold.

institute (TTI), founded in 1896. The prime cause of these relations was gold.

By the moment of TTI opening Siberia was glorified all over the world as large supplier of gold, as a place of unique deposits of this metal, but, unfortunately, just in that period Siberian gold-mining experienced acute crisis.

Arisen at the end of the first half of the past century Siberian gold mining was based on development of gold-bearing gravel, coming to a surface in some areas of Siberia. The basis for Siberian gold-mining was manual back-breaking labour of gold-strikers, characterized by a complete absence of machines and mechanical equipment. Besides, in Russia not a higher educational institution trained engineers for gold-mining, and extraction of gold were supervised by practicians who relied on their experience and intuition. Prospecting and exploitation of new and already working goldfields depended on their personal qualities in many respects.

In the latter half of the XIXth century all over the world were considerably exhausted deposits of placer gold, and the world had passed to prospecting and mining of native gold. At first it had required training of special engineers capable to find in depth the sites of golden ore deposit, to exploit them, and to extract gold from the ore. Secondly, to mechanize all works connected to prospecting and mining of native gold, to supersede manual labour with mechanized one. In the USA and Europe a number of faculties on training of the experts for gold-mining was opened; only Russia did not make a move in this direction, though in the nineties in Siberian gold-mining a recession of work was observed.

The mining faculty of TTI opened in 1901 was the first to create and organize in Russia the training of mining engineers for gold-mining. Just in TTI for the first time in Russia they have begun to lecture on "gold business". This speciality was organized by professor V. A. Obruchev, who did lecturing on geology of gold. The course of mining skill for gold-mining was lectured by the professor Lev L. Tove, a son of an English engineer who had arrived Russia in earnings. He graduated from St. Petersburg mining institute and for few years was working at gold-extracting enterprises of Siberia and Far East, so he knew much about the first dredges and drags, brought in Siberia mainly from America. It was the machines that laid the foundation of mechanization in gold-mining of the territory.

In Siberia the majority of placers were located in permafrost zones, where a spring began late, and there were early frosts in autumn with sudden temperature drops. The American machines designed for better conditions of work, often got broken, went out of service. Moreover, in Siberia there were no experts on maintenance and troubleshooting of mining machines, and there were no spare parts for repair.

Therefore first Siberian owners of gold-mines, who bought American

На фото: *Л.Л. Тове (1866-1917), профессор ТТИ, крупнейший специалист по добыче золота*
Photo: *L. L. Tove (1866-1917), professor of TTI, prominent expert in gold-striking*

machines which poorly worked at their gold-fields, were almost ruined. Nevertheless, Siberians have already understood advantage of mechanized labour over manual one and have not given up excavators and dredges. However, they have insisted on modifying their designs, have organized the training of qualified operators for these machines, have gradually created appropriate repair base.

The American companies were interested in good relations with Siberians and responded to their wishes. Moreover, at the end of the last and at the beginning of our century a number of the Americans had got concessions in Siberia and run extraction of gold here.

Gold-extracting companies and corporations in Siberia understood well, that to head all works, or rather, to be the leading consultant for introduction of mechanization in gold-mining, they needed an experienced person, who knew his onions. They chose the professor of mining faculty of TTI Lev Tove. He assented to the proposal and, remaining the regular professor of the institute, at the same time he was the main adviser of Siberian owners of gold-mines on mining problems for all the years of his work in TTI. They came to him for expert opinions from many gold-fields. Every summer he went round gold-diggings and the necessary instructions. Annually owners of gold-mines paid another professorial salary to professor Tove for this advices, as well as gratuities for the decision of difficult problems.

Supporting close business contacts with the designers of American mining machines and with the American businessmen engaged in production of gold in Siberia, professor Tove had gained a wide prominence both among Siberian owners of gold-mines, and among the Americans.

Professor of the mining faculty of TTI Pavel P. Gudkov and a number of other science officers of TTI under the order of American businessmen made gold prospecting - and highly successful - in the territories of Russia, allocated to them.

