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RESEARCH SUPPLEMENT TO
SCIENTIFIC INTELLIGENCE REPORT
CIA/SI 2-57

CONTRIBUTIONS OF GERMAN SCIENTISTS TO THE ATOMIC ENERGY PROGRAM SUNGUL

CIA/SI 2-RS II-57
15 April 1957

CENTRAL INTELLIGENCE AGENCY

OFFICE OF SCIENTIFIC INTELLIGENCE

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PREFACE

This is one of a series of six reports dealing with the activities of the German scientists who were imported into the Soviet Union in 1945 to do work related to the development and expansion of the Soviet Atomic Energy Program.

A summary report CIA/SI 2-57, Contributions of German Scientists to the Atomic Energy Program, January 1957, Secret, deals with the over-all aspects of the German contributions. See also:

CIA/SI 2-RS I-57	Contribution of German Scientists to the Soviet Atomic Energy Program - SINOP Secret
CIA/SI 2-RS III-57	Contributions of German Scientists to the Soviet Atomic Energy Program - AGUDZERI Secret
CIA/SI 2-RS IV-57	Contributions of German Scientists to the Soviet Atomic Energy Program - ELEKTROSTAL Secret
CIA/SI 2-RS V-57	Contributions of German Scientists to the Soviet Atomic Energy Program - OBNINSKOYE Secret

All information presented herein has been obtained from the testimonies of returned German and Austrian scientists and technicians.

Intelligence research ended 15 August 1956.

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FIGURES

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CONTRIBUTION OF GERMAN SCIENTISTS TO THE SOVIET ATOMIC ENERGY PROGRAM SUNGUL INSTITUTE

PROBLEM

To determine the role played by the German scientists at Sungul in contributing to the development of the Soviet atomic energy program.

CONCLUSIONS

1. While the work of the German scientists at Sungul probably contributed little of direct scientific value to the Soviet atomic energy program, this group of scientists was probably instrumental in the initiation, development and ultimate establishment of a comprehensive biological and medical program within the Soviet atomic energy complex.

2. German scientists at Sungul developed valuable schemes for separating fission products from "pile waste" perhaps as an approach to solving problems of waste storage and disposal and for the reclamation of the valuable isotopes.

DISCUSSION

One of the installations at which German scientists worked on atomic energy projects within the Soviet Union was located in the area south of Sverdlovsk, some 20 miles northeast of Kyshtym, in the vicinity of Kasli. The Institute was located on a peninsula on Lake Kasli, approximately 2 miles east of the small village of Sungul. The Institute has been called the Sungul Institute or "Obyekt Sungul" and the Kasli Institute. In this paper the institute will be referred to as the Sungul Institute.

The Sungul Institute was established in the close proximity of the nuclear energy production complex located near Kyshtym. There have been indications of a connection between the institute at Sungul and the complex at Kyshtym but these have never been confirmed. This institute appears to been developed into one of the chief radiobiological institutes in the Soviet Union. This development is even more likely in view of the rumored connections between this institute and several other Russian biological research institutes as well as with the Soviet Ministry of Health.

The Sungul institute was the last to be established by the Soviets for the employment of German scientists assigned to work on an atomic energy project within the Soviet Union. The personnel for this institute were drawn from other institutes where German scientists were working on other atomic research problems. The first persons to be assigned to the institute were German POW's from the Sukhumi complex. They were transferred and assigned to the institute in late 1946. In July 1947 several sentenced Soviet scientists arrived at the institute and in late 1947 the German contract workers that had made up the biological group at

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Elektrostal were transferred to the institute. In early 1948 the "JUNG" group was transferred into the institute. This group was made up of a number of German POW's which had been taken from prisoner of war camps and sent to Sukhumi for work, where they had continually refused to work. They were transferred to the institute at Sungul more or less as prisoners because of their belligerent attitude. After their transfer to the institute they still refused to work and in 1949 they were transferred along with many other POW's to prision camps for eventual repatriation. In late 1949 the remainder of the Sinop Biological Department, under Menke, was transferred to Sungul. This was the last group of Germans to be assigned to the institute, however, there were instances where individual Germans were later transferred. The most notable of these transfers was that of Riehl, presumably as the chief of the installation, in 1950 and the transfer of Schintlmeister in 1952, presumably to replace Riehl.

