

A. V. bert Davalan

Travels

Russia. 1958

49.

2303.9

Box 2

File 14



## CONFERENCE IN THE U.S.S.R.

The Tenth General Assembly of the International Astronomical Union met in Moscow in mid-August at the invitation of the Academy of Sciences of the Soviet Union. About fifteen astronomers went from Canada, of whom three are C.F.U.W. members, Dr. Helen Sawyer Hogg and Dr. Ruth Northcott of Toronto, and the writer. The first two flew after the Conference for a day in Tashkent and two days in the ancient city of Samarkand on the trade route from India to the western world over the deserts north of the Caspian Sea and south of the Ural mountains. The writer was the only Britisher among a group of eighteen astronomers of six countries who took the longer trip south to the Black Sea, visiting two fine astronomical institutions in the Crimea; sailing over the eastern end of the Black Sea to Sukhumi on the coast of Georgia and visiting Belisi and the Abastumani Observatory nearly 6000 feet up in the Caucasus Mountains; going south into Asia to Yeravan, the capital of the Armenian Soviet Republic, to see the Armenian astronomers at Bukaran; then flying north again as dawn "touched with roseate fingers" the high glaciers on 17,000 ft Mount Ararat just over the heavily guarded frontier of Turkey.

The Moscow meetings were attended by over 800 astronomers of 36 countries. The finest cooperation and free exchange of ideas took place, that is, strictly scientific ideas. Free discussion of world affairs and political differences was out of the question. The University on the Lenin Hill, the only high ground near Moscow, dominates the city. It is a huge skyscraper, the 30 storey central portion being entirely academic. Four 16 or 8 storey wings provide single or double room accommodation for 6000 students as well as several hundred professorial apartments. From my own observations I would say that the training in foreign languages and in physical sciences is of the highest quality; of other subjects



I had no opportunity to judge.

The cities, towns and country present tremendous contrasts - there is relative wealth and great poverty; privilege and lack of it; magnificence and shabbiness; great advances in industry, in beautification of public places and parks, in the erection of centres of culture, of recreation, of music and drama, of sanatoria, of pedagogical institutions and schools, and of apartment blocks to ease somewhat the (on our standards) frightful overcrowding in living quarters.

The Government honoured us at a lavish reception in the magnificent, spacious, ornate rooms of the Kremlin where the private chambers and chapel of the Czars was open for us to wander through. Everyone we met, the airport officials, bus conductors, hotel employees, the people on the streets and in the few shops which most of us found time to enter, were friendly and by means of a few words in Russian, French, German, English or sign language they showed their interest in the foreigners and were eager to be helpful. Miro Mir is their slogan for peace and for the ninety nine point nine nine percent it is a simple and sincere desire which we echo in our hearts with equal sincerity.



SOME OBSERVATIONS WITHIN THE U.S.S.R. I

The occasion which brought almost 600 astronomers from 35 countries to the U.S.S.R. where they were made welcome by some 240 Soviet astronomers, was the Xth General Assembly of the International Astronomical Union meeting in Moscow from August 12 - 20, 1958.

The Academy of Sciences of the Soviet Union had invited us to visit Leningrad either before or after the General Assembly, which explains why a considerable number of astronomers entered the U.S.S.R. from the north west, taking train or plane from Helsinki to Leningrad or arriving by boat at the mouth of the broad Neva river from London, Copenhagen, Stockholm or Helsinki.

I flew in by Soviet plane from Helsinki on August 6, finding myself on the same plane as Professor and <sup>me</sup> Mrs. Danjon of Paris, two astronomers from Herstmonceux, one from Teddington, and one American. To greet Dr. Danjon, the President of the I.A.U. 1955-58, the Director of Pulkovo Observatory, Dr. Mikhailov with his wife, herself an astronomer, and Professor Sabbotin were out at the airport where they welcomed us all and escorted us to the "Intourist" waiting room of the three-storey airport. This room was furnished like a Victorian sitting room. For the astronomers all formalities were reduced to a minimum: no customs inspection; no long delay over passports; with apologies we were asked to list our money; and then bag and baggage we were taken in ~~the~~ taxis northward on a long straight road to Leningrad. We passed a large pretentious Military Academy, many <sup>new</sup> large rectangular apartment blocks, much road construction, especially where the city tram lines are being run further into the suburbs. Here we had our first view of women laborers



on the streets and ditches, a common sight from north to south as we were to observe during the next few weeks.

As in any great city of the western world, so too in the U.S.S.R., the contrasts are very great, they even seemed intensified to our eyes: the privileged and the under-privileged; the well-to-do, well and even smartly dressed, and the very poor, drab and shabbily clothed; the young and gay and the old people with patient eyes and tired weary bodies. The housing problem is very acute in Leningrad, Moscow and in every other place where we visited. Overcrowding of families in one or two rooms; no privacy for old or young or single people; sharing of cooking and washing facilities; all this drives people out onto the streets and into the many parks until all hours of night. Everywhere it was obvious that the authorities were providing more parks, even vacant lots were set up with a few shrubs, flower beds and benches. The permanent parks were very lovely and the formal flower beds well kept and gay with all the usual flowers well known to us - salvia, canna, begonias, geraniums, dahlias, zinneas, elysum, nasturtiums and golden glow.

Large numbers of women, mostly in black skirt, short black jacket or knitted wool cardigan and the inevitable kerchief tied about their heads, kept these beds tidy and the squares, streets and bridges of which Leningrad has many over the broad Neva and over the forty or more canals that drain the flat low land on which the city was founded in 1703 by Peter the Great. Laid out on a grand scale, Petersburg (as it was then called) became the imperial capital in 1712. After the 1917 revolution, because of Lenin's leadership in overthrowing the old and establishing the new order, the city was renamed for him. The main streets and squares are magnificent but courtyards and lesser streets are often shabby and dilapidated. Nevertheless cleaner cities and towns I have seen nowhere. No one drops newspapers or scraps of paper or tram tickets. Litter receptacles are numerous and obvious, and are used by the citizens.



Leningrad suffered greatly in the long bombardment to which the Germans subjected it. Unlike Moscow it has no skyscrapers. The main streets, the beautiful granite walled embankments of the Neva on both sides, are well kept and the buildings are impressive. Many of the finest are rich golden ochre trimmed with white, like the huge Admiralty with its <sup>low</sup> dome and <sup>high</sup> needle-sharp golden spire; or a <sup>U</sup>trillo blue-green with white pilasters and window trim, like the Winter Palace, and the adjacent Hermitage Art Gallery and a smaller building erected by Catherine the Great as a private museum of art. These three buildings on the south bank of the river are connected by passages and together form one of the greatest art museums in existance. Ceilings, floors, furniture and statuary (including some by Michelangelo and Rodin) call for prolonged study. The guide speaks of <sup>two</sup> ~~one~~ million objects d'art of which the hurried visitor sees a dazzling few, for it is the great paintings that draw forth exclamations of wonder and appreciation.

Room after room of great Italian art including two small Madonna and Child<sup>s</sup> claimed to be by Leonardo da Vinci; Titians and Tinterettos, and Raphaels, del Sartos and Lippo Lippis, Guido Renis and Luinis; an exact replica of Raphael's Logia in the Vatican; fine examples of the Spanish painters, Murillo, Velasquez, Goya, El Greco; a rich collection of Dutch, especially fine Rembrandts and van Dyck; <sup>many examples</sup> of German and of British painters. On the third floor in a series of dazzling rooms are the French collection - an entire <sup>178</sup> room of Monets, another with twenty-two Picassos, many of Cezanne's finest and Gauguin, Renoir, Matisse . . . . but why try to name even these when so much must be left unsaid and no attempt made to describe the Throne Room, the Great Hall of 1812, the Hall of St. George or the magnificent marble stairway. The galleries were uncomfortably crowded with conducted groups of adults and of children from all over the Soviet Union and from China as well as western foreigners - the children looking supersaturated



with wonders and eager only to find a bench on which to rest their weary little limbs.

Sixteen churches, our guide informed us, are open for worship in Leningrad, but every one we passed on a bus tour of the city was either a museum or "closed for repairs". I subsequently went into two of these church-museums. St. Isaac's has triple rows of polished red granite columns outside, and dazzling green malachite-veneered columns inside, an ornate iconostas with some fine old icons and many less interesting ones. The dome is about 93 metres high, third only to St. Peters in Rome and St. Pauls in London. A Foucault pendulum was swinging with a solemn 18-second period and a young woman was expounding in Russian to the crowds of citizens and visitors, the evidence for the rotation of the earth which the pendulum provides.

The Fortress of Peter and Paul is on an island set deeply into the north bank of the Neva and approached by two bridges. \* Within ~~its~~ thick grim red brick walls, built in 1703, is the small cathedral (so-called) in which is the tomb of Peter the Great and some 30 other subsequent Tsars or members of the royal families. Of all these great white marble tombs, each with its large gilt cross on the lid, one was marked by two vases of flowers - that of Peter the Great, founder of the city, a man of simple tastes and high ideals for his people and his country. His memory is highly respected even though this great city no longer bears his name.

The scientific object of our visiting this great one-time capital city of the Russian Empire was Pulkovo Observatory, founded in 1839 by F.W. Struve (1793 - 1864) under the auspices of the Academy of Sciences. Fundamental astronomical work was carried out from its inception at the highest level of accuracy, values of astronomical constants were obtained and pioneer work was done in stellar parallax determinations. International cooperation was early established with Paris, Greenwich, Washington, Germany and the Cape Observatory, and has expanded

\* see insert



★ I set out to walk to it from my hotel on my last afternoon. Finding it much further than I had imagined, I was directed to the right tram by a traffic policeman at the far end of the long Neva bridge - a few Russian words and many gesticulations go a long way when everyone is eager to be helpful - I got on at the wrong end of a crowded tram, could not possibly work my way down to the conductor's end and was finally forcibly ejected by a kind little boy and several interested women at a short cut to the Fortress bridge!

★ Insert for page 4.



continuously. Today Pulkovo is one of the great observatories, renowned for the high quality and range of observational work and for the vigor with which new methods and ideas are developed. The buildings and domes were largely destroyed by the German invaders, but now one can count about fifteen domes. Work is in progress in Time Service, Latitude variation, photographic, photometric and spectrographic stellar research, solar physics and radioastronomy.

There are extensive optical works at Pulkovo and today Russian scientists, craftsmen and technicians have made it unnecessary for any equipment to be imported from foreign countries, in sharp contrast to the situation forty years ago. Just prior to the first world war a 41-inch objective lens<sup>e</sup> was ordered by the Russian government from the Sir Howard Grubb, Parsons firm of Newcastle-on-Tyne. This fine objective was purchased by the Soviet government in the early 1920's and put to good use by Soviet astronomers at Semeis Observatory<sup>in the</sup> southern Crimea, but the German invasion swept over the Crimea and this beautiful lens was ruthlessly dismantled by the army and transported to Berlin. In 1945 the Soviet astronomers retrieved it, but only as an example of the stupidity of war! - its once beautiful surface is pocked and splintered as though by a machine gun spray. We saw it at Pulkovo. When they wish to replace it, the glass works of Leningrad can make the blank and the optical works of Pulkovo can figure and polish the lens.

Soviet scientists are justifiably proud of their three artificial satellites. Visual and photographic records of their positions, compilation of observations reported regularly by observatories in every continent, calculation of orbital changes and of the geophysical data which the satellites are providing - in all this Pulkovo is playing a leading role.

The Director, Dr. A.A. Mikhailov, spoke to us of the history and present scope of the observatory in the beautiful auditorum, then personally conducted one group of us from dome to dome, energetically discussing improvements and techniques and answering a barrage of questions; and finally entertained us at



a buffet lunch in the central observatory building where we enjoyed caviar, smoked salmon, salad, hard boiled eggs, little sweet cakes, soft drinks and chocolates - this last a very expensive luxury in the U.S.S.R. where a 2 oz bar of milk chocolate sells for 90 cents. As we returned the 11 miles to Leningrad, by the straight road over the flat plain the 250 ft hill crowned by Pulkovo Observatory stood up impressively against the southern sky.

1958 Sept. 23

A. VIBERT DOUGLAS

Professor of Astronomy, Queen's University



SOME OBSERVATIONS WITHIN THE U.S.S.R. I

The occasion which brought almost 600 astronomers from 35 countries to the U.S.S.R. where they were made welcome by some 240 Soviet astronomers, was the Xth General Assembly of the International Astronomical Union meeting in Moscow from August 12 - 20, 1958.

The Academy of Sciences of the Soviet Union had invited us to visit Leningrad either before or after the General Assembly, which explains why a considerable number of astronomers entered the U.S.S.R. from the north west, taking train or plane from Helsinki to Leningrad or arriving by boat at the mouth of the broad Neva river from London, Copenhagen, Stockholm or Helsinki.

I flew in by Soviet <sup>air line</sup> plane from Helsinki on August 6, finding myself on the same plane as Professor and Mrs. Danjon of Paris, two astronomers from Herstmonceux, one from Teddington, and one American. ~~To greet~~ Dr. Danjon <sup>was met by</sup> the President of the I.A.U. 1955-58, the Director of Pulkovo Observatory, Dr. Mikhailov with his wife, herself an astronomer, and Professor Sabbotin were out at the airport where they welcomed us all and escorted us to the "Intourist" waiting room of the three-storey airport. This room was furnished like a Victorian sittingroom. For the astronomers all formalities were reduced to a minimum: no customs inspection; no long delay over passports; with apologies we were asked to list our money; and then, bag and baggage, we were taken in ~~two~~ taxis northward on a long straight road to Leningrad. We passed a large pretentious Military Academy, many <sup>new</sup> large rectangular apartment blocks, much road construction, especially where the city tram lines are being run further into the suburbs. Here we had our first view of women laborers



on the streets and ditches, a common sight from north to south as we were to observe during the next few weeks.

As in any great city of the western world, so too in the U.S.S.R., the contrasts are very great, they even seemed intensified to our eyes: the privileged and the under-privileged; the well-to-do, well and even smartly dressed, and the very poor, drab and shabbily clothed; the young and gay and the old people with patient eyes and tired weary bodies. The housing problem is very acute in Leningrad, Moscow and in every other place where we visited. Overcrowding of families in one or two rooms; no privacy for old or young or single people; sharing of cooking and washing facilities; all this drives people out onto the streets and into the many parks until all hours of night. Everywhere it was obvious that the authorities were providing more parks, even vacant lots were set up with a few shrubs, flower beds and benches. The permanent parks were very lovely and the formal flower beds well kept and gay with all the usual flowers well known to us - salvia, canna, begonias, geraniums, dahlias, zinneas, elysum, nasturtiums and golden glow.

Large numbers of women, mostly in black skirt, short black jacket or knitted wool cardigan and the inevitable kerchief tied about their heads, kept these beds tidy and the squares, streets and bridges of which Leningrad has many over the broad Neva and over the forty or more canals that drain the flat low land on which the city was founded in 1703 by Peter the Great. Laid out on a grand scale, Petersburg (as it was then called) became the imperial capital in 1712. After the 1917 revolution, because of Lenin's leadership in overthrowing the old and establishing the new order, the city was renamed for him. The main streets and squares are magnificent but courtyards and lesser streets are often shabby and dilapidated. Nevertheless cleaner cities and towns I have seen nowhere. No one drops newspapers or scraps of paper or tram tickets. Litter receptacles are numerous and obvious, and are used by the citizens.



Leningrad suffered greatly in the long bombardment to which the Germans subjected it. Unlike Moscow it has no skyscrapers. The main streets, the beautiful granite walled embankments of the Neva on both sides, are well kept and the buildings are impressive. Many of the finest are rich golden ochre trimmed with white, like the huge Admiralty with its <sup>low</sup>dome and <sup>high</sup>needle-sharp golden spire; or a trillio blue-green with white pilasters and window trim, like the Winter Palace, and the adjacent Hermitage Art Gallery and a smaller building erected by Catherine the Great as a private museum of art. These three buildings on the south bank of the river are connected by passages and together form one of the greatest art museums in existence. Ceilings, floors, furniture and statuary (including some by Michelangelo and Rodin) call for prolonged study. The guide speaks of ~~two~~ million objects d'art of which the hurried visitor sees a dazzling few, for it is the great paintings that draw forth exclamations of wonder and appreciation.

Room after room of great Italian art including two small Madonna and Child claimed to be by Leonardo da Vinci, Titians and Tinterettos, and Raphaels, del Sartos and Lippe Lippis, Guido Renis and Luinis; an exact replica of Raphael's Logia in the Vatican; fine examples of the Spanish painters, Murillo, Velasquez, Goya, El Greco; a rich collection of Dutch, especially fine Rembrandts and van Dyck; <sup>many examples</sup> of German and of British painters. On the third floor in a series of dazzling rooms are the French collection - an ~~entire~~ <sup>entire</sup> room of Monets, another with twenty-two Picassos, many of Cezannes' finest and Gauguin, Renoir, Matisse . . . . but why try to name even these when so much must be left unsaid and no attempt made to describe the Throne Room, the Great Hall of 1812, the Hall of St. George or the magnificent marble stairway. The galleries were uncomfortably crowded with conducted groups of adults and of children from all over the Soviet Union and from China as well as western foreigners - the children looking supersaturated



with wonders and eager only to find a bench on which to rest their weary little limbs.

Sixteen churches, our guide informed us, are open for worship in Leningrad, but every one we passed on a bus tour of the city was either a museum or "closed for repairs". I subsequently went into two of these church-museums. St. Isaac's has triple rows of polished red granite columns outside, and dazzling green malachite veneered columns inside, an ornate iconostas with some fine old icons and many less interesting ones. The dome is about 93 metres high, third only to St. Peters in Rome and St. Pauls in London. A Foucault pendulum was swinging with a solemn 18 second period and a young woman was expounding in Russian to the crowds of citizens and visitors, the evidence for the rotation of the earth which the pendulum provides.

\*  
↓  
The Fortress of Peter and Paul is on an island set deeply into the north bank of the Neva and approached by two bridges. <sup>\*</sup> Within its thick grim red brick walls, built in 1703, is the small cathedral (so-called) in which is the tomb of Peter the Great and some 30 other subsequent Tsars or members of the royal families. Of all these great white marble tombs, each with its large gilt cross on the lid, one was marked by two vases of flowers - that of Peter the Great, founder of the city, a man of simple tastes and high ideals for his people and his country. His memory is highly respected even though this great city no longer bears his name.

The scientific object of our visiting this great one-time capital city of the Russian Empire was Pulkovo Observatory, founded in 1839 by F.W. Struve (1793 - 1864) under the auspices of the Academy of Sciences. Fundamental astronomical work was carried out from its inception at the highest level of accuracy, values of astronomical constants were obtained and pioneer work was done in stellar parallax determinations. International cooperation was early established with Paris, Greenwich, Washington, Germany and the Cape Observatory, and has expanded



continuously. Today Pulkovo is one of the great observatories, renowned for the high quality and range of observational work and for the vigor with which new methods and ideas are developed. The buildings and domes were largely destroyed by the German invaders, but now one can count about fifteen domes. Work is in progress in Time Service, Latitude variation, photographic, photometric and spectrographic stellar research, solar physics and radioastronomy.

There are extensive optical works at Pulkovo and today Russian scientists, craftsmen and technicians have made it unnecessary for any equipment to be imported from foreign countries, in sharp contrast to the situation forty years ago. Just prior to the first world war a 41 inch objective lens was ordered by the Russian government from the Sir Howard Grubb, Parsons firm of Newcastle-on-Tyne. This fine objective was purchased by the Soviet government in the early 1920's and put to good use by Soviet astronomers at Semeis Observatory <sup>in the</sup> southern Crimea, but the German invasion swept over the Crimea and this beautiful lens was ruthlessly dismantled by the army and transported to Berlin. In 1945 the Soviet astronomers retrieved it, but ~~only~~ <sup>as</sup> an example of the <sup>ruthless</sup> stupidity of war! ~~its~~ <sup>ruined,</sup> once beautiful surface is pocked and splintered as though by a machine gun spray. We saw it at Pulkovo. When they wish to replace it, the glass works of Leningrad can make the blank and the optical works of Pulkovo can figure and polish the lens.

Soviet scientists are justifiably proud of their three artificial satellites. Visual and photographic records of their positions, compilation of observations reported regularly by observatories in every continent, calculation of orbital changes and of the geophysical data which the satellites are providing - in all this Pulkovo is playing a leading role.

The Director, Dr. A.A. Mikhallov, spoke to us of the history and present scope of the observatory in the beautiful auditorium, then personally conducted one group of us from dome to dome, energetically discussing improvements and techniques and answering a barrage of questions; and finally entertained us at



a buffet lunch in the central observatory building where we enjoyed caviar, smoked salmon, salad, hard boiled eggs, little sweet cakes, soft drinks and chocolates - this last a very expensive luxury in the U.S.S.R. where a 2 oz bar of milk chocolate sells for 90 cents. As we returned the 11 miles to Leningrad, by the straight road over the flat plain the 250 ft hill crowned by Pulkovo Observatory stood up impressively against the southern sky - a phoenix arisen from its ashes.



\* I set out to walk to it from my hotel on my last afternoon. Finding it much further than I had imagined, I was directed to the right tram by a traffic policeman at the far end of the long Neva bridge - a few Russian words and many gesticulations go a long way when everyone is eager to be helpful - I got on at the wrong end of a crowded tram, could not possibly work my way down to the conductor's end and was finally forcibly ejected by a kind little boy and several interested women at a short cut to the Fortress bridge!

\* Insert for page 4.



SOME OBSERVATIONS WITHIN THE U.S.S.R. II

My bedroom at the Astroria Hotel in Leningrad during my four day visit to that beautiful city was Victorian in the extreme: heavy red plush drapes, red plush and gilt chairs and divan, large gilt legged desk with two heavy brass ornaments not however of Zeus and Apollo but of muscular labourers; an alcove for the bed with red plush curtain and on the bed a white lace spread and two huge square pillows with a white lace cover; a centre table draped with a handsome pile rug. The heavily carpeted stairs spiralled around the one small lift and were usually indicated as the way of descent even from the fourth and higher floors, though usually by patient waiting one could squeeze into the lift going up. In complete contrast was the new sky scraper Hotel Ukraina (with accent on the penultimate syllable) to which almost all the foreign astronomers were escorted on arrival in Moscow. Erected rather too hurriedly in the last two or three years, it is already showing signs of undue wear and tear, bathroom tiles, for example, were loosening and cracking. The bedrooms were simply and adequately furnished. A few "luxury" suites consisted of a vestibule, sittingroom with sofa, comfortable chairs and a piano, and two bedrooms. I was interested to see one such apartment which had been assigned to a senior, titled astronomer from Great Britain.

On each floor of the hotel was a central lobby presided over by an observant guardian of the keys. Three lifts served floors 1 - 10 and three more floors 10 - 24. One of each was frequently without an operator so that the delays either for going up or down were often tedious. The stairs were for emergency only and were kept locked off on every floor. On the 24th floor of the central



tower was a small cafe with a balcony around the four sides from which one obtained commanding views of the city and the Moscow River which passes the Ukraina Hotel and then runs in a long bend around the oldest part of the city.

Moscow dates back to the 12th century when the power of Kiev, now capital of Ukraine, was dwindling away. The original fortress on the Kremlin site was of wood and was destroyed by the Tartars. Successive forts were built to withstand the Polish and Tartar invasions. Now the Kremlin with its high 15th century red brick walls and its twenty towers comprises a large area rising with stately impressiveness on a hill on the left bank of the river. Inside the walls are the ochre and white 19th century "grand residence of the Tsars" used for state receptions and the high councils of the Soviet, <sup>also</sup> the armory, a large museum of state treasures, some blocks of government offices, broad walks and gardens, a high white bell tower and three 15th century churches with frescoes over the entrance and on the inner walls from floor to vaulted roof and even on the columns.

On one side of the Kremlin is the great Red Square paved with red granite blocks. At the river end is the triumph of Russian ecclesiastical architecture St. Basils, every one of its nine onion domes glistening with a different combination of coloured glazed tiles. Along the Kremlin wall stretches a narrow garden planted with fir and cypress trees and in this setting is the red granite tomb where Lenin and Stalin lie recumbent on black marble biers in impressive silence and darkness, their white faces lit by a concealed fluorescent lamp. The graves of some leading heroes of the revolution are behind the mausoleum among the cypress trees by the Kremlin Wall.

Opposite the river end of the Red Square is a large historical museum and down the hill behind the Kremlin lies the busy, thronged centre of the city, — the main streets very broad and very clean, the Bolshoi Opera House, some good hotels, shops and offices, the Lenin Library and the Pushkin Museum of Art, the



House of Trade Unions with its fine large Hall of Columns and workers' clubs. The old university where now the Social Studies and Humanities are taught faces a square in this part of old Moscow. The new university where the sciences are taught is a mammoth skyscraper dominating the city from the crest of the only real hill in or near Moscow, the Lenin Hill at the south side of the U-shaped bend of the river. As this was where the General Assembly of the International Astronomical Union was held, more will be said of this great building later.

Moscow boasts seven or eight ornate Chrysler-type skyscrapers which tower up to lofty pinnacles surmounted by a star or hammer and sickle. They are widely spaced over the great city and contrast strikingly with the severe blocks of six to nine storey apartment buildings being built in large numbers in various sections and in new suburbs, and even more strikingly with the old city buildings, and with the districts of low shabby buildings, tenements and one storey cottages all of which will disappear gradually with apartment blocks taking their places. More living space is a crying need not minimized by any of our interpreters or our guides on sight-seeing tours. It was quite a shock, however, when we were told that space in the new housing blocks was allocated by the authorities on the basis of five square metres per person - this is a floor space of approximately nine feet by six feet. Thus a room 14 ft x 16 ft would be shared by four people with bathroom and cooking facilities shared also by the occupants of other rooms.

Walking along the streets of Leningrad or Moscow I often glanced at the window of a basement room; if the usually neat clean white curtain were drawn back two, three or even four beds or a double and one or two single beds might be seen according to the size of the room. One of the clerical assistants at the university told me she was one of a family of six; they had two rooms and shared cooking and washroom facilities with three other families. Was the kitchen large enough for more than one stove? "No, one gas stove, but it has four burners. We are too crowded, but we manage to get on amicably!" She said they had their name listed



for better accommodation but it would take time. Evidently a letter from the Labour Union official helped in this as in many other matters such as holiday trips.

Everyone is not thus cramped. A priveleged class exists - and they, we were told, are the intelligensia - members of the higher ranks of government, professors, research scientists, the best artists. Other privileged people, apparently are those who carry the widest responsibilities in management in industry and in the other manifold organizational posts in a socialized state. There are also the families, mostly in the country, who own their cottages and small gardens. Many but not all of these are one storey, many are built of logs with nineteenth century fretwork about the eaves, the logs stained and weathered to a rich walnut brown. Driving past several miles of such cottages on the road to Zagorsk we saw at long intervals the community well and boys and women drawing water and carrying it in buckets along the roadside. If we passed a large house in extensive grounds, our guide would tell us the use to which it is now put - a workers' club, a rest home, or perhaps an agricultural experimental centre.

The astronomers' committee which planned the details of our conference included either just before or after the Conference proper, many tours to places of special interest such as art galleries, museums, Tolstoi's house in a working district of the city, and the vast permanent Exhibitions of Agriculture and Industry. Many of us visited the Exhibition on a Sunday afternoon when the place was thronged with citizens and visitors. Every State of the Union has its own building with magnificent displays of its natural products, mineral resources, manufactures, arts and crafts. Other buildings house the agricultural displays, light and heavy industry, atomic energy and the full size models of the three artificial satellites, the sputniks. I was deeply impressed by the fine educational job which the last two buildings achieve - an actual atomic pile



producing a glow at the bottom of a 30 foot tank of heavy water, and the sputnik models with excellent wall diagrams, charts and explanations were very impressive. When the Soviet technicians and craftsmen wish to achieve the highest quality, they can do it superbly.



SOME OBSERVATIONS WITHIN THE U.S.S.R. II

My bedroom at the Astroria Hotel in Leningrad during my four day visit to that beautiful city was Victorian in the extreme: heavy red plush drapes, red plush and gilt chairs and divan, large gilt legged desk with two heavy brass ornaments, not however of Zeus and Apollo but of muscular labourers; an alcove for the bed with red plush curtain and on the bed a white lace spread and two huge square pillows with a white lace cover; a centre table draped with a handsome pile rug. The heavily carpeted stairs spiralled around the one small lift and were ~~usually~~ <sup>frequently</sup> indicated as the way of descent even from the fourth and higher floors, though usually by patient waiting one could squeeze into the lift going up. In complete contrast was the new sky scraper Hotel Ukraina (with accent on the penultimate syllable) to which almost all the foreign astronomers were escorted on arrival in Moscow. Erected rather too hurriedly in the last two or three years, it is already showing signs of undue wear and tear, bathroom tiles, for example, were loosening and cracking. The bedrooms were simply and adequately furnished. A few "luxury" suites consisted of a vestibule, sittingroom with sofa, comfortable chairs and a piano, and two bedrooms. I was interested to see one such apartment which had been assigned to a senior, ~~senior~~ astronomer from Great Britain.

On each floor of the hotel was a central lobby presided over by an observant guardian of the keys. Three lifts served floors 1 - 10 and three more floors 10 - 24. One of each was frequently without an operator so that the delays either for going up or down were often tedious. The stairs were for emergency only and were kept locked off on every floor. On the 24th floor of the central



tower was a small cafe with a balcony around the four sides from which one obtained commanding views of the city and the Moscow River which passes the Ukraina Hotel and then runs in a long bend around the oldest part of the city.

Moscow dates back to the 12th century when the power of Kiev, now capital of Ukraine, was dwindling away. The original fortress on the Kremlin site was of wood and was destroyed by the Tartars. Successive forts were built to withstand the Polish and Tartar invasions. Now the Kremlin with its high 15th century red brick walls and its twenty towers comprises a large area rising with stately impressiveness on a <sup>low</sup> hill on the left bank of the river. Inside the walls are the ochre and white 19th century "grand residence of the Tsars" used for state receptions and the high councils of the Soviet, the armory, a large museum of state treasures, some blocks of government offices, broad walks and gardens, a high white bell tower and three 15th century churches with frescoes over the entrance and on the inner walls from floor to vaulted roof and even on the columns.

On one side of the Kremlin is the great Red Square paved with red granite blocks. At the river end is the triumph of Russian ecclesiastical architecture St. Basils, every one of its nine onion domes glistening with a different combination of coloured glazed tiles. Along the Kremlin wall stretches a narrow garden planted with fir and cypress trees and in this setting is the red granite tomb where Lenin and Stalin lie recumbent on black marble biers in impressive silence and darkness, their white faces lit by a concealed fluorescent lamp. The graves of some leading heroes of the revolution are behind the mausoleum among the cypress trees by the Kremlin wall. One of the clerical assistants at the university told me opposite the river end of the Red Square is a large historical museum and down the hill behind the Kremlin lies the busy, thronged centre of the city, the main streets very broad and very clean, the Bolshoi Opera House, some good hotels, shops and offices, the Lenin Library and the Pushkin Museum of Art, the



House of Trade Unions with its fine large Hall of Columns and workers' clubs.

The old university where now the Social Studies and Humanities are taught faces a square in this part of old Moscow. The new university where the sciences <sup>and languages</sup> are taught is a mammoth skyscraper dominating the city from the crest of the only real hill in or near Moscow, the Lenin Hill at the south side of the U-shaped bend of the river. As this was where the General Assembly of the International Astronomical Union was held, more will be said of this great building later.

Moscow boasts seven or eight ornate Chrysler-type skyscrapers which tower up to lofty pinnacles surmounted by a star or hammer and sickle. They are widely spaced over the great city and contrast strikingly with the severe blocks of six to nine storey apartment buildings being built in large numbers in various sections and in new suburbs, and even more strikingly with the old city buildings, and with the districts of low shabby buildings, tenements and one storey cottages all of which will disappear gradually with apartment blocks taking their places. More living space is a crying need not minimized by any of our interpreters or our guides on sight-seeing tours. It was quite a shock, however, when we were told that space in the new housing blocks was allocated by the authorities on the basis of five square metres per person - this is a floor space of approximately nine feet by six feet. Thus a room 14 ft x 16 ft would be shared by four people with bathroom and cooking facilities shared also by the occupants of other rooms.

Walking along the streets of Leningrad or Moscow I often glanced at the window of a basement room; if the usually neat clean white curtain were drawn back two, three or even four beds or a double and one or two single beds might be seen according to the size of the room. One of the clerical assistants at the university told me she was one of a family of six; they had two rooms and shared cooking and washroom facilities with three other families. Was the kitchen large enough for more than one stove? "No, one gas stove, but it has four burners. We are too crowded, but we manage to get on amicably!" She said they had their name listed



for better accommodation but it would take time. Evidently a letter from the Labour Union official helped in this as in many other matters such as holiday trips.

Everyone is not thus cramped. A privileged class exists - and they, we were told, are the intelligensia - members of the higher ranks of government, professors, research scientists, the best artists. Other privileged people, apparently are those who carry the widest responsibilities in management in industry and in the other manifold organizational posts in a socialized state. There are also the families, mostly in the country, who own their cottages and small gardens. Many but not all of these are one storey, many are built of logs with nineteenth century fretwork about the eaves, the logs stained and weathered to a rich walnut brown. Driving past several miles of such cottages on the road to Zagorsk we saw at long intervals the community well and boys and women drawing water and carrying it in buckets along the roadside. If we passed a large house in extensive grounds, our guide would tell us the use to which it is now put - a workers' club, a rest home, or perhaps an agricultural experimental centre.

The astronomers' committee which planned the details of our conference included, either just before or after the Conference proper, many tours to places of special interest such as art galleries, museums, Tolstoi's house in a working district of the city, and the vast permanent Exhibitions of Agriculture and Industry. Many of us visited the Exhibition on a Sunday afternoon when the place was thronged with citizens and visitors. Every State of the Union has its own building with magnificent displays of its natural products, mineral resources, manufactures, arts and crafts. Other buildings house the agricultural displays, light and heavy industry, atomic energy and the full size models of the three artificial satellites, the sputniks. I was deeply impressed by the fine educational job which the last two buildings achieve - an actual atomic pile



producing a glow at the bottom of a 30 foot tank of heavy water, and the sputnik models with excellent wall diagrams, charts and explanations were very impressive. When the Soviet technicians and craftsmen wish to achieve the highest quality, they can do it superbly.



SOME OBSERVATIONS WITHIN THE U.S.S.R. III

Moscow University was founded by Catherine the Great in 1755. In the years 1949-53 a huge new building was erected on the low ridge overlooking the Moscow River to the south of the old city. This Lenin Hill follows the curve of the river and, by contrast with the flatness of the plain on which Moscow stands, it provides a commanding site for this 30 storey skyscraper which terminates in a tower and spire half as high again and topped by a star set in olive branches.

Student accommodation is provided for 6000 in two wide deep 16 storey wings which extend to east and west, beyond which are two 8 storey wings terminating in four higher blocks of professors' apartments. A professor may be given a four room self contained apartment for himself and his family. The students are in single and fewer in double rooms, according to my informant, a third year language student assisting at the conference information desk. Cafeterias, kitchenettes, laundries and lounge rooms are provided. Each student has a desk, table, two 5-foot book shelves, a metal bed with springs and a thin mattress, one or two upright wood chairs, a built-in wardrobe with shelves, and lockers above it, and the luxury of a toilet, shower and basin. The single and double rooms shown to me were said to be typical.

The entire central block of this vast building is academic. It is built of yellow brick with some red trimmings such as the polished granite pillars at the broad entrance. This entrance leads into a spacious extensive lobby with several thousand pigeon-holes behind a series of porters' desks. Beyond this is a sequence of marble halls with three sets of stairs on either side leading up to the first floor. This gives an idea of the great depth of the building. The auditorium where our



General Assembly met and where the main Symposia were held is spacious and efficiently designed. In medallions on left and right of the platform are overlapping profiles of Marx and Engels and of Lenin and Stalin. Booths had been installed at the side for simultaneous translators for Russian, English and French.

Classrooms are of many sizes, some large amphitheatre type, some with sloping floor, and other smaller rooms. The solid built-in desks and seats with few aisles necessitated considerable climbing over one another to get down to the black-board or to escape from a long drawn out session of one Commission in order to attend another. Black-boards were good and in the larger rooms moved up or down freely as more space was wanted or for further reference to a formula written out earlier. Projection lanterns gave considerable trouble to the operators in nearly every hall or classroom. In the auditorium the simultaneous translation was heard by ear phones attached to a light compact radio-telephone receiver on a shoulder strap which was issued to each delegate just before a meeting at which translation was to be made.

The ten day Conference opened on the evening of August 12 when about 1000 astronomers and guests assembled in the great Hall of Columns in the House of Trade Unions - a large impressive white marble hall hung with chandeliers. Here under the chairmanship of Dr. Mikhailov of Pulkovo Observatory, we were welcomed by representatives of the Government (the Council of Ministers) the Academy of Science, Dr. Ambartzumian (Chairman of the committee of Soviet astronomers who planned the Assembly) and Dr. Danjon (President of the International Astronomical Union). The speeches of the first two were not unmingled with political remarks and overtones. Relatively insignificant contributions to astronomical science made or planned by satellite countries were emphasised and the great additions to knowledge which China would soon be making. Even the Arab states were not omitted, by the expedient of reminding us that many stars bear arabic names bestowed upon them more than twenty one centuries ago.



After the formal part of the meeting was over, the stage was set up for the Armenian Symphony Orchestra and an hour of fine Russian music followed. On our return to the hotel about 11.15pm many of us who had had no supper earlier (Russians have dinner between 12.30 and 3.30 and supper between 6.30 and 12pm) sat down in the hotel Dining Room at 11.30pm to shrimps in oil, cold roast veal, bread and butter and fruit juice.

The scientific sessions began the following day. A symposium on astronomical observations by means of rockets, balloons and artificial satellites provided several interesting reports. The granules, myriad relatively small radiating patches on the surface of the sun, have been photographed by British and French observers in the cage of a balloon at 21,000 ft. Directionally controlled telescopes in unmanned American balloons at 80,000 ft indicate a large range of diameters from 150 miles to 900 miles. The problems posed by granules demand further theoretical and observational study, the latter with larger telescopes than are at present used with balloons. Geiger counters in rockets have recorded the X-ray spectrum of the sun at several bands of frequency. The **Soviet** scientists reported on the electron densities at various heights in the ionosphere deduced from the varying intensity of the radio signals received from their "sputniks" as they traversed the elliptical orbits through successive layers of the earth's atmosphere. The height at which our atmosphere merges into interplanetary space conditions is given as 1200 to 1800 miles.

Printed reports to the I.G.Y. committee were given us on the physiological effects on animals which Soviet scientists have rocketed up to 120 miles and recovered alive - with no evident ill effects even after six months subsequent observation.

Long sessions were devoted to old and new theories on the evolution of stars, the formation of a planetary system, the luminosity of cepheid variable stars and the distance scale of the great universe of galaxies; and to consideration of the accumulating evidence that seems only to add to the complexity of the picture in each case. With 800 astronomers from 36 countries it was certain that, in spite of the inevitable overlapping



of sessions on perhaps five or six branches of astronomy which occurred frequently, there would always be an interesting international group exchanging views and viewpoints at any one session. The symposium on the origin of the earth and planets stands out in my memory in this respect for the air was often electric with argument and counter-argument, thrust and parry, between men whose names are internationally known such as Sir Harold Jeffreys and Fred Hoyle of Great Britain, G.P. Kuiper and H. Urey of U.S.A., B.U. Levin of U.S.S.R. and E. Schatzman of France.

Certain groups of astronomers were of course concentrating on the subjects of special concern to them - celestial mechanics, instruments, photometry, double stars, spectrum line standards, time determinations, latitude variations, stellar statistics, eclipses, history of astronomy, bibliography and a score of other subdivisions. The newest and most rapidly developing branch is radioastronomy, and several stimulating sessions were devoted to this. Part of the energy carried up from the hot glowing gases at the surface of the sun by turbulent currents is dissipated in the sun's chromosphere and corona by the emission of radio waves, short waves just over an inch from crest to crest near the surface, longer and longer waves at higher levels. Localized regions of radio emission on the sun are being investigated by improved methods. Radio waves are recorded also from certain explosive stars, from turbulent gases or nebulae in interstellar space and from many of the great galaxies distributed throughout this vast universe and from many unidentified sources whose optical radiations are too weak to be photographed.

Since hydrogen atoms are known to emit a radio frequency corresponding to a wavelength 21 cm (or about  $8\frac{1}{4}$  inches) it is now possible to map the distribution of vast regions of hydrogen gas in the Milky Way, and this has confirmed in spectacular measure the assumption that the great galaxy of which our sun is one humble member is in fact a great spiral galaxy from whose central region hydrogen is streaming outwards and in whose spiral arms great clouds of hydrogen have accumulated.



No account of the Conference should fail to refer to the unforgettable reception tendered by the Government in the magnificent series of State rooms of the Kremlin. From the great white barrel vaulted ball-room glistening with the myriad lights of six gigantic chandeliers, we wandered through a spacious domed rotunda, with high minstrels gallery where an orchestra played throughout the evening. Here dancing began about 10pm. From this handsome lobby a series of distinctly Russian rooms opened, one beyond the other, each with heavily ornate doors and pillars and with frescoes on walls and vaulted ceilings, most of them of Biblical scenes or based on legends of the lives of early Russian saints. From the rotunda we were free to ascend to the private apartments of the Tsars - the audience chamber, the bedroom, the chapel with its fine dark icons and rich elaborate silver grill door to the Sanctum, the hanging censers still smelling of the incense which smouldered in them long years ago. Truly "the old order passeth, yielding place to new" and this is true not only in the social and political world but in the realm of science as this great conference of astronomers bore ample evidence.



General Assembly met and where the main symposia were held in spacious and efficiently designed. In addition, at left and right of the building are overlapping profiles of Marx and Engels and of Lenin and Stalin. Booths had been installed at the side for simultaneous translators for Russian, English and French.

SCENE OBSERVATIONS WITHIN THE U.S.S.R. III

Classrooms are of many sizes, some large amphitheatre type, some with sloping floor. Moscow University was founded by Catherine the Great in 1755. In the years 1949-53 a huge new building was erected on the low ridge overlooking the Moscow River to the south of the old city. This Lenin Hill follows the curve of the river and, by contrast with the flatness of the plain on which Moscow stands, it provides a commanding site for this 30 storey skyscraper which terminates in a tower and spire half as high again and topped by a star set in olive branches.

Student accommodation is provided for 6000 in two wide deep 16 storey wings which extend to east and west, beyond which are two 8 storey wings terminating in four higher blocks of professors' apartments. A professor may be given a four room self contained apartment for himself and his family. The students are in single and fewer in double rooms, according to my informant <sup>who was</sup> a third year language student assisting at the conference information desk. Cafeterias, kitchenettes, laundries and lounge rooms are provided. Each student has a desk, table, two 5-foot book shelves, a metal bed with springs and a thin mattress, one or two upright wood chairs, a built-in wardrobe with shelves, and lockers above it, and the luxury of a toilet, shower and basin. The single and double rooms shown to me were said to be typical.

The entire central block of this vast building is academic. It is built of yellow brick with some red trimmings such as the polished granite pillars at the broad entrance. This entrance leads into a spacious extensive lobby with several thousand pigeon-holes behind a series of porters' desks. Beyond this is a sequence of marble halls with three sets of stairs on either side leading up to the first floor. This gives an idea of the great depth of the building. The auditorium where our



After the formal part of the meeting was over, the stage was set up for the General Assembly met and where the main Symposia were held is spacious and efficiently designed. In medallions on left and right of the platform are overlapping profiles of Marx and Engels and of Lenin and Stalin. Booths had been installed at the side for simultaneous translators for Russian, English and French.

Classrooms are of many sizes, some large amphitheatre type, some with sloping floor, and other smaller rooms. The solid built-in desks and seats with few aisles necessitated considerable climbing over one another to get down to the black-board or to escape from a long drawn out session of one Commission in order to attend another. Black-boards were good and in the larger rooms moved up or down freely as more space was wanted or for further reference to a formula written out earlier. Projection lanterns gave considerable trouble to the operators in nearly every hall or classroom. In the auditorium the simultaneous translation was heard by ear phones attached to a light compact radio-telephone receiver on a shoulder strap which was issued to each delegate just before a meeting at which translation was to be made.

The ten day Conference opened on the evening of August 12 when about 1000 astronomers and guests assembled in the great Hall of Columns in the House of Trade Unions - a large impressive white marble hall hung with chandeliers. Here under the chairmanship of Dr. Mikhailov of Pulkovo Observatory, we were welcomed by representatives of the Government (the Council of Ministers), the Academy of Science, Dr. Ambartzumian (Chairman of the committee of Soviet astronomers who planned the Assembly) and Dr. Danjon (President of the International Astronomical Union). The speeches of the first two were not unmixd with political remarks and overtones. Relatively insignificant contributions to astronomical science made or planned by satellite countries were emphasised and the great additions to knowledge which China would soon be making. Even the Arab states were not omitted, by the expedient of reminding us that many stars bear arabic names bestowed upon them more than twenty one centuries ago.



After the formal part of the meeting was over, the stage was set up for the Armenian Symphony Orchestra and an hour of fine Russian music followed. On our return to the hotel about 11.15pm many of us who had had no supper earlier (Russians have dinner between 12.30 and 3.30 and supper between 6.30 and 12pm) sat down in the hotel Dining Room at 11.30pm to shrimps in oil, cold roast veal, bread and butter and fruit juice.

The scientific sessions began the following day. A symposium on astronomical observations by means of rockets, balloons and artificial satellites provided several interesting reports. The granules, myriad relatively small radiating patches on the surface of the sun, have been photographed by British and French observers in the cage of a balloon at 21,000 ft. Directionally controlled telescopes in unmanned American balloons at 80,000 ft indicate a large range of diameters from 150 miles to 900 miles. The problems posed by granules demand further theoretical and observational study, the latter with larger telescopes than are at present used with balloons. Geiger counters in rockets have recorded the X-ray spectrum of the sun at several bands of frequency. The Soviet scientists reported on the electron densities at various heights in the ionosphere deduced from the varying intensity of the radio signals received from their "sputniks" as they traversed the elliptical orbits through successive layers of the earth's atmosphere. The height at which our atmosphere merges into interplanetary space conditions is given as 1200 to 1800 miles.