The geologists and mining engineers of TTI had rather high authority with Americans that can be testified with the numerous documents of those years.

In pre-revolutionary years professor of TTI Nikolai I. Trushkov, who lectured in TTI courses on "Exploitation of ore deposits ", "Timbering" and some others, repeatedly and for long intervals visited the USA. For some years Prof. Trushkov practically supervised exploitation and extraction of zinc, lead and coal in Kirghiz steppe (now Ekibastuz). He is the author of a large cycle of the articles on methods of ores mining at USA enterprises. Since 1909 Prof. Trushkov was the member of the American institute of mining engineers and all the following years kept up the business relations with it. Nikolai I. Trushkov was the biggest Russian expert in the field of mining sciences, and for many years he headed the scientific mining school created by him. At the end of 1925 he was elected professor of Leningrad mining institute and worked there up to

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the end of his life. He died in 1947 in Leningrad.

The student of the first intake of TTI mining faculty Nikolai S. Penn, Englishman nationality, already within study had trips for practice to some USA enterprises, where he learnt not only new progressive "know-how", but also business ability, so characteristic of Americans. The following years N. Penn maintained business relations with the USA, had contacts with some American scientists. He became the authority in the field of mining art. For many years Prof. Penn has worked in TTI.

Improving the knowledge, he, after graduating from TTI in 1908, has also graduated from Massachusetts technological institute (USA) in 1914. He was the big scientist and practician in the field of mining art, the outstanding expert in ores concentration.

For many years professor of TTI Vladimir Ya. Mostovich had the close business relations with Americans the who did lecturing on non-ferrous metals concentration, a course on assaying art, and who have created the world-famous school of non-ferrous metals in TTI.

Lev D. Shevyakov was also world-widely known as the largest scientist in the field of mining art. In the middle of the twenties L.D. Shevyakov improved his knowledge at different enterprises and higher educational institutions of America. In the thirties professor L.D. Shevyakov was elected member of the USSR Academy of Sciences and left Tomsk, but till the end of his life Academician Shevyakov kept up the closest relations with the scientists of TTI, especially with professor D. A. Strelnikov.

Mikhail Erastovich Yanishevsky was professor of paleontology at the mining faculty of TTI; he worked at the institute from the moment of its opening till 1911. The eminent explorer of Siberia, Prof. M.E. Yanishevsky maintained close contacts with some scientists from the USA, participated in scientific congresses at the USA. The Honoured scientist, professor Yanishevsky has lived long and fruitful life, has left many talented progeny and plenty of scientific works, many of which have not staled up to the present.

Professor Boris P. Veinberg was the investigator of terrestrial magnetism. For years of work in TTI B. P. Veinberg has lead 23 geomagnetic expeditions about Siberia and certain districts, which result was a huge scientific material, laid the foundation of systematic study of the geophysical data in Siberia. It is significant that for all the years the professor Veinberg worked in close contacts with many foreign scientists and, in particular, with the Americans. In 1911, on money of the Americans in Tomsk the first in Siberia seismological station was built, which had allowed conducting of the qualified observation of crust fluctuations in Siberia. In 1912 professor Veinberg with his pupils began work on creation of an electrical road on a magnetic cushion. Only a year later the installation, which was the first operating one in the world, was not only created, but also started