When the first German personnel arrived at Sungul in 1946, the institute consisted of several buildings that were formerly part of a sanitorium. Even as late as early 1948 the institute buildings had not been completed and little work had been done since 1946. At this time a few "make-work" projects of a very elementary nature had been initiated just to give the people something to do. Up until 1948 the Soviets were apparently very displeased with the work that was being done there and were constantly trying to improve it. This probably was the reason that so many changes were made in the administration of the institute in the early stages of its development. No work of great value appears to have been conducted at the institute up until the time the main body of Germans left in 1952. Although the main body of Germans left in the fall of 1952 to return to Sukhumi for their "cooling off" period, a few Germans remained at the institute until 1953. One of these remaining Germans indicated that the Soviets were building a large plant in the vicinity of the Sungul institute for the separation of fission products. Later reports indicate that this plant has been finished and is now in production. It was stated that a separate city had grown up around, and in conjunction with, this plant. This is probably the center for radioisotope separation and purification in the Soviet Union. Latest reports have indicated that Sungul is to become the "Health Physics" laboratory for the nearby atomic energy installations.

When the institute at Sungul was first established, it was under the technical direction of Nikolay Timofeyev-Ressovskiy. Timofeyev-Ressovskiy was a Soviet national that had gone to Germany prior to the war and had worked there during the war. When he was returned by force to the Soviet Union after the war, he was returned in disgrace and sentenced to a long prison term. Instead of leaving him to waste away unproductively in prison, he was sent to the institute to work. He seemed to have had a defeatist attitude and cared little for his work. One source of his disagreements with Soviet regime was based on his insistence in adhering to the classical Mendelian theory of genetics rather than adopting the Lysenko theory. It is assumed that the Soviets allowed Timofeyev-Ressovskiy to continue his experiments in line with the Medelian theory and it is upon this basis that the work of Sungul was first started.

Research at the Sungul Institute.--When the institute at Sungul was first established there was very little equipment available and very few basic research assignments were made. As a result of this very little useful research was accomplished in the initial period of operation of the institute. After the institute had been operative for a period of time a basic program of research evolved as being:

1. Basic biological radiation effects studies.
2. Isolation and separation of various fission products.
3. Investigation of radiation effects as produced by specific radioisotopes.
4. Investigation of ion-exchange separation procedures for rare-earth separations.

This program, of course, was implemented by other projects as time went on.

In the initial organization of the Sungul institute, Nikolay Timofeyev-Ressovskiy was listed as the scientific director of the institute under the political director Col. Uralets. There were two main divisions of the institute when it was first organized: the Biological Section under the leadership of Timofeyev-Ressovskiy and the Chemical Section under the leadership of a Soviet chemist Professor Vosnessenskiy.

The initial research at the institute dealt primarily with a study of the genetic effects of radiation according to the Mendelian theory. Although the "Lysenko" theories were the ones then currently accepted as the party line in the Soviet Union, it is apparent that the Soviets allowed Timofeyev to continue research along the Mendelian lines rather than forcing him to adhere to the Lysenko theory. Fruit flies, fish, and small mammals were the subjects of this research and there are no indications that human subjects were used in any way connected with the radiation studies at the institute nor that such experimentation was contemplated. When Timofeyev-Ressovskiy was removed as the general scientific director of the institute, most if not all of these initial research projects were terminated. It was stated that by the order of Col. Uralets all genetic research and related projects at the institute were discontinued in the winter of 1949-50 due to adverse critiques he had received on the work of Timofeyev-Ressovskiy. However, Nikolay Viktorovich Luchnik continued "genetic" research on botanical subjects but he referred to his work as a study of the "cytological effects" of radiation rather than as the "genetic effects".

The first fission products are reported to have arrived in Sungul in late 1948 or early 1949. These were only minute quantities obtained from the bombardment of source of materials in a high energy accelerator. The first shipment of fission products mixture (pile soup) is reported to have arrived at the institute in late 1950. Confirmation of the origin of this material is lacking but it is logical to assume that it originated in the nearby "reactor complex" at Kyshtym. This mixture arrived at the institute in one liter stainless steel cannisters which were protected by a surrounding layer of lead 5 centimeters thick. Each container was packed in a wooden case and each shipment usually consisted of ten such container cases. Many instances were noticed where leakage of the containers

had occurred. Each shipment was delivered by MVD guarded delivery vehicles but there was no evidence of any other protective measures having been taken, either from the standpoint of radiation protection or from the standpoint of physical security.