Printed reports to the I.G.Y. committee were given us on the physiological effects on animals which Soviet scientists have rocketed up to 120 miles and recovered alive - with no evident ill effects even after six months subsequent observation.

Long sessions were devoted to old and new theories on the evolution of stars, the formation of a planetary system, the luminosity of cepheid variable stars and the distance scale of the great universe of galaxies; and to consideration of the accumulating evidence that seems only to add to the complexity of the picture in each case. With 800 astronomers from 36 countries it was certain that, in spite of the inevitable overlapping



of sessions on perhaps five or six branches of astronomy which occurred frequently, there would always be an interesting international group exchanging views and viewpoints at any one session. The symposium on the origin of the earth and planets stands out in my memory in this respect for the air was often electric with argument and counter-argument, thrust and parry, between men whose names are internationally known such as Sir Harold Jeffreys and Fred Hoyle of Great Britain, G.P. Kuiper and H. Urey of U.S.A., B.U. Levin of U.S.S.R. and E. Schatzman of France.

Certain groups of astronomers were of course concentrating on the subjects of special concern to them - celestial mechanics, instruments, photometry, double stars, spectrum line standards, time determinations, latitude variations, stellar statistics, eclipses, history of astronomy, bibliography and a score of other subdivisions. The newest and most rapidly developing branch is radioastronomy, and several stimulating sessions were devoted to this. Part of the energy carried up from the hot glowing gases at the surface of the sun by turbulent currents is dissipated in the sun's chromosphere and corona by the emission of radio waves, short waves just over an inch from crest to crest near the surface, longer and longer waves at higher levels. Localized regions of radio emission on the sun are being investigated by improved methods. Radio waves are recorded also from certain explosive stars, from turbulent gases or nebulae in interstellar space, ~~and~~ from many of the great galaxies distributed throughout this vast universe and from many unidentified sources whose optical radiations are too weak to be photographed.

Since hydrogen atoms are known to emit a radio frequency corresponding to a wavelength 21 cm (or about 8½ inches) it is now possible to map the distribution of vast regions of hydrogen gas in the Milky Way, and this has confirmed in spectacular measure the assumption that the great galaxy of which our sun is one humble member is in fact a great spiral galaxy from whose central region hydrogen is streaming outwards and in whose spiral arms great clouds of hydrogen have accumulated.



No account of the Conference should fail to refer to the unforgettable reception tendered by the Government in the magnificent series of State rooms of the Kremlin. From the great white barrel-vaulted ball-room glistening with the myriad lights of six gigantic chandeliers, we wandered through a spacious domed rotunda, with high minstrel's gallery where an orchestra played throughout the evening. Here dancing began about 10pm. From this handsome lobby a series of distinctly Russian rooms opened, one beyond the other, each with heavily ornate doors and pillars and with frescoes on walls and vaulted ceilings, most of them of Biblical scenes or based on legends of the lives of early Russian saints. From the rotunda we were free to ascend to the private apartments of the Tsare - the audience chamber, the bedroom, the chapel with its fine dark icons and rich elaborate silver grill door to the Sanctum, the hanging censers still smelling of the incense which smoldered in them long years ago. Truly "the old order <sup>changeth</sup> ~~passeth~~, yielding place to new" and this is true not only in the social and political world but in the realm of science as this great conference of astronomers bore ample evidence.



SOME OBSERVATIONS IN THE U.S.S.R. - IV

After the final meeting of the General Assembly of the International Astronomical Union in Moscow on August 20, various members, who did not have to leave the U.S.S.R. immediately, availed themselves of the opportunity to see something of the south central or of the south western regions of the Soviet Union. I selected the tour which kept me longest inside the country, the 9-day trip to Crimea, the Georgian S.S.R. and the Armenian S.S.R., in the course of which four observatories would be visited and perhaps - with the luck of the weather gods - Mt. Elbrus highest mountain of Europe might be glimpsed.

I found myself the only Britisher in a group of 18 astronomers. We represented six nationalities: a few from France, Belgium, Sweden, Germany and the majority from the U.S.A. of whom one had been born in Bulgaria, one in Bessarabia, one in Germany, one in Scandinavia and one in Gt. Britain - enough variety to make an interesting party. The man of senior position in our group was Dr. Minkowski of Mount Wilson and Palomar.

Leaving Moscow late on the evening of August 21 we flew south over the great grain growing collective farms of the Ukraine, and put down at the large city of Kharkov in the darkness of night and in pours of rain. After a three hour delay we continued southward. The dawn light showed vast fields and far spaced villages. Later in the morning we crossed the blue waters of the Gulf of Azov near the isthmus joining the Crimea to the mainland. We saw the long railway bridge and the large industrial city of Dzhankoi, skirted the low infertile eastern coast, then inland over rising land toward the mountains of the beautiful south coast region. Landing at Simferopol in a blaze of subtropical sunshine, we were transferred to a bus which



rattled us over tortuous roads and up into the mountains with fine grey escarpments, many evergreen trees and also poplars, acacias, many kinds of nut trees, sycamores and rowans in abundance. About 10.30am we drew up at a mountain restaurant high above a beautiful rocky coastline. Here we had breakfast before driving for another hour and a half through mountain roads and down the hairpin bends to the beautiful harbour front of Yalta. This is a lovely little city spreading in terraces far up onto the hillsides, its esplanades lined with palms and flowering shrubs. A long grey stone mole and lighthouse guard the harbour where the passenger ships and the smaller tramp ships of the Mediterranean and Black Sea lie at anchor or at the wharves. The famous white marble palace of the last Tsar lies in beautiful grounds on a high rocky promontory overlooking the blue waters of the sea a few miles south of Yalta. It is now a sanatorium for non-chronic cases of tuberculosis. To get admission to it or similar places we were told by our interpreter that it was necessary to get not only a medical certificate of need but a letter of recommendation from the Trade Union official.

From Yalta we visited two fine research institutions, the Astrophysical Observatory of the Crimea 2000 feet up on the high ~~and~~<sup>arid</sup> south central plateau and Semeis Observatory on the mountain slopes of the south coast. At the former we were shown the double astrographs, the large reflector (50 inch) for spectrographic work, the refractor with objective prism for radial velocity determinations, a very short focus "stove pipe" telescope for work in the ultraviolet. We were taken to see the foundations being laid for a new telescope. Seven women were running the cement mixer and handling the wheelbarrows in the full blaze of early afternoon sun. The temperature in the shade was 110°F.

Solar research was in progress in  $H_{\alpha}$  light with a vertical and in the K line with a horizontal set-up working in the 4th to the 8th order with resulting large dispersions. Radio astronomy is being developed vigorously at wavelengths 1.5m and 10cm. A special apparatus is in use for the study of atmospheric surges. A Mills Cross is planned for 21 cm hydrogen research.



In the courtyard of the main residence we sat down with our hosts to an abundant lunch with the wines of the country and luscious grapes and peaches.

At Semeis the following day we were seeing an institution founded in 1908 and known throughout the astronomical world for the work of its late Director, Dr. Shajn, and for its great 41 inch refractor ordered originally by the Tsar from the Grubb Parsons firm at Newcastle-on-Tyne. This lens was irreparably damaged when taken to Berlin by the German invaders in the second great war. Many of us had seen it lying chipped and scratched on the floor of a building at Pulkova Observatory. Dr. Shajn's office and portrait were shown to us and his great atlas of the diffuse nebulae. We examined the plates taken with their 60 cm aperture meniscus telescope; their solar spectra and flare spectra. They took us to the brink of a hill where a plane mirror throws the light of nebulae down to a special spectrograph in the valley. We saw the aluminium coated pyrex coelostat and the solar laboratory with its slits and grating. Observational conditions in the southern Crimea are excellent since the atmosphere is remarkably steady.

After much needed cool drinks and fruit we bade farewell to our genial hosts and descended by steep winding roads to the sea where a short walk brought us to a rocky beach with huge waves rolling in, beyond the hazard of which swimming in the long swells was a life-restoring delight.

Late that evening we embarked on S.S. Ukraina, going ashore next day on the east coast of the Black Sea at Novorossi, then Tuapsi where we visited the fruit market and saw nearly everyone carrying home melons, then Sochi a health resort town of lovely parks and fountains overlooking bathing beaches. The following morning at 5am we disembarked at Sukhumi a thriving seaside resort backed by the foot hills of the high Caucasus. Part of a large park is a monkey reserve attached to the Biological Centre of the Academy of Medical Sciences. A slow train journey through the great valleys between the northern rampart of the Caucasus and the less high southern range brought us through the town of Gori on the Kura river with a huge statue of its famous son



Stalin on the station platform; and so to the capital of the Georgia S.S.R., Tbilisi (Tiflis). This is a city of 800,000, with many fine streets and public buildings on either side of the winding Kura River which flows south eastward 300 miles to the Caspian Sea. It is an historic city and with apparent pride the interpreter informed us that Christianity was brought up into south east Europe through <sup>Armenia to</sup> Tbilisi in the 4th century. We were shown extremely interesting 12th century churches on 4th century foundations, one now a museum, one still in use for Georgian Orthodox worship, and one in the care of a few pathetically poor aged nuns.

From Tbilisi we drove up the valley and high up mountain roads through pines, spruce and balsam to Abastumani Observatory, at altitude 5300 feet in the southern Caucasus. Sixty years ago S. P. Glasenap had selected this site because of the remarkable transparency of the atmosphere but his dream of a great research observatory was not realized under the Tsarist regime. Today this first of the Soviet mountain observatories is a hive of activity. We saw the 40 cm Zeiss refractor with two 20 cm cameras on the same mounting frequently used for objective prism work. A lunar electropolarimeter is sometimes used at the main focus of the large telescope. There are domes for a 30 cm refractor; a 33 cm reflector with fork type mounting for photoelectric work; a 44 cm Schmidt used largely for cepheid variables and for colour indices of extragalactic nebulae. Solar research includes work in  $H_{\alpha}$ , the infrared, prominences and flares. A fourth building in this series is for problems of night glow in the visible, ultraviolet and infrared regions. The latest addition is a new Maksutov 70 cm meniscus telescope with an  $8^{\circ}$  objective prism (the second largest known) giving stellar spectra down to 3500 A of  $13^m$  stars with 40 minute exposure.

Library, laboratories, staff house and a dining room are built under the pines. We were entertained at dinner from 3.30pm to 5pm, then given each a bag of the finest Georgian fruit, grapes, pears, peaches and a bottle of red Georgian wine for our long drive back to Tbilisi and a night train to Armenia.

In the darkness we came through the mountain passes and by daylight ran south



very close by the carefully guarded Turkish frontier to the capital of this Socialist Soviet Republic, Erevan. It is situated on a high hot plateau. About fifty miles to the south on the Turkish side of the frontier rises a magnificent massive with Mt. Ararat's snow capped peak standing nearly 17,000 ft above sea level. From this prosperous little city of 400,000 (eleven times its population in 1917) we drove up 4000 ft into the mountains to the Burakan Astrophysical Observatory, established in 1946 by the Armenian Academy of Sciences of the U.S.S.R. The Director is the distinguished Armenian scientist Dr. V. A. Ambartzumian. He and his staff conducted us around this impressive group of buildings where seven or eight telescopes are in operation, astrographs for two-colour plates of variable stars, a Schmidt instrument for research on stellar associations (a relatively new idea which had its birth at Burakan in 1947), a 21 inch Schmidt for colorimetric work on galaxies, a spectrograph for nebula studies and a 3 meter parabolic mirror for solar radiation of 50 cm wavelength. As the sun was flooding the western slopes of Ararat with slanting golden light we went up to the site of the radio telescopes, three large flat aerials for study of discrete sources at wavelengths of 1.5 m and 4.2 m. Other radio telescopes are under construction at a still higher altitude where a 1-metre Schmidt is also being erected.

Theoretical, statistical and observational work are in full flow at Burakan. One comment may be of interest about the equipment in the computation room - side by side with the computing machines is the abacus. The speed with which calculations are done on this simple apparatus is amazing. From Leningrad to Erevan we saw it in use in observatories, post offices, banks, shops and even in the markets.

That evening in the new Intourist Hotel in Erevan, the Director and his colleagues entertained us with true Armenian hospitality, informality and friendliness at a dinner at which innumerable toasts were proposed. We sat down at 9.30pm and rose at midnight, said farewell to our hosts, packed our bags, slept for four hours and then were off to the airport. Mt. Ararat's snowy summit was touched softly by the "roseate



fingers of dawn" as we winged our way northward on August 31. We passed over the lesser Caucasus, the great valley of the Kura, and the high Caucasus getting a splendid view of Mt. Elbrus towering snow clad to more than 18,000 feet; over the southern steppe land to Rostov airport on the delta of the Don and the Donets then off again over the vast collective farms of Ukraine and so by mid-afternoon to Moscow.



SOME OBSERVATIONS IN THE U.S.S.R. - IV

walked us over tortuous roads and up into the mountains with fine grey escarpments, many evergreen trees and also poplars, aspens, many kinds of soft trees, spruces and rowans in abundance. Here we had breakfast before driving for another hour and a half through mountain roads and down the hairpin bends to the beautiful

After the final meeting of the General Assembly of the International Astronomical Union in Moscow on August 20, various members, who did not have to leave the U.S.S.R. immediately, availed themselves of the opportunity to see something of the south central or of the south western regions of the Soviet Union. I selected the tour which kept me longest inside the country, the 9-day trip to Crimea, the Georgian S.S.R. and the Armenian S.S.R., in the course of which four observatories would be visited and perhaps - with the luck of the weather gods - Mt. Elbrus highest mountain of Europe might be glimpsed.

I found myself the only Britisher in a group of 18 astronomers. We represented six nationalities: a few from France, Belgium, Sweden, Germany and the majority from the U.S.A. of whom one had been born in Bulgaria, one in Bessarabia, one in Germany, one in Scandinavia and one in Gt. Britain - enough variety to make an interesting party. The man of senior position in our group was Dr. Minkowski of Mount Wilson and Palomar.

Leaving Moscow late on the evening of August 21 we flew south over the great grain growing collective farms of the Ukraine, and put down at the large city of Kharkov in the darkness of night and in pours of rain. After a three hour delay we continued southward. The dawn light showed vast fields and far spaced villages. Later in the morning we crossed the blue waters of the Gulf of Azov near the isthmus joining the Crimea to the mainland. We saw the long railway bridge and the large industrial city of Dzhankoi, skirted the low infertile eastern coast, then inland over rising land toward the mountains of the beautiful south coast region. Landing at Simferopol in a blaze of subtropical sunshine, we were transferred to a bus which



rattled us over tortuous roads and up into the mountains with fine grey escarpments, many evergreen trees and also poplars, acacias, many kinds of nut trees, sycamores and rowans in abundance. About 10,30am we drew up at a mountain restaurant high above a beautiful rocky coastline. Here we had breakfast before driving for another hour and a half through mountain roads and down the hairpin bends to the beautiful harbour front of Yalta. This is a lovely little city spreading in terraces far up onto the hillsides, its esplanades lined with palms and flowering shrubs. A long grey stone mole and lighthouse guard the harbour where the passenger ships and the smaller tramp ships of the Mediterranean and Black Seas lie at anchor or at the wharves. The famous white marble palace of the last Tsar lies in beautiful grounds on a high rocky promontory overlooking the blue waters of the sea a few miles south of Yalta. It is now a sanatorium for non-chronic cases of tuberculosis. To get admission to it or similar places we were told by our interpreter that it was necessary to get not only a medical certificate of need but a letter of recommendation from the Trade Union official.

From Yalta we visited two fine research institutions, the Astrophysical Observatory of the Crimea 2000 feet up on the high <sup>and</sup> south central plateau and Semeis Observatory on the mountain slopes of the south coast. At the former we were shown the double astrographs, the large reflector (50 inch) for spectrographic work, the refractor with objective prism for radial velocity determinations, a very short focus "stove pipe" telescope for work in the ultraviolet. We were taken to see the foundations being laid for a new telescope. Seven women were running the cement mixer and handling the wheelbarrows in the full blaze of early afternoon sun. The temperature in the shade was 110°F.

Solar research was in progress in H<sub>α</sub> light with a vertical and in the K line with a horizontal set-up working in the 4th to the 8th order with resulting large dispersions. Radio astronomy is being developed vigorously at wavelengths 1.5m and 10cm. A special apparatus is in use for the study of atmospheric surges. A Mills Cross is planned for 21 cm hydrogen research.



In the courtyard of the main residence we sat down with our hosts to an abundant lunch with the wines of the country and luscious grapes and peaches.

At Semeis the following day we were seeing an institution founded in 1908 and known throughout the astronomical world for the work of its late Director, Dr. Shajn, and for its great 41 inch refractor ordered originally by the Tsar from the Grubb Parsons firm at Newcastle-on-Tyne. This lens was irreparably damaged when taken to Berlin by the German invaders in the second great war. Many of us had seen it lying chipped and scratched on the floor of a building at Pulkova Observatory. Dr. Shajn's office and portrait were shown to us and his great atlas of the diffuse nebulae. We examined the plates taken with their 60 cm aperture meniscus telescope; their solar spectra and flare spectra. They took us to the brink of a hill where a plane mirror throws the light of nebulae down to a special spectrograph in the valley. We saw the aluminium coated pyrex coelostat and the solar laboratory with its slits and grating. Observational conditions in the southern Crimea are excellent ~~since~~ <sup>because</sup> the atmosphere is remarkably steady.

After much needed cool drinks and fruit we bade farewell to our genial hosts and descended by steep winding roads to the sea where a short walk brought us to a rocky beach with huge waves rolling in, beyond the hazard of which swimming in the long swells was a life-restoring delight.

Late that evening we embarked on S.S. Ukraina, going ashore next day on the east coast of the Black Sea at Novorossi, then Tuapsi where we visited the fruit market and saw nearly everyone carrying home melons, then Sochi a health resort town of lovely parks and fountains overlooking bathing beaches. The following morning at 5am we disembarked at Sukhumi a thriving seaside resort backed by the foot hills of the high Caucasus. Part of a large park is a monkey reserve attached to the Biological Centre of the Academy of Medical Sciences. A slow train journey through the great valleys between the northern rampart of the Caucasus and the less high southern range brought us through the town of Gori on the Kura river with a huge statue of its famous son



Stalin on the station platform; and so to the capital of the Georgia S.S.R., Tbilisi (Tiflis). This is a city of 800,000, with many fine streets and public buildings on either side of the winding Kura River which flows south eastward 300 miles to the Caspian Sea. It is an historic city and with apparent pride the interpreter informed us that Christianity was brought up into south east Europe through Tbilisi in the 4th century. We were shown extremely interesting 12th century churches on 4th century foundations, one now a museum, one still in use for Georgian Orthodox worship, and one in the care of a few pathetically poor aged nuns.

From Tbilisi we drove up the valley and high up mountain roads through pines, spruce and balsam to Abastumani Observatory, at altitude 5300 feet in the southern Caucasus. Sixty years ago S. P. Glasenap had selected this site because of the remarkable transparency of the atmosphere but his dream of a great research observatory was not realized under the Tsarist regime. Today this first of the Soviet mountain observatories is a hive of activity. We saw the 40 cm Zeiss refractor with two 20 cm cameras on the same mounting frequently used for objective prism work. A lunar electropolarimeter is sometimes used at the main focus of the large telescope. There are domes for a 30 cm refractor; a 33 cm reflector with fork type mounting for photoelectric work; a 44 cm Schmidt used largely for cepheid variables and for colour indices of extragalactic nebulae. Solar research includes work in  $H_{\alpha}$ , the infrared, prominences and flares. A fourth building in this series is for problems of night glow in the visible, ultraviolet and infrared regions. The latest addition is a new Maksutov 70 cm meniscus telescope with an  $8^{\circ}$  objective prism (the second largest known) giving stellar spectra down to 3500 A of  $13^m$  stars with 40 minute exposure.

Library, laboratories, staff house and a dining room are built under the pines. We were entertained at dinner from 3.30pm to 5pm, then given each a bag of the finest Georgian fruit, grapes, pears, peaches and a bottle of red Georgian wine for our long drive back to Tbilisi and a night train to Armenia.

In the darkness we came through the mountain passes and by daylight ran south



very close by the carefully guarded Turkish frontier to the capital of this Socialist Soviet Republic, Erevan. It is situated on a high hot plateau. About fifty miles to the south on the Turkish side of the frontier rises a magnificent massive with Mt. Ararat's snow capped peak standing nearly 17,000 ft above sea level. From this prosperous little city of 400,000 (eleven times its population in 1917) we drove up 4000 ft into the mountains to the Burakan Astrophysical Observatory, established in 1946 by the Armenian Academy of Sciences of the U.S.S.R. The Director is the distinguished Armenian scientist Dr. V. A. Ambartzumian. He and his staff conducted us around this impressive group of buildings where seven or eight telescopes are in operation, astrographs for two-colour plates of variable stars, a Schmidt instrument for research on stellar associations (a relatively new idea which had its birth at Burakan in 1947), a 21 inch Schmidt for colorimetric work on galaxies, a spectrograph for nebula studies and a 3 meter parabolic mirror for solar radiation of 50 cm wavelength. As the sun was flooding the western slopes of Ararat with slanting golden light we went up to the site of the radio telescopes, three large flat aerials for study of discrete sources at wavelengths of 1.5 m and 4.2 m. Other radio telescopes are under construction at a still higher altitude where a 1-metre Schmidt is also being erected.

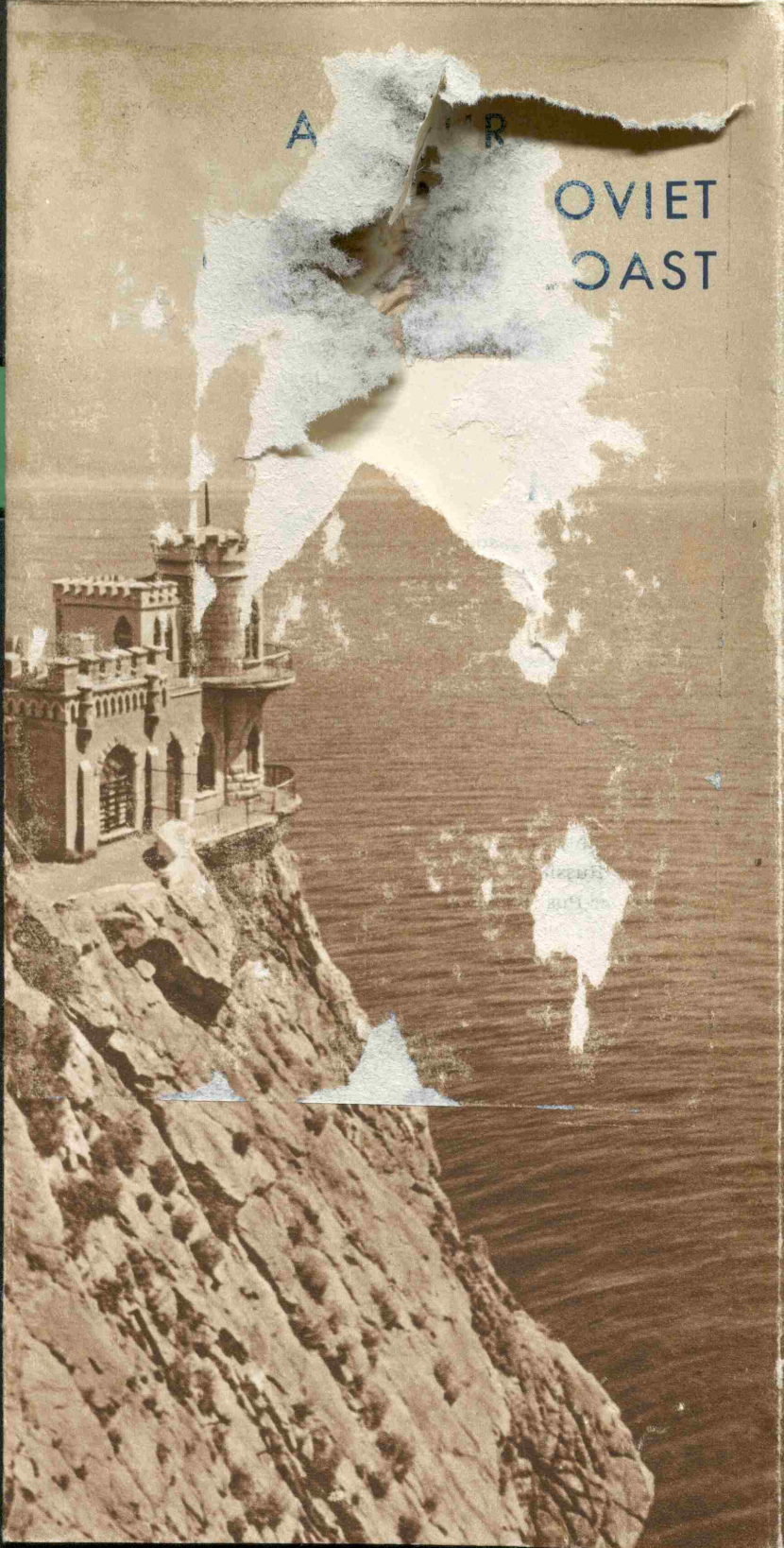
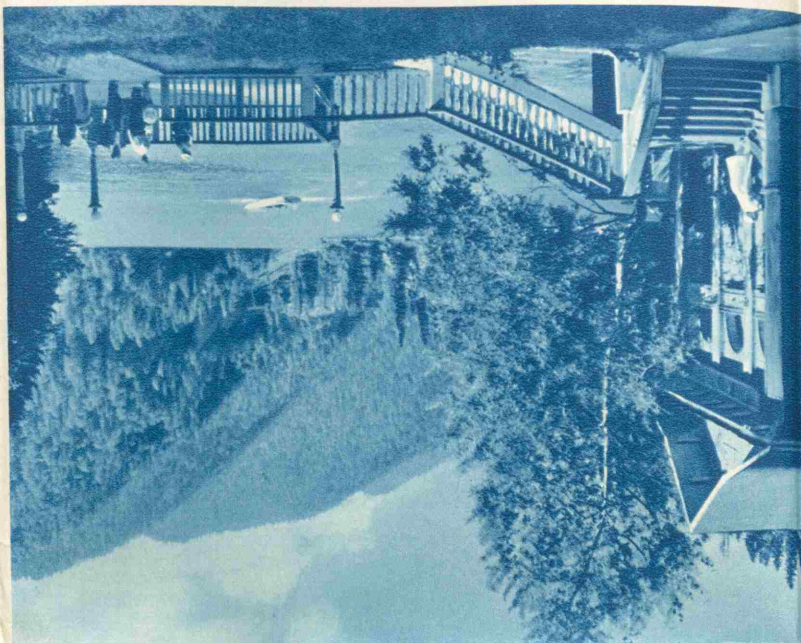
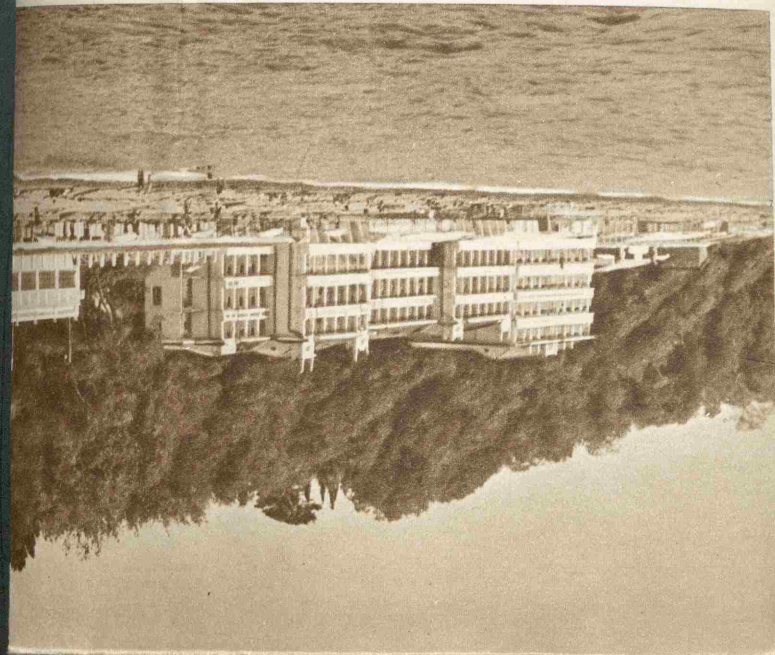
Theoretical, statistical and observational work are in full flow at Burakan. One comment may be of interest about the equipment in the computation room - side by side with the computing machines is the abacus. The speed with which calculations are done on this simple apparatus is amazing. From Leningrad to Erevan we saw it in use in observatories, post offices, banks, shops and even in the markets.

That evening in the new Intourist Hotel in Erevan, the Director and his colleagues entertained us with true Armenian hospitality, informality and friendliness at a dinner at which innumerable toasts were proposed. We sat down at 9.30pm and rose at midnight, said farewell to our hosts, packed our bags, slept for four hours and then were off to the airport. Mt. Ararat's snowy summit was touched softly by the "roseate



fingers of dawn" as we winged our way northward on August 31. We passed over the lesser Caucasus, the great valley of the Kura, and the high Caucasus getting a splendid view of Mt. Elbrus towering snow clad to more than 18,000 feet; over the southern steppe land to Rostov airport on the delta of the Don and the Donets, then off again over the vast collective farms of Ukraine and so by mid-afternoon to Moscow.



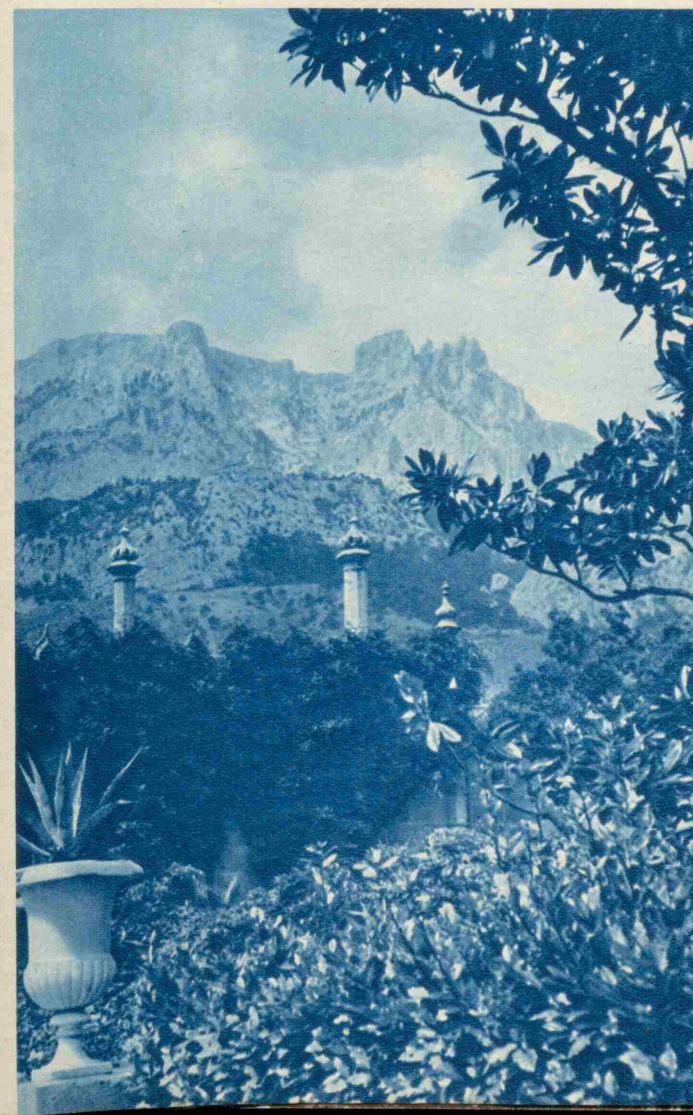


A R  
SOVIET  
COAST

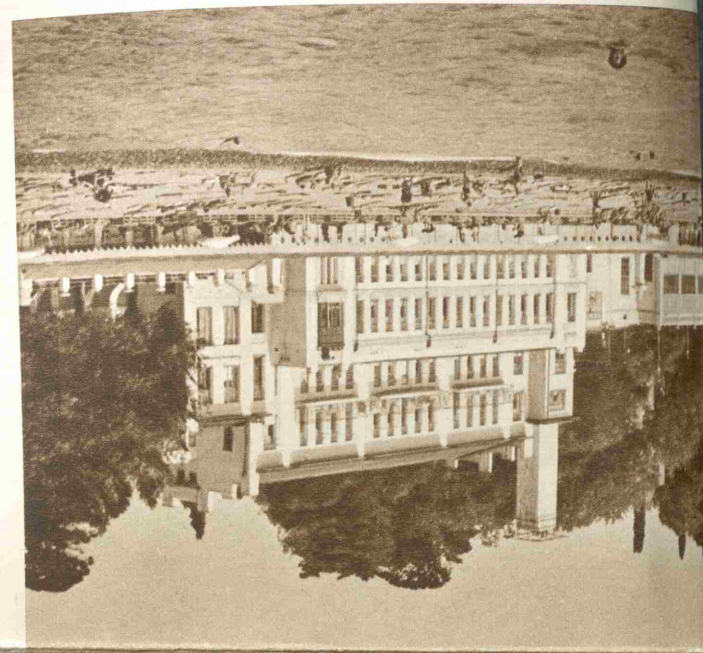
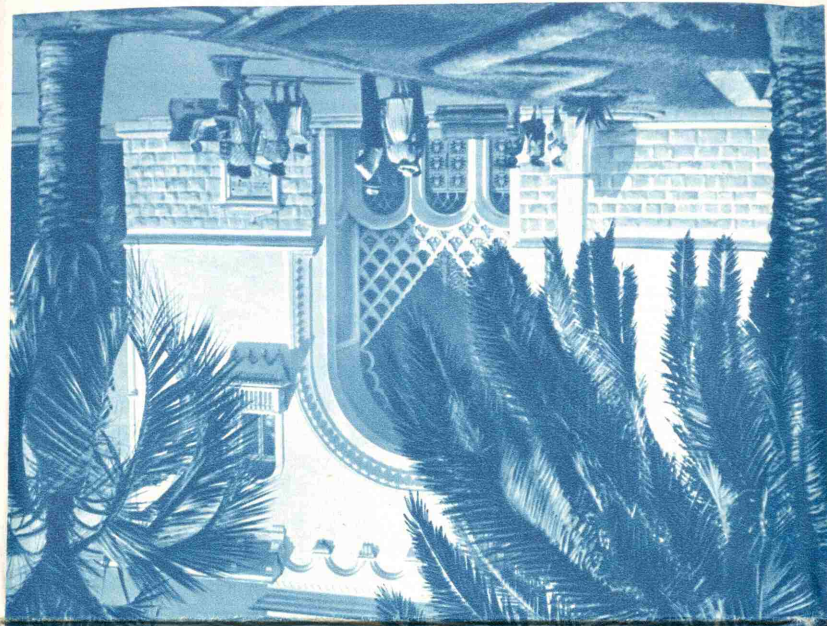
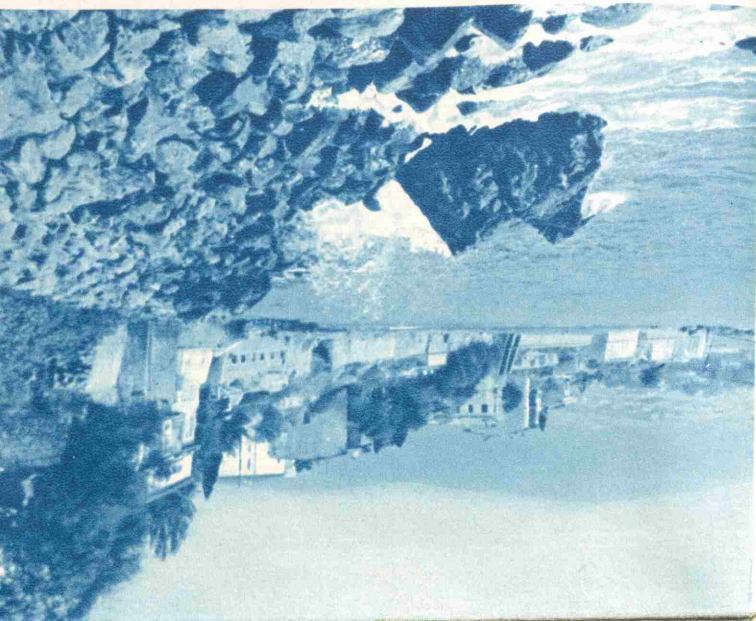


Stretching from the mouth of the Danube in the north-west to the Chorokh River (Batumi) in the south-east, lies the lovely Soviet Black Sea coast, known for its mild climate, abundance of sunshine, beautiful mountains and valleys and luxuriant subtropical vegetation. All this has won it the fame of the finest health resort region in the U.S.S.R.

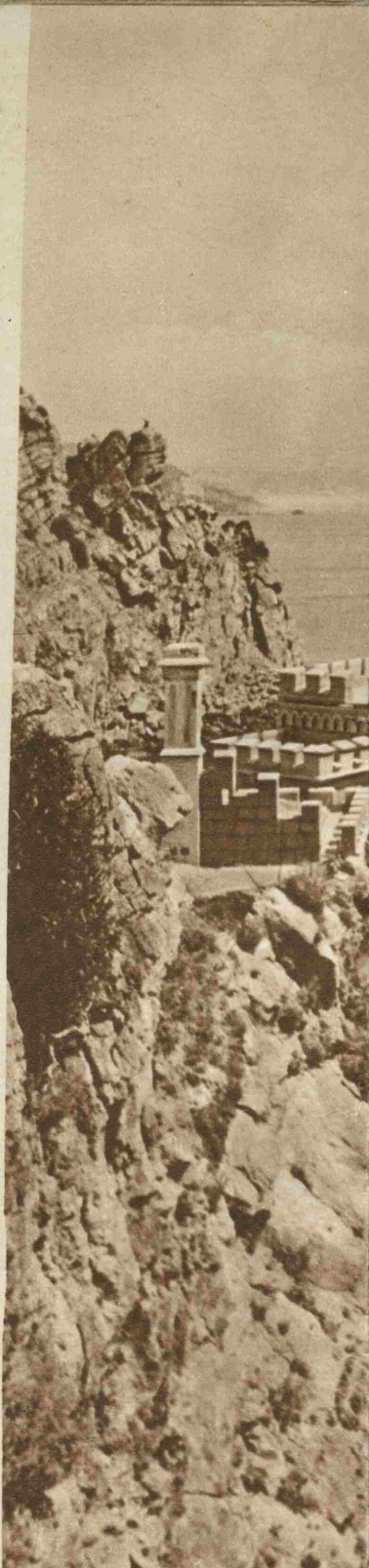
Hundreds of thousands of people from all parts of the Soviet Union and foreign countries annually visit the hospitable towns of the Soviet Black Sea coast, spend their vacations in the comfortable rest-homes and sanatoriums and go out on interesting excursions to the mountains.







A trip along the Black Sea coast of the Soviet Union offers tourists the sights of beautiful and lively Odessa, the exquisite landscapes of the Crimea, the majestic views of the Caucasian coast with its snow-capped mountains, gorgeous subtropical nature, palatial sanatoriums, orchards and plantations. It is an excellent holiday filled with vivid, unforgettable impressions.





## YALTA

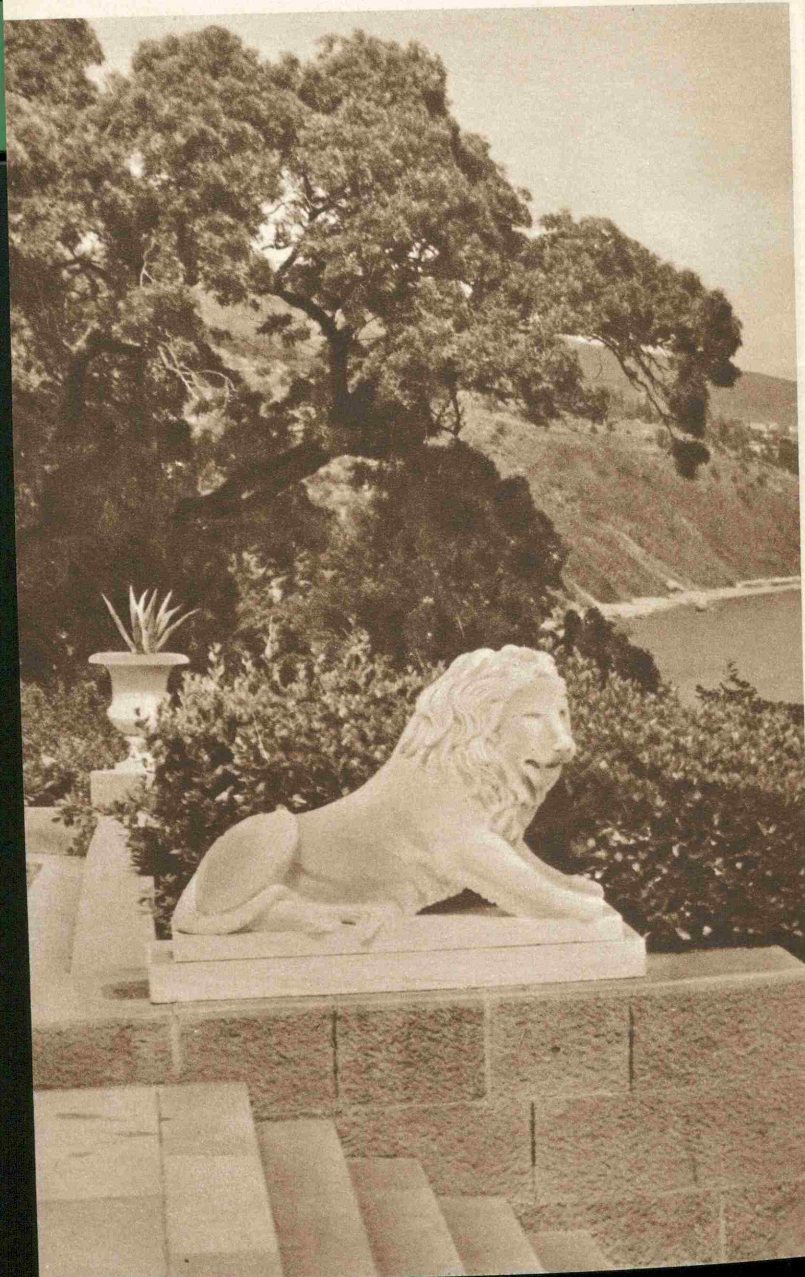
Enchanting nature, mild climate, a warm sea and abundance of fruit attract hosts of tourists to this excellent seaside resort.

The largest of the numerous health resorts on the southern shore of the Crimea, Yalta, spreads in an amphitheatre above the sea, and is virtually immersed in acacia trees, cypresses, laurels and Lombardy poplars.

Thrilling automobile and launch trips may be taken from Yalta to the other Crimean resorts and picturesque spots along the coast.

The dazzlingly beautiful road from Yalta to Simeiz winds above the sea, past orchards, vineyards and tobacco plantations. Lovely beaches and an unbroken chain of magnificent sanatoriums and rest-homes lie all along the shore (Livadia, Oreanda, Kurpaty, Miskhor, Simeiz).

The Massandra vineyards stretch between Yalta and Alushta. Here world-famous Massandra wines are made. Further along the coast is Nikitsky Botanical Gardens, followed by Gurzuf, with the Ayu-Dag Mountain (Bear Mt.) beyond it.



## SOCHI

The pearl of Caucasian seaside resorts, Sochi, lies on the eastern shore of the Black Sea. Its warm climate and curative springs vie with those of the French and Italian Riviera. The slopes of the Caucasian Range rise in terraces from the sea-shore, followed by densely wooded mountain ridges and snow-capped peaks rising high to the skies.

Along the shore, the palatial buildings of the numerous sanatoriums glitter white amidst gorgeous subtropical greenery.

During the years of Soviet government Sochi has become a veritable flowering park. To spend their holidays, tourists and vacationers throng from all parts of the country to this enchanting spot.

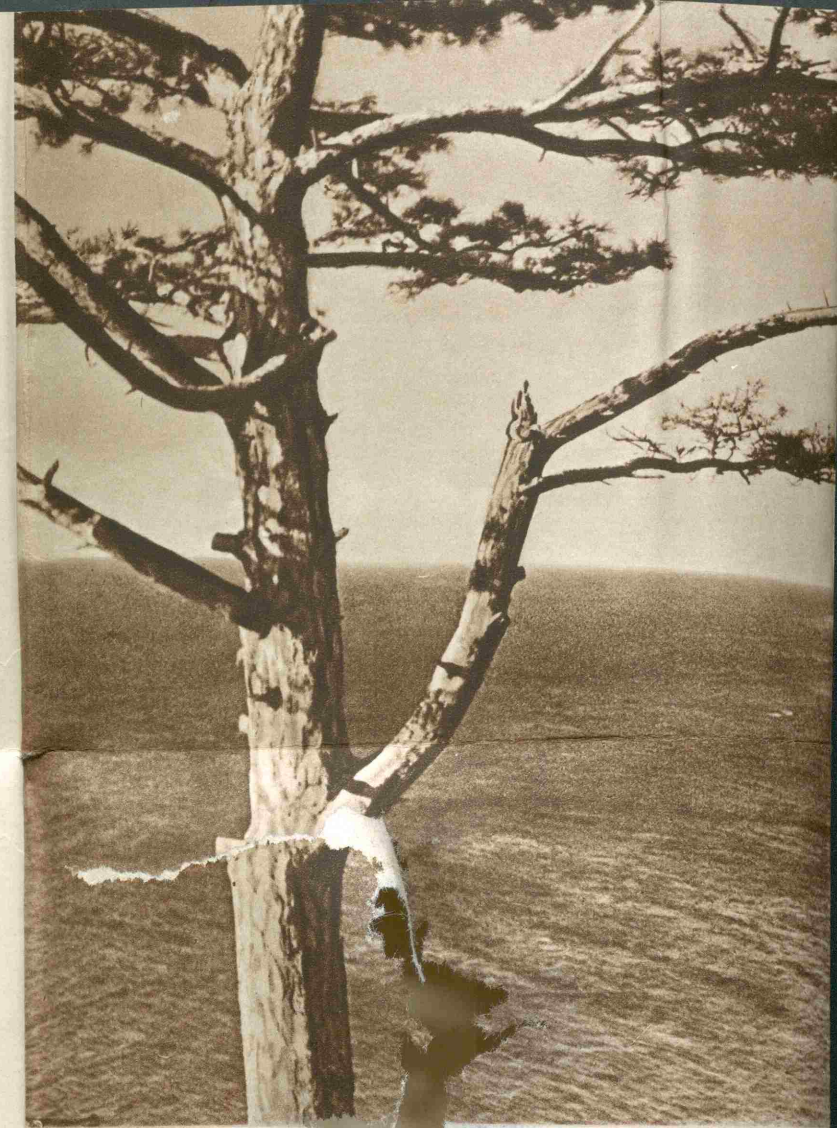
The entire district extending from Sochi to Matsesta presents an excellent health-building resort. Widely popular are Matsesta hydrogen sulphide springs.