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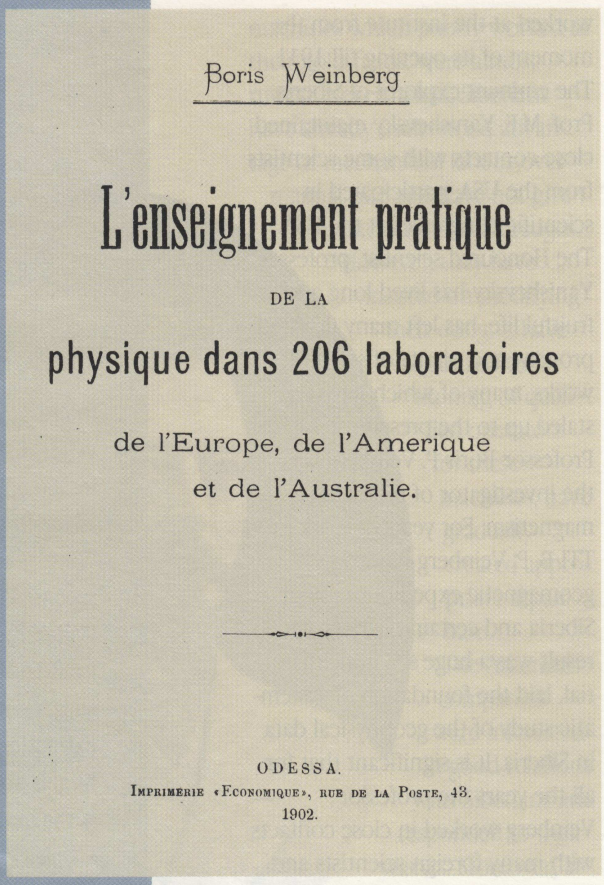

Boris Weinberg

L'enseignement pratique

DE LA

physique dans 206 laboratoires

de l'Europe, de l'Amerique

et de l'Australie.

ODESSA.

Imprimerie «Economique», rue de la Poste, 43.

1902.

and trouble-free worked. The message about it quickly spread through the world and created a furore. And soon from America in Tomsk there had arrived a big group of the scientists and journalists to look at the new world miracle, created in Tomsk. Many articles were written about a road on a magnetic cushion, and the Americans had shot a film about it. Soon the Academy of Sciences invited professor Veinberg to St. Petersburg, where he prelected about the new work. In 1914 this lecture was issued as a separate book in St. Petersburg.

One year later B. P. Veinberg as head of Russian delegation was sent to the USA and stayed there almost for three years. During this time he set good contacts with many scientists and industrialists of the USA and, in particular, with brothers Right, first pilots in the world.

1919 was especially stressful for the Siberians. Exhausted by the long-term world war and by even more ruinous civil war, Siberia starved, perished with hard epidemics, absence of medicines and the most needful things.

And here, in July 1919 in the main building of Tomsk technological institute, the Americans opened a hospital containing one thousand beds as a matter of rendering the humanitarian help. The whole equipment, facilities, nourishment and medicines were at the expense of the American help, free of charge. Simultaneously, the American Red Cross opened in Tomsk feeding stations on rendering the food help for students and employees of the local university and the technological institute. All these measures were of great importance, since at that time only a typhus epidemic took hundreds of lives daily.

American charitable hospital and feeding stations did not subsisted long and were liquidated soon after arrival of Red Army units to Tomsk. Those years this help was considered as intrigues of imperialistic America and was rejected as the matter of principle. But the help that had been rendered by the Americans, saved lives of many Siberians and refugees, which were brought to Tomsk by the civil war, when fled from red units.

After the Civil war the relations with the USA became significantly weaker and were partly revived only with industrialization, when the construction of Kuznetsk metallurgical combine began.

Speaking about relations with Americans in the middle of the twenties, it is necessary to mention a name of Mikhail Levanovich Terasaturov, who graduated from the institute in 1926 with the speciality "tractor

construction". On graduating from TTI he was directed to Leningrad Putilovsky works, at which in those years tractors "Fordzon" were made under the license. In a workshop the engineer Terasaturov had passed all initial stages of his career, beginning from an ordinary worker. Then he left for the USA and there, working at different tractor plants, practically studied everything, concerning design and manufacture of tractors of different sorts. There Terasaturov joined the Society of Russian Engineers that existed in the USA in those years. Returning to Leningrad, Terasaturov designed and organized a flow-production of first home tractors. The next years, when in the country they began to build large tractor plants in Kharkov, Stalingrad, Chelyabinsk, the engineer Terasaturov became one of the leading advisers of our country in the field of tractor construction. In middle of the thirties he was appointed director of Kirovsky (Putilovsky) works in Leningrad. And both as the talented engineer and as the organizer he did much for development of this largest in the country enterprise. In 1938 he was shot as an enemy of the people, but after twenty years he was completely rehabilitated.