When shipment of mixed fission products arrived at Sungul, the material was delivered to the radiochemical laboratory of Dr. Hans Born. To Dr. Born was assigned the task of purification of the mixture and its separation into the various radioactive components. Of course, it was first necessary for him to develop methods for accomplishing this purification and separation. A radiological examination of the material indicated an age varying from nine months to thirty months. This age range would place the material in the age bracket of material that would have been available from Kyshtym at this time.

Initial physical examination and chemical analysis of the material showed it to be a saturated solution of highly radioactive materials with a high concentratic of sodium and acetate ions but a very low concentration of uranium or plutonium ions. The radioactive strength of each sample was usually 100 curies. It was quite apparent that this material was concentrated waste from a chemical fuel or plutonium processing plant.

When the shipments were delivered to Born, they were stored in vertical underground shafts constructed for this purpose. Each shaft was equipped with an elevator and covered with a heavy shielded cover. The cover arrangement was such that caged specimens could be placed in position over the shaft opening and the stored radioactive materials raised in the shaft to provide crudely determined amounts of irradiation. This work was apparently for the study of biological effects of radiation although it is difficult to imagine that accurate quantitative results could arise from such crude experimental procedures and techniques.

In the radiochemical laboratory Born was successful in isolating strontium, ruthenium, lanthanum, columbium, cesium, cerium, barium and yttrium. He was asked to separate out europium and possibly did manage to separate out a small quantity of this material. One of his chief problems was the detailed study of the processes for separating the cerium-lanthanum pair. After a process was developed for isolating the radioisotopes, Born then attempted to prepare calibrated sources of certain of the materials. It was stated that he prepared several 50 millicurie samples of strontium and yttrium. These calibrated sources and other uncalibrated sources of the radioisotopes were supplied to the various laboratories within the complex and probably without, for use in radiation experiments. Catsch and Zimmer received such samples of the material for their research on the biological effects of radiations. Since there were references to the fact that Cobalt-60 was being sent in or at least promised, in calibrated sources, it is improbable that they were preparing such sources in the radiochemical laboratory at Sungul.

Catsch has been reported to have been supplied with miligram samples of plutonium in solution for use in his research project on the effects of ingested plutonium in rats. He received one such mixture of 15 milliliters of plutonium

in July 1950... An analysis of the mixture indicated 300 microcuries of Pu 239. There was also a strong beta contaminant present: Alpha count, 100; beta count, 25. The principal rare-earth constituent of this particular sample was Cerium 137. There was no indication as to the immediate source of this sample.

In addition to his work on the study of biological effects of radiation, Karl Zimmer was working on dosimetry and dosimetric methods. Of course, one of the chief goals of this type research is to establish tolerance dosage levels and to develop methods for determining and measuring these levels. At the time this work was being done at Sungul the tolerance dosage was established at .05 roentgen per day but in late 1953 instructions were sent down from Moscow, presumably from the Biophysical Institute, to lower this tolerance to .01 roentgen. The German scientists that were working with radioactive materials seemed to have been well aware of the harmful effects of radiation and appear to have exercised due caution with regards to the hazards present, but many of the Soviets involved in this work disregarded all safety precautions and as a result received overdoses, some to the extent of actual radiation burns. The reported average radiation dose in the laboratories was .3 roentgen per week, however, there was one reported incident where Soviet workers had received as much as 20 times the allowable tolerance dose while working in the ion-exchange laboratory.

Vosnessenskiy worked hard but accomplished little as chief of the Chemical Section. He was very active in trying to develop a process whereby fission products could be separated by ion-exchange procedures. He had many different type resins for this work such as samples of an American resin "Dowex", samples of British types such as "Zedcab", German products such as Bitterfelf product "Wofatit" as well as samples of Russian resins. Russian resins were available but were very difficult to obtain. It was indicated that the available Russian resins were inferior in quality to the Western resins.

Polyanskiy of the Chemical Section worked with Vosnessenskiy on some surface decontamination experiments using as their subjects various contaminated objects that apparently came from a production plant. In their work they used versones, complexing agents for selective decontamination and precipitation. This work came late in the research program and the results are unknown.