Sochi offers a host of interesting sites for the tourist, among them the Regional Museum; the N. A. Ostrovsky Museum, former home of the author so beloved by Soviet youth; the magnificent Botanical Gardens and the beautiful white-stone building of the Sochi Theatre.

A broad alley lined with platans runs from the city to the handsome building of the Sochi railway station and the port. The city's fruit bazaars are truly horns of plenty.

Looming high beyond Matsesta is the Great Akhun Mountain, which offers a breath-taking panorama of the surrounding mountains and the sea below. A short distance away from Matsesta are the famous Agura Falls.

An excellent highway runs along the seashore all the way to Batumi. The next stop-over on the way is Hosta with its luxurious centuries-old yew-and-box-tree grove, covering an area of 300 hectares.



## ODESSA

A big and bustling southern port and major industrial and cultural centre, Odessa, is at the same time a popular seaside resort.

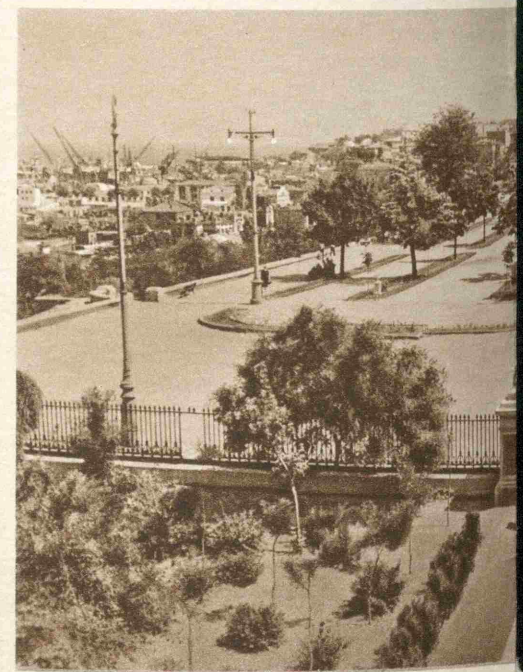
The numerous notable sights of the city include the monumental Potemkin Stairway on Primorsky (Seaside) Boulevard, leading from the city to the port. Across from it, on the boulevard, is a monument to Richelieu, the first mayor of the city. Nearby is another monument, to the brilliant Russian poet Alexander Pushkin, and still another, dedicated to the glory of Russian arms—a gun from an enemy frigate "Tiger" sunk in 1854.

A short distance away from Pushkin's statue, also on Primorsky Boulevard, loom the Young Pioneer Palace and Seamen's Club.

Odessa has seven theatres, among them the magnificent building of the Odessa

Opera and Ballet Theatre. Concerts and performances of standing Russian composers, singers as Tchaikovsky, Liszt, Paganini, Glinka, Rimsky-Korsakov, Prokofiev, Shostakovich, Scriabin, Stravinsky, and Scriabin, Chaliapin and Sobinov, and there are streets bearing the names of Pushkin, Gogol and Ca...

The city's numerous m...







## SUKHUMI

Following the road to Sukhumi we come to Gagra—an exquisite spot in sun-bathed Abkhazia. Here mountains come close to the sea. A beautiful park with numerous species of southern flora, among them date and coco-nut palms, magnolias, oleanders, bamboos and platans growing out in the open, stretches all along the beach.

A road, extremely popular with tourists, runs from Gagra to Ritsa, a picturesque mountain lake situated 950 m. above sea level. The beautiful road to the lake lies across gorges and mountain rivers. The lake is hemmed in by densely wooded mountains. A comfortable hotel and restaurant offer excellent accommodation and tasty food; at the service of the tourists are launches for trips on the lake.

Sukhumi—capital of the Abkhazian Autonomous Soviet Socialist Republic—is one of the oldest and most beautiful cities of the Caucasian Black Sea coast. It is also a popular health resort.

Sukhumi is a bustling city immersed in subtropical vegetation. Handsome buildings, big department stores, excellent restaurants and cafés add to its beauty. Graceful palms line the seaside boulevard, where roses are in bloom almost all the year round. A broad stairway leads to Mt. Sukhumi, with a big park on top.

The city boasts of numerous notable sights, foremost among them being the monkey nursery where extensive scientific work is conducted.

Numerous exhibits relating to the history of Abkhazia and Sukhumi are on display in the Regional Museum; the Botanical Gardens offer numerous specimens of the region's flora. Here one will see *Victoria Regia*, huge cactuses reaching four metres in height, varnish-trees, golden bamboo and other rare plants.

There are numerous caves in the environs of Sukhumi. The biggest, stretching for two kilometres, is Chlousk Cave with several vast halls, fanciful stalactites, a subterranean river and lake.

## BATUMI

The long chain of the Caucasian Black Sea resorts ends in the south with a group of holiday places in the vicinity of Batumi, the southernmost Soviet city on the Black Sea coast.

Batumi—capital of the Adjar Autonomous Soviet Socialist Republic—is a major industrial centre and a busy seaport.

There are many ancient Greek legends dedicated to Adjaria—one of the oldest regions of Georgia and at one time part of Kolchis. In ancient times Batumi was a port of call of many Phoenician ships, Roman galleys, Genoese caravels and Zaporozhye skiffs.

Vast tea plantations have been laid around Batumi during the years of Soviet government. The tea produced by the local factories vies with the choicest Indian, Ceylonese and Chinese sorts. Citrus plantations, cultivated by local collective and state farms in the environs of Batumi, yield millions of tangerines, oranges, and lemons annually. Batumi has become a major citrus-growing area of the Soviet Union.

Zelyony Mys, a suburb of Batumi, nine kilometres away from the city, is famed for its gorgeous Botanical Gardens laid on an area of 100 hectares. This is a veritable natural museum, representing the flora of Japan, China, the Himalayas, New Zealand, Australia, Mexico, Florida and Chile.

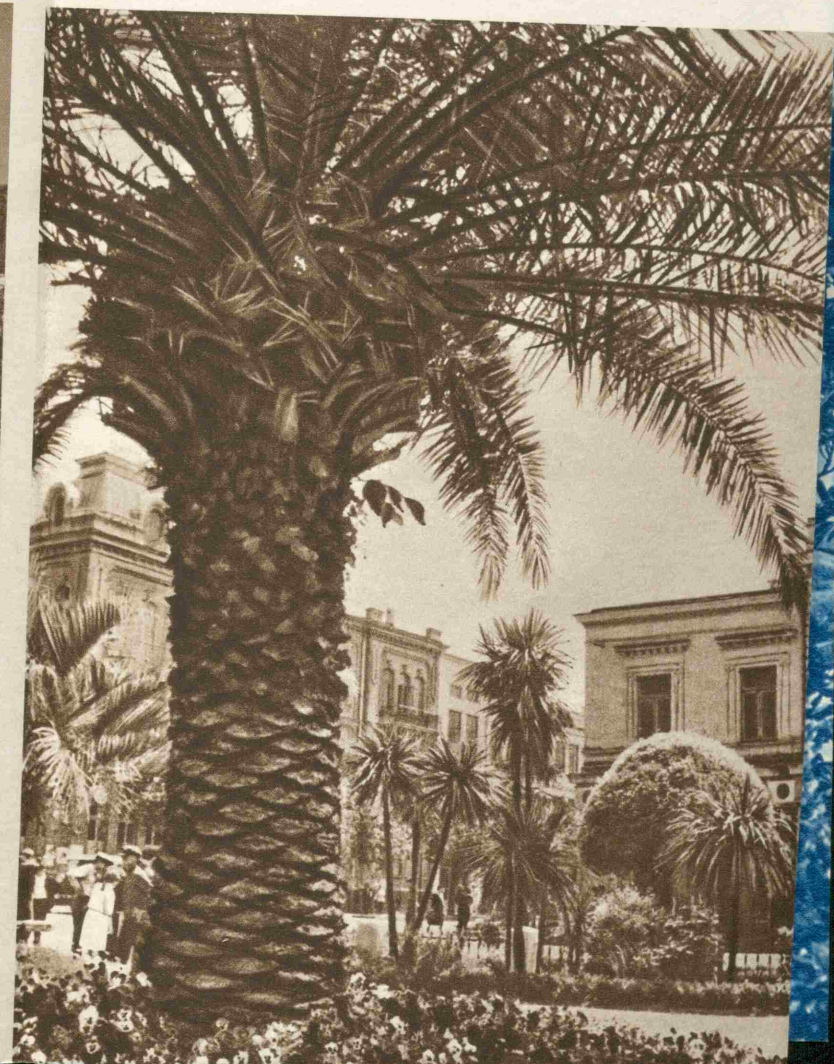
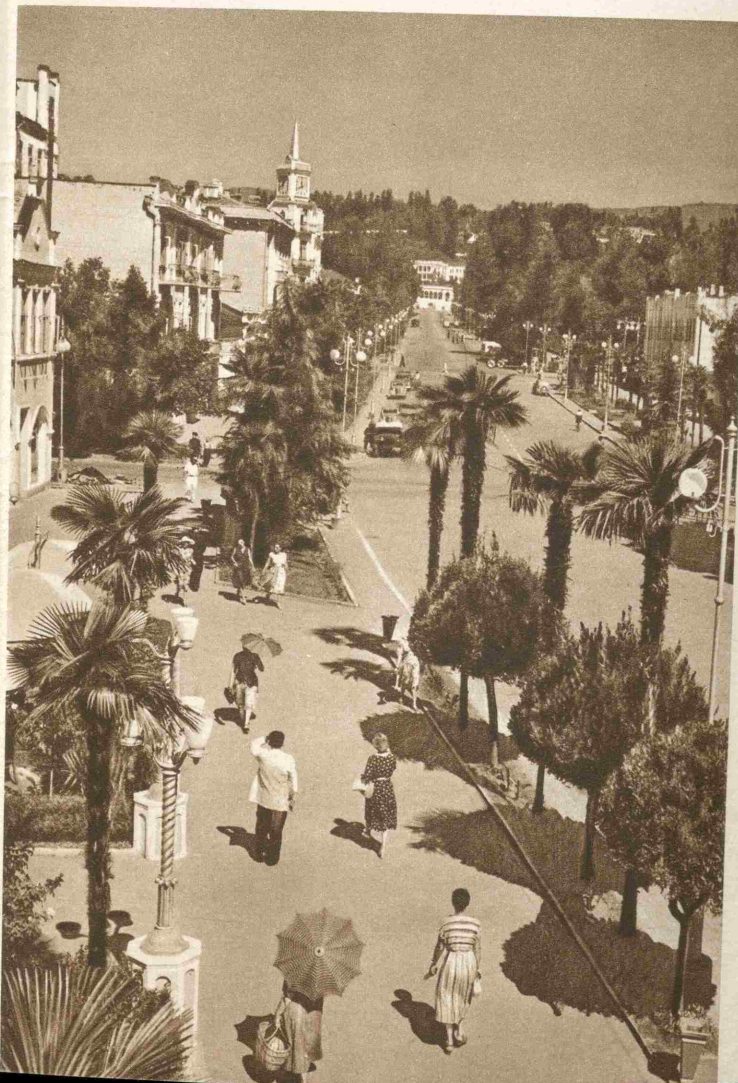
Many excellent health resorts, among them Makhinjauri, Zelyony Mys, Tsikhis-Dziri and Kobuleti, dot the seashore in the environs of Batumi.

which remembers  
ces by such out-  
ers, musicians and  
Rubinstein, Glazou-  
ov.  
rky lived in Odessa  
ing their names.  
useums include an

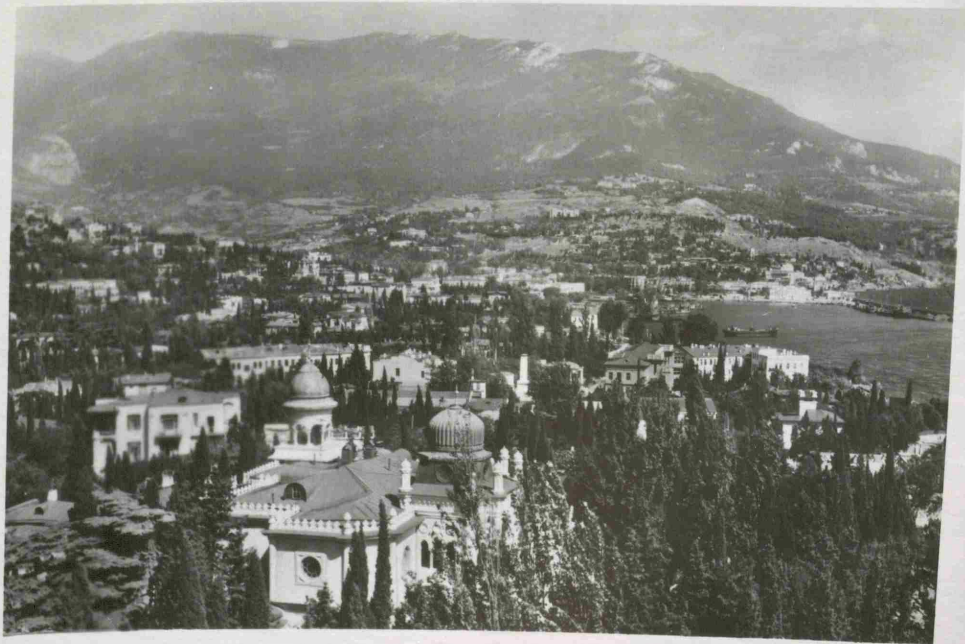
art gallery containing a brilliant collection of paintings by outstanding Russian and Ukrainian artists; a museum of Western and Eastern arts, displaying sculptures of ancient Greece and Rome, canvases by old Italian and Dutch masters, French paintings, the art of China, Japan, India and Iran. The State Archeological Museum acquaints its visitors with exhibits relating to the past of the Black Sea coast.

The history of Odessa and the heroic part played by the city in the Great Patriotic War are illustrated by numerous documents and materials collected in the Odessa Regional Museum.

The environs of Odessa are famed for their mineral springs and medicinal muds, comfortable sanatoriums and rest-homes, summer accommodations for children and golden beaches.











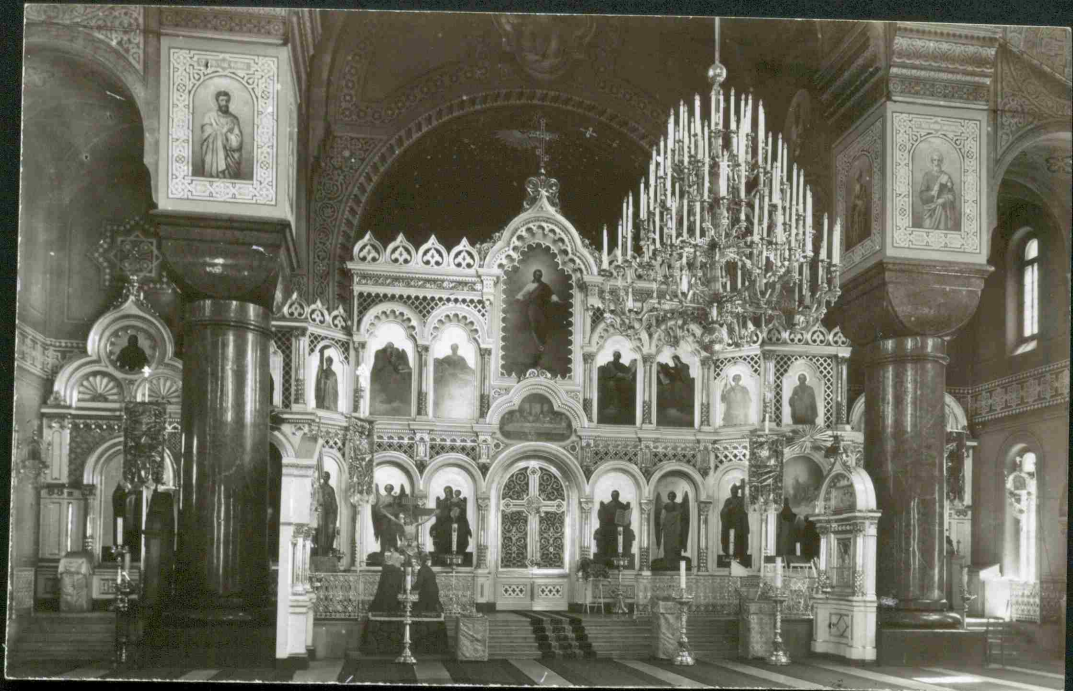


1958 August 6

Russian Orthodox Church  
in Helsinki - about 1850

Geraert







1958 August 6

Russian Orthodox Church in  
Helsinki - about 1850.

Gevaert

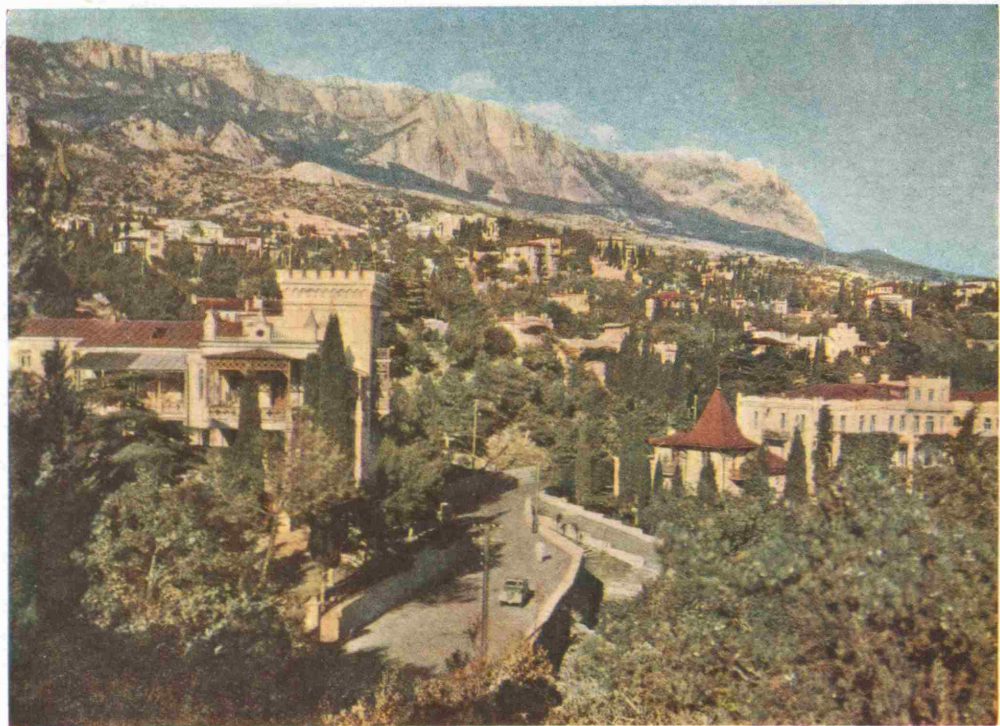














ТЪНЦИ

















# Some Soviet Union Citizens Resent Label of "Russians"

Citizens of the Soviet Union — not Russians — is a proper designation for nationals of the USSR, said Dr. A. Vibert Douglas, professor of astronomy at Queen's University, speaking at the ladies' night banquet at Sydenham Street United Club Men's club.

There are a number of national groups whose members of the Society resent being called Russians. Two of such groups are Armenians and Georgians, both with ancient histories pointed out.

Dr. Douglas attended the international sessions of world astronomers in Moscow and in London, and gave some of her impressions.

Overcrowding in the cities, with families confined to one or two rooms in apartment buildings, was one of the nation's biggest problems. The people lived in hope, the hope that next year with the aid of

their training for other occasions.

or  
au-  
ter  
one  
in  
glas  
is a  
some  
en to  
e fine  
Rus-



omy is  
n the  
astronom-  
ce sessions.

at acceptance  
the Soviet Union's demand  
that the Russian language be  
made an official language of the  
organization — with English and  
French — could not be too long  
delayed.

Prof. A. V. Corlett, president, introduced Dr. Douglas who was thanked by F. L. Forrest.

*Whitby Standard 1953 Nov 14*



*Leningrad*



*Moscow*



GORKY STREET 1, MOSCOW  
TELEPHONE: Б 9-96-86  
CABLE ADDRESS:  
INTOURIST MOSCOW

Vneshtorgizdat. Order 17269

*Kiev*



*Kharkov*



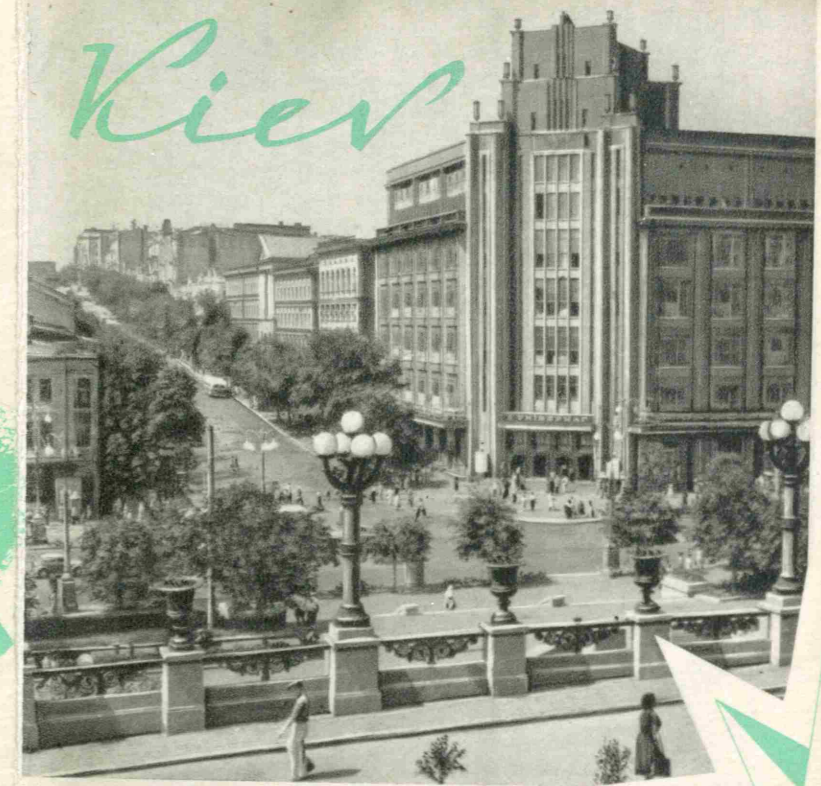
*Leningrad*



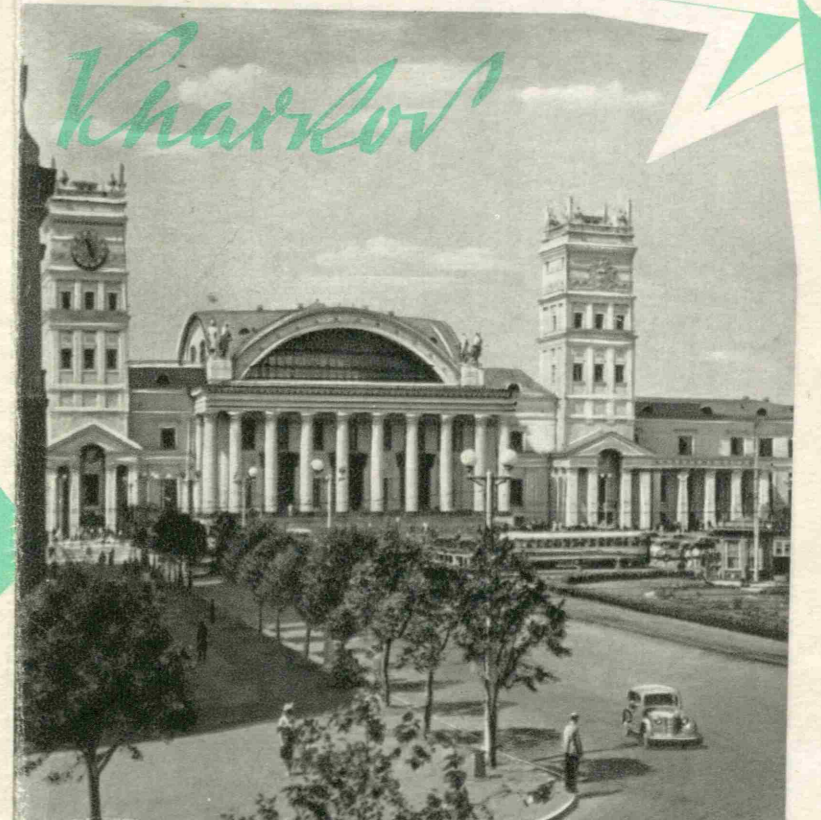
*Moscow*



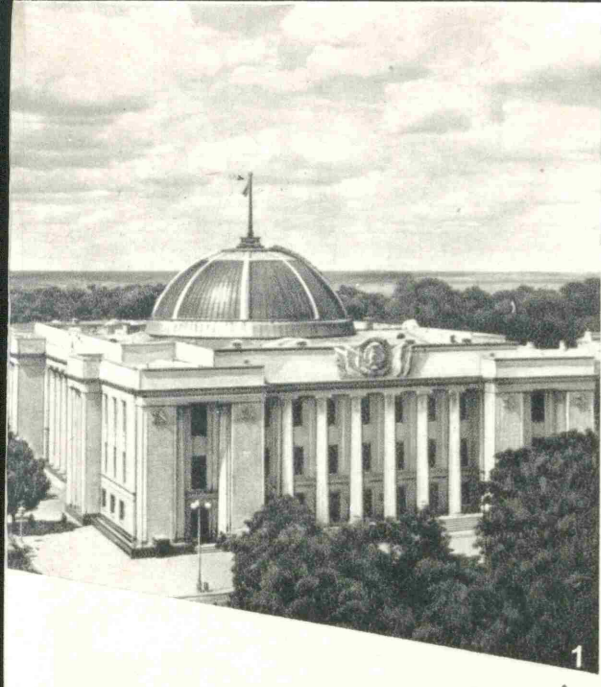
*Kiev*



*Kharkov*







**K**iev, the capital of the Ukrainian Soviet Socialist Republic, is one of the oldest cities in the Soviet Union. From the 10th through the 12th century Kiev was the capital of Kievskaya Rus, the powerful state of the Eastern Slavs.

In 1654 the historical decision to unite the Ukraine with Russia was adopted at an assembly held in Pereiaslav. By this act the Ukrainian people confirmed the close and lasting ties which had developed between them and the people of Russia in the course of their history.

Today Kiev is a large thriving city. It stands third in population in the Soviet Union, after Moscow and Leningrad, and is the chief industrial and cultural centre of Soviet Ukraine.

It is situated on the banks of the Dnieper, one of the largest rivers in Europe.

The city's central thoroughfare is the splendid Kreshchatik, a broad avenue with many new multi-storied buildings. Like all the streets of Kiev, it has a lovely green array of chestnut, poplar, linden and maple trees.

A monument to V. I. Lenin, the founder of the Soviet state, was erected in 1946 on Shevchenko Boulevard. A little further on, opposite the University, is a monument to Taras Shevchenko, a great son of the Ukrainian people.

Kiev is rich in places and buildings of historical interest. In the centre of the upper part of the city, on Vladimirskaya Street, are the remains of an 11th century fortress known as the Golden Gates. Looking through the Gates one sees the golden cupolas of the St. Sophia Cathedral, a magnificent edifice of the 11th century with splendidly preserved frescoes.

Nearer the Dnieper, on a hill in that part of the city

known as Podol, stands the graceful structure of the Andreyev Church (18th century) which was designed by Rastrelli.

On the high bank of the Dnieper is the group of buildings comprising the Kievo-Pecherskaya Monastery. These buildings, dating to the period from the 16th to the 19th century, and the historical objects preserved in the Museum of the monastery testify to the great mastery of the architects who designed them.

Kiev is the scientific centre of the Ukrainian S.S.R. It is the seat of the Academy of Sciences of the Ukrainian Republic which directs the work of hundreds of research institutes, the Academy of Agricultural Sciences, the Academy of Building and Architecture. There are more than 20 institutions of higher learning in the city which provide the country with more than 40,000 new specialists every year. Tens of thousands of children study in its 165 elementary and secondary schools.

There are many museums in Kiev: the Lenin Museum, which is a branch of the Central Lenin Museum in Moscow, the Historical Museum, with exhibits showing the history of the Ukraine from ancient times to the present, the Museum of Ukrainian Art, the Museum of Western and Oriental Culture. Two museums acquaint visitors with the life and work of Taras Shevchenko, a great Ukrainian poet.

The city has several large libraries. That of the Academy of Sciences, for instance, has a fund of 13 million books, periodicals and manuscripts.

1. The Council of Ministers of the Ukrainian SSR
2. Kreshchatik Street
3. Railway Transport Engineering Institute
4. The Opera House

There are 7 large theatres in Kiev: the Shevchenko Opera and Ballet Theatre, the Franko Theatre of Ukrainian Drama, the Lesya Ukrainka Theatre of Russian Drama, the Musical Comedy Theatre, the Kiev Philharmonic Association, the Puppet Theatre and the Young Spectators' Theatre.

There are 2 botanical gardens, many parks and gardens in the city. Only recently a new Memorial Park honouring the Fallen Heroes of the Soviet Army has been laid out on the sloping banks of the Dnieper. A perpetual flame burns at the grave of Unknown Soldier in the centre of the park.

Another thing worth seeing in Kiev is the park on the left bank of the Dnieper and Trukhanov Island, with its numerous facilities for all forms of water sports. The lovely river with its inviting beaches and shady groves is a favourite recreation spot for Kiev people and a sports centre for the youth.

# Kiev

**K**harkov is the second largest city of Soviet Ukraine. Three centuries ago Ukrainian settlers first put up their dwellings at a point where three small rivers — the Kharkov, the Lopan and the Uda — meet. This became the site of the future city of Kharkov. Situated near the Donbas, on travel routes leading from Moscow in the north to the Crimea and Caucasus in the south, Kharkov grew and developed at a rapid pace. By the end of the 19th century it was already a large industrial city. The Great October Revolution inaugurated a new era in the history of this city. In 1917 Kharkov became the capital of the Ukrainian Soviet Socialist Republic and remained it until 1934 when the capital was removed to Kiev. Many huge factories were erected in the city during the years of Soviet Power. Within the short span of twenty years its industry increased more than twelvefold and it became one of the country's major industrial centres.

The appearance of the city also greatly changed. Its territory more than tripled and many new settlements grew up on the outskirts. Numerous sanatoriums, rest homes and children's summer camps were built in the wooded area surrounding the city.

The Nazi invaders inflicted enormous damage to the city during World War II. Whole blocks of dwelling houses, large factory buildings, schools and institutes were razed to the ground. Today Kharkov has not only risen from its ruins but is even more beautiful than it was before the war.

Kharkov now occupies a territory of 300 sq. km. There are many buildings of historical interest in the city, among them the Pokrovsky Cathedral, the Uspensky Cathedral, and the former Ekaterininsky Palace. After the Great

Patriotic War a tremendous construction programme was launched in Kharkov. Many new districts appeared, the largest of these being the Ordzhonikidze District. The group of buildings on Dzerzhinsky Square, one of the largest city squares in the world, is now being reconstructed. New thoroughfares have been laid out; old factories and plants have been remodelled and reconstructed and many new ones built in the post-war years. Much is being done in planting of greenery.

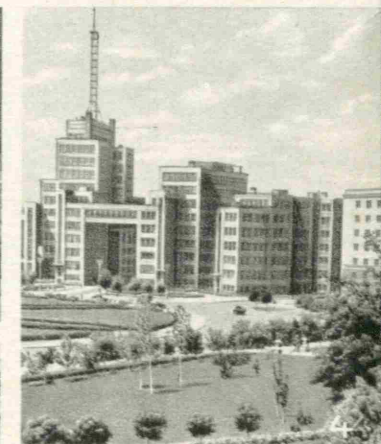
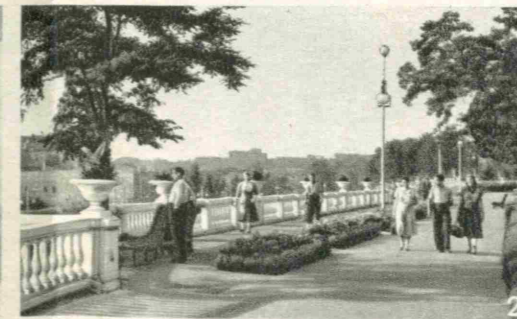
Extensive research work is carried out in the city's 44 institutes. About 60,000 students study in its 24 institutions of higher education and its many specialized secondary schools. There are 6 theatres, a philharmonic association, a circus, a TV centre, and many cinemas. The Kharkov Museum of Fine Arts is one of the largest in the country. The Historical Museum acquaints visitors with the city's historical and revolutionary past.

There are 45 clubs and about 500 libraries in the city.

Kharkov is one of the largest railway and highway junctions in the Soviet Union. It is the starting point of numerous trunk lines which radiate in many directions. Kharkov links the industry of Moscow and Leningrad with the Donetz coal-field and the southern metallurgical region. Railway lines and airways connecting the Ukraine with the Caucasus, the Volga region, and the Far East all pass through Kharkov. From Kharkov one may travel by automobile and motorbus to Kiev, Rostov-on-Don, Zaporozhye and the resorts on the Black Sea coast.

A trip along any of these routes takes one past Ukrainian villages with their lovely gardens and orchards and through the boundless steppe filled with the fragrance of wild flowers and ripening grain.

# Kharkov



1. Railway Transport Engineering Institute
2. A new garden laid out on the bank of the Lopan River
3. Rosa Luxemburg Square
4. Co-operative Society House



City of the Soviet Union, second to Moscow in importance, area, population and industrial output. Leningrad is the cradle of Russian culture and of the Russian revolution. Blockaded by the fascists during World War II, this heroic city, which bears the name of the great creator of the Soviet State Lenin, withstood a 900-day siege, which was unprecedented in the history of wars.

The beautiful, broad Neva and its numerous arms running through Leningrad, determined the future outlook of the city with its severe classical architecture, superb ensembles, panoramas and perspectives, striking monumental buildings, all forming an integral whole with the surrounding nature. Leningrad is one of the most beautiful cities in the world.

The October Revolution brought great changes to the city, effacing the contrast between its central districts and former suburbs. Former palaces have been turned into museums. New districts with modern apartment houses, numerous gardens and parks, public buildings, clubs, cinemas, sports grounds, polyclinics, schools and kindergartens have replaced the formerly wretched suburbs.

The territory of the city has grown fourfold. The recently built underground railway with its beautiful stations, halls and vestibules, connects the new districts with the centre.

Nevsky Prospect, the city's central thoroughfare, runs as straight as an arrow for five kilometres, beginning from the Admiralty to the Moscow Railway Station and further on to Alexander Nevsky Monastery.

Walking along the Nevsky Prospect, with its numerous historical monuments, magnificent buildings, big stores, restaurants and cafés, the tourist is attracted by the majestic semicircular colonnade of the Kazansky Cathedral with monuments to generals Kutuzov and Barclay de Tolly in front of it. Further on, on Ostrovsky Square looms the graceful structure of the Pushkin Theatre. The centre of the square is occupied by a garden with a monument to Catherine II. Nearby is the Anichkov Palace, now the Palace of Young Pioneers, and the Anichkov Bridge, with the famous rearing horses, the work of P. Klodt.

At the other end of Nevsky Prospect is the Palace Square skirted by the impressive semicircle of former Staff Headquarters with the triumphal arch in the middle. Rising in the centre of the square, before the majestic façade of the Winter Palace is a granite monolith—the Alexander Column. The opposite front of the Winter Palace faces the granite Neva embankment. Here opens a view which, according to the French writer Alexander Dumas, Sr., has no equal in the world. The Palace Bridge connects this part of Leningrad with Vasilevsky Island. Here two Rostral Columns rise

against the background of the exquisite building of the Naval Museum. Nearby is the austere and impressive pile of the Peter and Paul Fortress, and behind it, bathed in greenery, loom the turquoise minarets and cupolas of the mosque, which is greatly reminiscent of the celebrated mosques of Samarkand.

Next to the Winter Palace is the monumental Admiralty and further on the Decembrists Square, formed by the magnificent structures of the former Senate and St. Isaac Cathedral. The centre of the square is occupied by Falconet's celebrated creation, "The Bronze Horseman" — a monument to Peter I, the founder of the city.

Leningrad's largest square is the Mars Field, skirted by the former Pavlov Barracks and Engineering Palace, the lovely Summer Garden, and the Marble Palace, now Lenin Museum, which faces the Neva. Here too is the monument to the great Russian general Suvorov. In the centre of Mars Field, among numerous flowerbeds, stands a beautiful granite monument "To the Victims of the Revolution", marking the grave of the Heroes of October 1917.

Leningrad has as many as 400 bridges. The largest and most beautiful bridge, the Kirov Bridge, spans the Neva from Mars Field. Running from Kirov Bridge is Kirov

Prospect which stretches for several kilometres and ends on Kirov Islands, where the biggest parks of the city have been laid on the seashore: the Kirov Park and the Seaside Victory Park. The latter houses the Kirov Stadium, built on an artificial hill in 1950 and seating 80,000 spectators. A beautiful view opens from the stadium on to the Gulf of Finland and the picturesque Kirov Islands.

A special place among Leningrad ensembles is occupied by the reconstructed ensemble of the Smolny Palace, which housed the headquarters of the Revolution in 1917, and where Lenin worked.

Leningrad is a treasure-house of Russian national culture, science and art. The city has more than 60 higher educational establishments attended by some 100,000 students.

Among them are some of the country's oldest and biggest institutions of learning, such as the State Zhdanov University, Kalinin Polytechnical Institute, Leningrad Technological Institute, Mining Institute, Railway Engineering Institute, etc.

Prior to 1934, the USSR Academy of Sciences had its seat in Leningrad. Now the city and its suburbs house many of its institutes, laboratories and scientific institutions.

Leningrad is justly proud of its numerous museums and theatres. Its fifteen theatres include the Kirov Opera and Ballet Theatre (former Mariinsky Theatre), which brought forth many celebrated artists, among them Chaliapin, Sobinov, Pavlova, Ulanova; the Pushkin Theatre; the Maly Opera Theatre; the Bolshoi Drama Theatre named after Gorky, and the State Philharmony. An important part in the development of Soviet cinema art is played by the Lenfilm Studio.

The city boasts a great number of clubs and palaces of culture.

Foremost among Leningrad's museums is the State Hermitage, a repository of priceless works of art, counting more than two million exhibits. The paintings, sculptures and other exhibits on display at the Hermitage Museum reflect the history of culture and art of the antique world, ancient Egypt, China, India. More than 120 halls of the Hermitage are dedicated to works of Western painting and sculpture, including those by Leonardo da Vinci, Raphael, Tician, Michelangelo and other great masters. The Hermitage collection of canvases and engravings by Rembrandt is one of the largest in the world.

Another large museum, the Russian Museum; has in its custody up to 200,000 works by outstanding Russian painters and sculptors.

Leningrad's environs with their enchanting palaces and parks present an unforgettable picture.

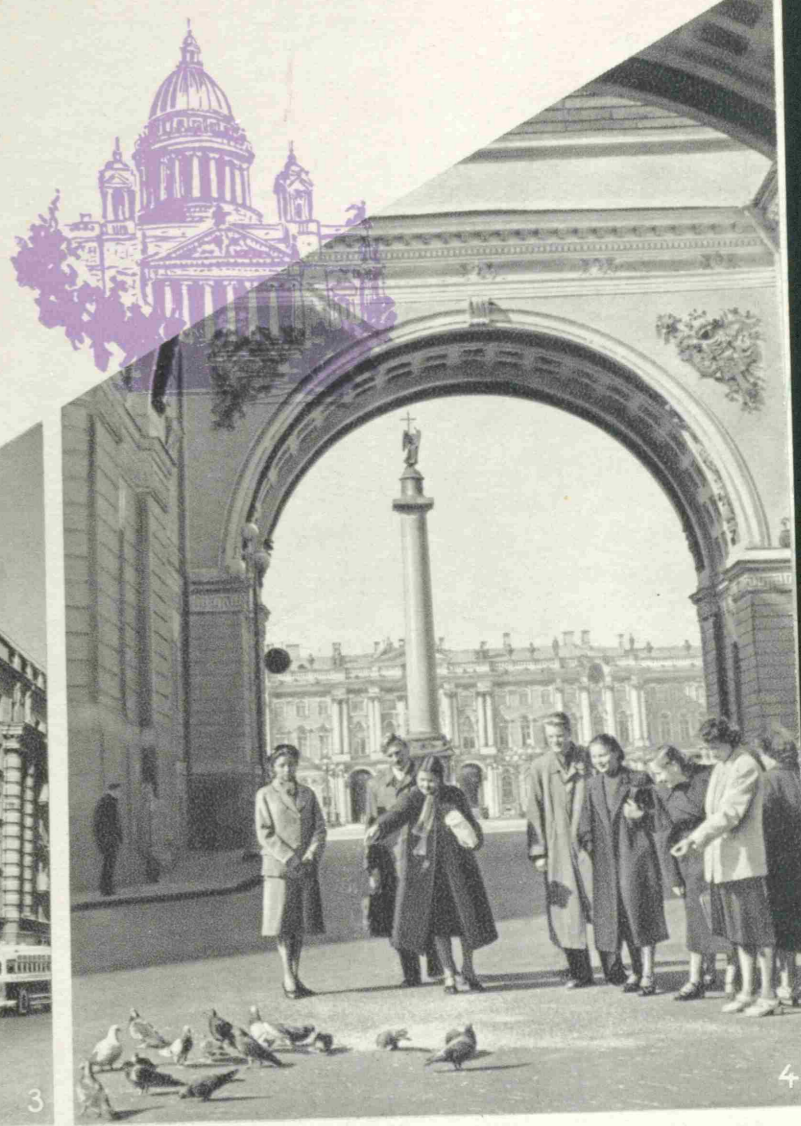
Petrodvorets is known throughout the world for its numerous fountains and the beautiful canal running from the foot of the palace to the seashore.

The town of Pushkin, formerly Tsarskoye Selo, situated at a distance of 20 km from Petrodvorets, is famous for its unique palaces, pavilions and parks.

A number of health resorts is situated along the shore of the Gulf of Finland, with lovely beaches, numerous sanatoriums, rest homes. Young Pioneer camps and tourist bases.

Leningrad, that majestic Russian city, leaves an indelible impression, presenting a host of interesting sights for the tourist.

# Leningrad



1. Narva Gates
2. Nevsky Prospect
3. New apartment houses on the Moscow Prospect
4. An arch adorning the Staff Headquarters building
5. General view



Moscow is the capital of the Union of fifteen Soviet Socialist Republics and the largest political, economic and cultural centre of the Soviet country. In 1947 Moscow celebrated its 800th anniversary.

Red Square is one of the most beautiful city squares in the world. The Cathedral of Vasily Blazhenny with its many multi-coloured cupolas, standing on this square, is a wonderful example of 16th century Russian architecture. In front of the Cathedral is a monument to the Russian patriots Minin and Pozharsky. To the right is the Spassky Tower from which the Kremlin chimes are heard throughout the world.

It is on Red Square that the armed forces of the Soviet Union demonstrate their might on national holidays and columns of working people march past the Lenin and Stalin Mausoleum with music, banners and flowers.

The Kremlin — this wonderful monument of Russian culture — is a majestic architectural ensemble of palaces, ancient cathedrals, belfries and towers. Near the Bell-Tower of Ivan the Great there is the famous Tsar Kolokol (King of the Bells) and not far off — the huge Tsar Cannon. Oruzheynaya Palata (the Armory), which houses the treasures of the Russian tsars, valuable artistic plate and antique arms, is also in the Kremlin.

It is the Great Kremlin Palace where the sessions of the Supreme Soviet of the USSR are held. On holidays, gala balls for the youth take place at the Palace and New Year Trees are lighted for schoolchildren.

Moscow's central thoroughfare is Gorky Street. There are many handsome new buildings with shops and cafés on the ground floor and lovely linden trees planted along the sidewalks. In the evening the street is thronged with lively crowds on their way to theatres, cinemas, concerts and other entertainments. On the squares adjoining Gorky Street are some of Moscow's best monuments — those of Yuri Doigorky, the founder of Moscow, the great Russian poet Alexander Pushkin and the great writer Maxim Gorky.

Such broad, handsome and lively thoroughfares as Gorky Street are now to be found in all the districts of the capital. They have appeared in the course of carrying out the general plan of Moscow's reconstruction during the Soviet period.

Under the ground there is the Moscow Metro with its comfortable trains that swiftly move in all directions from one brilliantly illuminated underground palace to another.

Moscow is the largest centre of culture in the country. Here are the USSR Academy of Sciences, the Academies of Medical Sciences, Pedagogical Sciences, Arts, Building and Architecture, the V. I. Lenin USSR Academy of Agricultural Sciences and others. There are also some 200 scientific-research institutes in the capital.

Close to 300,000 students are enrolled in more than 100 institutions of higher education which function in Moscow. In the magnificent new building of the Moscow University, towering over the Moscow River on Lenin Hills, there are twelve departments in which more than 20,000 students of different nationalities study.

The libraries of Moscow contain about 100 million books. The State Lenin Library alone has a fund of 18 million books, of which 200,000 are unique and rare volumes.

There are more than 30 theatres in Moscow. Most of them have been established in the Soviet period — the Stanislavsky and Nemirovich-Danchenko Musical Theatre, the Mayakovsky Theatre, the Central Soviet Army Theatre, the Vakhtangov Theatre and many others whose performances are daily attended by thousands of theatre-goers.

Moscow, and indeed the whole Soviet Union, takes particular pride in the Bolshoi Opera and Ballet Theatre, the Moscow Art Theatre, the Maly Theatre and others. The children's theatres and the puppet theatres are also very popular with Moscow children and grown-ups.