Those years of revolution and Civil war fortune brought in the USA some employees and graduates of the institute, which became greate experts there and scored in the history of our country.

Pavel Pavlovich Gudkov, a graduate of St.-Petersburg mining institute, has passed in TTI a way from a laboratory assistant to the professor, chief of the subfaculty of geology. The extremely talented person, soon he made himself conspicuous of professor V. A. Obruchev, and in due course he became his favorite pupil and assistant. After dismissal and removal of Obruchev from Tomsk, Gudkov occupied his place at the subfaculty. He was one of the founders and the first director of Siberian Geological Committee. As a scientist he made a lot for the development of geological explorations in Siberia. At the beginning of the 1920's professor Gudkov was invited to the USA and lived there up to the end of his life. In the USA he became one of the most prominent geologists of the country, was the member of five academies and scientific societies, and the largest expert in the field of petroleum geology. For many years P. P. Gudkov was the chief oil-consultant in leading petroleum companies of the USA and Mexico. All those years he kept up a correspondence with his teacher - Academician Vladimir A. Obruchev. In 1927 he became the citizen of the USA. A lot of his friends and colleagues liked him for his cultural level, sociability, jolly disposition and humor. He generously shared his knowledge and advised with everyone, who appealed to him. In the Russian colony of Los Angeles he actively supervised organization of the help to Russian immigrants, the aged and all needed assistance. Professor P. Gudkov had gift to bring harmony and calmness, where there was a dispute, misun-

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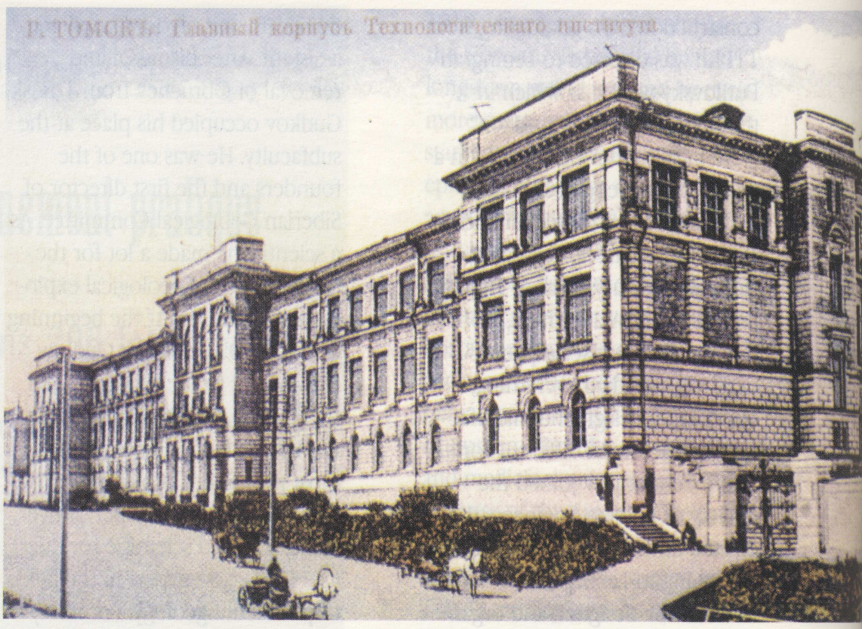

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На репродукции: *Главный корпус Томского Технологического Института, 19??*
In the reproduction: *Principal building of Tomsk Technologic Institute, 19??*

derstanding or unfriendliness earlier.