Catsch was doing some work with chelating agents. This was in addition to his work on radiation effects. He had read an article in "Helvetica Chemica Acta", written by Schwartzerbach, on the subject and became interested in the compound ethylene diamine triacetate. He had Pany prepare some of the compound in order that he could have it available for some experimental work. Pany prepared the compound and Catsch used it in some research relative to the selective removal of bone-seeking radioactive isotopes.

Another one of the associates of Vosnessenskiy, Anokhin, performed some research directed toward the development of a method for using ion-exchange procedures for the separation of lithium isotopes. This work was carried out in 1951 but the results were negative, and insofar as it is known, the experiments were discontinued.

Certain research was conducted at Sungul with the purpose of developing and producing an agent for immunizing against the effects of radiation. Among the materials tried were cystine, glutathion, ascorbic acid, and cyanide. The value of this work was limited due to the dangerous nature of the materials used.

Insofar as safety measures and precautions were concerned, they were most noticeable by their absence. Many of the materials with which the scientists worked were rather "hot" and yet there were no special "hot labs" in the sense that we know them and there was very little remote handling equipment available for use by the scientists. The only evidence of remote handling equipment at Sungul were some very crude remote handling forceps and pipettes which were constructed locally in the institute workshops. Some of the scientists reported having seen drawings of remote handling equipment designed at NII 9 but no evidence of the equipment itself and very little descriptive material pertaining thereto.

Scientists at Sungul were not permitted to eat, drink or smoke while working with the "hot" materials. Rubber gloves and special shoes were worn during such experiments and were discarded upon leaving the area in which the experiments were proceeding. It was necessary that all personnel leaving such areas, take a thorough shower. The entire body, particularly the hands, was examined for excess radioactivity. Among the decontaminants used were oxalic acid, citric acid, and hydrochloric acid. A special soap for decontamination was introduced by the Biophysical Institute, Moscow, but was less effective than the acid decontaminants and was soon discarded.

Personnel involved in research utilizing "hot" materials were given extra milk rations, frequent blood tests and an extra two-week vacation. It is unknown what procedures were used in the institute in case of an overexposure to radiation.

The scientists had access at Sungul and at the other such institutes in the Soviet Union to most of the applicable technical journals and publications of the western nations and they made great use of the material published therein. In fact, much of the research initiated was a result of articles appearing in western publications. A list of the publications available at the library at Sungul Institute is appended to this report.

The contribution to the Soviet atomic energy program by this group is probably very small. However, their work could well be the basis upon which the Soviets have established their health and safety program as well as their radioisotope separation and purification processes and production.