Muscovites as well as the capital's guests can hear the world's best music in the performance of great masters of art at the Conservatoire, the Chaikovsky Concert Hall and other concert halls.

Treasures of great value are collected at Moscow's 60 museums. Such museums as the V. I. Lenin Museum, dedicated to the great founder of the Soviet state, the Tretyakov Art Gallery, the Pushkin Museum of Fine Arts, the Historical Museum and others are famous for their superb collections throughout the world.

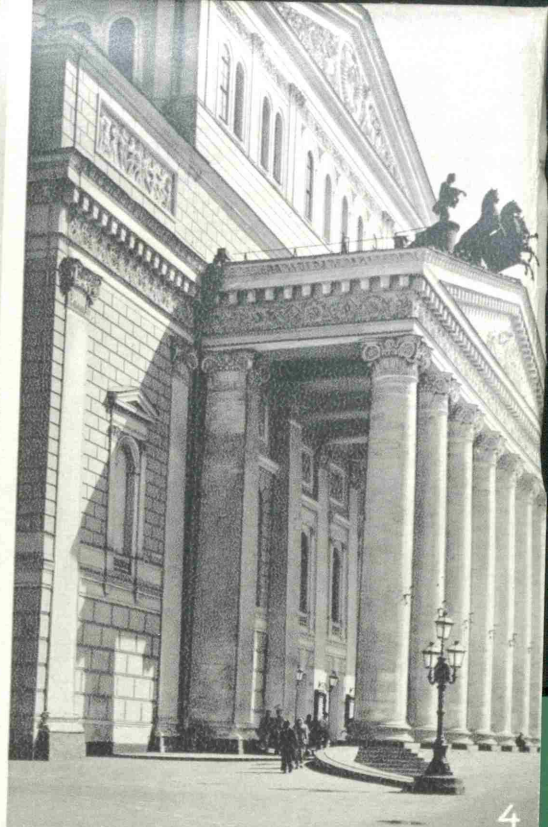
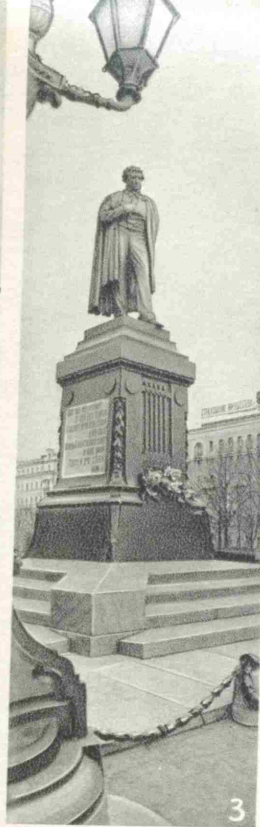
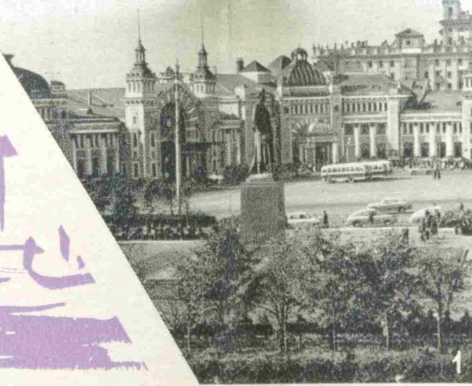
There are many historical monuments and places of old culture in the environs of Moscow. Among the most interesting are Zvenigorod, the Troitse-Sergiyev Monastery, the Palace-Museums at Arkhangelskoye, Ostankino and Kuskovo, the art-and-literary museum at Abramtsevo and many others.

Moscow is also a major Soviet sports centre. It possesses dozens of stadiums, football fields, sports halls, yacht clubs, etc. The new Lenin Central Stadium for one hundred thousand spectators was built in one year at Luzhniki on the bank of the Moscow River, opposite the Lenin Hills. Opened in 1956, this sports centre contains a large sports arena, swimming pool, a small sports arena, an indoor Palace of Sports, more than 130 gymnasiums, volley-ball, basket-ball and tennis courts, premises for track-and-field events and football grounds.

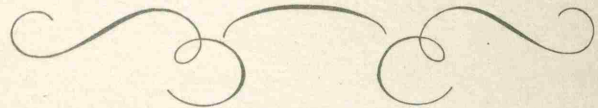
Physical culture and sports are truly mass undertakings in Moscow, as they are throughout the Soviet Union. Hundreds of thousands of workers, office employees, students and schoolchildren are ardent enthusiasts of all forms of sport.

Another of Moscow's places of interest are the Industrial

1. Byelorussian Railway Terminal
2. A multi-storey building erected on Kotelnicheskaya Embankment
3. Monument to A. S. Pushkin
4. The Bolshoi Theatre
5. The Pushkin Museum of Fine Arts
6. A view of Red Square opening from a Kremlin tower.

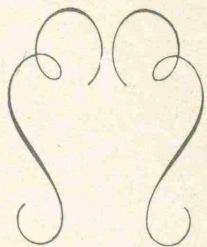






Дабский монастырь в 10 км от Боржоми, Тимотесубанский монастырь XI века.

Изумительные картины природы открываются взгляду во время поездки по узкоколейной железной дороге от Боржоми до станции Бакуриани по ущелью реки Гуджаретис-Цхали.



*КУРОРТЫ ГРУЗИНСКОЙ ССР.*

ИЗДАНИЕ МИНИСТЕРСТВА КУЛЬТУРЫ ГРУЗИНСКОЙ ССР

Фото *Размадзе Г. И.*

Редактор *Начиташвили Б. Г.*

Технический редактор *Михайлов П. П.*

Отпечатано в Образцовой типографии Латгавиздата  
гор. Рига, ул. Пушкина, 12.

Заказ № 114. Тираж 50 000 экз. УЭ 01799.  
Цена 1 руб.



# Боржоми







*Санаторий Минздрава ГССР.*

## БОРЖОМИ

В живописной долине рек Куры, Боржомула и Гуджаретис-Цхали, в 150 км от Тбилиси расположен курорт Боржоми, связанный с главной магистралью Закавказской железной дороги линией Тбилиси—Ахалцихе.

Зеленый массив, составляющий большую часть площади курорта, состоит главным образом из хвойных и лиственных пород. Разбито много парков: в долине реки Боржомула нахо-

*Санаторий «Ликани».*



дится парк им. Орджоникидзе, на высоком плато — парк имени 26 комиссаров, к которому примыкает Садгерский лесопарк.

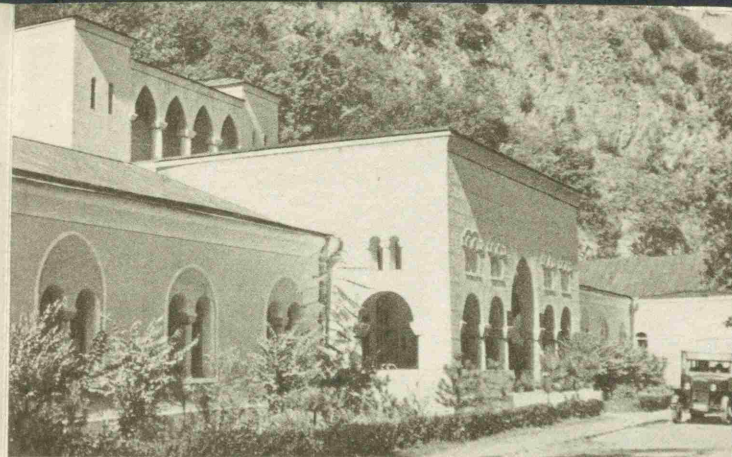
Климат курорта Боржоми среднегорный, теплый, умеренно влажный, с мягкой зимой и теплым летом. Наиболее солнечный период — с середины мая по октябрь включительно.

Основным лечебным фактором Боржоми по праву считаются его минеральные воды. Кроме старых, обнаруженных еще до Октябрьской революции источников, в настоящее время в результате разведочных работ было получено несколько новых выходов вод. Дебит боржомских источников исчисляется до 250 тыс. литров в сутки, что позволяет не только использовать минеральные воды на месте, но и производить розлив их для всего Советского Союза. Боржомская вода по своим физико-химическим свойствам не имеет себе равных. С нею несколько сходна вода источника Виши во Франции.

Минеральная вода Боржоми, относящаяся к субтермальным углекислым гидро-карбонатно-натриевым водам, применяется как внутрь, так и в виде ванн. Температура различных источников варьирует от 16,6° до 31,6°. Используется боржомская минеральная вода для лечения целого ряда заболеваний (желудочно-кишечных, обмена веществ и др.).

Для обслуживания курортных больных оборудованы бальнеофизиотерапевтическая лечебница, в которой имеются отделения для минеральных и углекислых ванн, грязелечебница, гидро-терапевтическое отделение, электро-светолечебница, а также отделение для гинекологических орошений и механо-терапевтические, ингаляционные, рентгеновские отделения, аэро-солярий и лаборатория.

В Боржоми функционирует ряд санаториев и домов отдыха. Амбулаторные больные размещаются в гостинице. Медицинское обслужива-

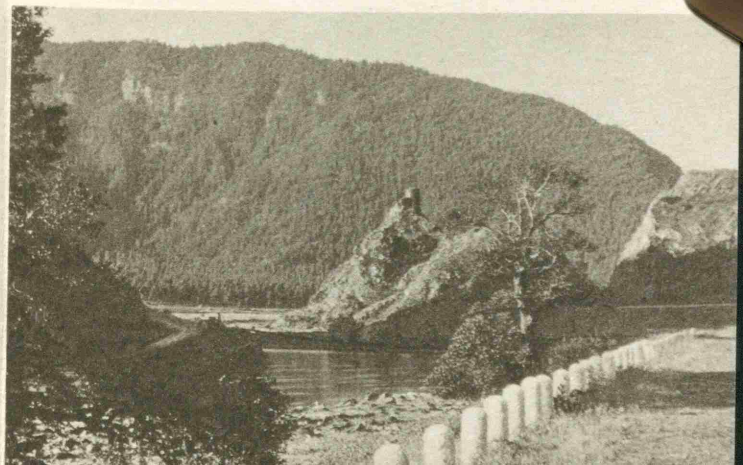


*Ванное здание.*

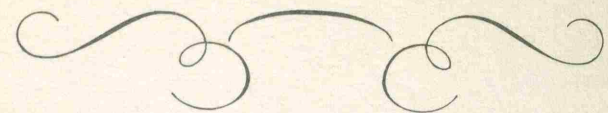
ние амбулаторных больных осуществляется поликлиникой.

Замечательные окрестности Боржоми всегда привлекают любителей прогулок. Особенно интересны прогулки вверх по ущелью реки Боржомула, мимо водопада и гидро-электрической станции до Садгерских серных источников; на плато имени 26 комиссаров, на Торское плато, в Ликани по долине Куры, к крепостям Петрес-Цихе и Гогнас-Цихе. Для дальних экскурсий интересны знаменитый Вардзийский пещерный город XII века в Ахалцихском районе.

*Крепость по дороге.*







На курорте имеется большой парк и сосновая роща. Чрезвычайно живописны окрестности Абастумани. Из курортных рощ поднимаются тропинки на соседние горные хребты с тенистыми чащами, водопадами и ущельями. Для экскурсий особый интерес представляет Тамарисцихе (замок Тамары), хорошо сохранившийся исторический памятник, расположенный недалеко от курорта. Весьма интересны прогулки к «Воротам очарования», где сходится цепь горных ущелий, сплошь покрытых вековыми соснами, и на Зекарский перевал, с высшей точки которого в ясные дни видно Черное море. В 10 км от Абастумани расположена всемирно известная астрофизическая обсерватория, осмотр которой также представляет огромный интерес.



КУРОРТЫ ГРУЗИНСКОЙ ССР.

ИЗДАНИЕ МИНИСТЕРСТВА КУЛЬТУРЫ ГРУЗИНСКОЙ ССР

Фото Размадзе Г. И.

Редактор Наниташвили Б. Г.

Технический редактор Михайлов П. П.

Отпечатано в Образцовой типографии Латгавиздата  
гор. Рига, ул. Пушкина, 12.

Заказ №114. Тираж 50 000 экз. УЭ02023

Цена 1 руб.

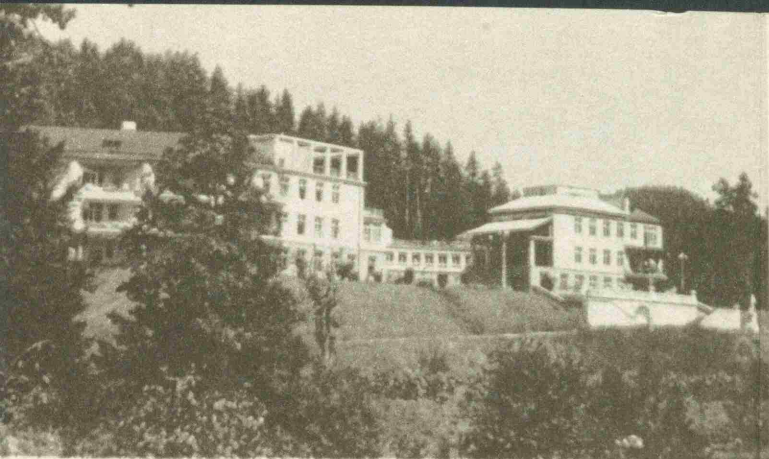
\*



# Абастумани





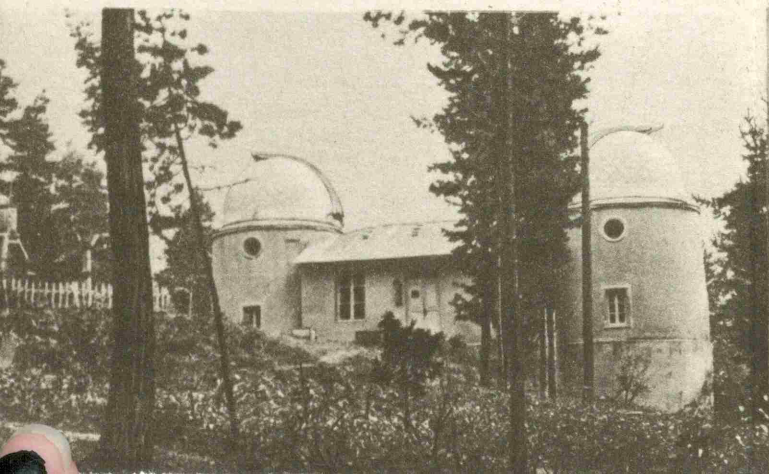


Санаторий «Агобили».

## АБАСТУМАНИ

На высоте 1300 метров над уровнем моря, среди живописных, вечнозеленых гор, покрытых сплошными хвойными лесами, в одном из ущелий Аджаро-Имеретинского хребта расположен горноклиматический курорт Абастумани. Ущелье замыкается с севера цепью высоких гор — Зекарским хребтом, который является надежным заслоном от северных и западных ветров. Воздух в Абастумани, насыщенный за-

Здание обсерватории.



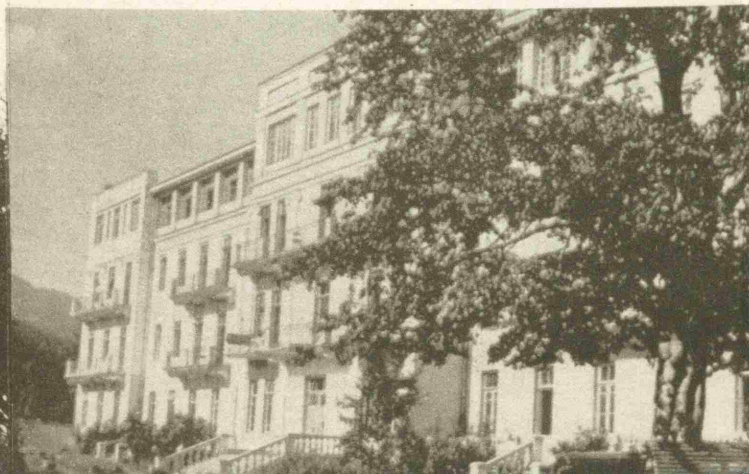
пахом сосны, чист и ароматен; колебания температуры и атмосферного давления весьма незначительны, жарких дней не бывает, вечера прохладны, сырости нет.

Средняя годовая температура воздуха  $6,5^{\circ}$ , температура самого холодного месяца, января, —  $6^{\circ}$ , самого теплого, июля, —  $17,7^{\circ}$ . Влажность умеренная, летом она держится в пределах 50%. Количество осадков относительно невелико (618 мм), это объясняется защищаемостью Абастумани от непосредственного воздействия морских воздушных течений. Господствующие ветры — северные и южные. Преобладающее значение в вентиляции ущелья имеют горно-долинные ветры. Продолжительность солнечного сияния в Абастумани, несмотря на то, что горизонт закрыт горами, довольно высокая и достигает 1980 часов.

Замечательное расположение курорта и его исключительные климатические условия делают Абастумани незаменимым для больных, страдающих туберкулезными заболеваниями органов дыхания. Научная работа, в основном, сосредоточена в Абастуманском филиале Научно-исследовательского туберкулезного института Грузинской ССР.

Помимо прекрасного высокогорного клима-

Санаторий «Аразиндо».

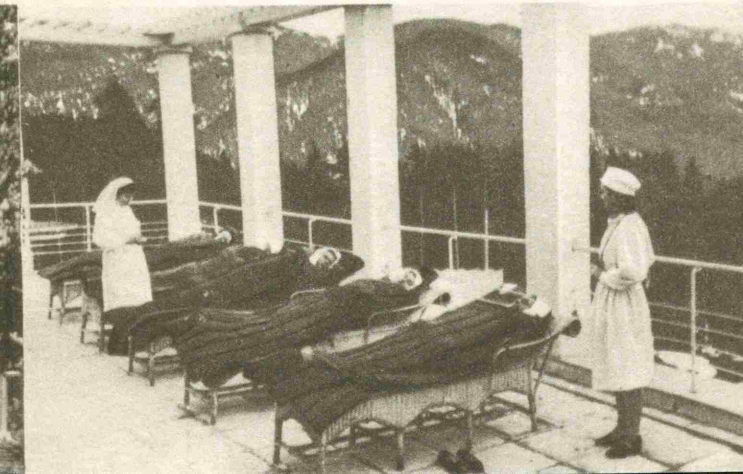


Санаторий «Зекари».

та, лечебное значение курорта обусловлено также наличием минеральных вод: теомальные источники, общий дебит которых превышает один миллион литров в сутки, создают возможность для лечения больных с нарушением органов движения, гинекологическими заболеваниями и др.

С этой целью на курорте оборудовано прекрасное ванное здание с 32 кабинками, гидропатическим отделением и мраморными бассейнами. Кроме того, в отдельном здании находятся два больших бассейна для плавания.

Аэрарий санатория «Агобили».







Курортная гостиница «Тбилиси».

## ЦХАЛТУБО

Цхалтубо находится в 12 км к северо-западу от гор. Кутаиси. Курорт расположен в живописной долине, окаймленной со всех сторон холмами, утопающими в зелени. Раньше здесь протекала речка Цхалтубо, которая брала начало из двух небольших озер, находящихся недалеко от курорта. Сейчас эта речка отведена по двум бетонированным каналам, которые как бы кольцом окружают курорт.

Ванное здание источника № 6.



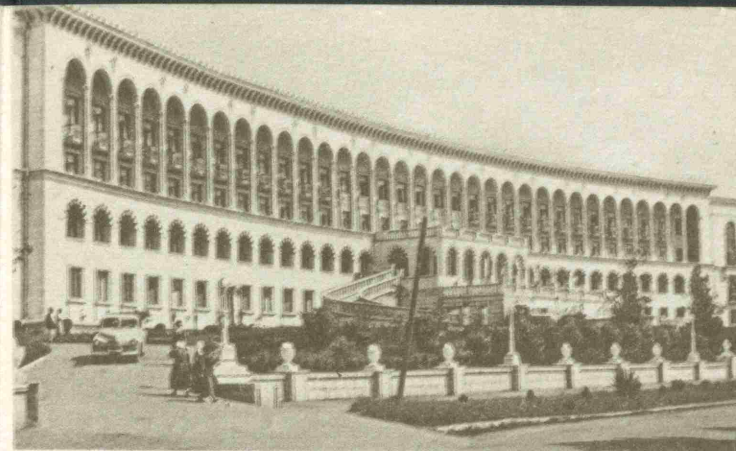
Климат Цхалтубо теплый, умеренно влажный. Благоприятные климатические условия дают возможность для круглогодичного функционирования курорта.

Славу Цхалтубо создали теплые радиоактивные минеральные источники, которые выходят из речных отложений долины реки Цхалтубо в виде многочисленных грифонов. Вода источников слабоминерализованная, количество emanации радия (радона) в различных источниках неодинаково и колеблется в пределах 3—30 единиц Махе; в некоторых буровых скважинах радиоактивность еще выше.

Особенностью цхалтубской воды является ее температура, варьирующая в различных источниках в пределах 32—35°, что позволяет применять ее для ванн без нагрева и охлаждения, а также содержание в ней азота. Огромный дебит этих вод дает возможность проводить лечение больных в проточных бассейнах, в кабинах. Многолетний опыт показал большую эффективность лечения цхалтубскими водами заболеваний сердечно-сосудистой системы, опорно-двигательного аппарата, болезней периферической нервной системы, женских заболеваний и др.

За годы Советской власти в Цхалтубо построен целый ряд первоклассных санаториев

Санаторий «Железнодорожник».



Санаторий «Шахтер».

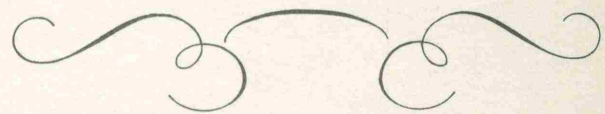
и домов отдыха, 6 благоустроенных ваннных зданий. С каждым годом растет территория курорта: в настоящее время она занимает площадь в 730 га, причем на 80 га раскинулся курортный парк, в котором представлено почти 100 разновидностей субтропической флоры.

На курорте открыт филиал Научно-исследовательского института курортологии и физиотерапии Министерства здравоохранения Грузинской ССР, разрабатывающий вопросы лечения цхалтубскими водами и их действия при различных заболеваниях.

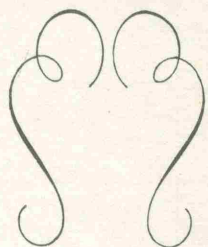
Фойе ванного здания № 6.







Для обслуживания курортников построен курзал, имеются театр, кино, в парке — раковина, библиотека. В окрестностях курорта много живописных мест. Ближайшая прогулка — к озеру, образовавшемуся у вновь построенной плотины. Очень интересна прогулка к сталактитовым пещерам, расположенным близ курорта. Можно также совершать экскурсии в гор. Кутаиси, один из крупнейших и красивейших городов Грузии, в Гелатский монастырь, памятник грузинского зодчества XI века.



*КУРОРТЫ ГРУЗИНСКОЙ ССР.*

ИЗДАНИЕ МИНИСТЕРСТВА КУЛЬТУРЫ ГРУЗИНСКОЙ ССР

Фото *Размадзе Г. И.*

Редактор *Наниташвили Б. Г.*

Технический редактор *Михайлов П. П.*

Отпечатано в Образцовой типографии Латглавиздата  
гор. Рига, ул. Пушкина, 12.

Заказ № 114. Тираж 50 000 экз. УЭ 01797.

Цена 1 руб.



# Цхалтубо





От Цеми железная и шоссейная дорога ведет через Либани (превосходный горноклиматический курорт), с санаторием для больных, с открытыми формами туберкулеза легких, функционирующим круглый год, Патара-Цеми (детская здравница) к Бакуриани, расположенному на высоте 1654 метра над уровнем моря. Здесь проходит нижняя граница альпийской зоны.

Это обстоятельство в значительной степени обуславливает специфичность климатических условий Бакуриани. Зима на курорте устойчивая, со снежным покровом, достигающим 50 см; это дает возможность широко развивать здесь зимний спорт. Облачность небольшая, много солнечных дней, особенно с августа по октябрь.

На Бакурианском курорте проводят лето нуждающиеся в отдыхе и восстановлении своих сил. Зимой же функционируют горнолыжные базы, привлекающие в Бакуриани многочисленных любителей лыжного спорта со всех концов Советского Союза.

КУРОРТЫ ГРУЗИНСКОЙ ССР.

ИЗДАНИЕ МИНИСТЕРСТВА КУЛЬТУРЫ ГРУЗИНСКОЙ ССР

Фото Размадзе Г. И.

Редактор Наниташвили Б. Г.

Технический редактор Михайлов П. П.

Отпечатано в Образцовой типографии Латгавиздата  
гор. Рига, ул. Пушкина, 12.

Заказ № 114. Тираж 50 000 экз. УЭ 01796.

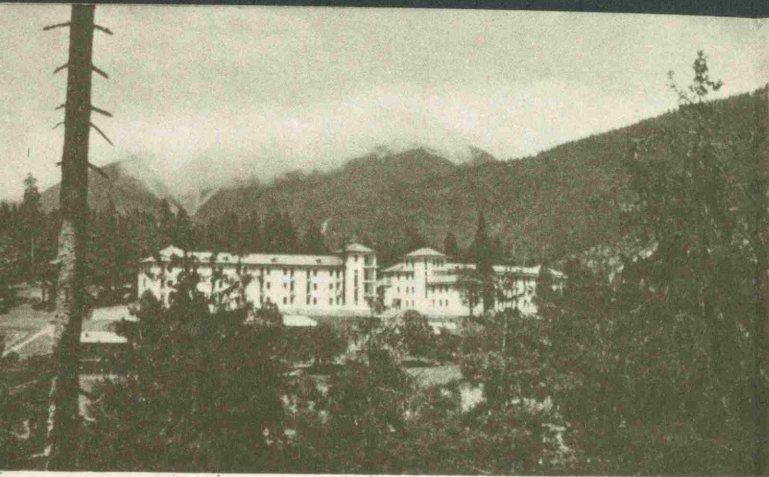
Цена 1 руб.

\*



# Бакуриани





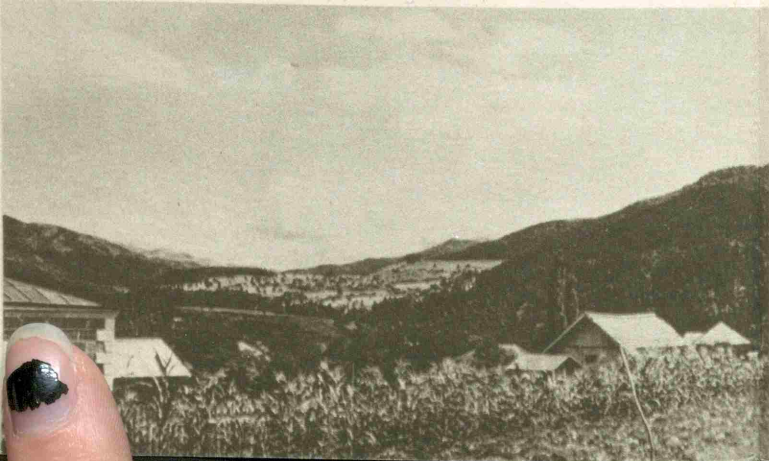
*Цагвери. Дом отдыха «Кечхоби».*

### **ЦАГВЕРИ, ЦЕМИ, ЛИБАНИ, БАКУРИАНИ**

Узкоколейная железная дорога, а также автомобильное шоссе связывают город Боржоми с курортом Бакуриани. И на всем протяжении пути (37 км) расположены великолепные горноклиматические станции, по праву снискавшие известность в нашей стране.

На 14-м километре дороги, в долине реки Гуджаретис-Цхали находится курорт Цагвери. Курорт со всех сторон окружен горами, ограждающими его от сильных ветров и резких колебаний температуры.

*Цеми. Общий вид.*

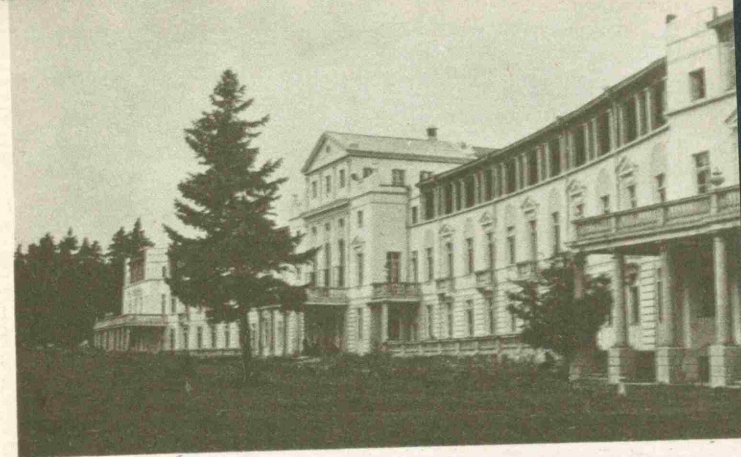


Цагвери как горноклиматический курорт, расположенный на средней высоте, особенно подходит для лечения лёгочных больных, которым противопоказан высокогорный климат.

Курорт с каждым годом привлекает все больше отдыхающих; уже построено несколько санаториев для взрослых и детей, а амбулаторные больные размещаются в специально подготовленных домах и получают лечебную помощь в поликлинике курорта.

Рядом с Цагвери, на высоте 1117 м над уровнем моря, находится курорт Цеми. Попастъ в Цеми можно по Боржоми-Бакурианской узкоколейной железной дороге или по автомобильному шоссе. Весь путь (от Цагвери — 4 км) очень живописен, проходит он через Цемский виадук длиной около 80 м, перекинутый на тридцатиметровой высоте через Баку-

*Бакуриани. Зимой.*

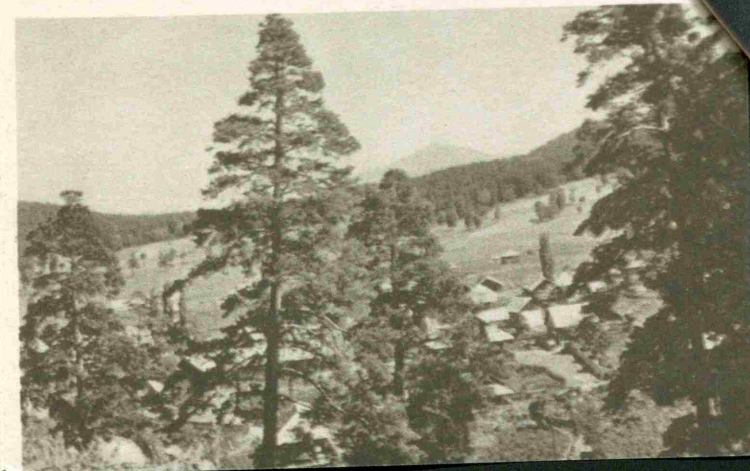


*Либани. Санаторий «Либани».*

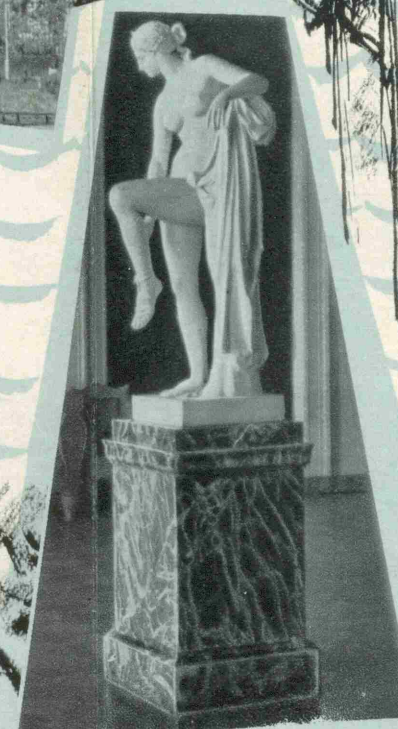
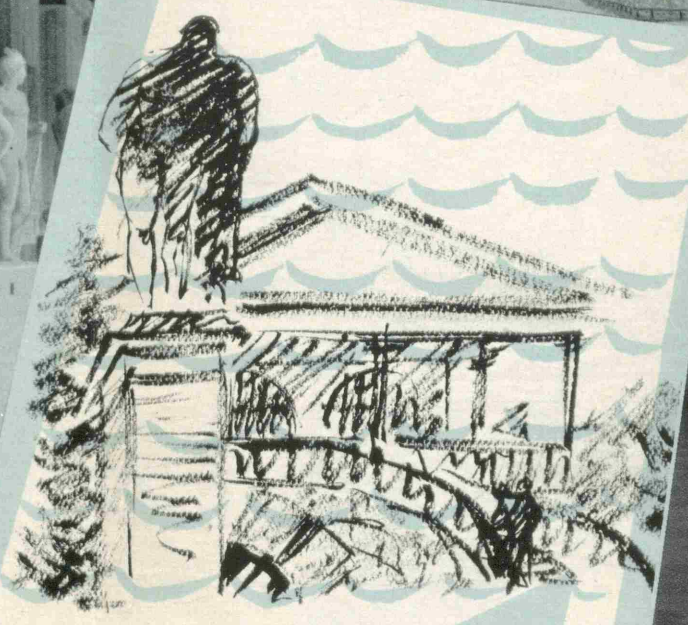
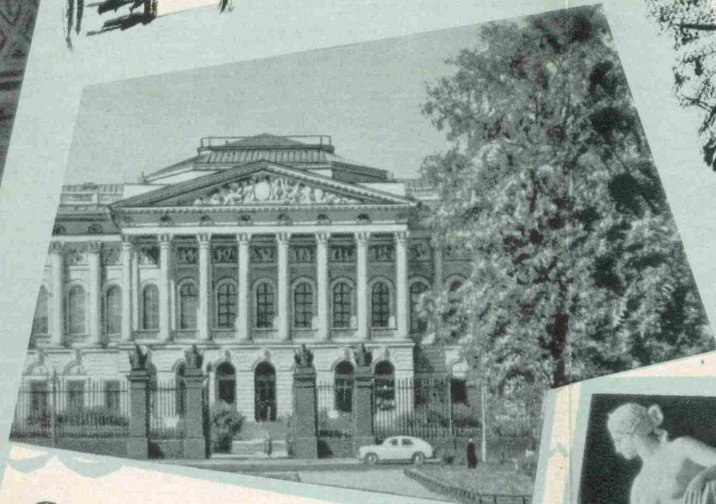
рианское ущелье. Курорт раскинулся на открытом плато и доступен солнечным лучам на протяжении всего дня. Плато покрыто хвойным лесом и защищено от холодных ветров Триалетскими горами. Климат курорта ровный, сухой. Средняя влажность равна 61%.

Цеми, в основном, курорт для легочно-туберкулезных больных, но здесь так же хорошо направляются больные, страдающие заболеваниями дыхательных органов не туберкулезного происхождения. На курорте функционирует уже несколько санаториев.

*Бакуриани. Общий вид.*







Petrodvorets is known throughout the world for its numerous fountains and the beautiful canal running from the foot of the palace to the seashore.

The town of Pushkin, formerly Tsarskoye Selo, situated at a distance of 20 km from Petrodvorets, is famous for its unique palaces, pavilions and parks.

A number of health resorts is situated along the shore of the Gulf of Finland with lovely beaches, numerous sanatoriums, rest homes, Young Pioneer camps and tourist bases.

Leningrad, that majestic Russian city, leaves an indelible impression, presenting a host of interesting sights for the tourist.

ch brought forth many celebrated artists, among them Chaliapin, Ulanova; the Pushkin Theatre; the Maly Opera Theatre; the named after Gorky, and the State Philharmony. An important t of Soviet cinema art is played by the Lenfilm Studio.

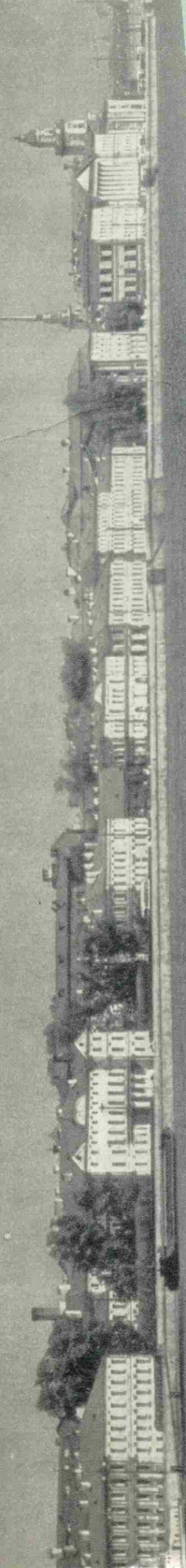
reat number of clubs and palaces of culture.

eningrad's museums is the State Hermitage, a repository of counting more than two million exhibits. The paintings, sculp-

tures and other exhibits on display at the Hermitage Museum reflect the history of culture and art of the antique world, ancient Egypt, China, India. More than 120 halls of the Hermitage are dedicated to works of Western painting and sculpture, including those by Leonardo da Vinci, Raphael, Tician, Michelangelo and other great masters.

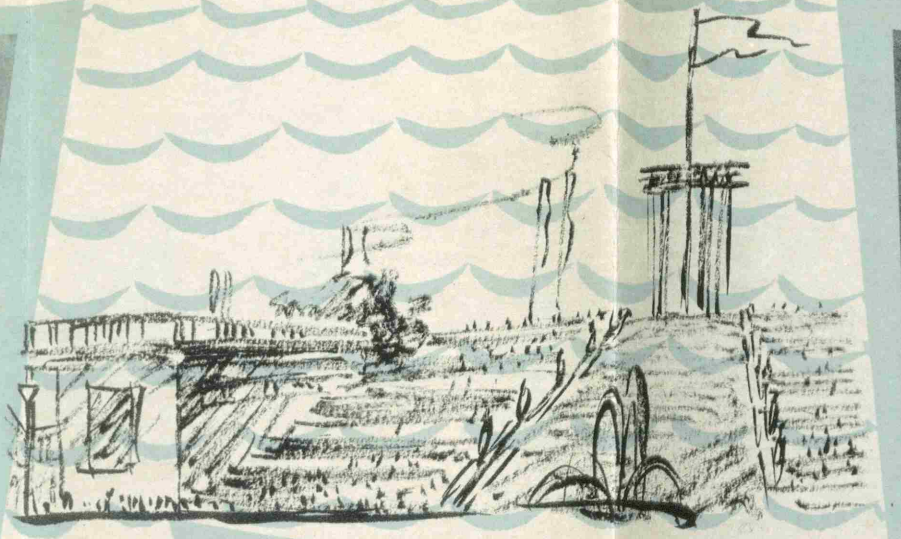
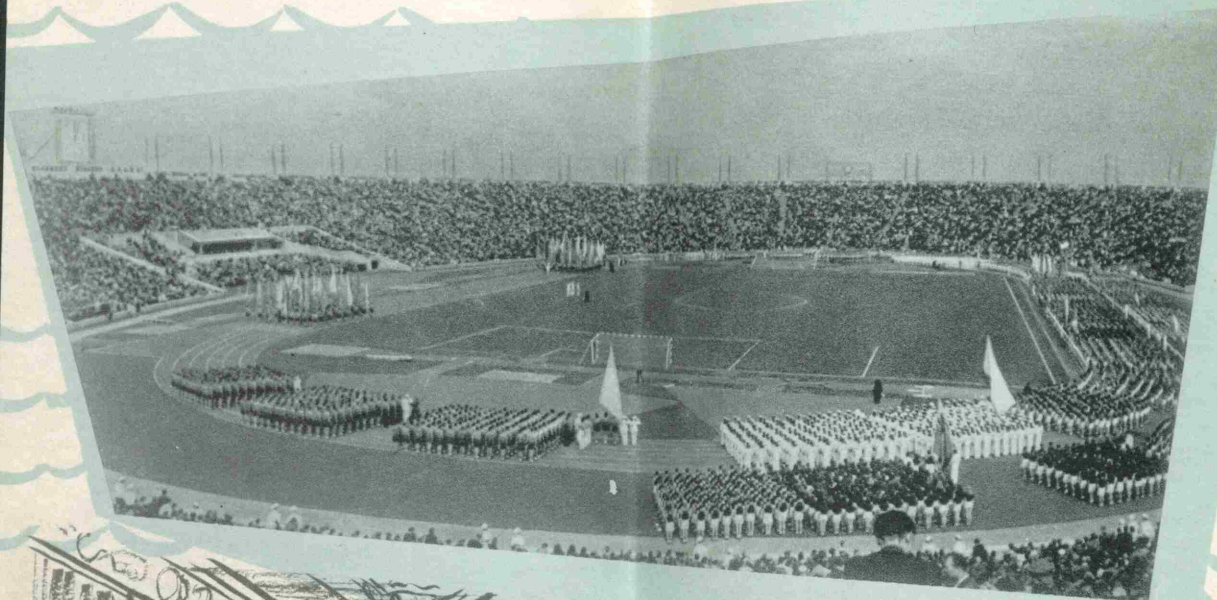
Another large museum, the Russian Museum, has in its custody up to 200,000 works by outstanding Russian painters and sculptors.

Leningrad's environs with their enchanting palaces and parks present an unforgettable picture.

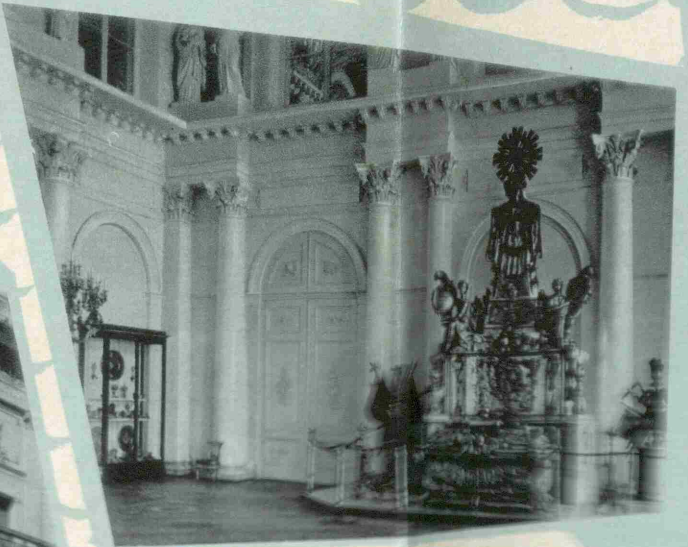
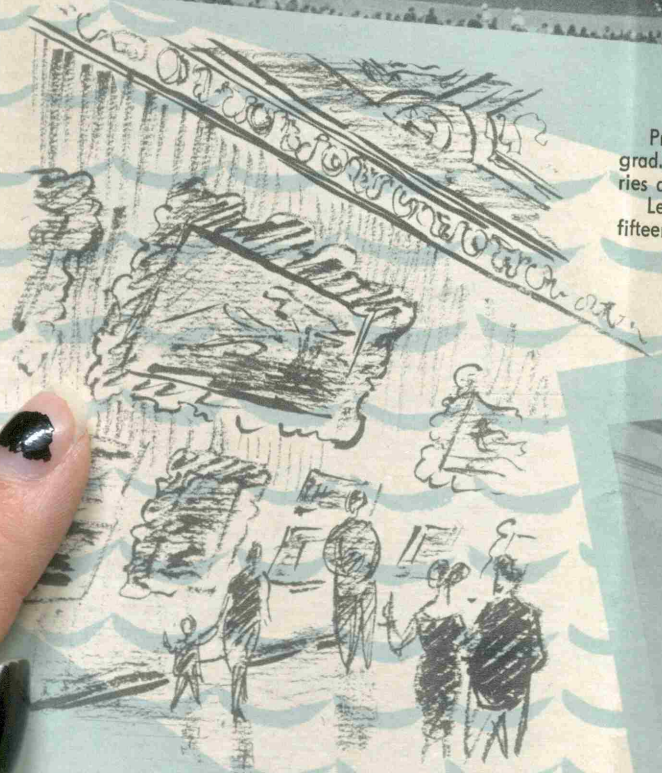


# L E N I N G R A D

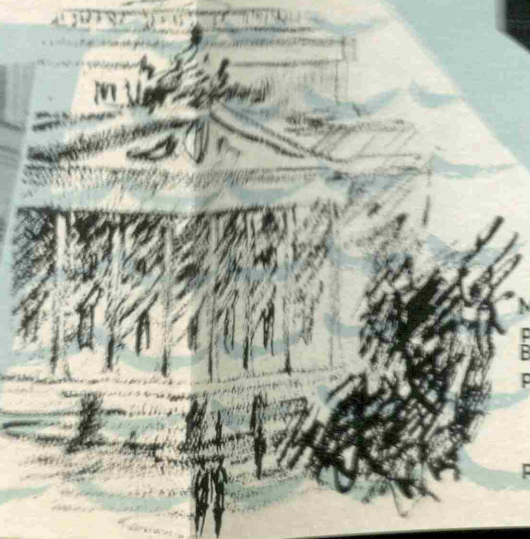




Prior to 1934, the USSR Academy of Science had its seat in Leningrad. Now the city and its suburbs house many of its institutes, laboratories and scientific institutions. Leningrad is justly proud of its numerous museums and theatres. Its fifteen theatres include the Kirov Opera and Ballet Theatre (former

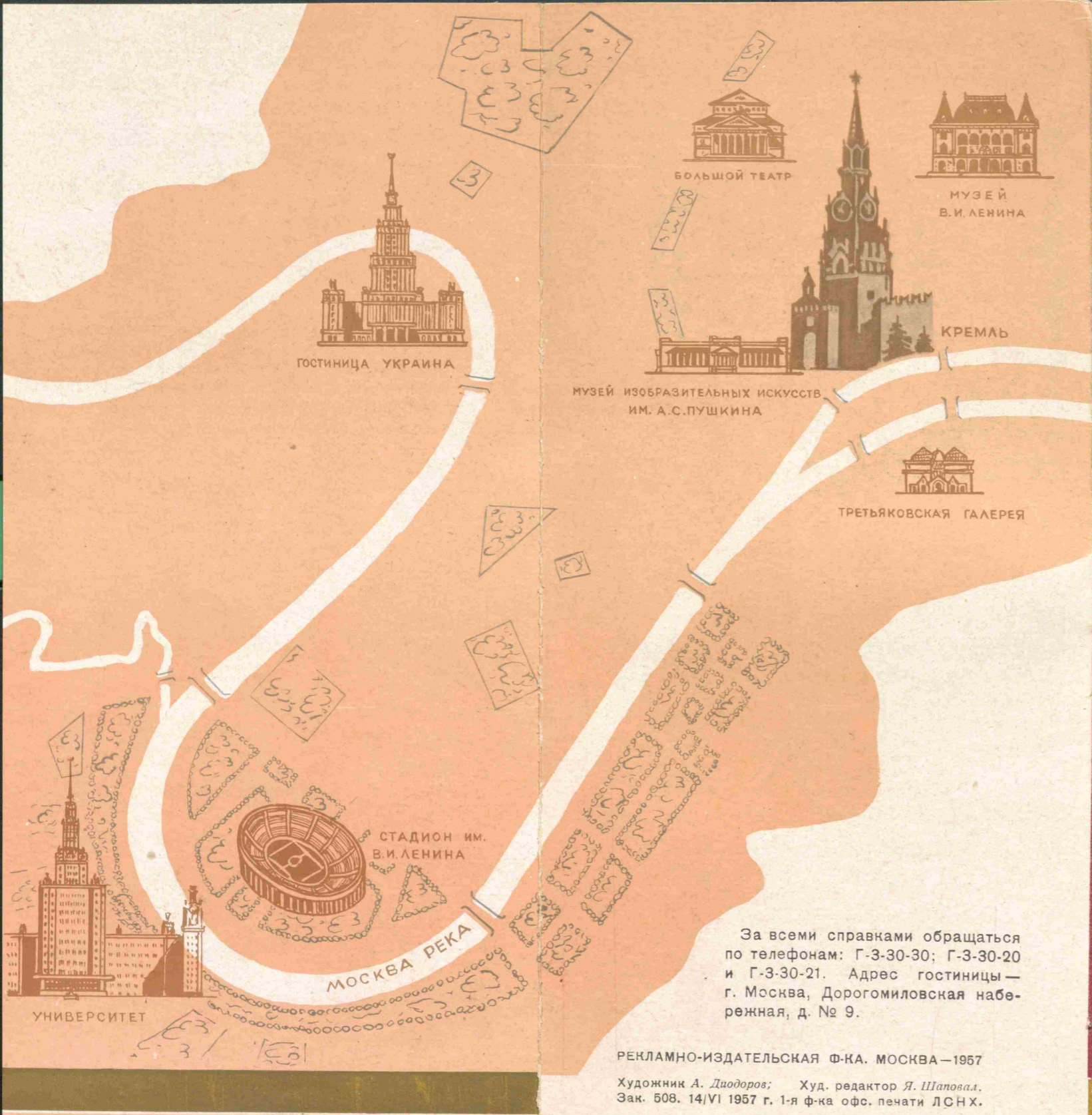


Leningrad is a treasurehouse of Russian national culture, science and art. The city has more than 60 higher educational establishments attended by some 100,000 students. Among them are some of the country's oldest and biggest institutions of learning, such as the State Zhdanov University, Kalinin Polytechnical Institute, Lensoviet Technological Institute, Mining Institute, Railway Engineering Institute, etc.