Recently the information about the life of the TTI allumnus of 1916 Vasily T. Fyodorov was received. The son of the militarian, after finishing Tashkent Cadet corps he entered a chemical branch of Tomsk technological institute and graduated it successfully. Then he participated in the First World War as an officer. In 1977 one of the famous scientific magazines in the USA published a big necrologue, devoted to the memory of professor Fyodorov. From this necrologue follows, that after the revolution he appeared in emigration, graduated from Sorbonne, has received a doctor degree there, then appeared in the USA, where he become the leading expert in explosive substances and special fuel. He died at his 86-th year of life, being considered in the USA as a largest expert in his field.

The complete reliable information about the number of graduates from TTI, left for the USA, about time and circumstances of their departure is lacking in the institute, but, by the unverified data, this number is rather significant.

Finishing the brief review of contacts of Tomsk polytechnical university with the United States of America, I want to stop at two points, which are not covered on the previous pages.

First, all the years the Tomskovites traced closely the organization of education in the USA, analyzed it, took the most best therefrom and introduced it in practice here. Moreover, Tomsk newspapers rather in detail covered these questions on their pages and enabled Siberians to get acquainted with school education and vocationak schooling in the USA. In the basis of it there laid personal impressions and notes of the Tomskovites, who visited the USA for scientific congresses and business trips.

Here I touch upon only one article on these questions published in 1907 in the newspaper " Siberian life ".

Considering a problem of organization of school and higher education in the USA, the author paid attention that in this country the basis for everything is a private property and material well being

of educational institutions only. In early 20s in the USA colleges and universities owned more than 20 million acres of land, buildings and structures. Besides, annually the educational institutions received from the state more than $400,000,000 and also huge donations from sponsors. For examples of that Carnegie donated to universities and colleges over $300,000,000, donations of the Rockefellers for some universities and schools, creation of "Rockefeller foundation" iexeeded 2 billion dollars intended specially for rendering the financial assistant to educational and research institutions.

He emphasized, that the educational institutions of the USA had as the main task not only to give the pupils the certain sum of knowledge, but also to teach them to enjoy work. In the article the detailed analysis of systems of training and methods of teaching is given. The chief thing in high schools of the USA was considered to study not much, but thoroughly. In this country training is conducted not on a course system, but on a subject one. The latter rather interested Tomsk technologists, which only had begun to change course training systems, traditional in Russian high schools, to subject ones. In conditions of low material security of the majority of the students of Russian high schools, who had to spend much time for earnings, and hence did not have possibility to attend lessons regularly and in time to move up to the next year, the subject system of training was much more effective.

As a result, the author of the article quoted some data about the oldest university in the USA - Harvard (Boston). This richest institute, which possessed a lot of houses, owned huge material values allowing to financing of the educational and research works, maintaining the highly skilled staff.

In the article the attention of readers was called to the fact that in the majority of educational institutions of the USA training was free-of-charge, that in educational institutions a lot of attention was paid to preservation of health, and consequently the sport is well advanced, there are many sports clubs. Special attention is given to inner development of the young people.

For our generation it is also interesting to know the opinion of the outstanding American scientific professor Rossel, who visited Tomsk in 1918 and in detail got acquainted with teaching at the Technological institute, at the University, at gymnasiums and real schools. Though for Siberians that time was rather hard in every respect, the professor Rossel painstakingly had analyzed all materials about activity of educational institutes and had come to a conclusion, that the Russian school "suffered" excessive theoreticality and gave to the pupils little practical knowledge, which could be applied to a particular business. In turn, the American schools suffered excessive practicality. Professor Rossel believed, that it would be rather desirable to organize an exchange of insti-

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tute and school teachers, and pupils of educational institutions of Tomsk and the USA, since the latter undoubtedly would bring large benefit both for Russians, and for Americans.

Finishing the review of that period, I want to note the warm and simple human relations between the American Red Cross and Tomsk polytechicians during civil war.