Figure 1

TECHNICAL ORGANIZATION OF SUNGUL

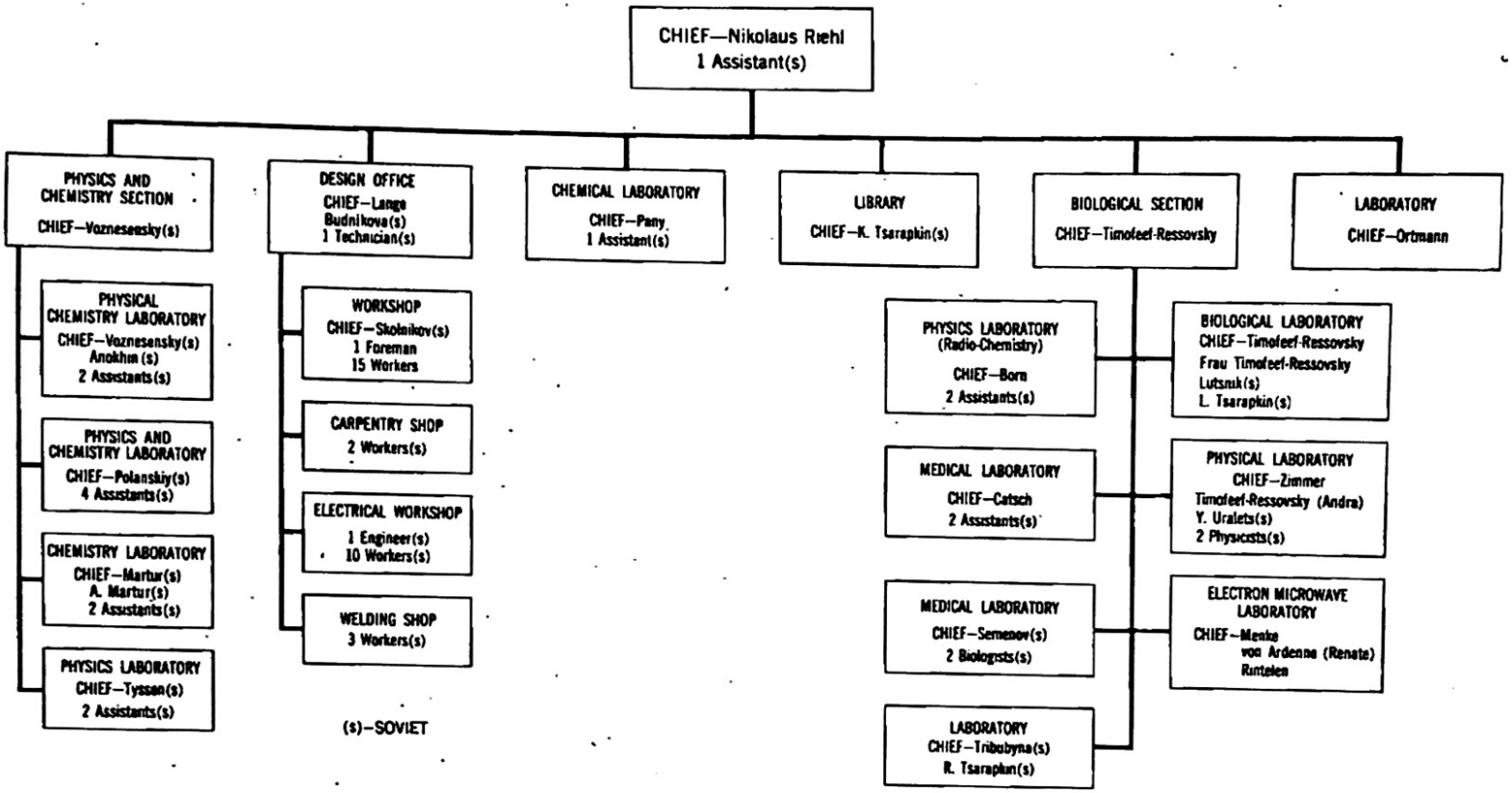

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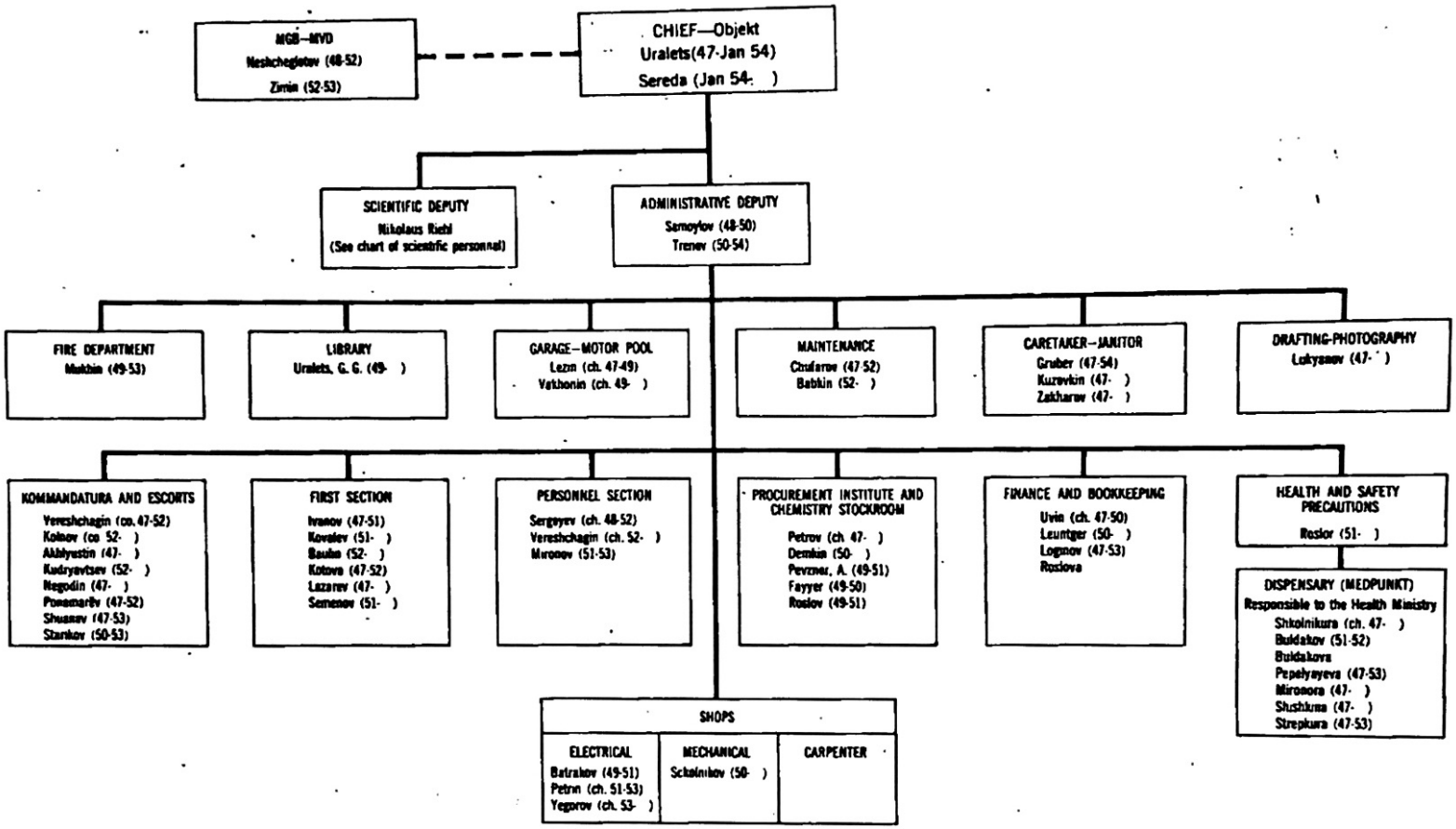
Figure 2