Mariinsky Theatre), which includes the names of the great Russian dancers, Sobinov, Pavlova, Bolshoi Drama Theatre part in the development of the city. The city boasts a great number of theatres. Foremost among Leningrad's priceless works of art,





ГОСТИНИЦА УКРАИНА

БОЛЬШОЙ ТЕАТР

МУЗЕЙ  
В.И. ЛЕНИНА

КРЕМЛЬ

МУЗЕЙ ИЗОБРАЗИТЕЛЬНЫХ ИСКУССТВ  
ИМ. А.С. ПУШКИНА

ТРЕТЬЯКОВСКАЯ ГАЛЕРЕЯ

СТАДИОН ИМ.  
В.И. ЛЕНИНА

МОСКВА РЕКА

УНИВЕРСИТЕТ

За всеми справками обращаться по телефонам: Г-3-30-30; Г-3-30-20 и Г-3-30-21. Адрес гостиницы — г. Москва, Дорогомиловская набережная, д. № 9.

РЕКЛАМНО-ИЗДАТЕЛЬСКАЯ Ф-КА. МОСКВА—1957  
Художник А. Диодоров; Худ. редактор Я. Шаповал.  
Зак. 508. 14/VI 1957 г. 1-я ф-ка офс. печати ЛСНХ.



ГОСТИНИЦА

Украина

москва

ГОСТИНИЦА  
Украина

На берегу Москва-реки вблизи Киевского вокзала расположено высотное здание гостиницы „Украина“ — самой крупной в Советском Союзе.

В гостинице имеются 1026 уютных, красиво и удобно обставленных номеров, расположенных на 28 этажах этого монументального здания.

В каждом номере есть телефон, радио, ванна, душ, туалет.

Меблировку 2-х и 3-х комнатных номеров дополняют пианино, телевизоры, картины, ковры.

На этажах гостиницы для отдыха проживающих имеются хорошо оборудованные холлы и гостиные.



МОСКВА, КРЕМЛЬ





ВЕСТИБЮЛЬ



НОМЕР ОДНОКОМНАТНЫЙ, ОДНОКРОВАТНЫЙ



ГОСТИНАЯ 2-КОМНАТНОГО НОМЕРА



ХОЛЛ



СПАЛЬНЯ 2-КОМНАТНОГО НОМЕРА



На 2-м этаже расположены комфортабельные парикмахерские.

В вестибюле гостиницы к услугам проживающих имеются почта, телеграф, сберкасса. В киосках, расположенных в гостинице, Вы можете приобрести интересные сувениры в память о Москве, ювелирные и галантерейные изделия, парфюмерию, свежие номера газет, журналов, литературу, художественные альбомы, открытки и памятные значки.

На катере от гостиницы „Украина“ можно совершить увлекательную прогулку по Москва-реке к крупнейшему стадиону имени В. И. Ленина, к Московскому университету им. Ломоносова, к Центральному парку культуры и отдыха им. Горького и многим другим интересным местам города.



МОСКВА, ЗДАНИЕ МОСКОВСКОГО ГОРОДСКОГО СОВЕТА





ВЕСТИБЮЛЬ



Бюро обслуживания быстро выполнит Ваши заявки по различным вопросам.



РЕСТОРАН



ХОЛЛ



КИОСК СУВЕНИРОВ

В первом этаже гостиницы расположен первоклассный ресторан „Украина“, где имеются в большом выборе национальные блюда, горячие и холодные закуски, различные вина, напитки, фрукты, кондитерские изделия.

В залах ресторана играет оркестр. Для удобства проживающих на этажах имеются буфеты, а на 30 этаже размещено первоклассное кафе.

По желанию обеды, завтраки и ужины подаются в номера.

Пассажирские лифты быстро поднимают гостей по этажам.

Скоростной лифт поднимает Вас на прогулочную площадку 31-го этажа, откуда открывается прекрасная панорама Москвы.

В вестибюле гостиницы к услугам проживающих имеются почта, телеграф, сберкасса. В киосках, расположенных в гостинице, Вы можете приобрести интересные сувениры в память о Москве, ювелирные и галантерейные изделия, парфюмерию, свежие номера газет, журналов, литературу, художественные альбомы, открытки и памятные значки.

На катере от гостиницы „Украина“ можно совершить увлекательную прогулку по Москва-реке к крупнейшему стадиону имени В. И. Ленина, к Московскому университету им. Ломоносова, к Центральному парку культуры и отдыха им. Горького и многим другим интересным местам города.



МОСКВА, ЗДАНИЕ МОСКОВСКОГО ГОРОДСКОГО СОВЕТА



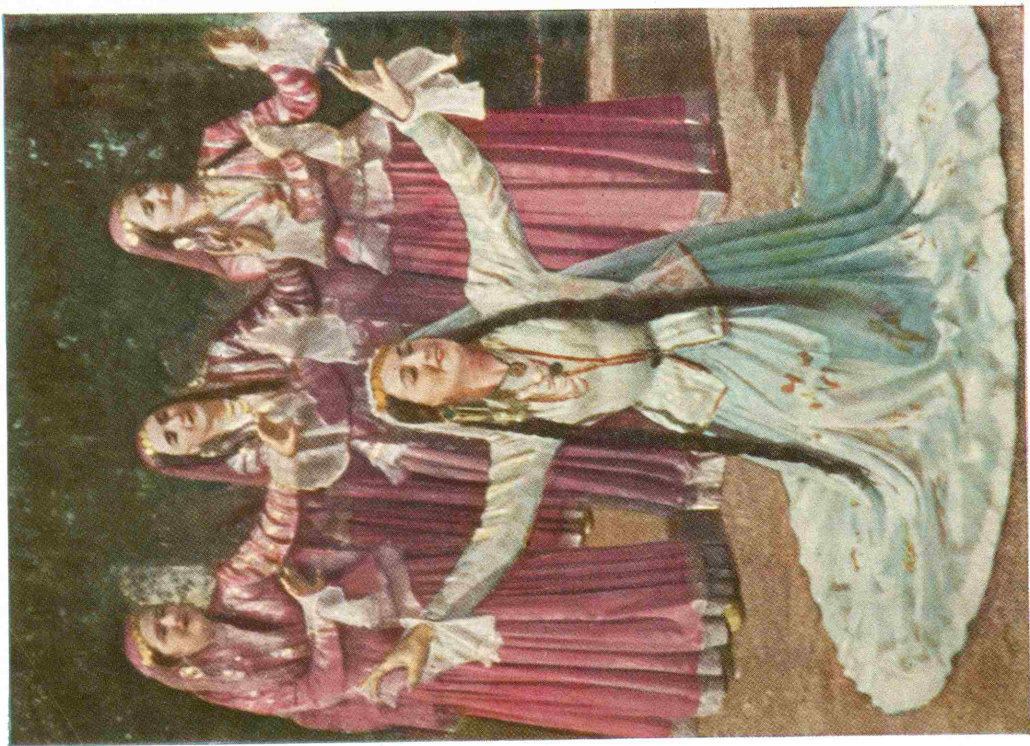
ГРУЗИНСКАЯ  
ССР











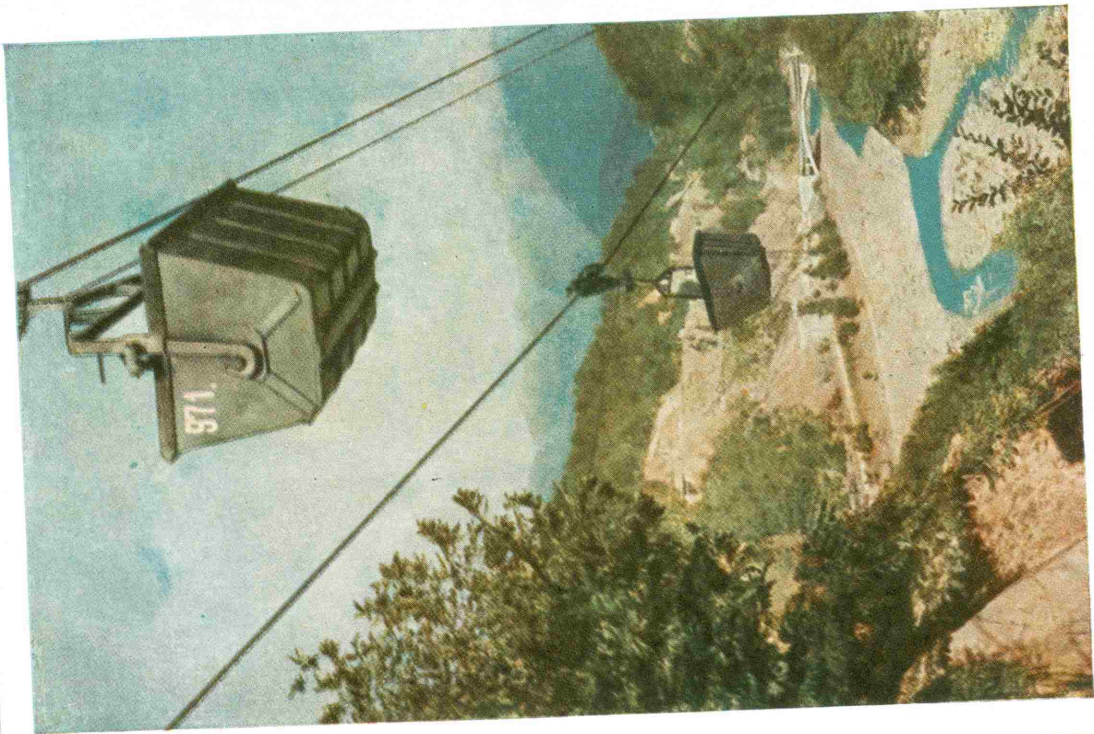




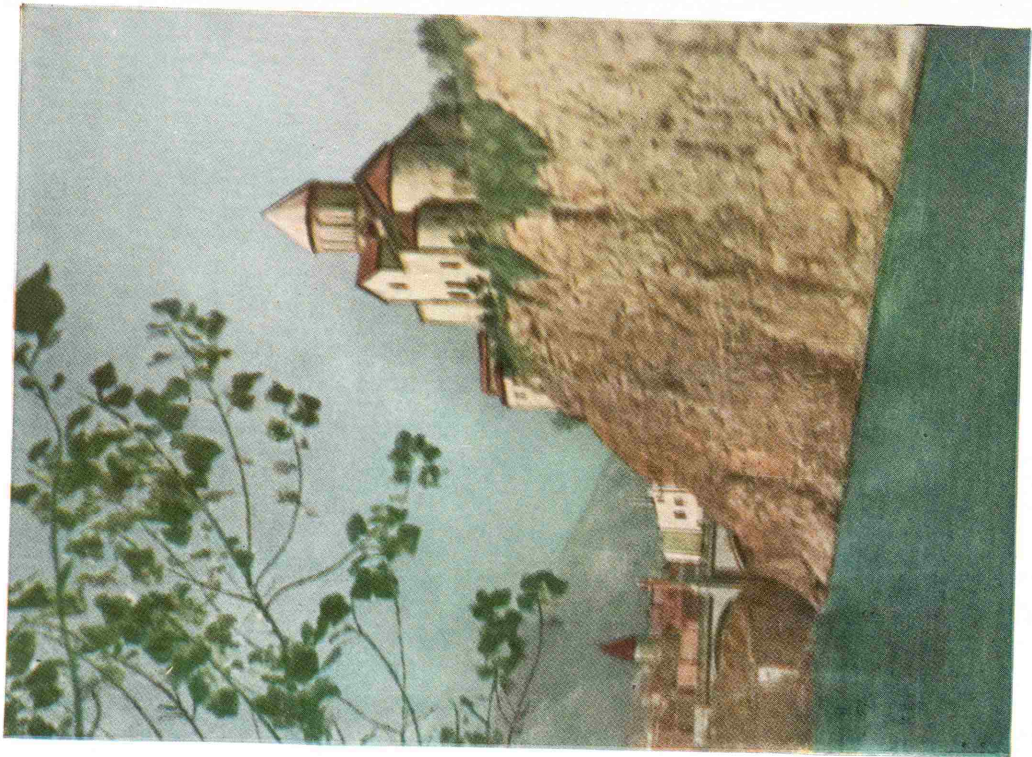


























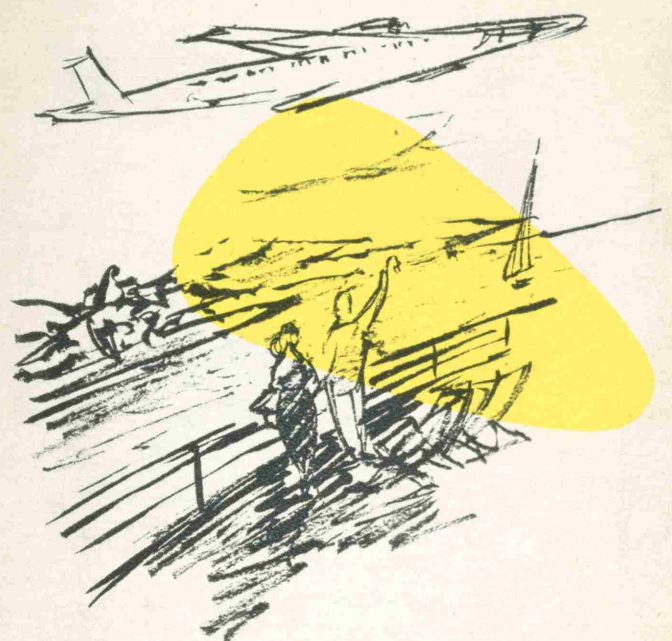
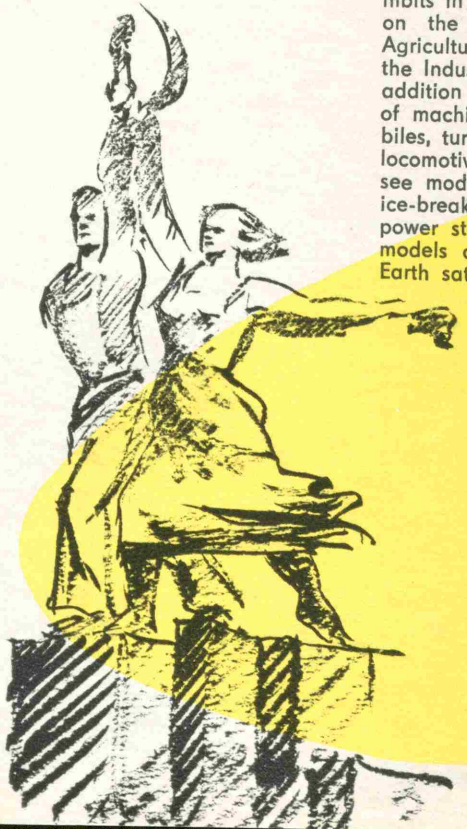






Another of Moscow's places of interest are the Industrial and the Agricultural Exhibitions. Beautiful pavilions, flower-gardens, orchards, and artificial lakes located there attract thousands of visitors.

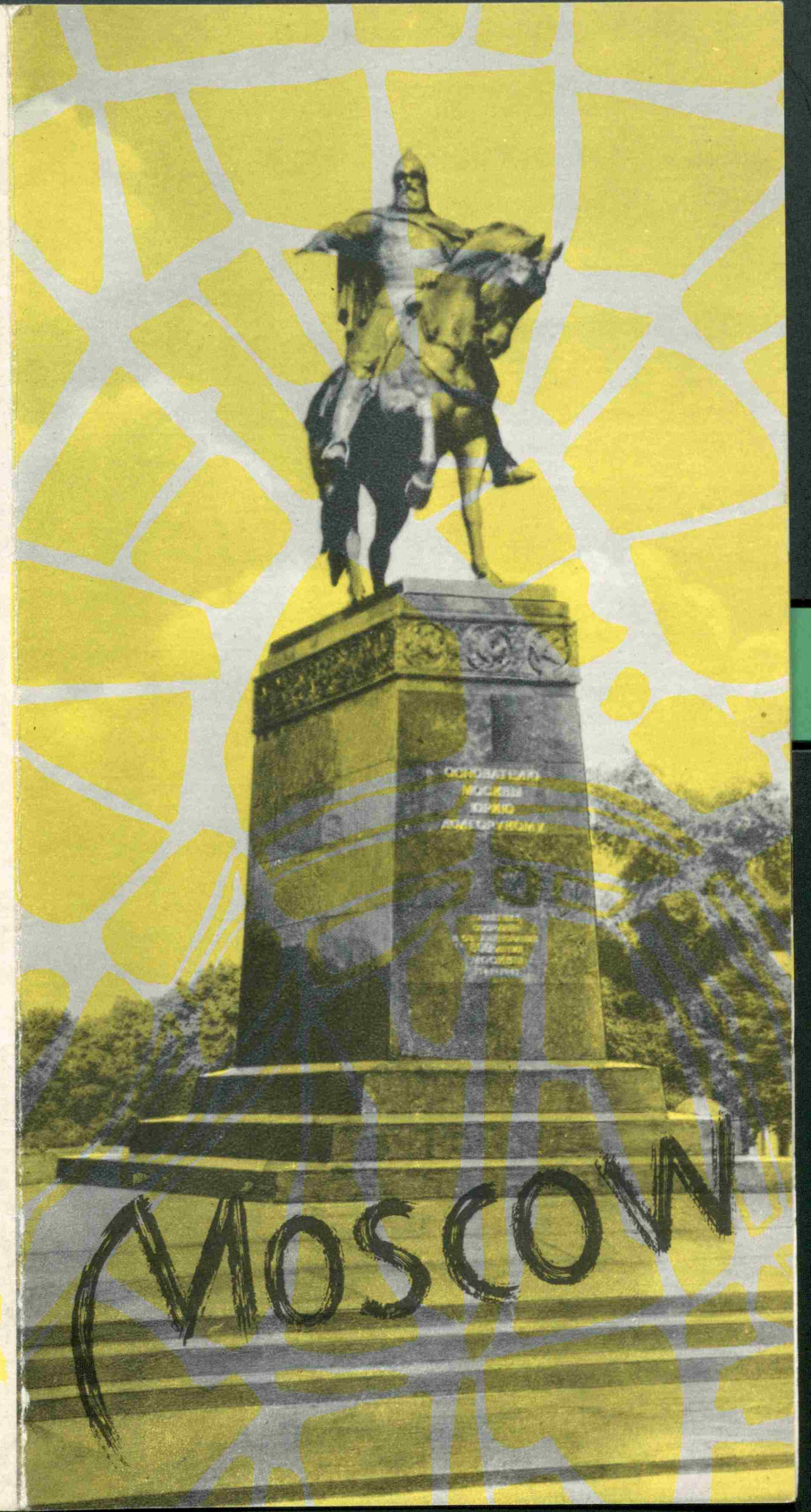
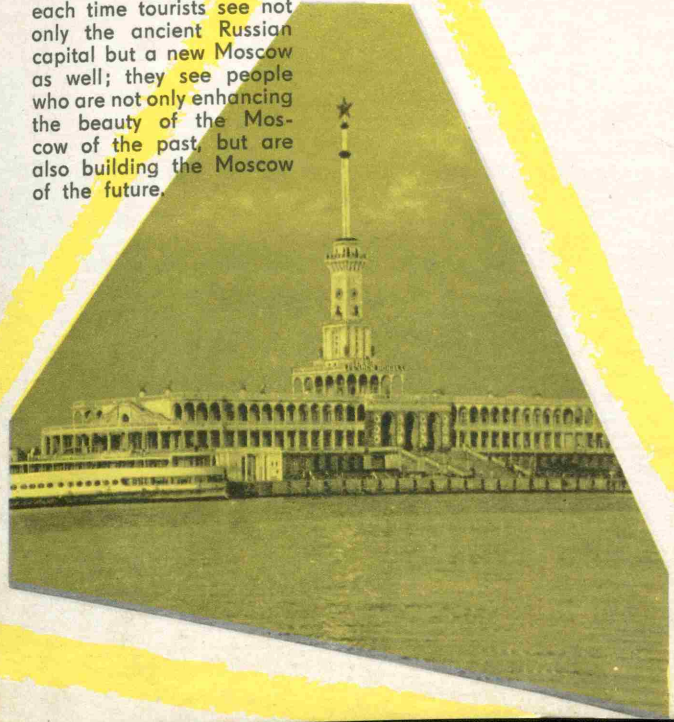
Achievements in agriculture, livestock farming and industry are graphically demonstrated by the many exhibits in the pavilions and on the grounds of the Agricultural Exhibition. At the Industrial Exhibition in addition to the latest types of machine-tools, automobiles, turbines and electric locomotives, visitors can see models of the atomic ice-breaker and the atomic power station and fullsize models of the man-made Earth satellites.



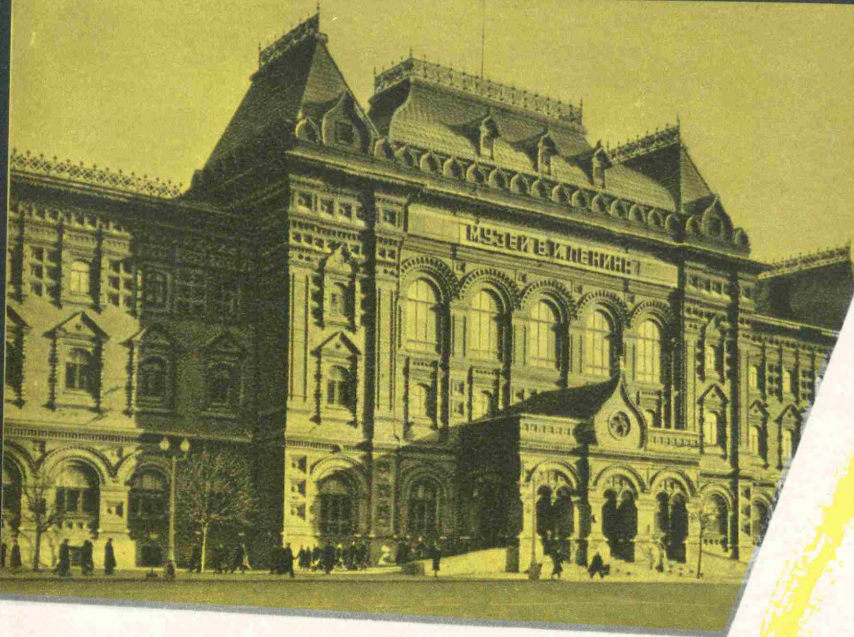
Moscow is a port of five seas and as such offers travelers a wide choice of interesting trips on modern, comfortable motor-vessels.

Moscow is also the centre of all the Soviet Union's air lines. Every day scores of air-liners from all parts of the world arrive at and depart from its airports. Traveling by Soviet jet air-liner TU-104, it takes only a few hours to cover the distance from Moscow to Peking, New York, Delhi, Kabul, London or Phyang-yang.

If you once visit Moscow, you will be sure to want to come again. And each time tourists see not only the ancient Russian capital but a new Moscow as well; they see people who are not only enhancing the beauty of the Moscow of the past, but are also building the Moscow of the future.



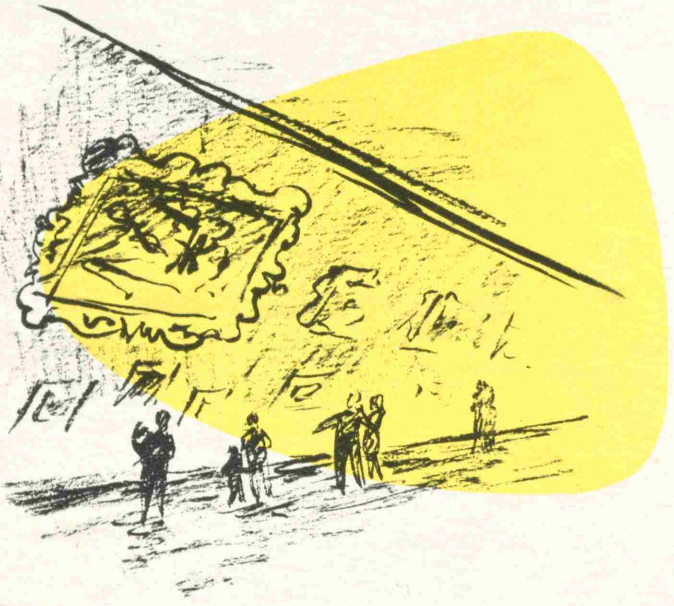




There are many historical monuments and places of old culture in the environs of Moscow. Among the most interesting are Zvenigorod, the Troitse-Sergiyev Monastery, the Palace-Museums at Arkhangelskoye, Ostankino and Kuskovo, the art-and-literary museum at Abramtsevo and many others.



Treasures of great value are collected at Moscow's 60 museums. Such museums as the V. I. Lenin Museum, dedicated to the great founder of the Soviet state, the Tretyakov Art Gallery, the Pushkin Museum of Fine Arts, the Historical Museum and others are famous for their superb collections throughout the world.



Moscow is also a major Soviet sports centre. It possesses dozens of stadiums, football fields, sports halls, yacht clubs, etc. The new Lenin Central Stadium for one hundred thousand spectators was built in one year at Luzhniki on the bank of the Moskva River, opposite the Lenin Hills. Opened in 1956, this sports centre contains a large sports arena, swimming pool, a small sports arena, an indoor Palace of Sports, more than 130 gymnasiums, volley-ball, basket-ball and tennis courts, premises for track-and-field events and football grounds.

Physical culture and sports are truly mass undertakings in Moscow, as they are throughout the Soviet Union. Hundreds of thousands of workers, office employees, students and schoolchildren are ardent enthusiasts of all forms of sport.





Moscow is the capital of the Union of fifteen Soviet Socialist Republics and the largest political, economic and cultural centre of the Soviet country. In 1947 Moscow celebrated its 800th anniversary.

Red Square is one of the most beautiful city squares in the world. The Cathedral of Vasily Blaz-



henny with its many multi-coloured cupolas, standing on this square, is a wonderful example of 16th century Russian architecture. In front of the Cathedral is a monument to the Russian patriots Minin and Pozharsky. To the right is the Spassky Tower from which the Kremlin chimes are heard throughout the world.

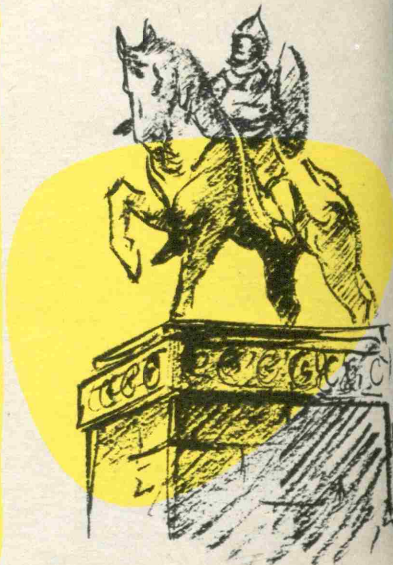
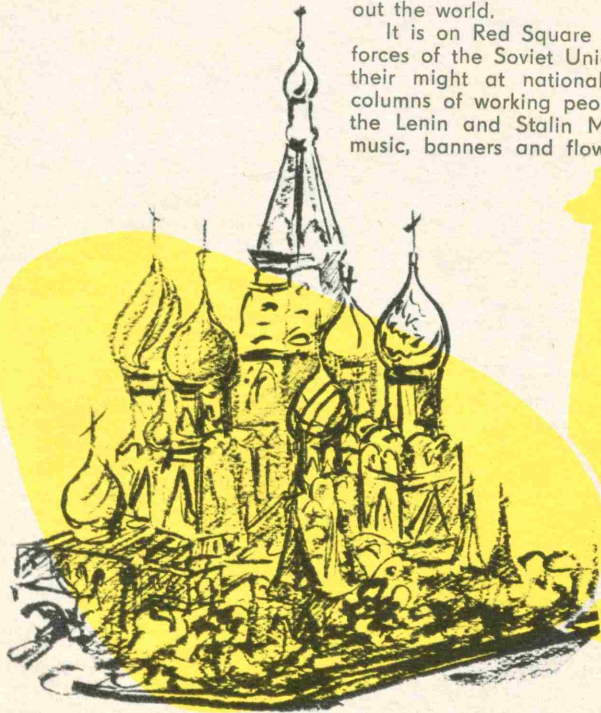
It is on Red Square that the armed forces of the Soviet Union demonstrate their might at national holidays and columns of working people march past the Lenin and Stalin Mausoleum with music, banners and flowers.

The Kremlin—this wonderful monument of Russian culture—is a majestic architectural ensemble of palaces, ancient cathedrals, belfries and towers. Near the Bell-Tower of Ivan the Great there is the famous Tsar Kolokol (King of the Bells) and not far off—the huge Tsar Cannon. Oruzheynaya Palata (the Armory), which houses the treasures of the Russian tsars, valuable artistic utensils and antique arms, is also in the Kremlin.

It is the Great Kremlin Palace where the sessions of the Supreme Soviet of the USSR are held. On holidays, gala balls for the youth take place at the Palace and New Year Trees are lighted for schoolchildren.

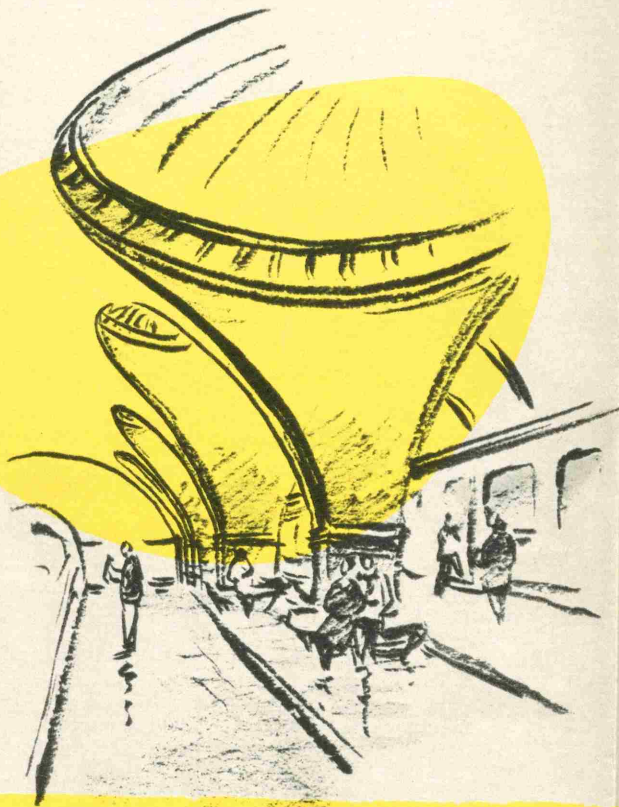
Moscow's central thoroughfare is Gorky Street. There are many handsome new buildings with shops and cafés on the ground floor and lovely linden trees planted along the sidewalks. In the evening the street is thronged with lively crowds on their way to theatres, cinemas, concerts and other entertainments. On the squares adjoining Gorky Street are some of Moscow's best monuments—those of Yuri Dolgoruky, the founder of Moscow, the great Russian poet Alexander Pushkin and the great writer Maxim Gorky.

Such broad, handsome and lively thoroughfares as Gorky Street are now to be found in all the districts of the capital. They have appeared in the course of carrying out the general plan of Moscow's reconstruction during the Soviet period.





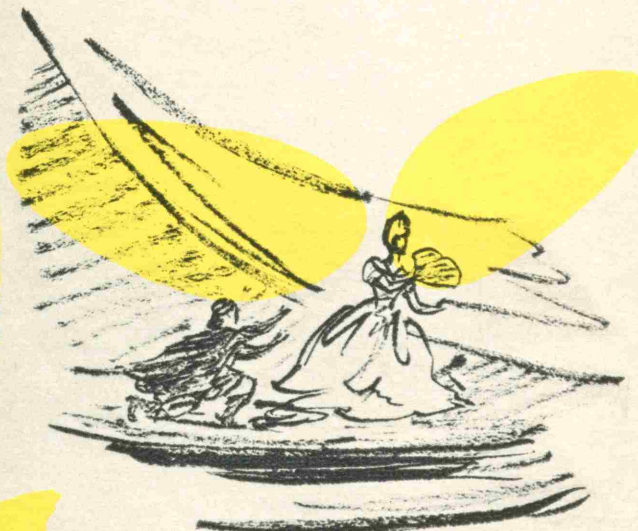
Under the ground there is the Moscow Metro with its comfortable trains that swiftly move in all directions, from one brilliantly illuminated underground palace to another.



Moscow is the largest centre of culture in the country. Here are the USSR Academy of Sciences, the Academies of Medical Sciences, Pedagogical Sciences, Arts, Building and Architecture, the V. I. Lenin USSR Academy of Agricultural Sciences and others. There are also some 200 scientific-research institutes in the Capital.

Close to 300,000 students are enrolled in more than 100 institutions of higher education which function in Moscow. In the magnificent new building of the Moscow University, towering over the Moskva River on Lenin Hills, there are twelve departments in which more than 20,000 students of different nationalities study.

The libraries of Moscow contain about 100 million books. The State Lenin Library alone has a fund of 18 million books, of which 200,000 are unique and rare volumes.



There are more than 30 theatres in Moscow. Most of them have been established in the Soviet period—the Stanislavsky and Nemirovich-Danchenko Musical Theatre, the Mayakovsky Theatre, the Central Soviet Army Theatre, the Vakhtangov Theatre and many others whose performances are daily attended by thousands of theatre-goers.

Moscow, and indeed the whole Soviet Union, takes particular pride in the Bolshoi Opera and Ballet Theatre, the Moscow Art Theatre, the Maly Theatre and others. The children's theatres and the puppet theatres are also very popular with Moscow children and grown-ups.

Muscovites as well as the capital's guests can hear the world's best music in the performance of great masters of art at the Conservatoire, the Chaikovsky Concert Hall and other concert halls.








# ОБСЕРВАТОРИИ СОВЕТСКОГО СОЮЗА





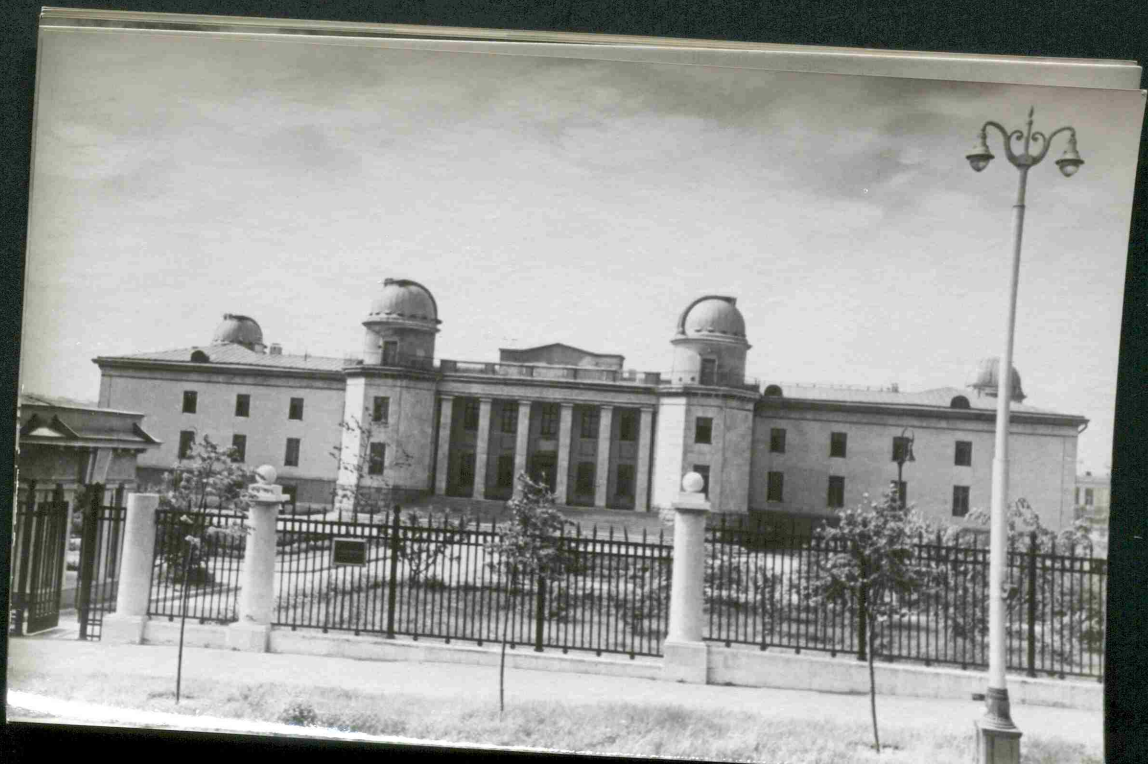
## АСТРОНОМИЧЕСКИЕ ОБСЕРВАТОРИИ СОВЕТСКОГО СОЮЗА

1. Главное здание Пулковской обсерватории АН СССР
2. Пулковская обсерватория
3. Бюраканская обсерватория
4. Бюраканская обсерватория
5. Здание 70-см менискового телескопа Абастуманской обсерватории
6. Астрономический институт имени Штернберга
7. Астрономический институт имени Штернберга
8. Крымская астрофизическая обсерватория
9. Башенный солнечный телескоп и башня коронографа Крымской обсерватории
10. Медрессе Улугбека