As was already spoken earlier, in 1919 in the main building of TTI the American hospital of Red Cross containing 2 thousand beds was placed, and the medical center of TTI was also placed there. Contrary to the American hospital, equipped well with the facilities and medicines, the medical center of the institute had nothing of it. The American hospital completely free-of-charge had supplied the medical center with all necessary medicines and equipment.

In May, 1919 the institute was visited by the representative of American Red Cross Mathew Mayer Kenwood and the consul of USA Mr. Dill. They had seen a disastrous situation of TTI owing to long civil war, and had rendered institute the effective help. Besides the hospital, American Red Cross in premises of the main building of TTI had the barracks, in which they rendered a medical help to many inhabitants of Tomsk, to refugees from West, evacuated in Tomsk and the numerous wounded, arriving in Tomsk in connection with retirement of the Kolchak army. The most terrible scourge in the autumn of 1919 had become the largest for the whole history of Siberia epidemic of typhus, which took many thousands of human lives, including Tomsk technologists.

After retreat of Kolchak Army and arrival of Red Army units the activity of the Americans in Tomsk was stopped.

In 1945 the Second World War was victoriously finished, which the USSR together with the USA waged against the fascist block of the states. Soon after the conclusion of peace the warm relations, which had been usual within the war between the allied powers, cracked, and then they had gone bad entirely. There come the period of cold war, when relations between the USSR and the USA become rather strained. Naturally, in those years any co-operation of higher schools was out of the question. Not only business contacts were persecuted but even mentions, references to the superiority of a American science, technology, etc. The cold war lasted some years, and only after Stalin's death relations between two great countries grew warmer, there were some opportunities of opening up business relations and scientific connections between higher schools of these states.

In 1959 TPI participated in the world exhibition in New York. This exhibition shown created with TPI stereobetatron, highly appreciated by the public. Professor Vladilen A. Moskalev, an allumnus of TPI, was a guide at the exhibition.

During one of excursions an incident took place. An old man, looking round the exhibition, asked Moskalev in Russian where he had arrived from. When the old man heard about Tomsk, he was very delighted and told that he was also an old Tomskovite, that he had emigrated from Russia even before the revolution in search of a better fortune, and that he had had a summer residence at Basandaika. The conversation of two Russian men, repre-

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sentatives of different generations, who had met in far New York, lasted for a long time.

After getting acquainted with the Tomsk betatron, the Americans became very interested in Tomsk science. Soon they had requested all issues of "Proceedings of Tomsk Polytechnical institute" for libraries of the Congress, of Californian and other leading universities of the country.

In 1969 director of Research Institute of Nuclear Physics at TPI Andrei N. Didenko visited the USA on a scientific business trip, however that time the trip had not resulted in stable scientific connections and co-operation.

The closer scientific relations of TPI with higher schools of the USA were established only at the end of the eighties. In 1980 the senior scientific worker of Research Institute of high voltages at TPI Vladimir A. Rakov was on special training in the USA, working in Florida and Arizona for ten months.

The next years the dean of one of TPI faculties - senior lecturer Borisov, working in the field of petroleum exploitation, visited the USA twice on prolonged scientific business trips.

In turn the USA professors E. Baum and M. Becker have been to the institute. They have got acquainted in detail with the system and methods of training of engineers. Then the question arose about organization of Russian-American center at TPI, about creation of American schools in Tomsk, about exchange of the science officers and students. Soon these projects began to be put into practice. In 1991 director of Research institute of nuclear physics at TPI professor Yury P. Usov and some other workers of the institute went to the USA on scientific business trip. The same year the vice-rector of TPI on scientific work, professor V.P. Vavilov spent a long time on a scientific business trip in the USA and Canada.

In the same time many scientists and businessmen from the USA visited TPI. The visit of the senior vice-president of American-Soviet trade-economic Council Peter Fisher was highly productive.

A number of attempts have followed to establish more stable contacts of Tomsk polytechicians with some scientists and universities of the USA, including Rockefeller fund and the head of the kin - David Rockefeller.

I.T. Lozovsky