ORGANIZATIONAL STRUCTURE OF SOVIET PERSONNEL AT SUNGUL, 1952



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APPENDIX A

SOVIET PERSONNEL KNOWN TO HAVE BEEN AT SUNGUL

Akhlyustin
Escort

Anokhin, Vladimir Lvovich
Physical Chemist

Babkin
Chief of Maintenance

Balashev
Physicist

Balasheva
Laboratory Assistant

Batrakov
Electrician

Baulin
Worked in First Section

Borisova, Nina Dmitriyevna
Scientific Assistant

Budko, Ludmilla Nikolayevna
Scientific Assistant

Budnikova, Iraida
Designer

Buldakov, Lev Aleksandrovich
Scientific Assistant

Buldakova, Margarita Nikolayevna
Medical Doctor

Chufarov, Mikhail Danilovich
Maintenance

Dankin, Aleksey Gavrilovich
Chief of Procurement

Dankina, Ainaida
Laboratory Assistant

Didko
Policeman

Fayyer
Warehouse Clerk

Garakhovskiy, Maj.
Chief, Construction Battalion

Gorbatyuk, Nestor Vasilyevich
Machanic, Laboratory Assistant

Gorkunova, Valentina
Laboratory Assistant

Goryunov, Anatoliy Alekseyevich
Chief Radiochemist

Gruber, Iosif Leybovich
Tailor

Ivanov, Aleksandr Terentyevich (Lt.)
Chief, First Section

Kachov, Andreas Stepanovich
Metallurigical Physicist

Kavanov, Captain
In charge of MVD Guards

Kolnov, Lt. Col. Aleksandr Fedorovich
Commandant of Sungul (1953...)

Komissarova, Valentina Ivanovna
Laboratory Assistant

Kotova, Mariya Konstantinovna
Worked in First Section

Kovalev, Vladimir Savelevich (Lt)
Chief of First Section

Krayevna, Yelena Gnadyevna
Radiochemical Technician

Kudryavtaev
Escort

Kuzovkin, Yergeniy Nikolayevich
Chief Caretaker

Kuzovkina, Lidiya Andreyevna
Chief Laboratory Technician

Lazarev, Vasiliy Georgevich
Worked in First Section

Leontyev, Ivan Pakhomich
Chief Bookkeeper

Lezin
Chief of Motor Pool

Loginov, Nikolay Nikolayevich
Bookkeeper

Luchnik, Nikolay Viktorovich
Scientific Assistant

Lukashin, Mefodiy Georgevich
Prescision Mechanic

Lukyanov, Anatoliy Aleksandrovich
Technical Draftsman

Lutsnik
Chemist (MVD Informer)