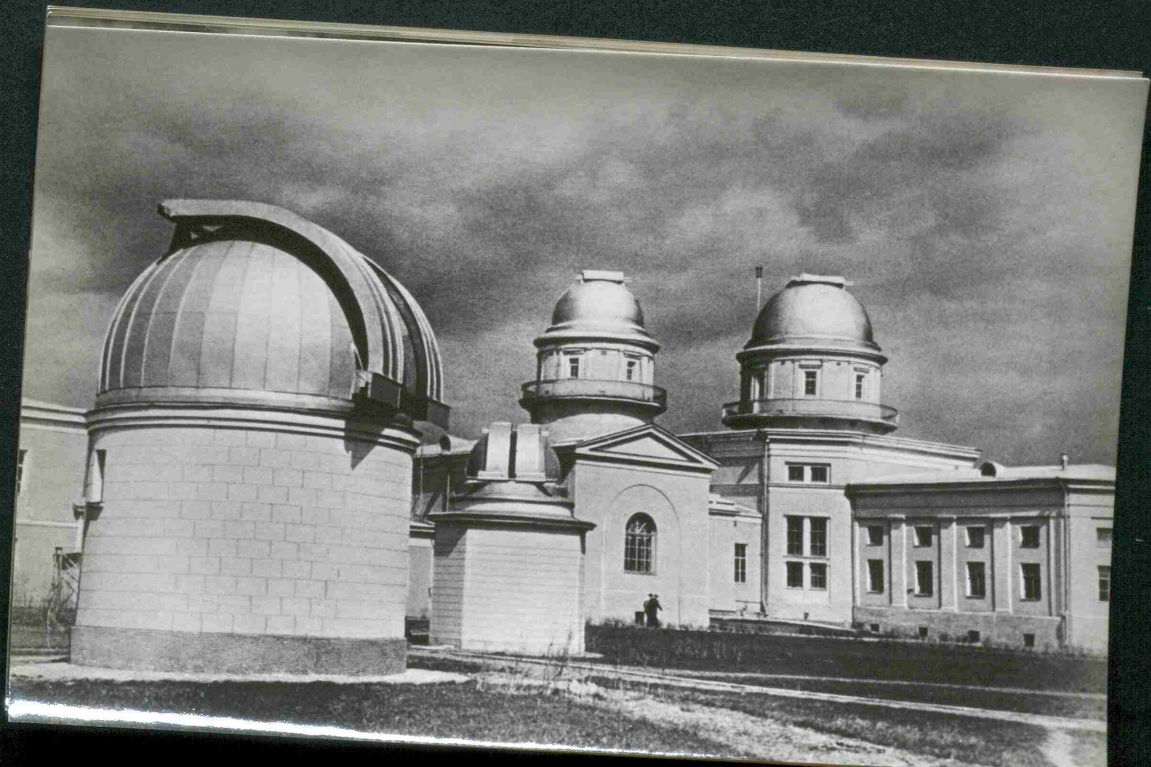








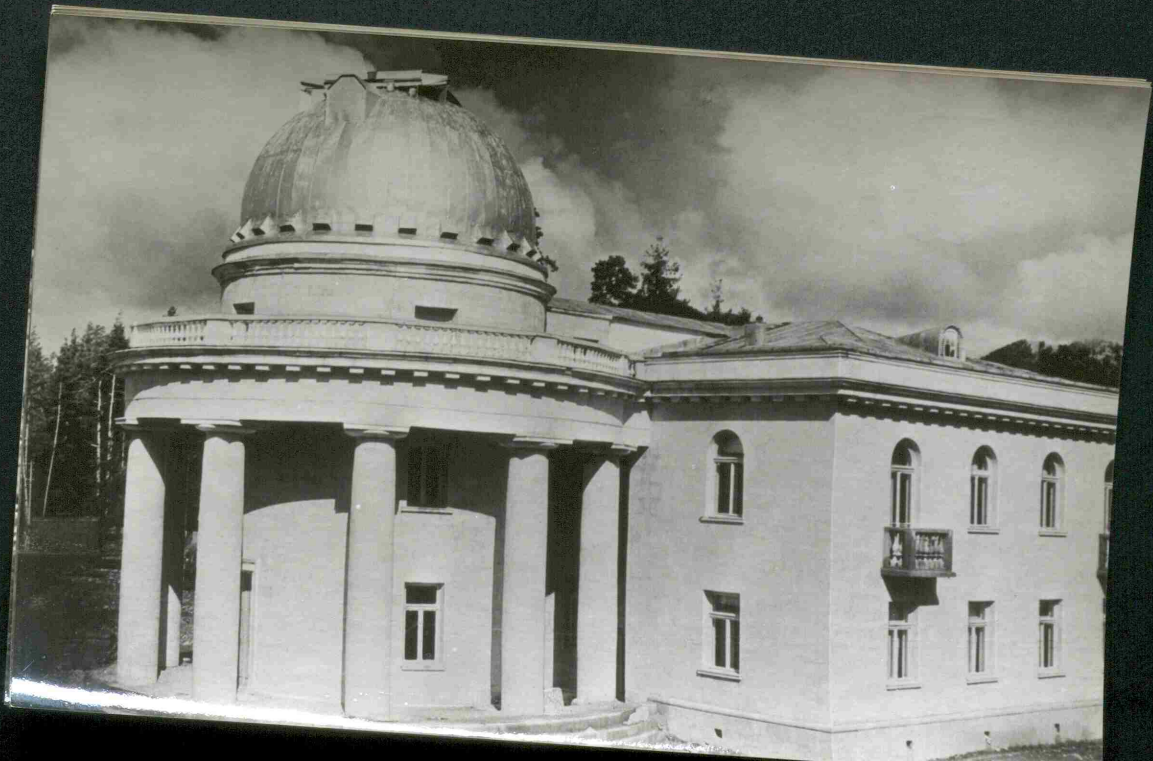








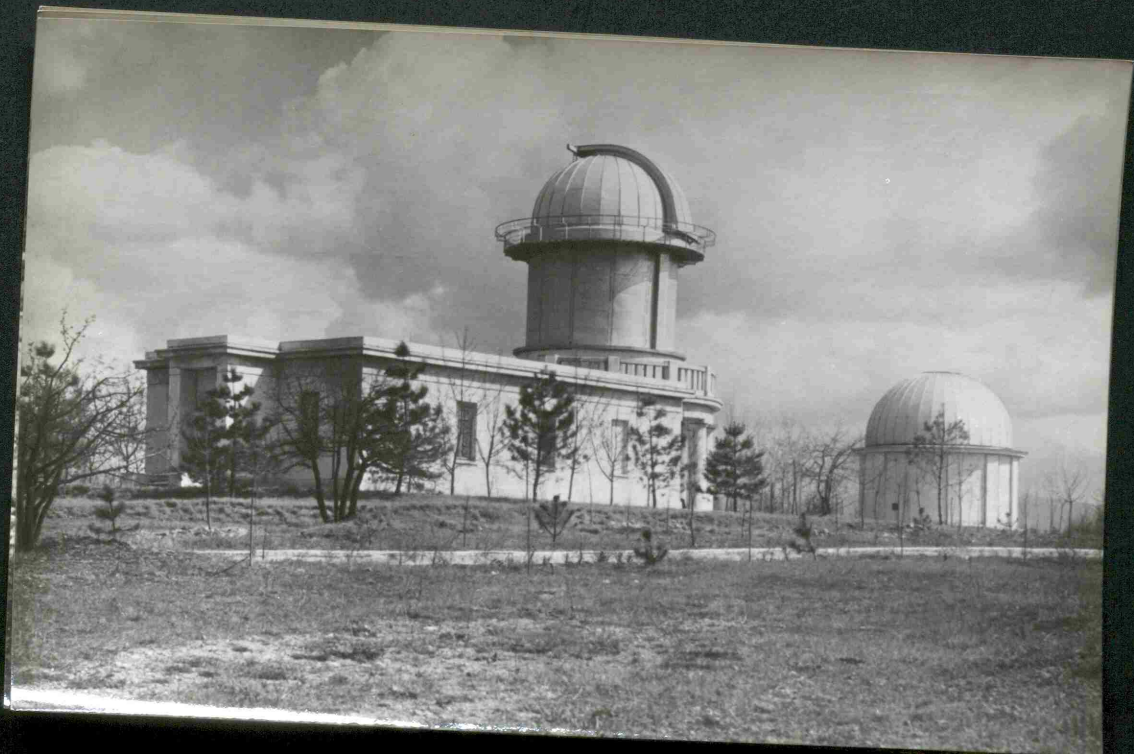




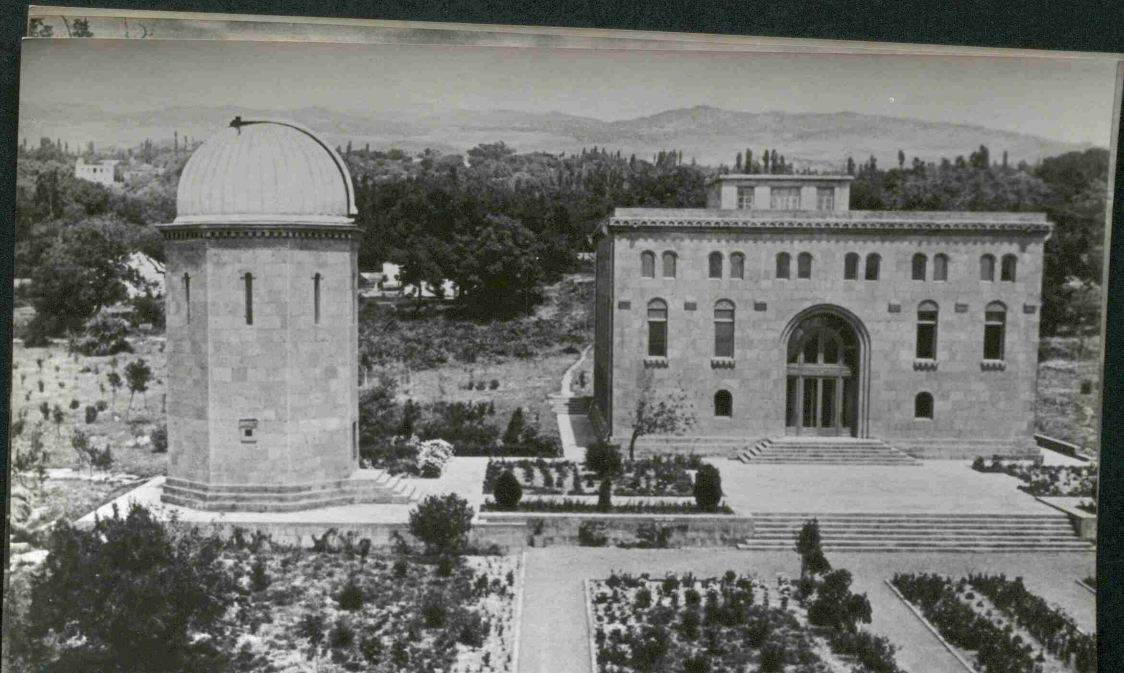




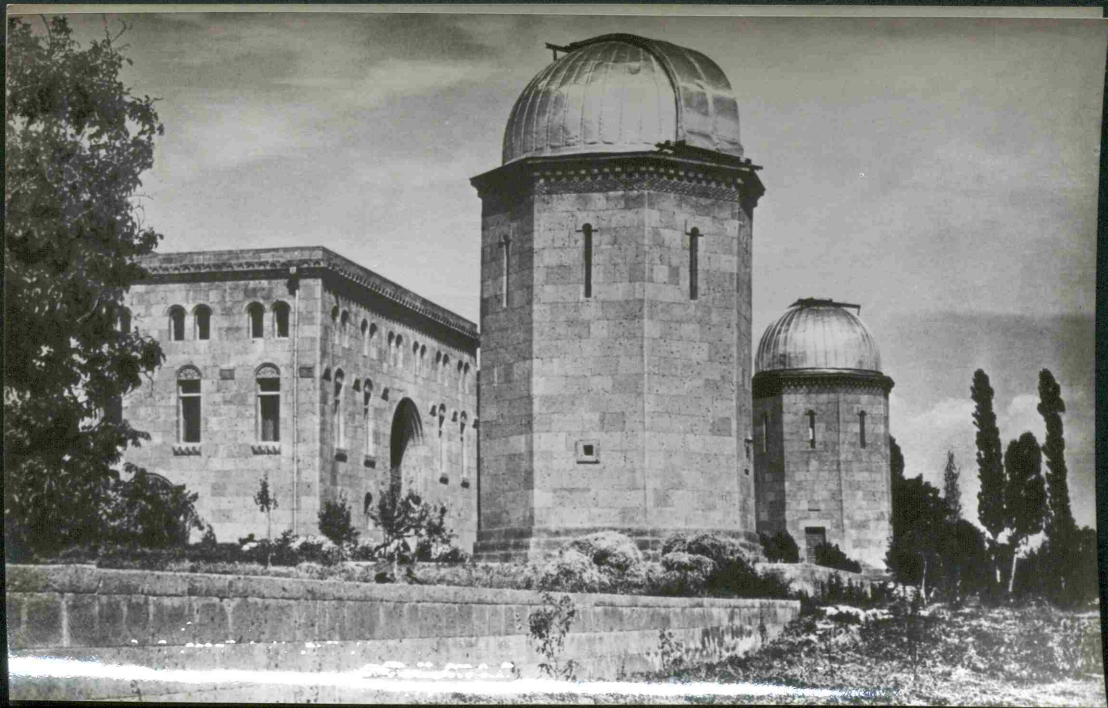




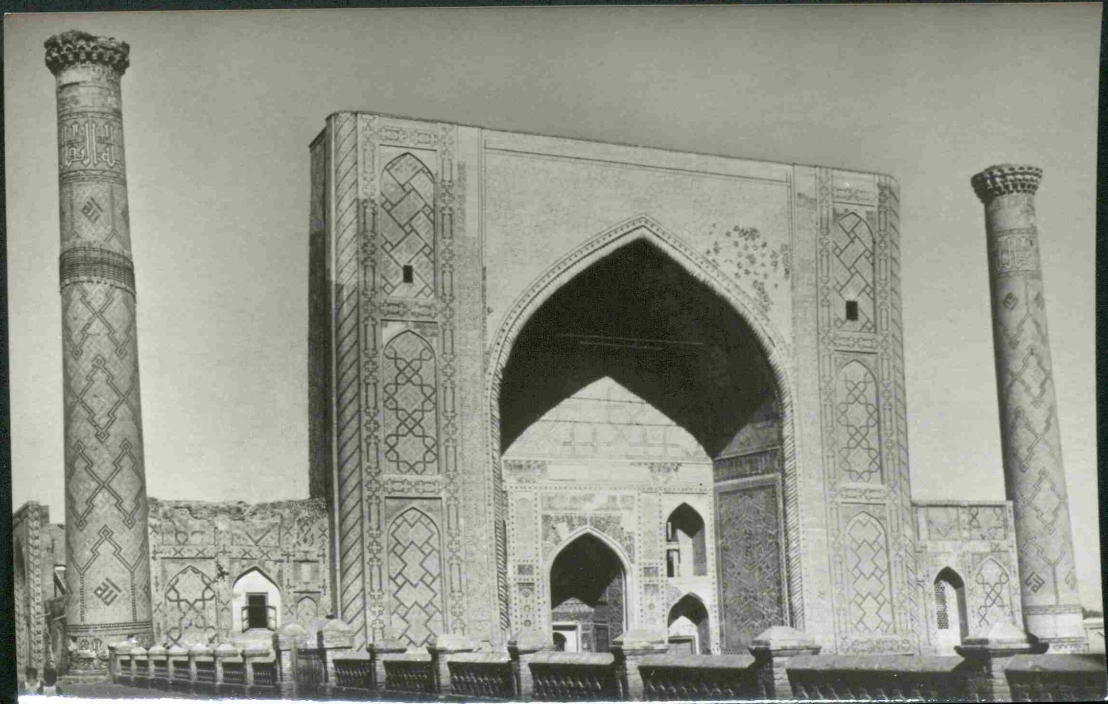














*Thornton Page*

After 5 days, return to

DEPARTMENT OF ASTRONOMY  
VAN VLECK OBSERVATORY  
WESLEYAN UNIVERSITY  
MIDDLETOWN, CONN.

MIDDLETOWN



*Professor A. V. Douglas  
Queens University  
Kingston,  
Ontario  
CANADA*







"SS Ukraina" deck

















Winnipeg. Oct 1958.

at Portage. 1958 Aug.

Concordia University







Black Sea shore  
near Samsat

3











From T. Page.  
van Vleet St.

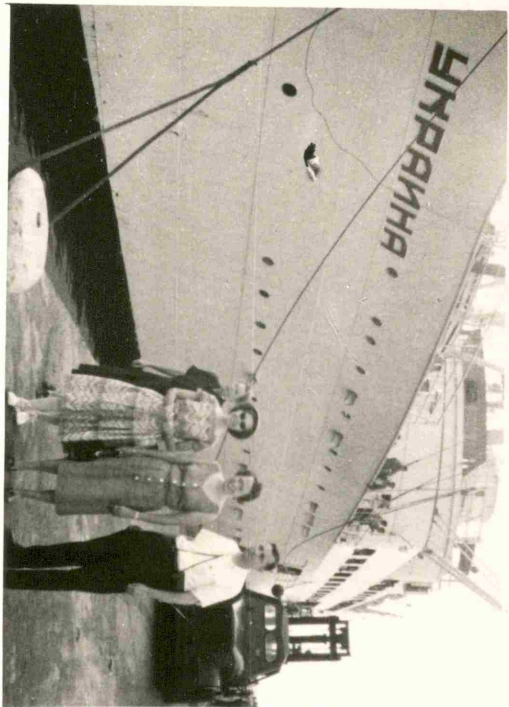
Aschmanni

- Lunch in Astorians Hall
- Dr Mrs Shankowski at left.
- Dr  
Statolician
- Dr Molders & Dalpus around  
my table to my r. hand
- Dr Dimitroff in far corner.











WESLEYAN UNIVERSITY  
MIDDLETOWN, CONNECTICUT  
DEPARTMENT OF ASTRONOMY

VAN VLECK OBSERVATORY

19 Nov 1958

Dear Miss Douglas:

Excuse my delay, please, in answering your letter of 17 Oct. One of the direct results of our most interesting trip was the hardships of "catching up" back here; together with extra lectures on what we saw, - after I got back.

Please keep the records. - Under oath, I certify that they would be of little use here. I have two small children who have ruined all the records we ever bought! I am enclosing a few photos to add to your memories of the good times we had together, and hope we will see each other again soon to exchange reminiscences. Do you plan to attend the AAS meeting in Florida?

Sincerely yours -

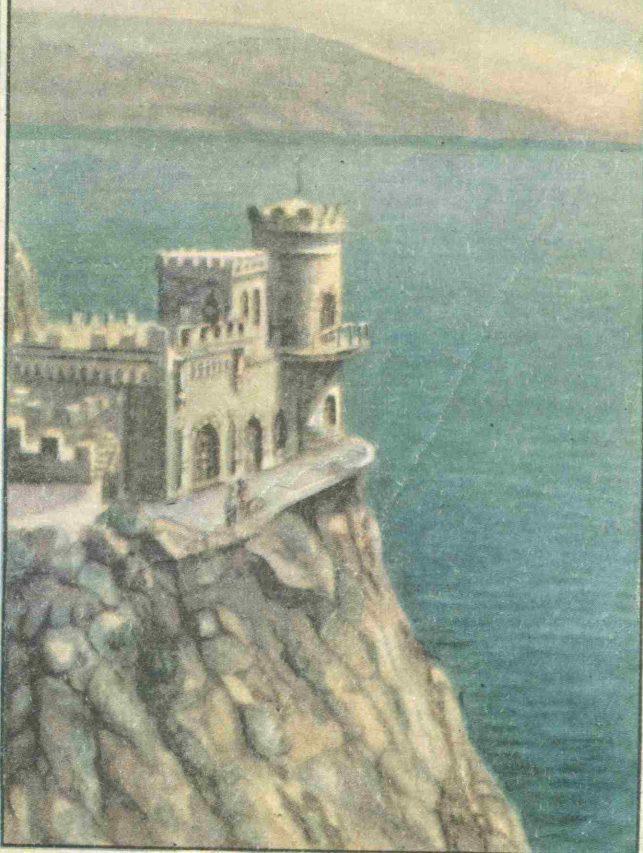
Thornton Page



*А. В. Давыдов*

# КРЫМ

ТУРИСТСКАЯ КАРТА





# КАРТА

## ТУРИСТСКАЯ КАРТА



**КЕРЧЬ**  
 О свыше 100 000 жителей  
 О от 10 000 до 100 000 жителей  
 О менее 10 000 жителей

**СИМФЕРОПОЛЬ**  
 О Центр области  
 О Центры районов

Примечание: пусоны населенных пунктов, имеющих комплекс туристских объектов, закрашены красным.

Города и поселки городского типа  
 Аулukka  
 Турищ

РАЗДАЛКА  
 Железика

Районные центры сельского типа  
 Прочие населенные пункты сельского типа

Станции  
 Железные дороги  
 Главные безрельсовые дороги  
 Линии автобусного движения  
 Прочие безрельсовые дороги  
 Топли  
 Морские рейсы  
 Неизгородные паромы  
 Порты и пристани  
 Граница области

Леса  
 Солончаки  
 Пески

МАСШТАБ 1:600 000  
 В ОДНОМ САНТИМЕТРЕ 6 КМ

0 6 12 18 24 30 36 42 км

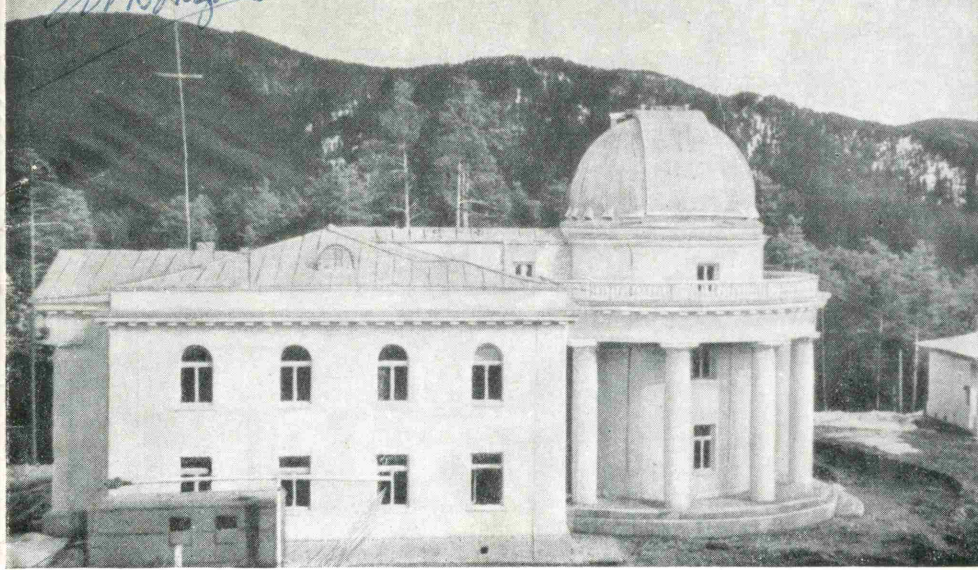
Водопады  
 Реки  
 Перепадающие реки и овраги  
 Озера пресные  
 Озера соленые  
 Главные горные вершины и их подножья  
 Главные горные вершины и их подножья  
 Главные горные вершины и их подножья







*AV Douglas*



**E. K. KHARADZE**

**THE ABASTUMANI  
ASTROPHYSICAL  
OBSERVATORY**

*AV Douglas*

1958



ACADEMY OF SCIENCES OF THE USSR  
ACADEMY OF SCIENCES OF THE GEORGIAN SSR

E. K. KHARADZE

THE ABASTUMANI  
ASTROPHYSICAL  
OBSERVATORY

1958

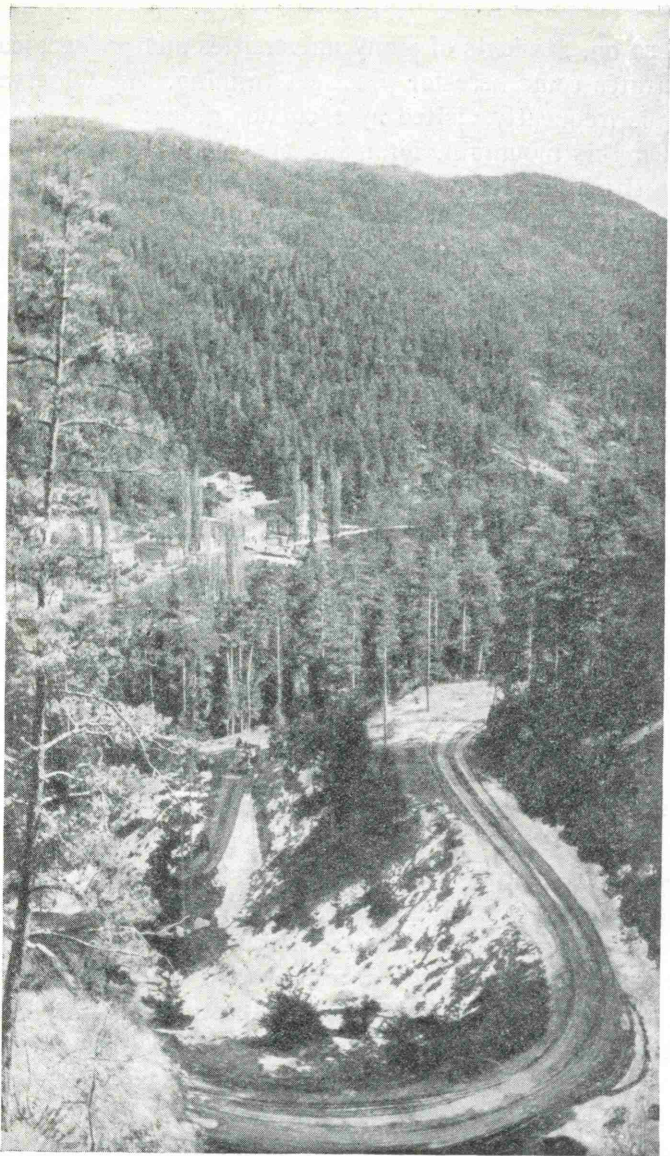


---

The well-known mountain health resort of Abastumani is situated 200 km west of Tbilisi, the capital of the Georgian SSR, on the forest-covered southern slopes of the Adzharo-Imeretin range, along the banks of the Otskhe, small mountain river.

The road from Tbilisi to Abastumani passes through the ancient city of Meskheta located on the Georgian Military Highway at the confluence of the rivers Aragva and Kura. It runs then through Gori and Khashuri, the lovely spa of Borzhomi, and through the ancient town of Akhaltsikhe, which lies 30 km from Abastumani and is connected by railroad with Tbilisi. In the past Akhaltsikhe was for a long time the political, cultural and economic centre of the south-western area of Georgia, Meskheta, the granary of the land and its ancient cultural seat. There are still numerous cultural monuments in its vicinity: fortresses, monasteries ornamented with rich frescoes by old Georgian masters,





Mount Kanobili road. Summer houses of the Abastumani resort  
are seen in the canyon



ly favourable. ...Professor Glasenap, with optical means vastly inferior to anything used by his illustrious predecessors, has undertaken to place his country again pre-eminent in this field.... doubtless the Russian government will place him in a position to carry on with more powerful instruments the work inaugurated at Abastumani\*.

Progressive Russian scientists had more than once insisted on the necessity of setting up an astronomical observatory in the vicinity of Abastumani. Collection of funds for the establishment of an observatory was commenced. In the «Bulletin of the Caucasian Department of the Imperial Russian Geographical Society» for 1900 one may read: «The Russian Astronomical Society is now discussing the question of re-establishing the mountain observatory in Abastumani\*\*, which excels all European observatories in air transparency. The observatory is to be equipped with the most up-to-date instruments»\*\*\*.

A year later, the following appeared in the same Bulletin: «According to the «St. Petersburg News», the collection of funds in the Russian Astronomical Society for the mountain observatory in Abastumani is proceeding successfully, and it will soon be opened. It is to be equipped with the most powerful refractors»\*\*\*\*.

However, under the tsarist regime the idea of creating a large scientific institution in an outlying location far from the centre of the Russian Empire could not be re-

---

\* S. W. Burnham. Astronomy in Russia. Astronomy and Astrophysics, vol. XII. No. 117, 1893, pp. 595—596.

\*\* This referred to the small (4-meter) dome set up just above the resort, containing S. P. Glasenap's 22-cm refractor. This tower is still there now.

\*\*\* Bulletin of the Caucasian Department of the Imperial Russian Geographical Society, vol. XIII, 1900, p. 193.

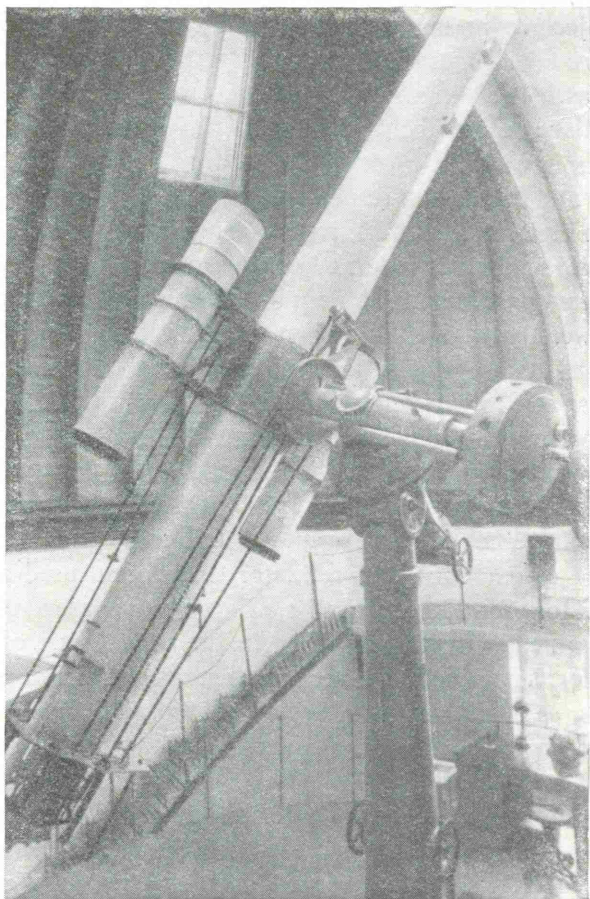
\*\*\*\* Bulletin of the Caucasian Department of the imperial Russian Geographical Society, vol. XIV, 1901, p. 34.





Main building with a tower housing the 40 cm refractor (south-west view). The dining room and the garage are seen to the left

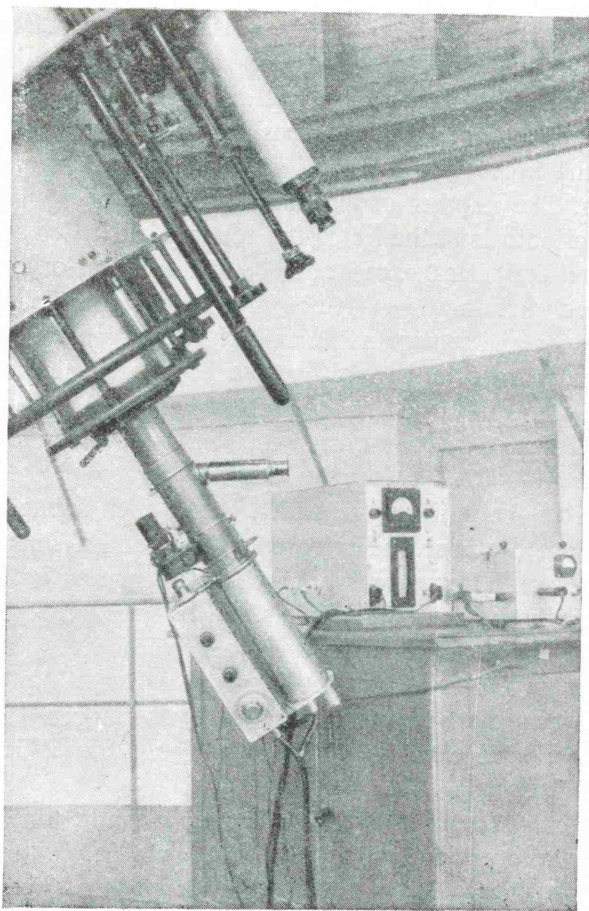




Zeiss 40-cm refractor with two 20 cm cameras

main work of sky photography is carried out with two cameras mounted parallel to the main tube. The four-lens objectives of the cameras have  $D = 20$  cm,  $F = 100$  cm, and produce a field of  $10 \times 13^\circ$  on  $18 \times 24$  cm plates.



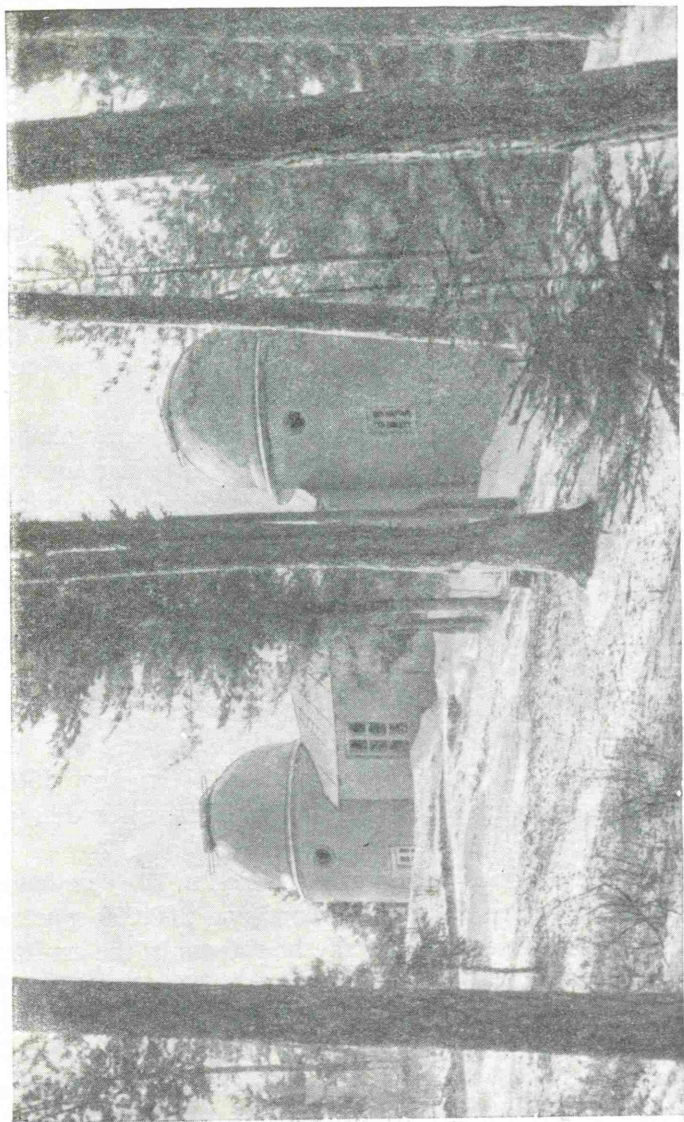


The electropolarimeter mounted in the main focus  
of the 40 cm refractor

Whipple and Fedtke), a nova (by R. A. Bartaya, 1948) and other objects.

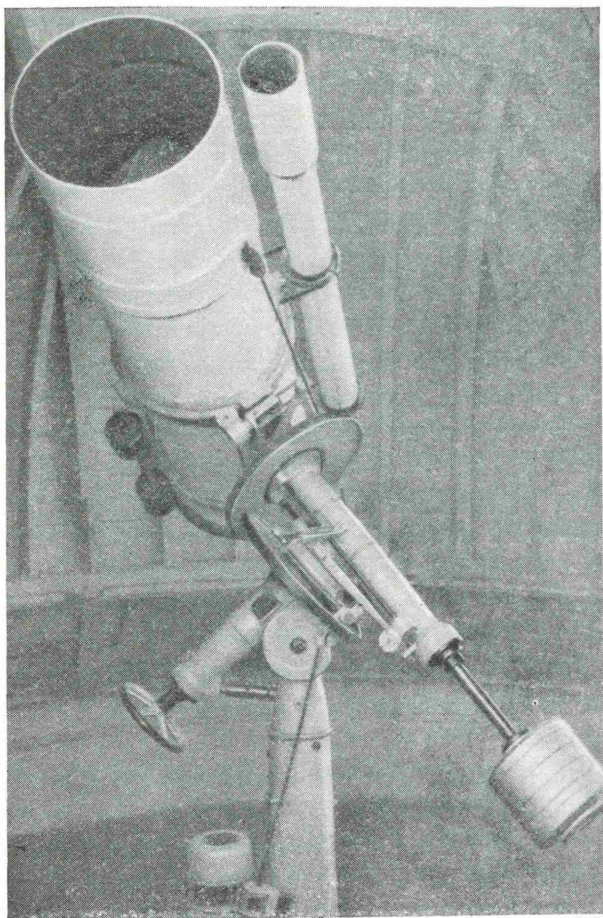
A specially designed lunar electropolarimeter placed in the main focus has been used recently.





The two-tower building housing the 33 cm reflector and the 44 cm Schmidt camera





The 44 cm Schmidt camera

terial enables us to draw important conclusions concerning the upper air structure.

Beside the 33 cm reflector, a coma free Schmidt telescope with a ratio of 1:1.75 is mounted under the western dome. The telescope camera has a spherical mir-



photographic device in combination with slits makes possible to take photographs of the entire solar image in monochromatic light, usually an intense red line of hydrogen.

Nearly two decades of work with the spectrohelioscope have yielded about 55000 visual observations, measurements and records of chromospheric formations: protuberances, filaments and flocculi. Visual observations have been supplemented since 1956 by photographic ones (spectroheliographic) in the calcium line; in addition, photography of the solar photosphere with a meniscus photoheliograph is carried on daily.

A new solar instrument — the chromosphere-photosphere telescope—was recently mounted in a newly-built tower south of the spectrohelioscope pavilion. This instrument consists of a double camera placed on the same parallactic mounting with a weight clockwork. The first camera — a chromospheric telescope — has an effective aperture of 6 cm, and two equivalent focal lengths: 543 cm and 214 cm, and is used for photographic and visual observations of the Sun in monochromatic light by means of an interference polarisation filter. For visual observations magnifications of 133, 90, 53 and 36 times can be achieved. The time of exposure can vary from 0.02 to 4 sec. The valid field of observation equals 34'. The image of the solar disc will be 50 and 20 mm depending on the focal length used. Of prime importance for the efficient performance of the chromospheric telescope is a new type of light filter manufactured by the Vavilov State Optical Institute. The construction of the filter is essentially based on the interference of polarized rays, which makes possible the isolation of a spectral band of 0.5 Å, and the taking of photographs of flares, protuberances and other phenomena originating with particular frequen-



resistance sensitive to infra-red radiation. Special amplifiers and a recorder register on a paper tape the energy distribution and the intensity of the lines. This instrument was designed at the Abastumani Observatory. It is mounted in a flat-roofed pavilion. On the roof there is a station for visual observations of artificial Earth satellites. About 20 or 30 observers watch their passage by means of special telescopes.

To the west from the pavilion stands a 14 meter tower with a platform under a rolling roof. On the platform stand three spectrographs for visual, ultra-violet and infra-red night-sky glow observations, electrophotometers for measuring the intensity of the crepuscular and night glow and also a photoelectric ozone meter for the study of the intensity variations of the ozone layer of the Earth's atmosphere. These observations, carried out according to the programme of the International Geophysical Year, are intended for investigations of the physical and chemical features of the upper atmosphere.

A white stone building with a 7.5 m dome just above the terrace, houses a 70 cm meniscus telescope (fig. 9) mounted on a 12 m high concrete base.

The Maksutov meniscus telescope of the Abastumani Observatory in combination with its objective prism, is the largest and the most powerful of its type.

This telescope was designed by B. K. Ioannissiani, Lenin Prize winner in 1957, and built by the State Optical Institute in 1955.

The meniscus, which is 70 cm in diameter is made of UV-glass transparent for the near ultra-violet light. The weight of the main telescope mirror is 220 kg, its diameter 975 mm. The plate-holder is inserted between the meniscus lens at one end and the spherical mirror at the other end of a thin-walled welded metal tube. An additio-

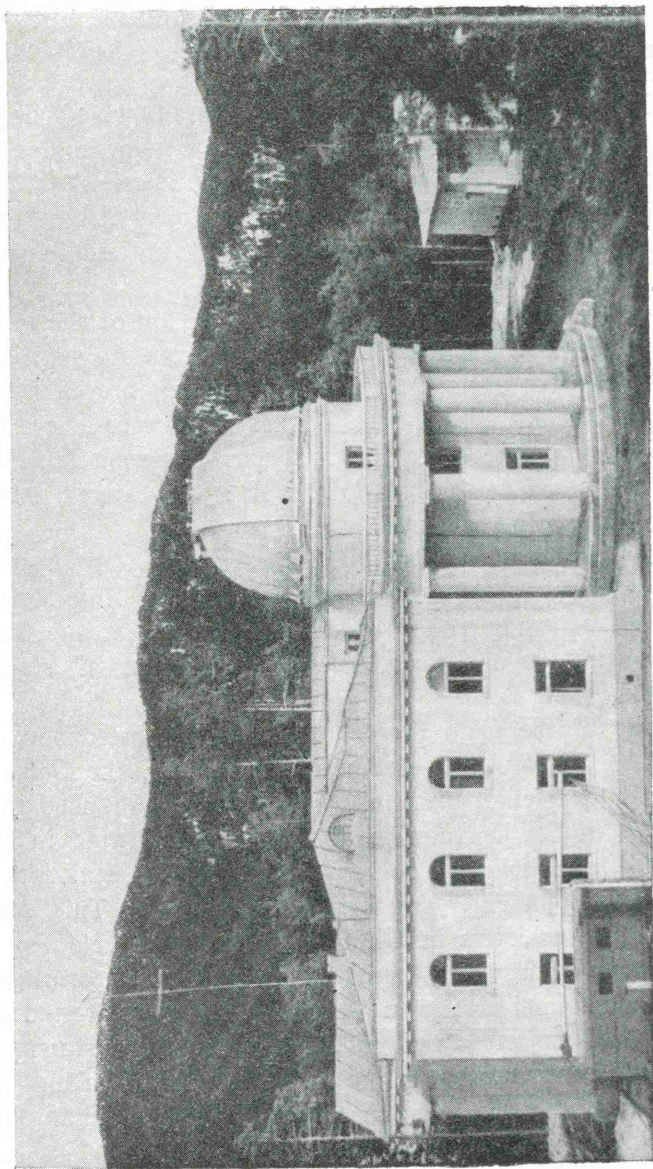


tively faint stars (up to  $12^m$  5— $13^m$  at forty minute exposures with very sensitive plates of high).

The telescope permits another optical combination, that is when a hyperbolic mirror is placed in front of the main mirror and the diagonal flat mirror directs the convergent beam of light into the second, the so-called Nasmyth, focus on the side of the outer surface of the tube. In this combination the equivalent focal length of the telescope is 1030 cm at a speed of 1 : 15; the diameter of the field is 40' at a scale of 20'' per mm. This system can either be used for direct photography or works with a slit spectrograph. The diffraction spectrograph is also of the meniscus type and is therefore very compact. The two changeable diffraction gratings give a dispersion of 83 and 22 Å mm respectively. The guides on either side of the tube are also of meniscus type.

The somewhat conical telescope tube is mounted on a massive forked polar axis. Handles, grips, steering wheels, divided circles, etc., usual for ordinary telescopes, are absent. The instrument is electrically operated from a desk in the southeastern section of the tower whose instrument-board is equipped with adjusting and control dials, divided into degrees and parts of degrees, hours, minutes and seconds, also with coloured lamps, various switches, etc. The astronomer operates the telescope from this desk. The adjustment of the telescope to a given point of the sky, the broadening of the spectrum by using the objective prism, the manipulation of the shutter and numerous other operations are carried out automatically. All this was introduced by B. K. Ioannissiani and will greatly facilitate the work. Of course it involves complications in the design of the instrument: the telescope and desk consist of over 2500 parts; a number of relays, fourteen motors in the telescope body and in the desk are running





New laboratory building



Since its foundation the Abastumani Observatory has been studying interstellar matter. Dispersion of stellar light by the dust particles of interstellar matter causes reddening of the stars and changes their colour index. An analysis of colour indices of a large number of stars yields data on the distribution, thickness and physical properties of the interstellar dust medium.

Catalogues of colour indices of a large number of stars have been compiled at the observatory. The study of these catalogues has shown a non-uniform distribution of interstellar dust in the Galaxy. The peculiar features of the structure and spatial distribution of the dust have been revealed, i. e. the tendency of small separate clouds to form groups, their asymmetrical distribution in relation to the equatorial plane of the Galaxy. An analysis of the catalogue of dark galactic nebulae established that the plane of symmetry of this system of nebulae is inclined towards the galactic plane.

Some of the investigations of diffuse matter were devoted to the study of the light polarisation of a number of galactic nebulae. Polarisation of the emission of the Crab nebula, a remnant of the Supernova of 1054, was discovered by M. A. Vashakidze. Several photoelectric studies were made of galactic diffuse and planetary nebulae, as well as calculations of the mass of nebulae and determinations of the degree of concentration of electrons, protons, oxygen ions, etc., in them\*.

---

\* For these and several other studies of the problem see Bulletin of the Abastumani Astrophysical Observatory, No. 2, 1938; No. 11, 1950; No. 12, 1952; No. 13, 1953; No. 14, 1953; No. 18, 1955; No. 20, 1956; No. 23, 1958; Astronomical Journal (USSR), No. No. 1 and 5, 1956; No. 2, 1957 etc. (Papers by J. F. Alanya, V. A. Ambartsumian, S. G. Gordeladze, M. A. Vashakidze, T. A. Kotchlashvili, V. B. Nikonov, N. A. Razmadze, A. F. Torondjadze, Y. S. Khavtasi, E. K. Kharadze.)



known previously or discovered at Abastumani, were explained\*.

Stellar astronomy is also represented at Abastumani by investigations of the properties of motion of stars belonging to the early spectral classes. These properties have found a new explanation in the light of the theory of stellar associations put forward by V. A. Ambartsunian. Several regularities in the motion of stars in solar surroundings in the so-called Local System have been studied. The motion of stars perpendicular to the galactic plane was analysed. On the basis of the expression of the gravity potential deduced by P. P. Parenago, a theoretical study was made of the galactocentric stellar orbits and conclusions drawn as to the boundaries of possible motions of stars belonging to different components of the Galaxy\*\*.

Several other studies in astrophysics and stellar astronomy were carried out at the Observatory; in particular a method for the determination of spectral parallaxes of faint stars from low dispersion spectra has been elaborated\*\*\*.

The statistical method proposed by M. A. Vashakidze for the determination of spatial stellar densities in the

---

\* Bulletin of the Abastumani Astrophysical Observatory. No 1, 1937; No. 2, 1938; No. 4, 1940; No. 10, 1949; No. 11, 1950; No. 15, 1953; No. 20, 1956; No. 22, 1958; No. 23, 1958. (Papers by R. A. Bartaya, M. A. Vashakidze, S. G. Gordeladze, M. V. Dolidze, P. G. Kulikovskiy, Y. J. Kumsishvili, N. L. Magalashvili, V. B. Nikonov and E. S. Brodskaya, N. A. Razmadze, E. K. Kharadze).

\*\* Bulletin of the Abastumani Astrophysical Observatory, No. 15, 1953; No. 18, 1955; No. 20, 1956 (Papers by R. M. Dzigvashvili, A. F. Torondjadze.)

\*\*\* Bulletin of the Abastumani Astrophysical Observatory, No. 10, 1949; No. 15, 1953; No. 18, 1955; No. 22, 1958. (Papers by R. A. Bartaya and N. B. Kalandadze.)



Abastumani Observatory, for the observation of solar eclipses in 1936, 1941, 1945, 1947, 1952 and 1954 yielded important material which made it possible to clarify some properties of the solar corona. For instance, it was discovered that the degree of polarisation of coronal radiation and distance from the area of maximum polarisation to the solar photosphere depend on the solar activity\*.

The investigation of the physical properties of the planets and their satellites is closely linked with the cosmogony of the solar system. A correct theory of planetary origin must take into account data on the physical properties of the surfaces of the planets and their satellites. Such data are indispensable for the problem of interplanetary communication which has arisen in our epoch. Of special interest are studies of the structure of the lunar surface, the Moon being closest to the Earth.

Research carried out at Abastumani has shown that various parts of the lunar surface polarize light differently. The mean maximum of polarisation of lunar «seas» was found to be greater than that of the continents. This may be interpreted as a result of lesser pulverization of the sea surfaces and consequently their comparatively later origin. On the whole, observations made at Abastumani corroborate the hypothesis of the volcanic origin of the lunar relief\*\*.

As is known the night sky has its own luminescence, so faint that it may be measured only by extremely sensi-

---

\* Bulletin of the Abastumani Astrophysical Observatory No. 3, 1938; No. 7, 1943; No. 8, 1945; No. 11, 1950; No. 16, 1954; No. 17, 1954; No. 20, 1956, No. 22, 1958. (Papers by M. A. Vashakidze, K. G. Zakharin, M. S. Zeltser, Y. I. Kumsishvili, V. B. Nikonov, T. S. Razmadze.)

\*\* Bulletin of the Abastumani Astrophysical Observatory No. 21, 1957. (Paper by V. P. Djapiashvili.)



The Chair of astronomy of the Tbilisi State University, is closely connected with the Abastumani Observatory in its research and pedagogical activity. The staff of the Chair is engaged primarily in research work in celestial mechanics, the structure and kinematics of the Galaxy\*.

The Chair of astronomy possesses a planetarium, an astronomical tower with a small equatorial and a photometric and measuring laboratory. The Abastumani Observatory and the Chair of astronomy are responsible for the general astronomical education and astronomical instruction throughout the Republic. In connection with this the staff of the Observatory and the Chair devote much time to writing popular-science literature and textbooks on astronomy in Georgian, as well as to improving Georgian astronomical terminology.

The rich collections of manuscripts dating back to the IX century and earlier in the care of the State Museum in Tbilisi show that astronomical data and the then up-to-date theories were already widely known in Georgia\*\*. In the literary heritage belonging to the X and later centuries we find a fairly-rich Georgian astronomical terminology. Secular literature of the time is full of artistic expressions and metaphors of an astronomical origin.

Finally, we deem worthy of mention the two following remarkable facts. Firstly, that in the XIII century there existed in Tbilisi an astronomical observatory, some of

---

\* Bulletin of the Abastumani Astrophysical Observatory, No. 11, 1950; No. 20, 1956, No. 22, 1958. (Papers by M. G. Kolkhidashvili, N. G. Magnaradze.)

\*\* According to Brosset, «...already in 1233 the Georgians knew a good half of the inaccuracies of the old calendar system which compelled the Pope Gregory XIII to reform it in 1582» (Brosset. Etudes de chronologie technique, St. Petersburg, 1868).



Подписано к печати 1/VIII 1958 г. Формат 84×108<sup>1</sup>/<sub>32</sub>. Печ. л. 2,25=1,84  
усл. печ. л. Уч.-изд. л. 1,6. Тираж 2600 экз. Тип. зак. 616.

*Цена 1 р. 10 к.*

---

Издательство Академии наук СССР. Москва, Б-64, Подсосенский пер., 21  
2-я типография Издательства. Москва, Г-99, Шубинский пер., 10.

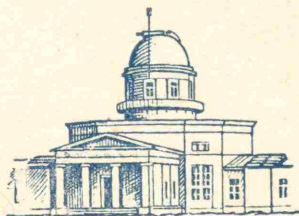


*A. N. Dadaev*

ACADEMY OF SCIENCES OF THE USSR

A. N. D A D A E V

THE PULKOVO  
OBSERVATORY



ACADEMY OF SCIENCES OF THE USSR PRESS



ACADEMY OF SCIENCES OF THE USSR  
CENTRAL ASTRONOMICAL OBSERVATORY

---

A. N. DADAEV

THE PULKOVO  
OBSERVATORY

ACADEMY OF SCIENCES OF THE USSR PRESS  
MOSCOW — 1958 — LENINGRAD



### THE HISTORY OF THE OBSERVATORY

The Pulkovo Observatory was founded by an outstanding astronomer of the nineteenth century, F. W. Struve (1793—1864). It was built according to the design of the well-known Russian architect, A. P. Brüllow (1798—1877). The official ceremonious inauguration of the observatory took place on August 19 (7), 1839.

The founding of a first-class astronomical observatory of the Academy of Sciences was dictated by the practical needs for a geographical study of the vast territory of the Russian Empire, which was then on the way to capitalistic development. The newly built observatory was equipped with the most perfect instruments of those days, these being ordered by F. W. Struve in foreign countries.

The main task of the observatory was the determination of the exact coordinates of celestial bodies in order to compile star catalogues. This problem was solved by the absolute and differential methods of observation. More precise values of astronomical constants were also derived from the data thus obtained.

In order to determine the absolute coordinates of stars, independently of any other previous measurements, F. W. Struve proposed that the right ascensions and declinations of the stars be observed separately. For this purpose



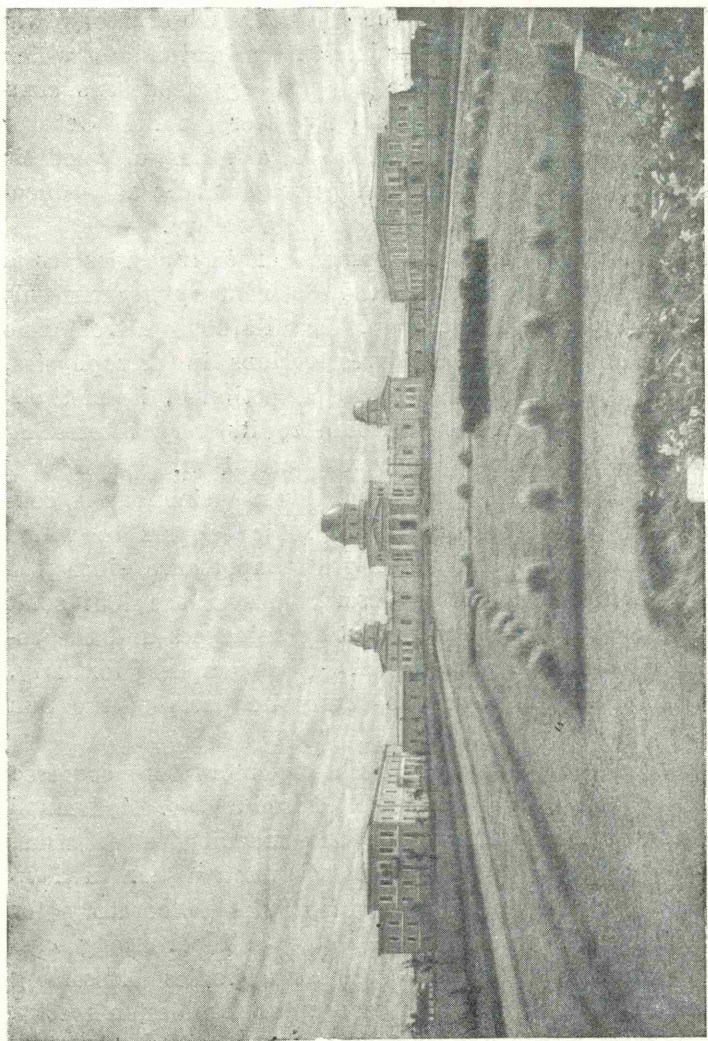
work was done in the seventeenth years of the past century in the USA and Germany (S. Newcomb, A. Auwers, L. Boss). The Pulkovo catalogues, distinguished by their exceptionally high precision, are used even now for the compilation of fundamental systems, invariably with the largest weight.

With the development of astrophotography a program was put forward at Pulkovo for the compilation of an absolute catalogue including stars exclusively of the magnitudes 5—7, uniformly distributed over the sky (one star for every 25 degrees) from the north pole to  $-15^\circ$ . This program served as a basis for observations with the transit instrument and vertical circle of the 1900 catalogue. In 1909 at the International conference in Paris the Pulkovo program, proposed by O. A. Backlund, was accepted as an international program, supplemented by Hough, then the director of the Cape Observatory, with stars of the southern sky. Later the observations of stars of the Backlund—Hough list made with meridian instruments of many observatories (Pulkovo, Nikolayev, Greenwich, Cape, Washington and others) served as a basis of the extensive and high-precision catalogues of 1915 and 1925.

However the compilation of star catalogues was not the only aim of observations made by Pulkovo astronomers. They also carried on classical investigations dealing with other problems of astronomy: the determination of the astronomical constants of precession, nutation and aberration, the study of the refraction of light in the Earth's atmosphere, the determination of stellar parallaxes (the distances to the stars), the determination of the peculiarities of stellar motions in connection with the motion of the solar system in space, etc.

So, in 1842 C. A. F. Peters and G. Lundahl printed the results of the determination of the constants of aberration and nutation, derived from observation made





Main building seen from the North.



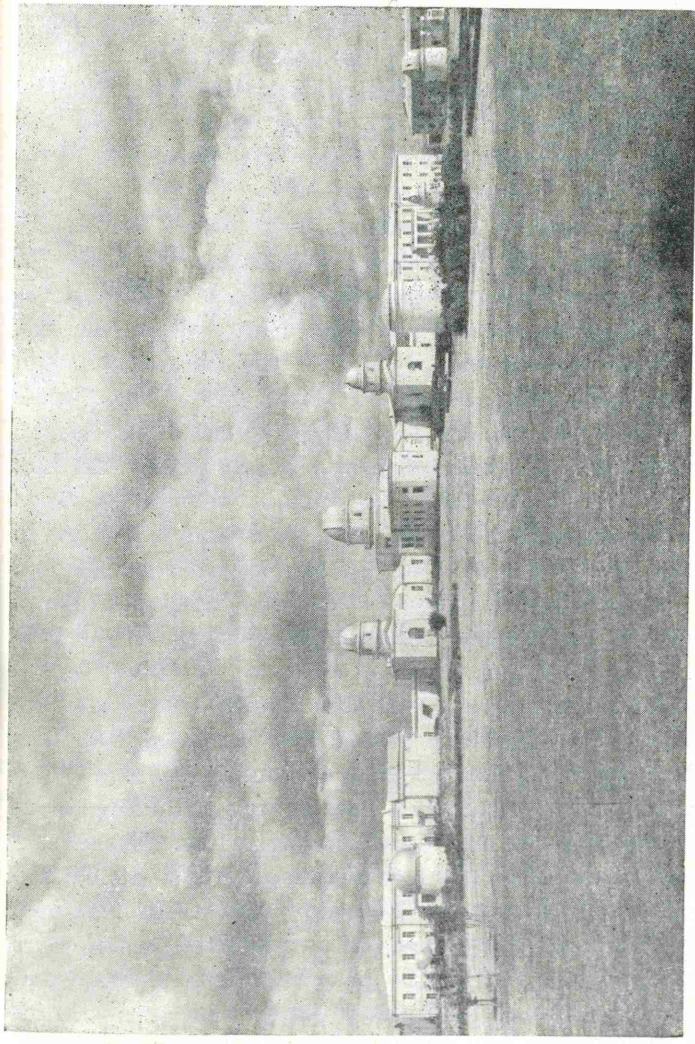
ompli-  
Scien-

was  
which  
com-  
tober  
detic  
duca-

as a  
this  
mers  
sics,  
hods  
sting

con-  
hich  
the  
olar  
co-  
rly,  
Sun

red  
nn  
rs,  
76  
or  
th  
rg  
a  
-  
s



General view from the South.



With the normal astrograph and an enlarging camera A. P. Hansky took remarkable unrivalled photographs of sunspots and granules. These were of such detail and quality that they were not surpassed until only recently.

The Bredichin astrograph enabled G. A. Tikhov to accomplish his photometric and colorimetric investigations of stars with which he was occupied during many years. For studying the colour indices of stars G. Tikhov elaborated the method of the «longitudinal spectrograph» in 1916. Using this method he determined the colours of all the Bonnerdurchmusterung stars in 91 Kapteyn areas.

G. Tikhov photographed the planets through light filters with the 30-inch refractor. The photographs of Mars, taken by him at Pulkovo during the great opposition in 1909, induced him to further investigations in this field and in 1947—1948 led to the well-founded conclusion of the existence of vegetation on Mars and the birth of a new branch of astronomy — astrobotany.

The development of astrospectroscopic investigations in Russia is closely connected with the name of A. A. Belopolsky. He was a pioneer in the elaboration of the method for determining the radial velocities of stars. Using the 30-inch refractor, to which he attached a three-prism spectrograph, Belopolsky determined the radial velocities of many stars in order to compile a catalogue. During this study he investigated several spectroscopic binaries, detected the variability of radial velocities of Cepheids, observed outbursting Novae, etc. He found the period of rotation of the Sun, major planets and Saturn's rings and observed the spectra of comets.

In 1894 A. Belopolsky experimentally corroborated the Doppler-Fizeau effect for light. He also made laboratory experiments, studying the spectra of glow discharges of gases and published a paper on the investigation of the glow discharge spectra of Geissler tubes. He paid much



Besides, a large solar spectrograph of the Littrow system with auxiliary optical parts (coelostat with a diameter of 250 mm, two additional mirrors and an object-glass,  $D=200$  mm,  $f=1280$  cm) was bought in England in 1922. This instrument enabled A. A. Belopolsky to develop in full measure the investigations of the Sun.

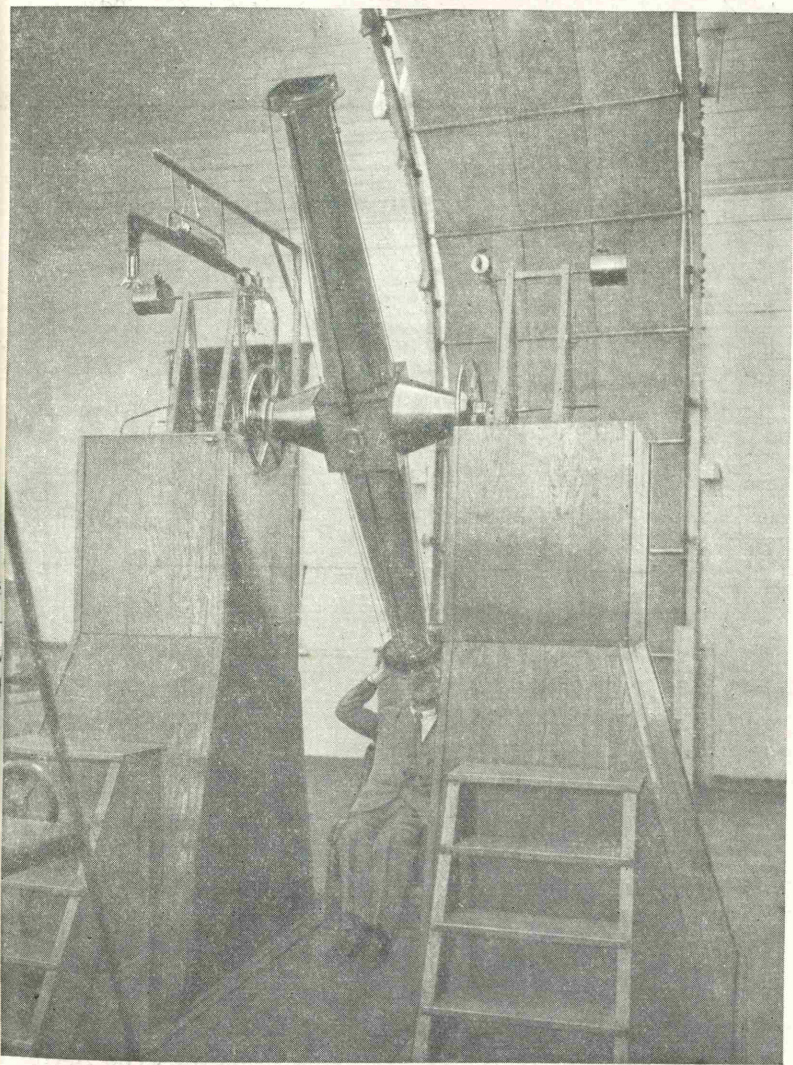
The Simeiz 40-inch reflector began to operate in 1925. On it (up to the occupation of the Crimea by the enemy-fascist forces in 1941—1944, during which the telescope perished) much work was done on the compilation of a catalogue of radial velocities and investigations of special problems of the spectroscopy of stars (G. A. Shajn, V. A. Albitsky).

In 1927 the Pulkovo Observatory acquired yet another instrument — a zonal Zeiss astrograph ( $D=160$  mm,  $f=205$  cm), which at the end of the thirties was transferred to Simeiz. During these years the observatory was reinforced with various other equipment. The firm of Grubb-Parsons made and sent to the USSR only the mounting and mechanical parts of the 32-inch refractor, as the numerous attempts to make the object-glass were unsuccessful. In 1940 the necessary object-glass was made by the Soviet optical industry, which developed during the years following the revolution.

In 1919 in accordance with the new rules an election was held for choosing a director of the observatory. There were two candidates: A. A. Belopolsky and A. A. Ivanov, then the rector of the Petrograd University. Before the elections A. A. Belopolsky withdrew his candidature and A. A. Ivanov was elected. He was re-elected twice and held the post of director till 1930.

The rules for the election of a director and all the scientific posts were fixed by the Statutes of the Central Russian Astronomical Observatory, introduced in 1921. According to the new statutes the Council of Astronomers received





The Ertel transit instrument.



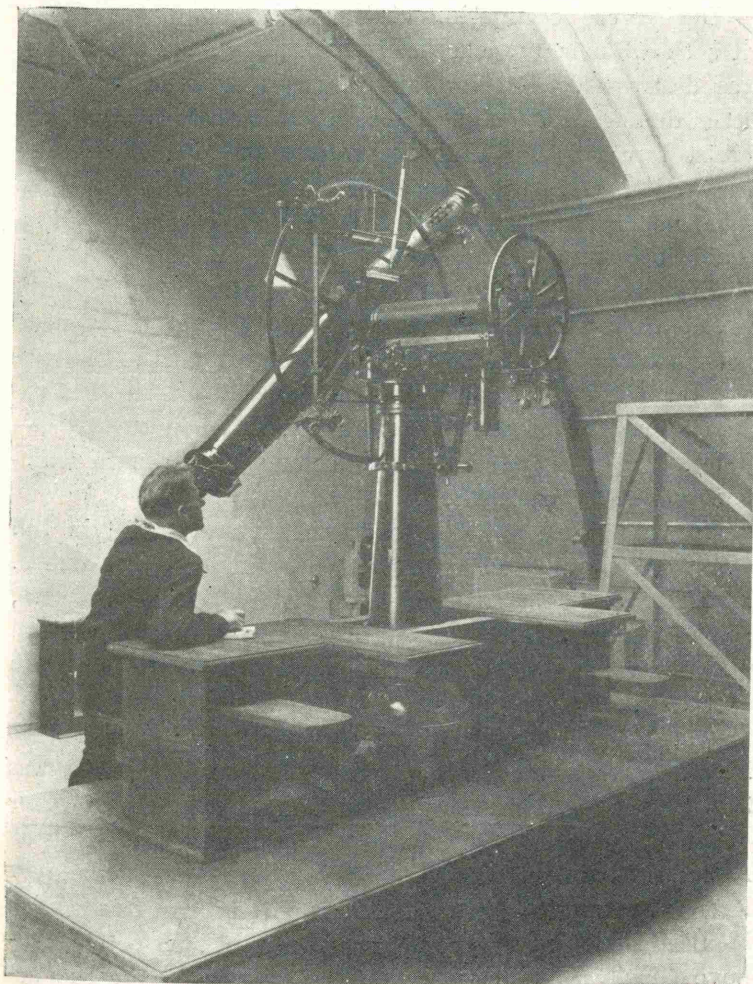
The role of astrophysical investigations at Pulkovo had grown greatly during these years. The work of Belopolsky on the detailed study of solar rotation, which he undertook after the installation of the Littrow spectrograph, served as a stimulus for the development of solar, in particular spectroscopic and spectrophotometric, investigations.

Great attention was paid to the study of solar activity. In 1932 at the Simeiz branch a photoheliograph for daily observations of the Sun (sunspots and faculae) was installed and in 1938 a spectrohelioscope for observing prominences and the chromosphere. These observations were the beginning of a continuous Solar Service of the USSR, the data of which has been published in «The Catalogue of Solar Activity» since 1938. The study of connections between solar and terrestrial phenomena and the generalization of investigations in this field led to the publication of a monograph «Solar Activity and its Terrestrial Manifestations» (M. S. Eigenson, M. N. Gnevishev, A. I. Öl, B. M. Rubashev) in 1948.

In 1927 an expedition to Sweden was organized for observing the total solar eclipse. Much preparatory work was done for observations of the 1936 total solar eclipse, which passed over a considerable territory of the USSR. All the expeditions were equipped with new, modern apparatus and instruments, made by the young optical-mechanical home industry. The successful results of the observations contributed to the further growth of the the significance of solar investigations.

In 1940 the Pulkovo Observatory acquired a horizontal solar telescope (the diameter of the coelostat mirror  $D=500$  mm, the main parabolic mirror  $D=500$  mm,  $f=1700$  cm), which was made in Leningrad under supervision of the talented constructor and astronomer, N. G. Ponomarev. The optical parts of the telescope were computed and made by





The Ertel vertical circle.



than 500 astronomers from various Soviet observatories, geodesists, builders of Pulkovo, representatives of the public and also scientists from 18 foreign countries. The observatory was able once again to carry on investigations in various branches of astronomy.

### THE OBSERVATORY AT PRESENT

The observatory, situated on a hill 75 meters above sea-level, occupies a territory of 150 hectares. On the north and east it is bordered by the Kiev highway, on the south by grounds where trees and shrubs are grown for the city of Leningrad and on the west by the lands of a live-stock breeding sovkhos.

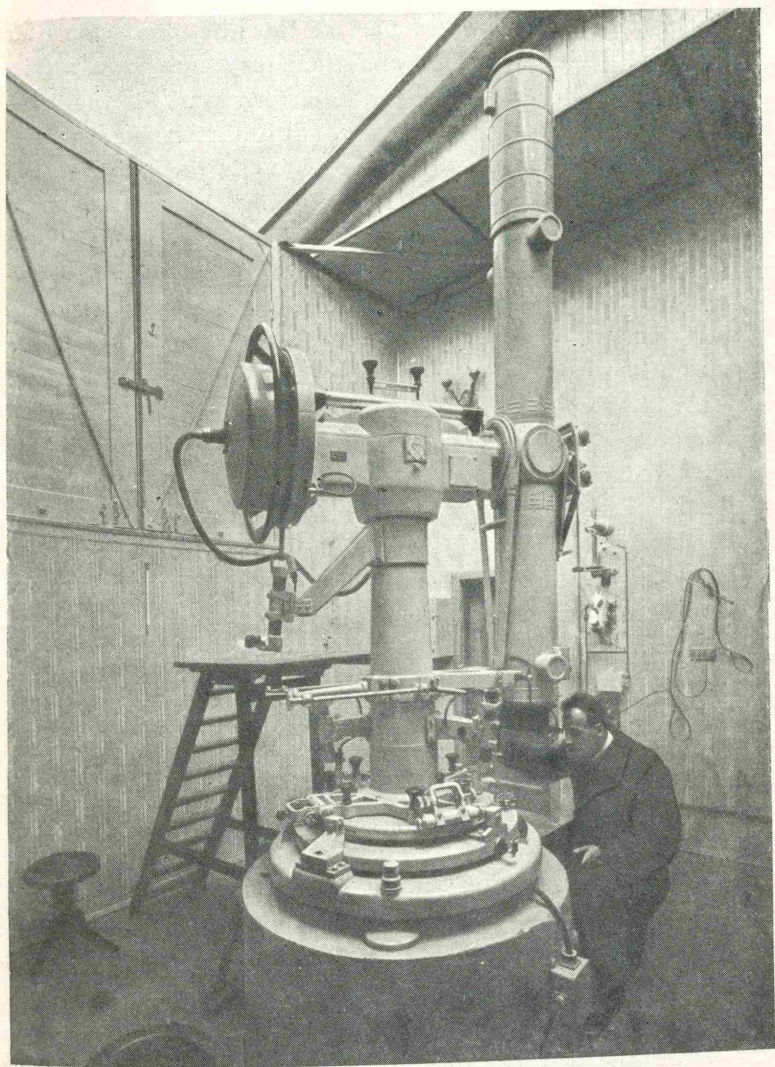
To the south-east is the city of Pushkin (formerly Tzarskoye Selo) hidden by parks. The distance from Pulkovo to the city of Pushkin is six kilometers by the road which branches off from the Kiev highway at the foot of the hill. The distance between the main building of the observatory and the center of Leningrad is eighteen kilometers. *11 miles*

To the south-west, rising above the horizon, is the Duderhof hill, the highest point (170 meters above sea-level) in the surroundings of Pulkovo.

To the north Leningrad is visible in the distance. More often it is seen in a haze through which the silhouette of a large city is noticeable. Sometimes, especially during clear autumn days, the blue waters of the Finnish Bay and the golden dome of the St. Isaac Cathedral and the spire of the Petropavlovsky fortress, shining in the sunlight, are discernible on the horizon.

The facade of the main building looks towards the north. It has been rebuilt on its former foundation, keeping the classical forms designed by Brüllow. Only the shapes of the domes are different. Instead of wooden rotating

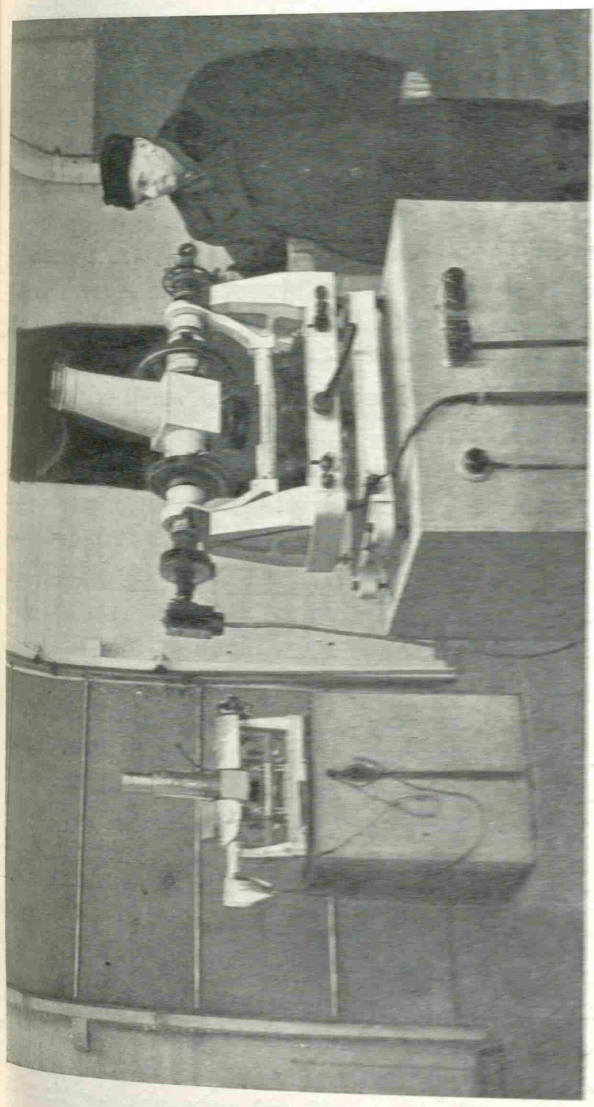




New large zenith-telescope.



g its  
Kiev  
e lo-  
erri-  
and  
and  
ade.  
the  
opy-  
nor-  
ance  
seen.  
sical  
l. It  
also  
s of  
nces,  
nory  
front  
ces-  
the  
and  
Ko-  
nd.  
Pul-  
non  
an.  
ure  
the  
ble  
old  
nt-



Time Service transit instruments with photoelectrical registration.



An important event in the life of the observatory was the construction of a radio telescope, the largest in the USSR, which operates in the centimeter diapason with a maximum revolving power (up to  $1'$  in the horizontal direction and about  $1^\circ$  in the vertical direction).

At present the observatory has eight scientific departments:

- 1) Fundamental astrometry,
- 2) Astronomical constants and the motion of the Earth's pole,
- 3) Time Service,
- 4) Photographic astrometry and stellar astronomy
- 5) Stellar physics,
- 6) Solar physics,
- 7) Radio astronomy,
- 8) Construction of astronomical instruments.

The Astrometrical Laboratory and the Computing Station, which serve all the astrometrical departments (the first four), are a part of the department of fundamental astrometry. The work of the station for observing sputniks is connected with the department of photographic astrometry and stellar astronomy. The department of radio astronomy includes a group of scientists who study planets. The expedition group for studying astroclimate is supervised by the department for the construction of astrometrical instruments.

The observatory is headed by the director, elected every three years according to the Statutes of the Academy of Sciences of the USSR by the general meeting of the Physical-Mathematical Division. Since 1947 the post of director has been occupied by the corresponding-member of the Academy, A. A. Mikhailov.

The Scientific Council of the observatory is a consultative body which discusses the plans for scientific investigations, scientific papers and information, problems deal-



paration of scientific personnel, ele  
partments and the senior scientific-w  
scientific degrees of candidate or doc  
mathematical sciences.

tronomical Observatory is a part of  
ical Division of the Academy of Scien  
work is coordinated with that of oth  
utions through the Astronomical Co

y has two branches: the Nikolay  
kolayev, the Ukraine) and a Mount  
vodsk, Northern Caucasus).

of a southern branch (first in Ode  
) had as its aim the extension of m  
made at Pulkovo to the southern sh  
kolayev branch essentially suppleme  
o Observatory of the compilation  
the Nikolayev Observatory has a we  
ice which is one of the twelve Sov  
h precision.

the main instruments of the Nikolay  
iberg transit instrument ( $D=108$  m  
vertical circle ( $D=108$  mm,  $f=140$  c  
meridian circle (moved from Pulko  
is headed by a Pulkovo astronome

ation at a height of 2130 meters abo  
meters from Kislovodsk was organiz  
for observations of the solar coron  
t coronagraph ( $D=200$  mm,  $f=300$  cm  
ar observations supplement the obse  
These are made with the instrument  
eniscus heliograph of the Maksuto  
 $f=880$  cm), a diffraction spectro  
optical parts (coelostat  $D=300$  mm



Observations according to the program of the Catalogue of Faint Stars made during the post-war years at eight Soviet and two foreign observatories (Bucharest and Wrocław) served as a basis for «The Preliminary General Catalogue of Fundamental Faint Stars» compiled at Pulkovo by M. S. Zverev and D. D. Polozentsev.

As a result of the analyses of a one hundred year series of absolute observations with the large transit instrument A. A. Nemiro compiled «The Pulkovo Catalogue of Right Ascensions of Stars».

The program of photographic observations for the determination of the proper motions of stars relative to the galaxies, drawn-up by the Pulkovo astronomers, is now adopted by several Soviet and foreign observatories. In 1955 A. N. Deutsch, V. V. Lavdovsky and N. V. Fat-chikhin published «The Catalogue of 1508 Galaxies» which contained data on galaxies in 157 selected areas and an estimation on the suitability of the photographic image of each galaxy for photographic measurements. Now a program for observations in other regions of the sky with galaxies is being worked-out. The photographs of areas of the sky with galaxies taken with the normal astrograph supply the data for the first epochs and will be of great importance for fundamental catalogues in the future.

At Pulkovo much attention is paid to another traditional problem — the determination of astronomical constants — values which characterize the motion of the Earth and the position of its axis in space (precession and nutation) and also connected with the velocity of light (annual and diurnal aberration). In order to derive more precise values of the constants of nutation and aberration A. A. Mikhailov proposed the design of a fixed photographic tube which systematically registers the position of the celestial pole by photographing the polar region of the sky. Such a polar tube was made in rebuilt Pulkovo.



worked in this field since 1953,  
ed the method of observations and

in increasing the precision of astro-  
l observations is played by syste-  
inations (Latitude Service), which  
motion of the pole connected with  
moment of inertia of the Earth. The  
ice, the first to resume observations  
rebuilding of the observatory, deri-  
cision which are used by the Soviet  
ates of the Earth's pole and are re-  
entral Bureau of the International  
rin, Italy) and the International  
Paris.

ne International Geophysical Year a  
e was mounted for studying the in-  
al errors on the results of latitude  
increasing the precision of the lat-  
ving simultaneously with two zenith  
ed by Pulkovo astronomers and ap-  
It was also adopted by several observa-  
atitude work (Poltava, Kazan, Kitab).  
nted new instrument, the photogra-  
taneously deals with two problems —  
ime Service — and should essentially  
of observations of astronomical clock  
de variations.

comprises three elements: the deter-  
om astronomical observations, the  
n clocks of high-accuracy and the  
s of exact time by radio. Accord-  
of observations the Pulkovo Time  
of the first places in the world. In  
oelectric method of registration of



by N. N. Pavlov was of great importance. The personal error of the observer, which had wide application and the same method enable the derivation of increasing precision.

Working during many years with the photographic transit instrument permitted the avoidance of instrumental errors, especially of origin. The investigation of the thermal errors of transit instruments and its influence on astronomical observations, made by V. M. Vavilov, necessitated taking into account the temperature inequalities of the instrument, and of their more detailed study of observations.

Pavlov designed a new transit instrument of which should further the increase of accuracy of observations. For improving the accuracy of time four quartz clocks are kept in the observatory deep. At present the transmission of the observatory, although the instrument belongs to it.

With the launching of the sputniks new problems arose which received immediate attention at Pulkovo. As the sputniks represent fast-moving objects, to determine their position (coordinates and time) it is necessary to observe them with high precision in order to determine the orbit of the sputnik and solve a series of geodesical problems. At the observatory a stand was set up for visual observations of the sputniks with 30 standard telescopes ( $D=50$  mm, field angle  $11^\circ$ ). The observations of the sputniks are made daily by a group of voluntary observers. The observations were begun with the launching of the first sputnik. These have an advantage over



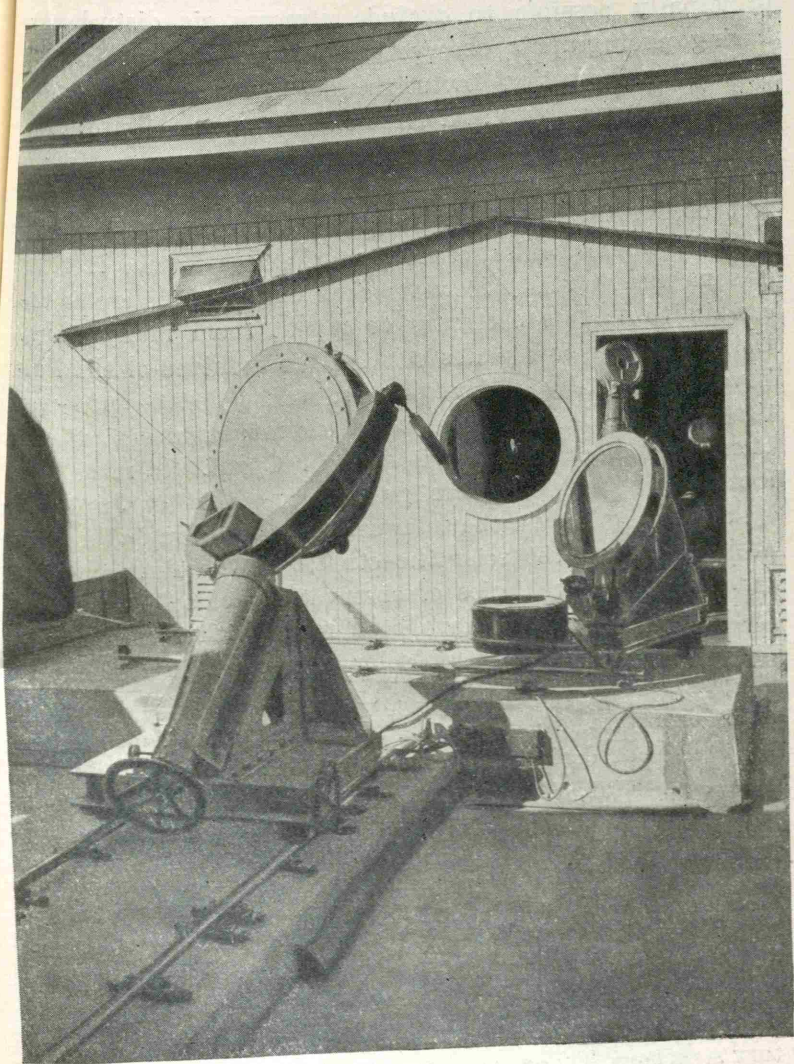
the photographs of the second epochs, taken during recent years, and their measurement together with those taken by Kostinsky made possible the determination of proper motions of about 25 000 stars in open stellar clusters and associations, the cosmogonical significance of which was proved by Ambartsumian at Burakan, Armenia.

Systematic investigations of spectrophotometric gradients of stars of various spectral types are made by the department of stellar physics, headed by O. A. Melnikov. As a result of the study of continuous spectra of stars and their comparison with spectra of laboratory sources of light and the Sun, a more precise value of the zero-point of the scale of stellar temperatures was derived (the spectrophotometric temperature of A0 stars was found to be close to  $16\,000^\circ$ . Former measurements made at Potsdam and Greenwich gave  $9000$  and  $18\,000^\circ$  respectively).

In 1944 O. A. Melnikov completed a large investigation on the spectrophotometry of Cepheids (a full account of this work was published in 1950). During this investigation the total and selective interstellar absorption was found and the problem of the zero-point of the period — luminosity curve studied, the latter being of fundamental importance for the determination of the scale of the Universe. He obtained an unexpected, at that time, result which spoke in favour of an increase of the already known distances of galaxies. Later Baade found that these distances should be increased two times. At present O. A. Melnikov, using new data on interstellar light absorption, Cepheids and different types of stellar population in the Galaxy, has confirmed his previous results.

The Pulkovo astrophysicists are keeping up the traditions of their predecessors, Hasselberg and Belopolsky, by combining astronomical observations with laboratory experiments. This is demonstrated, for example, by such a complicated experiment as the imitation of interstellar

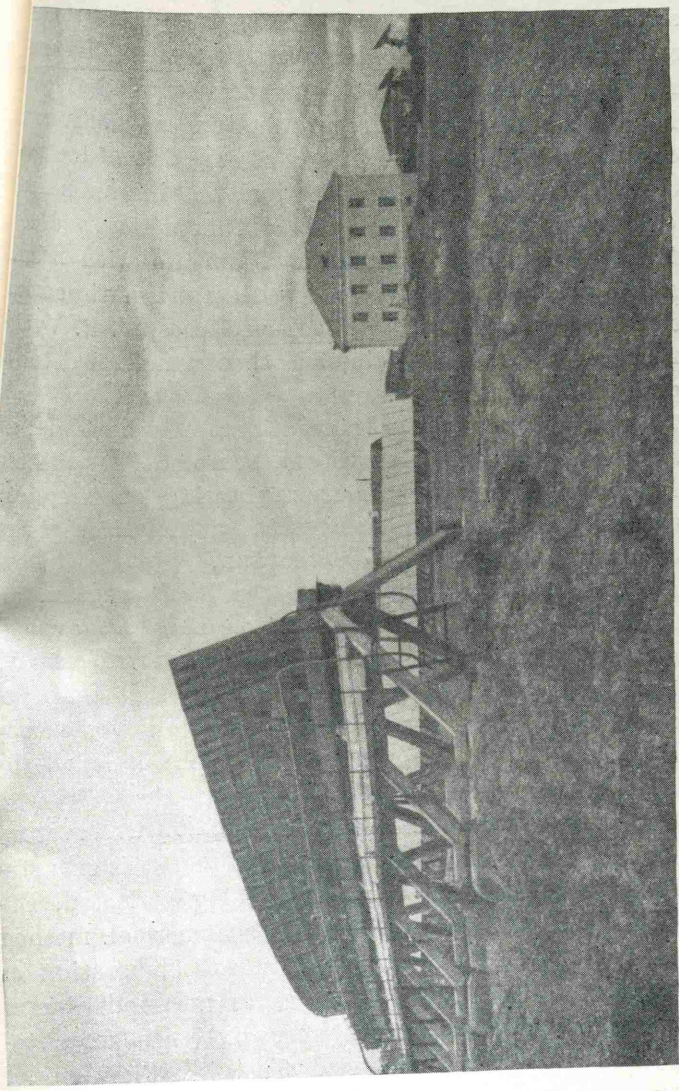




Coelostat of the horizontal solar-telescope.



is  
ces.  
ble  
he  
li-  
le  
as  
n-  
s.  
l-  
r  
s



The large radio telescope.





Earth». Some success has been reached in the study of the mechanism connecting the active processes on the Sun with phenomena in the troposphere (the weather and climate).

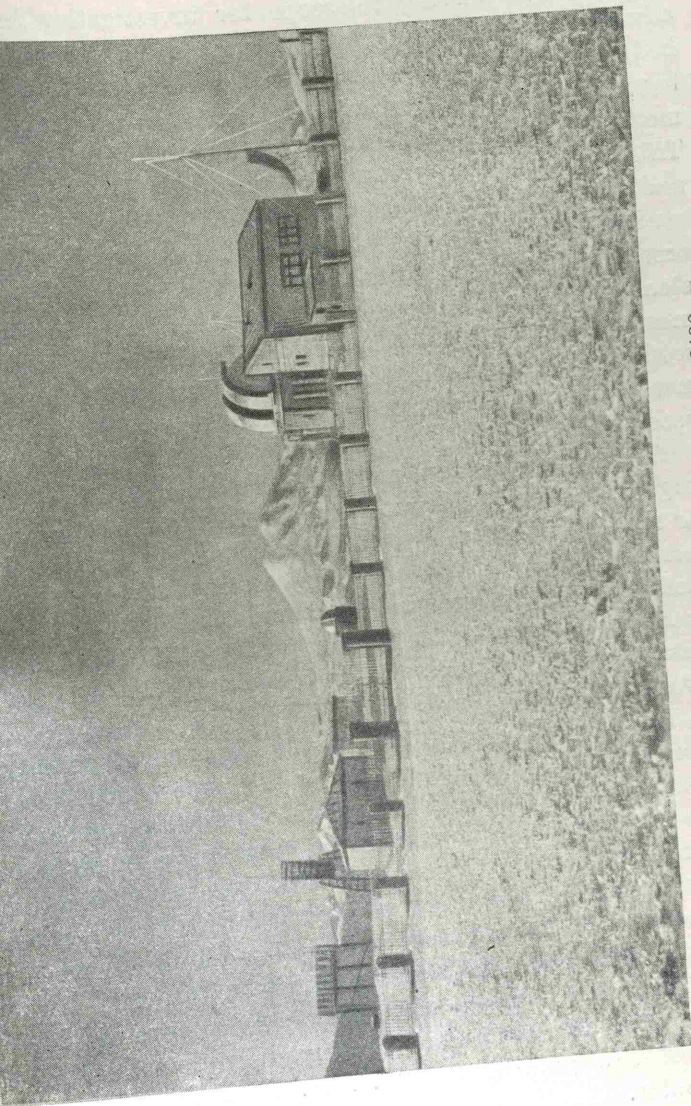
The department of radio astronomy, organized at Pulkovo in 1954, is now the largest scientific department of the observatory. It is equipped with modern apparatus, including a radio telescope of high resolving-power, constructed according to the design of S. E. Khaikin and N. L. Kaidanovsky.

The reflector of the large radio telescope consists of 90 separate plane shields, forming a zone cut out of a paraboloid. The length of the reflector, measured along the chord, is 120 meters. Observations are made in the meridian. As the celestial bodies cross the meridian at different heights the form of the surface of the reflector must previously be changed by a corresponding arrangement of the reflecting shields. The focus of the paraboloid also changes, remaining on a horizontal line which lies in the plane of the meridian. The dipole in the focus is connected by a cable with radio reception apparatus located in a separate building.

The high resolving-power of the radio telescope permits observations to be made of the intensity of radio emission across the solar disk or the Moon and also the study of the structure of local sources of radio emission in the Galaxy («radio nebulae»). Observations of the Sun and separate phenomena in its photosphere (in particular chromospheric flares), which are made in conjunction with optical observations on the horizontal solar telescope, will furnish new data for the study of solar structure and the nature of active processes.

Systematic observations of the effective center of radio emission of the Sun and the polarization of its radio emission in the centimeter diapason (both these problems are part of the observational program of the IGY) are made





Solar station in the Caucasus, altitude 2130 m.



New astronomical instruments are also designed by the Astrometrical Laboratory of the observatory. In 1953 L. A. Sukharev completed a model of a horizontal meridian instrument ( $D=115$  mm,  $f=160$  cm, diameter of the mirror — 180 mm). Its advantage over the usual meridian instrument is that there is no tube flexure as the usual rotating tube is replaced by a combination of a plane rotating mirror and two non-movable horizontal tubes. The experimental observations with the model of the instrument proved the expediency of such a construction. Now a large-sized horizontal meridian telescope ( $D=190$  mm,  $f=420$  cm, diameter of the mirror — 300 mm) is being made at an optical shop.

The astronomical laboratory has the task of designing on a modern technical basis a large transit instrument and vertical circle which will replace the main equipment of the observatory for absolute measurements of coordinates of celestial bodies.

The new problems have made essential changes in the profile of work of the observatory. Its outer appearance is also changing — now only the main building reminds one of the old Pulkovo Observatory. It is a new large scientific institution which contains the seeds of its future growth and development.

---



№ \_\_\_\_\_

თარიღი \_\_\_\_\_

ობიექტი \_\_\_\_\_

ა \_\_\_\_\_ ბ \_\_\_\_\_

კამერა \_\_\_\_\_

ფოკუსი \_\_\_\_\_

ფირფიტა \_\_\_\_\_

ექსპოზიცია \_\_\_\_\_

დამკვირვებელი \_\_\_\_\_

*Tbilisi*





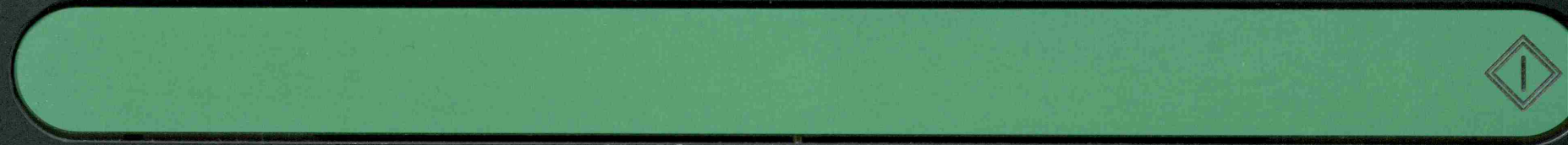












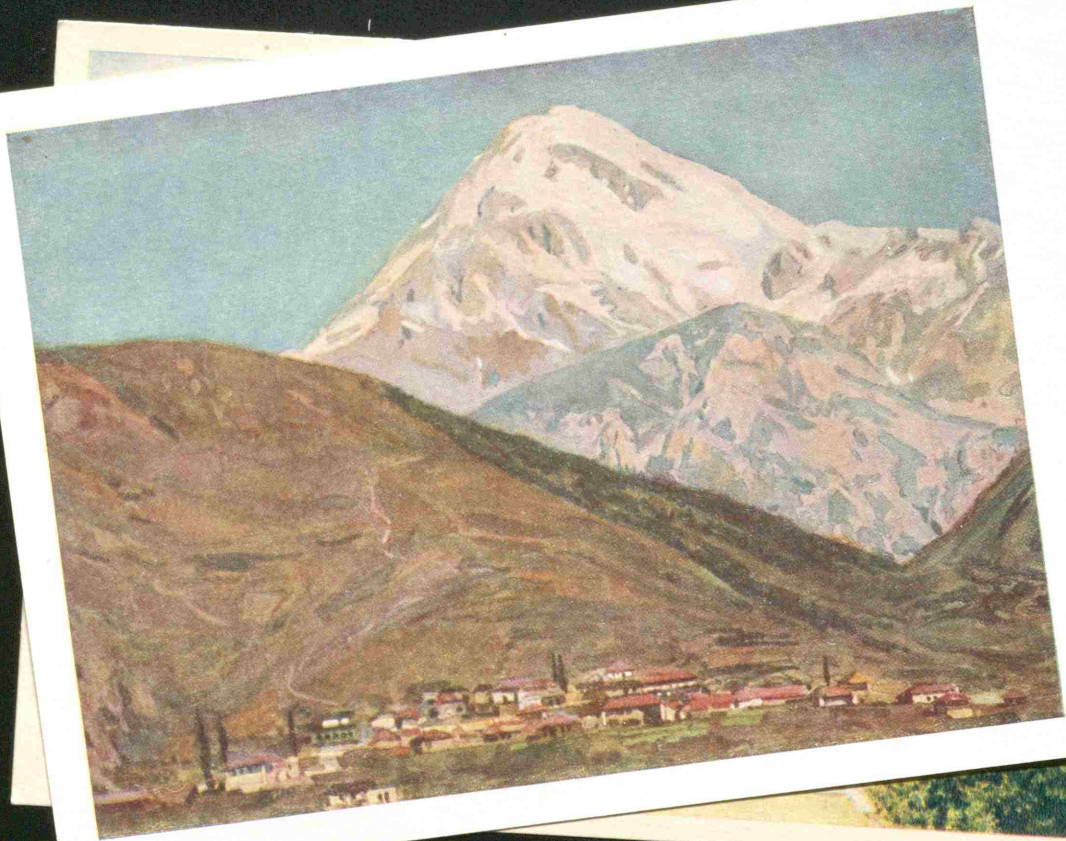




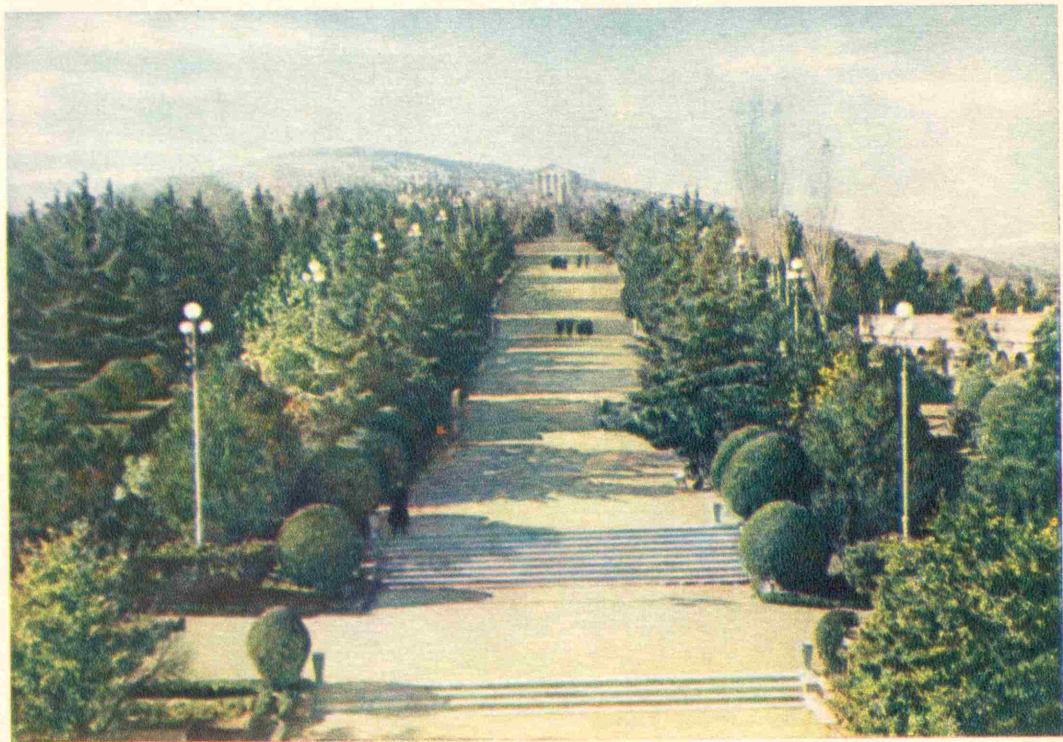














25 к.

«МУЗЕЙ-УСАДЬБА Л. Н. ТОЛСТОГО В МОСКВЕ»

Составители — З. Л. Бокк, Е. Н. Чеботаревская.

Под редакцией А. И. Шифмана.

Сдано в набор 20/VI 1957 г. Подп. к печ. 19/VII 1957 г.

Форм. бум.  $70 \times 92 \frac{1}{32}$ . Печ. л. 0,25 (условных — 0,29).

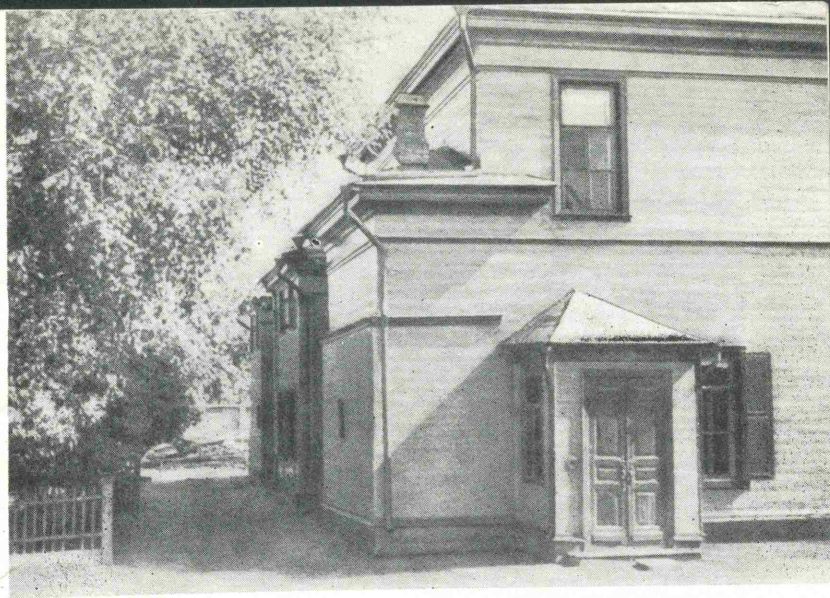
Уч.-изд. л. 0,25. Тираж 10 000 экз. Ш05818.

«Искусство», Москва, И-51, Цветной бульвар, 25.

Изд. № 13860. Заказ тип. № 288.

Экспериментальная тип. ВНИИПтиТ.

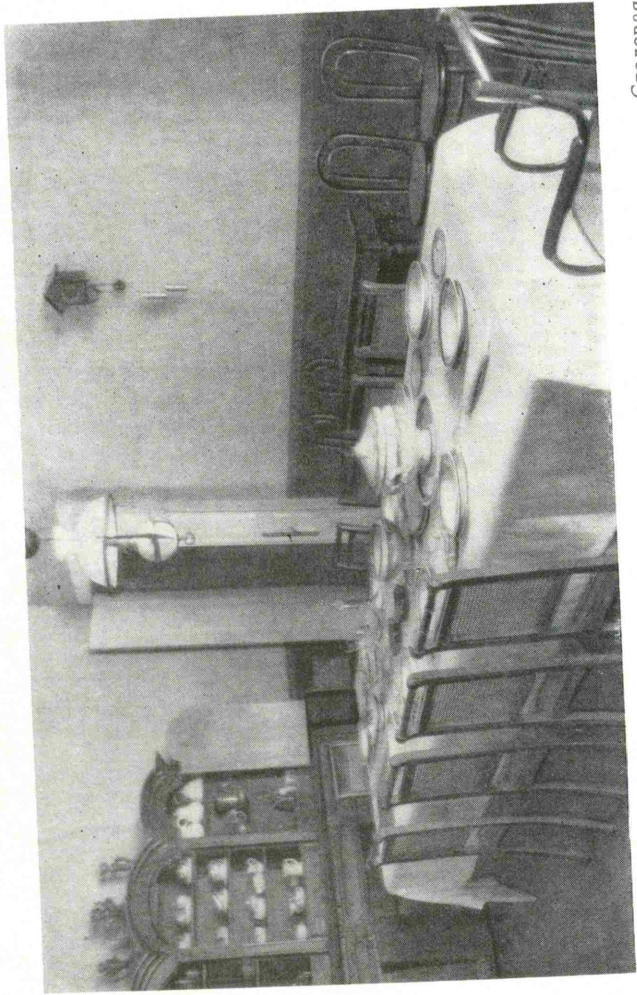
Москва, Б. Комсомольский, 9.



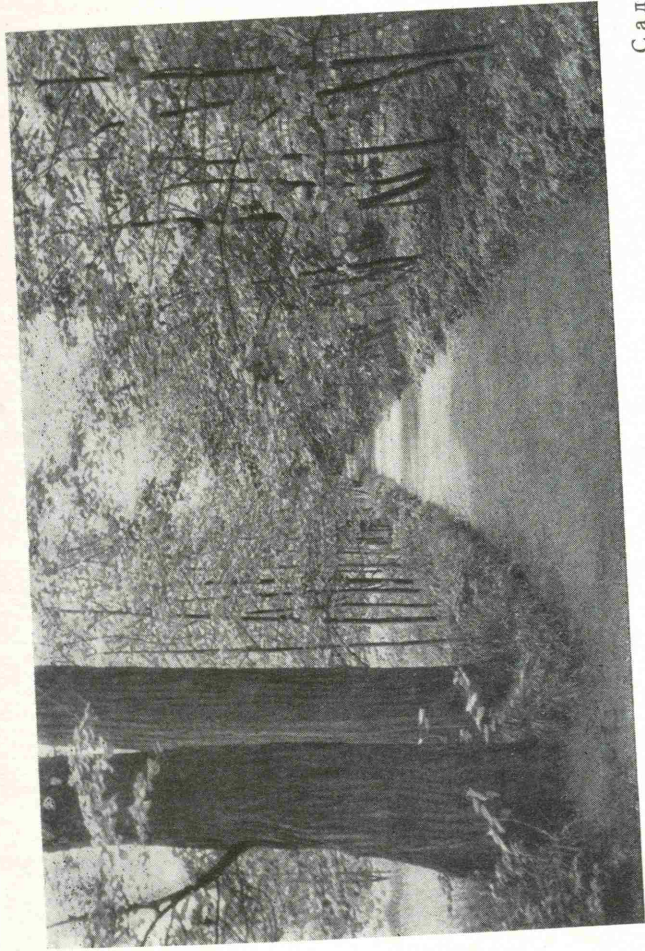
---

# МУЗЕЙ-УСАДЬБА Л.Н. ТОЛСТОГО В МОСКВЕ





Столовая

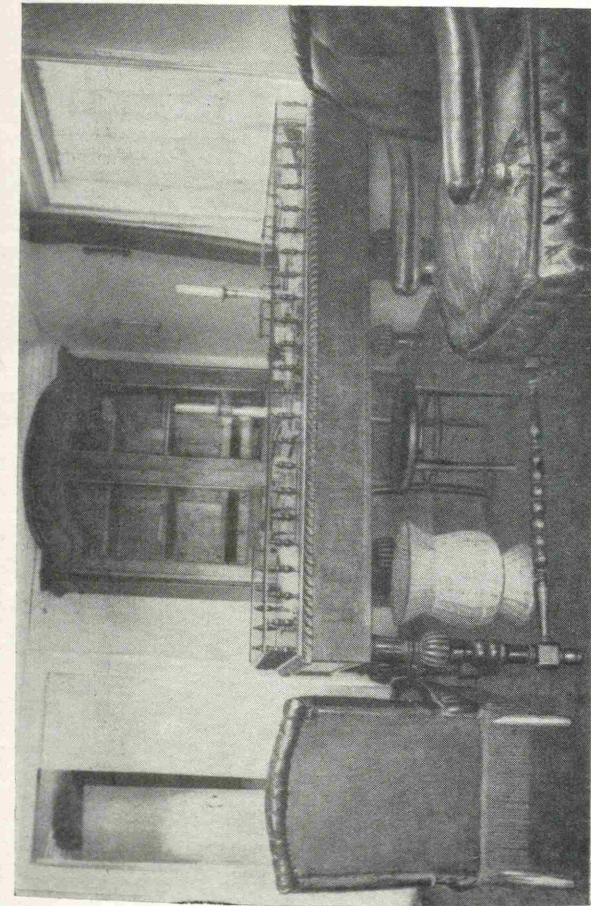


Сад

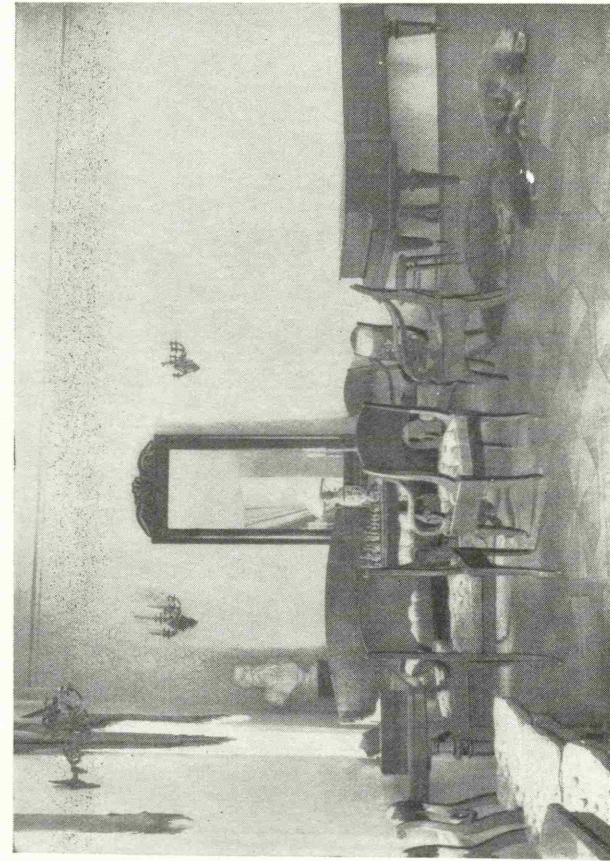




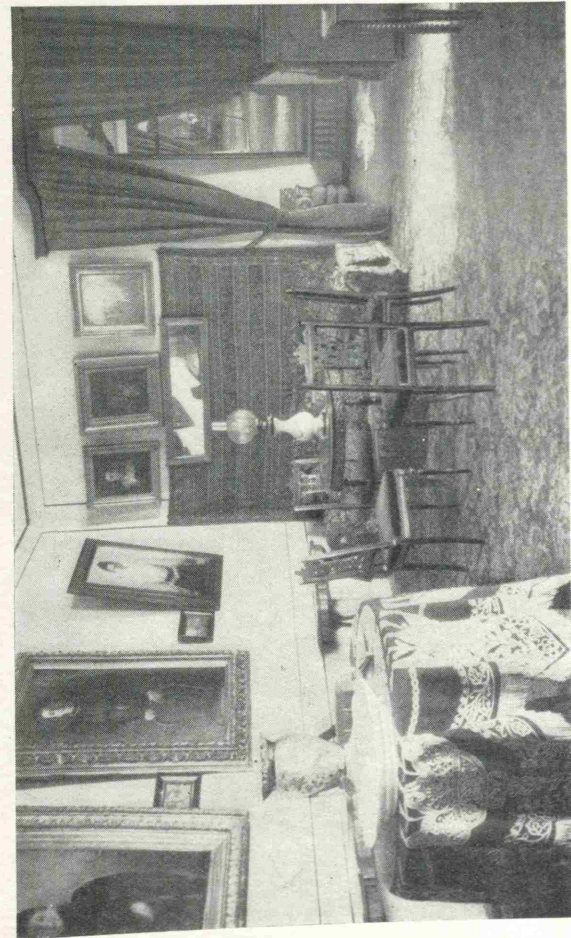
Л. Н. Толстой. 1884 г.  
Н. Н. Ге. Масло.



Кабинет Л. Н. Толстого



Уголок зала



Гостиная

Музей-усадьба Л. Н. Толстого в Москве принадлежит к числу известнейших мемориально-бытовых музеев столицы. В своем московском доме Толстой прожил около двадцати лет — с 1882 по 1901 год.

Здесь он работал над романом «Воскресение», повестью «Хаджи-Мурат», пьесами «Власть тьмы», «Плоды просвещения», «Живой труп» и многими другими произведениями.

В 80—90-х годах минувшего века дом Толстого являлся одним из центров культурной жизни Москвы. Сюда приезжали выдающиеся деятели русского и мирового искусства, литературы и науки. Чехов, Горький, Островский, Короленко, Репин, Суриков, Серов, Римский-Корсаков, Танеев, Рахманинов, Рубинштейн, Шаляпин, Станиславский, Стасов не раз бывали в этом доме.

В 1920 году В. И. Ленин посетил дом Толстого. 6 апреля того же года он подписал декрет о создании музея. В 1921 году музей был открыт. В доме и в саду все сохраняется так, как было при жизни Л. Н. Толстого.



# Astronomy in USSR.

Czarist Russia - Pulkovo - 1839 F.W. Struve, Dr. Mikhaeloff  
Leningrad 1703 Peter the Great. engineer. 250 ft tall  
St Isaac's { 93 ft dome 18" pendulum. 11 mi. S. of Leningrad.  
300 ft.

Moscow: 12th Cent. (after waining power of Kiev.)  
Kremlin - Tartar & Polish invasions.  
15th Cent brick walls & towers etc.  
Ochre 19th cent Czar's palace & 3 15th Cent  
Red Sq. & St Basil's Churches.  
Central part of city.  
Moscow & Observatory - 1931 on Lenin Hill  
Exhibition: atomic pile & satellites.  
founded by Cath the Gr. 1755

Armenia Semey - founded by last Czar.  
41" lens. Grubb-Parsons.  
Astrophysical Obsy at Partizan

Georgia Abastumani 1932. 5200 ft alt

Armenia B

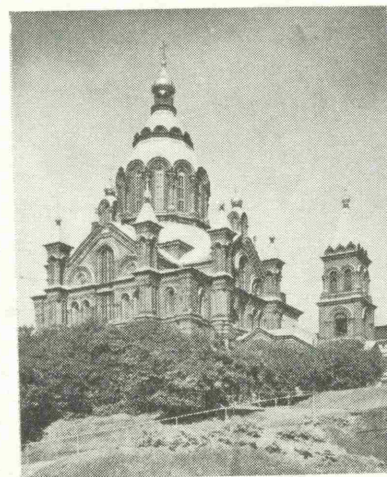


## Uspenski Kathedrale

(Katajanokka)

Uspenski Kathedrale ist gemäss den Plänen des Architekten Gornostajeff gebaut. Ihr Grundstein wurde im Jahre 1862 gelegt, im 1868 war der Tempel vollendet und war dem Andenken an den Tod der Heiligen Jungfrau Marie gewidmet (Uспенje).

Der Tempel, dessen Höhe ung. 50 m. (ung. 70 m. über dem Meeresspiegel) ist, ist der grösste der finnischen griechisch-katholischen Kirchen. Die grosse Glocke des Tempels wiegt 5216 kg. Die Ikonen sind von dem russischen Künstler Shiltzov hergestellt.



## Uspenskin katedraali

(Katajanokka)

Pyhän Neitsyt Marian Kuolinuneennukkumisen muistolle pyhitetyn, arkkitehti Gornostajevin suunnitteleman USPENSKIN KATEDRAALIN peruskivi laskettiin v. 1862 ja temppeli valmistui vuonna 1868.

Temppeli, jonka korkeus on n. 50 m. (meren pinnasta n. 70 m.), on Suomen Ortodoksisen Kirkkokunnan suurin Herran huone. Sen suurin kello painaa 5216 kg. Ikonit ovat venäläisen taiteilijan Shiltsovin käsialaa.



## Uspenski katedralen

(Skatudden)

Uspenski katedralen är byggd enligt ritningar utförda av arkitekten Gornostajeff. Grundstenen lades år 1862, templet stod färdigt år 1868 och blev helgad till minnet av Heliga Jungfru Marias död (Uспенje).

Templet, vars höjd är 50 m (c:a 70 m över havsytan), är det största av de grekisk-katolska kyrkorna i Finland. Klockstapelns största klocka väger 5216 kg. Ikonerna äro utförda av den ryske konstnären Shiltzov.

## Uspenski Cathedral

(Katajanokka)

Uspenski Cathedral is build according to the designs made by Gornostajeff, a Russian architect. Its foundation-stone was laid in 1862, the temple was finished in 1868 and it was consecrated to the commemoration of the death of Virgin Mary (Uспенje).

The temple, the height of which is 50 m. (c:a 70 m. above the sea level), is the largest of Finnish Orthodox Church. The biggest bell in the Cathedral has a weight of 5216 kg. The icons are made by Shiltzov, a Russian artist.

## Cathédrale Uspenski

(Katajanokka)

La Cathédrale Uspenski est construite d'après les plans dessinés par l'architecte Gornostajeff. La première pierre a été posée en 1862, le temple a été terminé en 1868 et il a été consacré à la commémoration de la mort de la Vierge Marie (Uспенje).

Le temple dont la hauteur est env. 50 m. (env. 70 m. du niveau de la mer) est le plus grand des églises orthodoxes de Finlande. La cloche la plus grande du temple a un poids de 5216 kg. Les icones sont exécutées par l'artiste russe, Shiltzov.

## Успенский Собор

(Катаянokka)

В 1860 г. 18/1 академик Горностаев представил разработанный проект плана постройки собора и руководил работой. С лета 1861 г. сдал работу академику де Варнек. Подрядчиком работ был Чечулин, а с 1862 г. сменил его Чернышев.

Закладка собора в торжественной обстановке совершена 15 августа 1862 г.

Гранитные глыбы с острова Уттер доставлены на баржах. Высота собора 48 мт, колокольня 26 мт. Колокола заказаны у И. Четверикова в Москве. Большой колокол весит 5216 кг. Иконостас работы художника Шильцова. Собор освящен 13 го октября 1868 года. Обновлен в 1893.

Успенский собор является в настоящее время самым большим храмом Финляндской православной церкви и принадлежит он Гельсингфорскому православному приходу.



---

---

Государственный  
Симфонический оркестр Армянской ССР

Дирижер — художественный руководитель и главный дирижер  
оркестра, Народный артист Армянской ССР

**Михаил МАЛУНЦЯН**

Солистка Государственного Академического Большого театра  
Союза ССР

**Ирина АРХИПОВА**

Солист Государственного Свердловского театра оперы и балета  
имени А. В. Луначарского

**Борис ШТОКОЛОВ**

Лауреат Международного конкурса в Праге

**Жан ТЕР-МЕРКЕРЯН**

ПРОГРАММА:

1. **ЧАЙКОВСКИЙ** — Итальянское каприччио
2. **ГЛИНКА** — Ария Сусанина из оперы «Иван Сусанин»  
**ЧАЙКОВСКИЙ** — «Благословляю вас, леса»  
Исполняет **Б. Штоколов**.
3. **ШОСТАКОВИЧ** — Праздничная увертюра
4. **ЧАЙКОВСКИЙ** — Ария Иоанны из оперы «Орлеанская дева»  
**РИМСКИЙ-КОРСАКОВ** — Третья песня Леля из оперы «Снегурочка»  
Исполняет **И. Архипова**
5. **ХАЧАТУРЯН** — Концерт для скрипки с оркестром  
Allegro con fermezza  
Andante sostenuto  
Allegro vivace  
Исполняет **Ж. Тер-Меркерян**
6. **ХАЧАТУРЯН** — «Танец с саблями» из балета «Гаянэ»

Ведет программу **М. Балакшеев**

---

---

---

---

STATE SYMPHONY ORCHESTRA OF THE ARMENIAN SSR

Conductor — artistic and chief conductor of the orchestra  
People's artist of the Armenian SSR

**Michael MALUNTSIAN**

Solist of the State Academy Bolshoi Theatre of the USSR

**Irine ARKHIPOVA**

Solist of the State Sverdlovsk Lunacharsky opera and ballet theatre

**Boris SHTOKOLOV**

Laureate of the International Competition in Prague

**Jan TER-MERKERIAN**

PROGRAMME

1. **TSCHAIKOVSKY** — Italian capriccio.
2. **GLINKA** — Sussanin's aria from opera «Ivan Sussanin».  
**TSCHAIKOVSKY** — «I bless you, the forests».  
Singer **B. Shtokolov**.
3. **SHOSTAKOVICH** — Festive overture.
4. **TSCHAIKOVSKY** — Joan's aria from opera «Maiden from Orlean».  
**RIMSKY-KORSAKOV** — Let's third song from opera «Snow Maiden».  
Singer **I. Arkhipova**
5. **KHACHATURIAN** — Concerto for violin and orchestra.  
Allegro con fermezza  
Andante sostenuto  
Allegro vivace  
Violinist **J. Ter-Merkerian**.
6. **KHACHATURIAN** — «Dance with sabres» from ballet «Gaianeh».

Programme is announced by **M. Balaksheev**.

---

---

*Chakovsky*



---

---

# К О Н Ц Е Р Т

в честь торжественного открытия  
X Международного  
Астрономического Съезда

12 августа 1958 года

КОЛОННЫЙ ЗАЛ ДОМА СОЮЗОВ  
г. Москва

## THE CONCERT

in honour of opening the 10th General Assembly  
of the International Astronomical Union

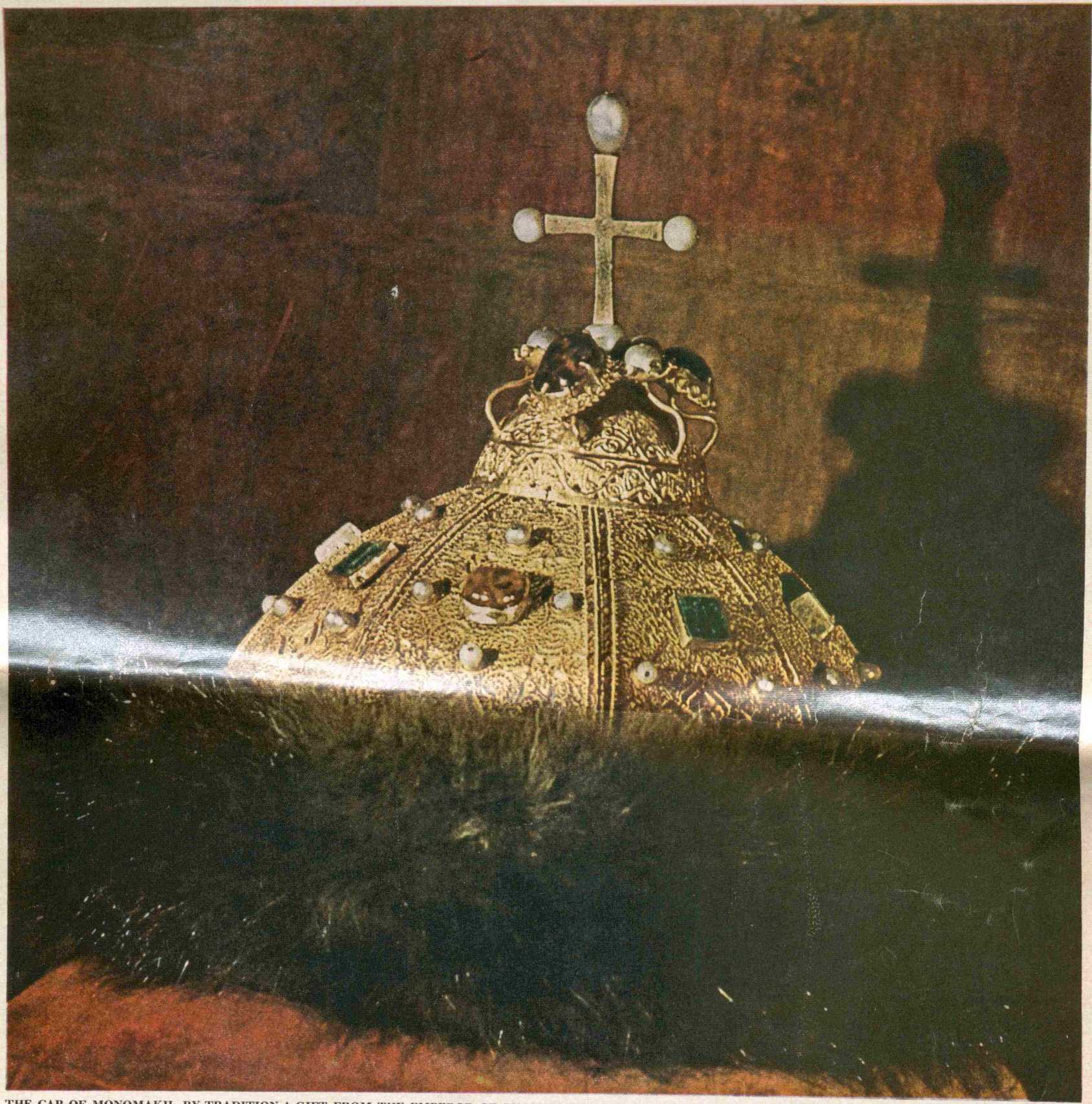
August 12, 1958

Column Hall of the House of Trade Unions  
Moscow

---

---





THE CAP OF MONOMAKH, BY TRADITION A GIFT FROM THE EMPEROR OF BYZANTIUM TO VLADIMIR II (1113-1125), SYMBOLIZES CZARDOM'S BYZANTINE LINEAGE

# IMPERIAL HERITAGE

## KREMLIN TREASURES LINK RUSSIA TO HER CZARIST PAST

**I**NSIDE the Kremlin, which today houses Russia's Communist rulers, is a dazzling link to Russia's stormy past—the treasure of the czars. Row after row in room after room it is displayed—enormous gems, glittering raiment, imperial baubles. One of the world's greatest national collections, its value is beyond counting. It dates back, with the cap of Monomakh (*above*), to the emergence of Russia as a nation in about 1150, but the bulk of the collection is from the 16th to 18th centuries, when Russian art was at its most elaborate. The men who knew these riches were the fearsome, fire-breathing czars like Ivan

the Terrible and Peter the Great who crushed down opposition and unrest with knout and sword.

Miraculously, the treasures survived the revolutions. They owe their safety in part to awe felt by the angry peasants when they broke into the palaces, in part to admonitions of men like Maxim Gorky. "Citizens," said Gorky to the rioters in the 1917 uprising, "take care of this heritage, take care of the palaces. . . . They are the embodiment of the spiritual power of yourselves and your forefathers. Citizens, do not touch one stone. . . . All this is your history, your pride."

Photographed by DAVID DOUGLAS DUNCAN

CONTINUED





**THE KREMLIN** is a complex of buildings surrounded by walls originally erected in wood in the late 13th Century and later changed to stone and brick to withstand the invasions of Tartars, Lithuanians, Poles and Swedes. Inside the walls

at extreme left is the Cathedral of the Annunciation, burned by the Tartars in 1382 and rebuilt in 1490. The square-towered structure is the tower of Philaret. Taller tower next right is the Bono, and the tallest tower is that of Ivan the Great.

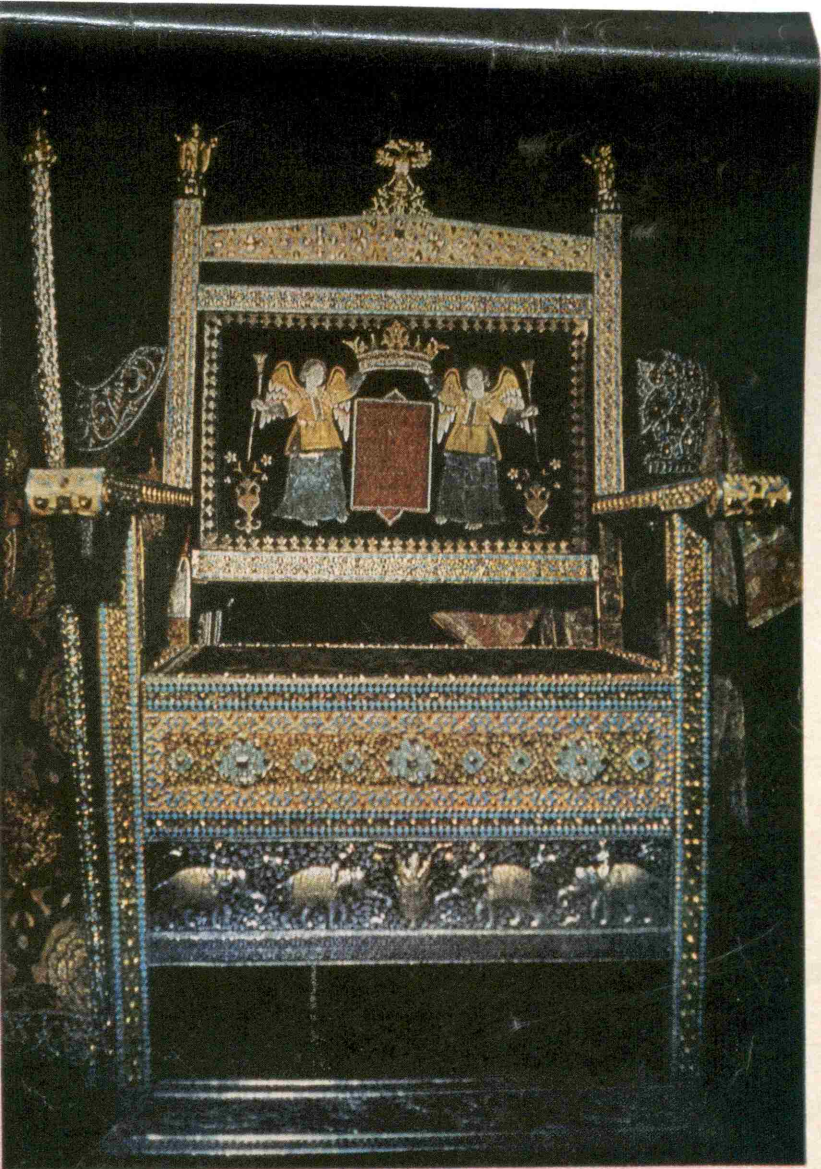


Built in 1600, it was shelled out of line by Napoleon's troops and is now called "Ivan the Slightly Topsy." Before these towers lies the Cathedral of the Archangel Michael, started by a Milanese architect in 1505 as a burial place for the czars.

Building with red star is the Savior's Tower, which rises over Kremlin entrance. Next two towers are watchtowers, used as storehouses during sieges. Varicolored building at far right outside the wall is the Church of St. Basil the Blessed.

CONTINUED





**DIAMOND THRONE** used in coronation ceremonies, sparkles with more

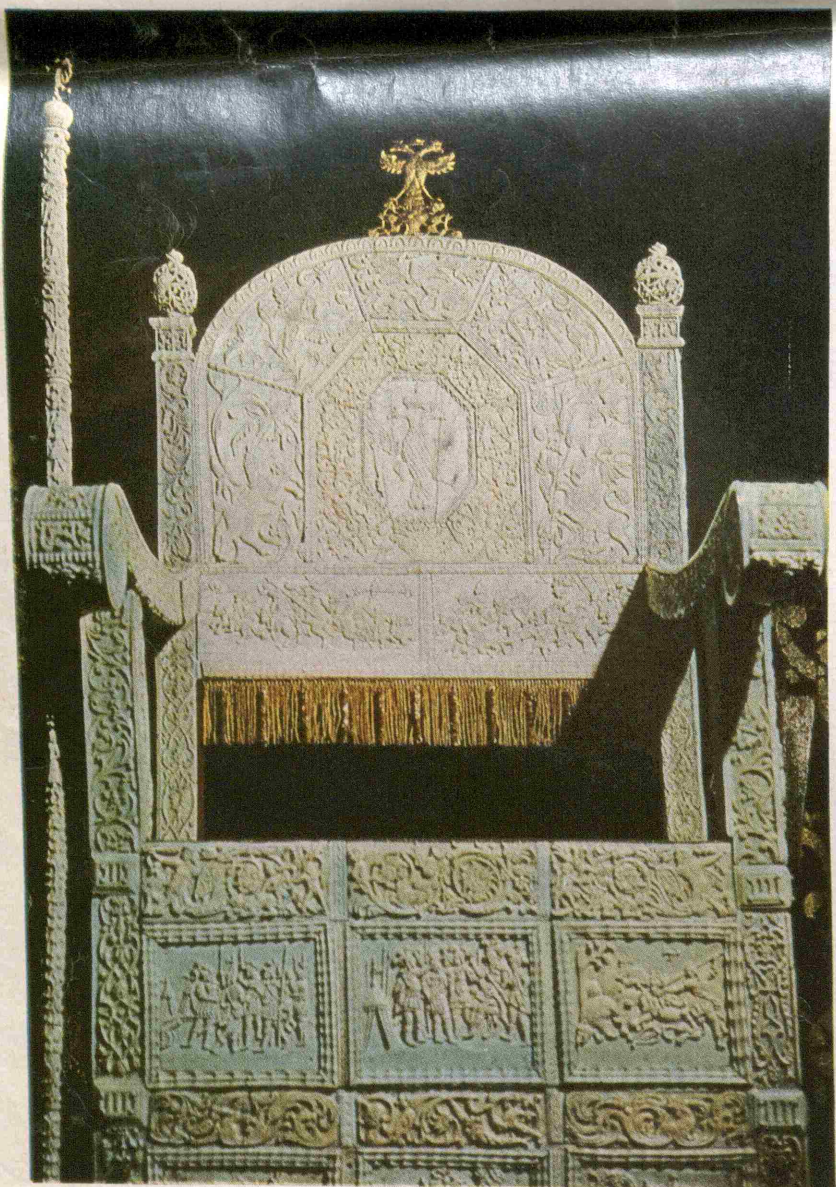


RUSSIAN REVOLUTION CONTINUED

## GEMS WORTH A CZAR'S RANSOM



THE KAZAN CROWN, of filigree gold covered with Persian turquoises and topped with a giant topaz and fresh-water pearls, was made in 1553. It commemorates the capture of the khanate of Kazan from the crumbling Tartar empire.



IVORY THRONE, brought to Moscow by Byzantine princess whom Ivan III married in 1472, is covered with ivory panels depicting mythological scenes. Ivan the Terrible sat in it, and it was used in coronations up to Nicholas II in 1896.

GREAT HALL IN PALACE OF FACETS WAS USED FOR RECEPTIONS →



SCEPTER AND ORB, lavishly studded with gems, has large ruby in center of cross. It was made in Constantinople for Czar Alexei Mikhailovich in 17th Century when the art of enameling was at its height. At right is gold bird's head.



DIAMOND THRONE, used in coronation ceremonies, sparkles with more than 2,000 diamonds and amethysts. It was brought from Persia for Czar Alexei Mikhailovich in 1660, has ivory relief panels with figures of birds, beasts, flowers.

CONTINUED





A RICH REMINDER of Russia's mission to protect the Christian world was this back panel of an elaborate carriage proffered Boris Godunov by England's Queen Elizabeth in 1600. (Boris had died before the carriage got to Moscow in

1625.) This was a time when Christian Europe was worried by the spreading Ottoman Empire and looked on Russia as a bulwark against the Turks. The panel shows a hypothetical battle between Turks and Russians before the gates of the

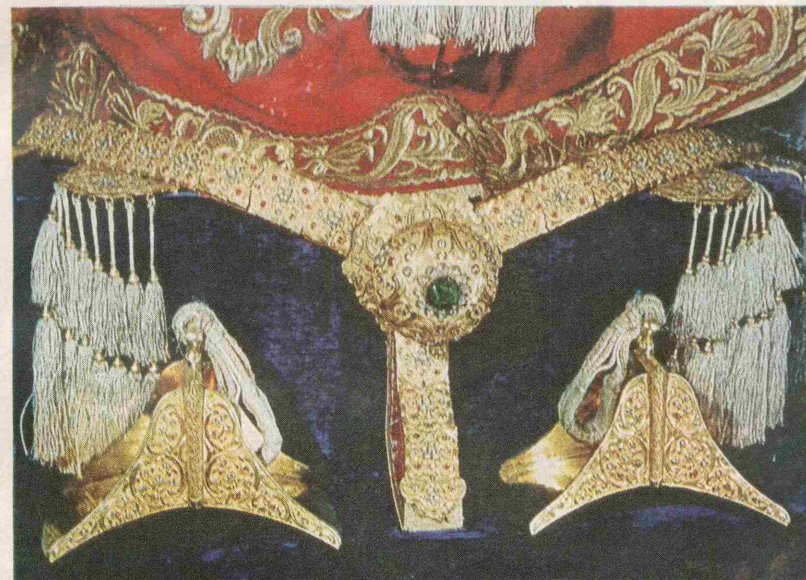
Kremlin. The Sultan's forces at right fly the flag of Islam. Boris is shown in left foreground, holding a huge spear which is piercing the Sultan's horse. Boris himself never fought the Turks but Peter the Great attacked Turkey in 1695 and

lost. In 1696 he attacked again and won. In 1711 he invaded Turkey once again but was driven back. Turkey remains a traditional enemy, and for centuries, as Americans play cowboy and Indian, Russian children played Russian and Turk.





RUSSIAN REVOLUTION CONTINUED



SADDLE GIVEN TO CATHERINE II HAS A GIANT EMERALD, 1,000 DIAMONDS

## PRIDE IN ARMOR

In the 14th and 15th centuries the Grand Duchy of Moscow, originally the city and a small surrounding area, was battling its way to national leadership. Then its arms were plain and utilitarian. But after Moscow won dominance over most of Russia in the late 15th Century, arms became symbols of stately importance, wealth and pride.

The palaces blossomed with finely wrought ceremonial arms and heraldic devices. For great nobles, living on the revenues of enormous estates, magnificence knew no limit. Their saddles, quivers and even tents sparkled with pearls and diamonds and cloth of gold, in keeping with their new importance. Impressed beyond measure, an English visitor to Ivan's court in 1553 wrote home, "I have seen the King's Majesties of England and the French King's pavilions, which are fayre, yet not like unto his. . . . I never heard of nor saw men so sumptuous."



CHILD'S ARMOR, used in the 17th Century by an 8-year-old son of Alexei Mikhailovich, is fashioned of wrought iron, was worn on ceremonial occasions. Children's armor increased in weight as the child grew older, finally adapting him to full load.

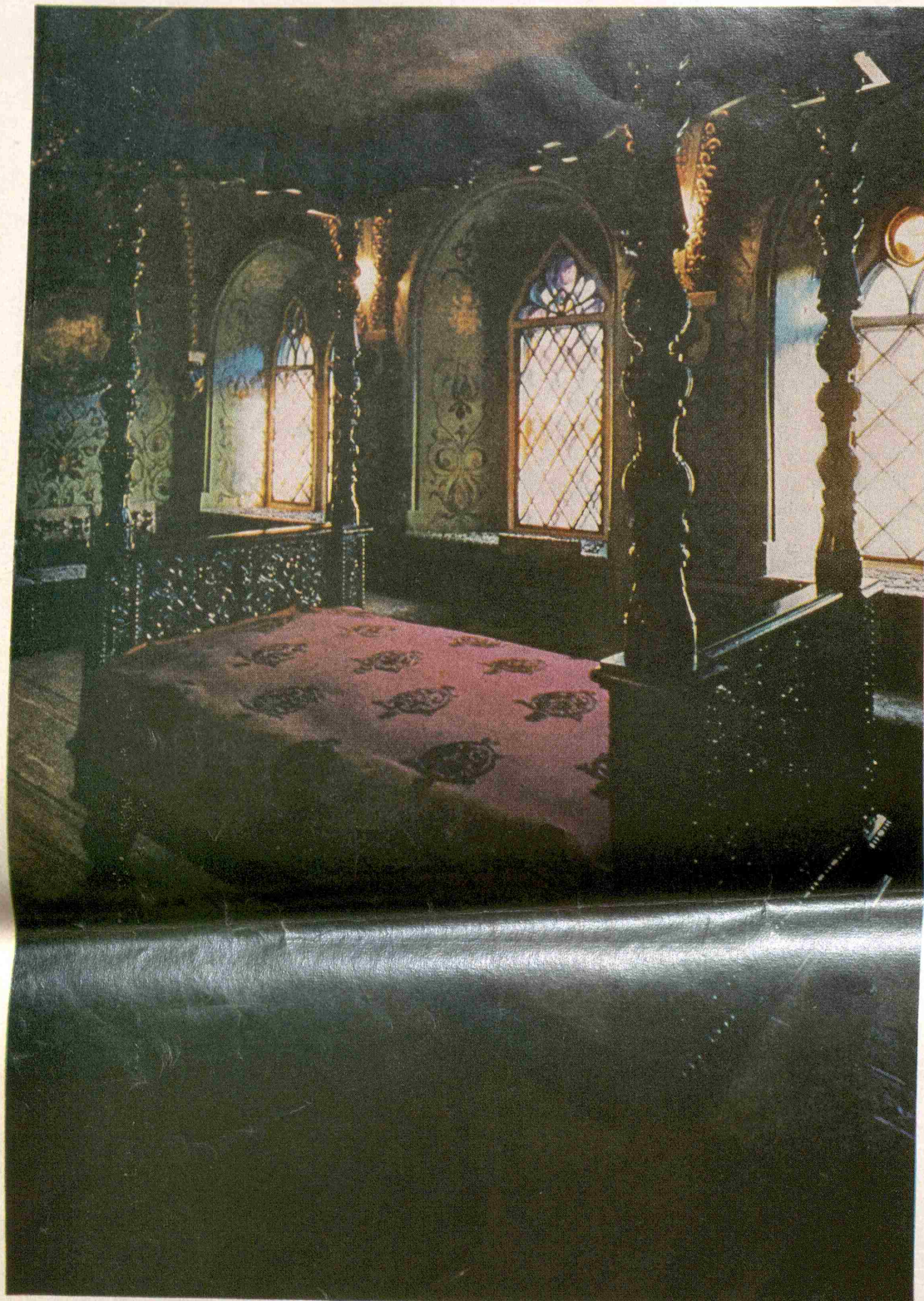


← STEEL HELMET, made for a Russian noble, probably dates from the 16th Century, has flange-like skull guard on top, an edging and nosepiece finely decorated in gold. It is displayed on a dummy wearing a suit of chain mail.

QUIVER AND BOW CASE (above) belonged to Czar Mikhail Feodorovich, the first Romanov. Made of leather, it is enameled, covered with gold and jewels and marked with the imperial eagle and St. George on horseback.

CONTINUED





**CZAR'S BEDROOM** on the fourth floor of the Terem Palace has a huge, elaborately carved four-poster bed in center and upholstered benches around

its walls. The czar's private chapel adjoins it. Though it has been restored several times, the apartment retains the full flavor of its 17th Century elegance.

## A CZAR'S CHAMBERS

In the race to furbish Moscow with luxury, the pace-setters were the czars themselves. In 1499 they built the Kremlin's Terem Palace, which remains today one of the world's oldest and most brilliant. They lived in it until Peter the Great moved the capital from Moscow to St. Petersburg in 1714. Ivan the Terrible occupied its ground floor, surrounded by the smaller establishments of the nobles and clergy. Alexei the Gentlest in 1650 did the most to beautify it; he moved upstairs to the fourth of its five stories and built himself the dazzling personal quarters shown above and at right. In the rooms he put fine carvings, Venetian velvet and golden frescoes. The rooms had a corridor behind

them where the daughters of nobles could be assembled. There he indicated which one he favored by the gift of an embroidered napkin. The over-all effect of opulence of the Terem Palace was enhanced by the windows, paned with stained mica, known as "Russian glass." They light the chambers with a soft, unearthly glow that gives a feeling of windows under the sea.

Perhaps to demonstrate they had not forgotten the masses, the czars lowered a long box from a window in the Golden Room (right). In it, the poor could place their pleas. But there the matter apparently ended, for even today the Russian equivalent of "to pigeonhole" is "to put it in the long box."



**ANNIVERSARY EGG**, made by French jeweler Fabergé in 1913, marks Romanov dynasty's 300th year, has Romanov portraits outside, globe inside.



**BIBLE COVER**, richly decorated, was a present from the Patriarch Nikon to Czar Alexei Mikhailovich about 1653. The cover stands a foot in height.

← **THE GOLDEN ROOM**, study of the czars, has an almost barbaric elegance. Here the czars received their nobles. The windowpanes are stained mica.



RUSSIAN REVOLUTION CONTINUED



**JEWELLED MITER** with imperial eagles of pearls and ruby-studded paintings of Christ, Mary and Joseph was given in 1744 to monastery by Czarina Elizabeth I. It was worn by a metropolitan, the Orthodox equivalent of archbishop.



**EMBROIDERED CHASUBLE** shows Christ ascendant, was worn by Metropolitan Photii who served from 1408 to 1431, was later canonized.

**DETAIL OF CHASUBLE**, showing Crucifixion, is embroidered in pearls taken from Russian rivers. Church raiment was frankly flamboyant.