Makarov
Scientific Assistant

Martur, Anatoliy Grigoryevich
Chief, Pu & U Chemical Section

Martur, Anni (Possibly the same as above) - Chemist

Mironov, Anatoliy
Personnel Section

Mironovo, Vera Volkovna
Dentist

Moskalev, Yurin Ivanovich
Scientific Assistant

Mukhin, Calt
Chief, Fire Department

Negodin, Lt.
Personnel Department

Neshcheglotov, Mikhail (Lt. Col.)
Chief, MGB Section

Nishiklotov, Capt. (MVD)

Palkin, Nikolay Georgevich
School Director

Pepelyeyeva, Galina
Laboratory Technician

Perov, Vyacheslav Stebanovich
Scientific Assistant

Petriv
Chief Electrical Engineer

Petrov
Chief of Procurement

Pevsner, Anatoliy
Worked in Procurement Section

Pevzner
Scientific Assistant

Polyanskiy, Nikolay Georgevich
Metallurgical Chemist

Polyanskiy (possibly the same man as above) - Chemist

Ponomarev, Captain
Worked in Kommandatura

Poryadkova, Nadezhda Alekseyevna
Scientific Assistant

Postak, Yelizaveta Abramovna
Radiochemical Assistant

Prezhibaylo, Major
MVD Chief after 1950

Pupkov
Scientific Assistant

Remezeva, Nina Alekseyevna
Chemical Technician

Roslov
Chief, Stockroom 49-51

Roslova
Bookkeeper

Samoylov, Major
Administrative Deputy to Director

Semenov, Aleksey Afanasevich
Worked in First Section

Semenov, Dmitriy Ivanovich
Scientific Assistant

Semenov
Medical Doctor

Sereda, Bleb Arkadiyevich
Chief, Sungual after 1953

Sergeyev, Aleksey Fedorovich (Capt.)
Personnel Chief, 1948-52

Shilova, Ida Borisovna
Scientific Assistant

Shishkina, Fedosiya Ivanovna
Medical Attendant

Shkolnikov, Leonid Borisovich
Chief of Workshop

Shkolnikova, Margarita Nikolayevna
Chief of Dispensary

Shvanev, Lt. Venyamin Semenovich
Chief Escort and Interpreter

Skolnikov
Engineer

Skorobogatova
Scientific Assistant

Sokurova, Yelizaveta Nikolayevna
Scientific Assistant

Starikov, Aleksandr Mikhaylovich
Escort

Streltsova, Vera Nikolayevna
Scientific Assistant

Strepkova, Angelina Pimenovna
Medical Assistant (Dispensary)

Sych, Ainaida Gavrilovaa
Scientific Assistant

Timofeyev-Ressovskaya, Andrey N.
Laboratory Assistant

Timofeyev-Ressovskiy, Nikolay Vladimirovich - Chief, Radiobiology Section

Timofeyev-Ressovskaya, Yelena A.
Scientific Assistant

Tissen, Mark Yulianovich
Chief, Physical Section

Tkachenko, Lt. General

Tregubenko, Irina Petrovna
Laboratory Assistant

Trenev, 1st Lt. Georgiy Petrovich
Administrative Deputy to Director

Trigubyna
Medical Assistant (MVD Informer)

Tsarapkin, Kayta
Laboratory Assistant (MVD Informer)

Tsarapkin, Sergey Romanovich
Biologist, Laboratory Assistant

Uralets, Col. Aleksandr Konstantinovich
Chief of Obyekt

Uralets, Galina Gavrilovna
Chief of Library

Uralets, Yurily Aleksandrovich
Radio Technician

Uvin, Lt. Ivan Petrovich
Chief Bookkeeper until 50

Vakhonin, Petr Fedorovich
Motor Pool Chief after 49

Vereshchagin, Maksim Nikolayevich
(Lt. Colonel)
Commandant, Sungul...1952

Vereshchagina, Aleksandra Semenovna
Laboratory Assistant

Voznesenskiy, Sergey Aleksandrovich
Chief, Chemical Section of Institute

Yakhontov
Chief Engineer until 1947

Yegorov
Chief Electrical Engineer- 1953

Yegorova, Yevgeniya Leontyevna
Laboratory Assistant

Zamoilov, Major (MVD)

Zimin, Major
Chief, MGB Section - 1952

APPENDIX B

GERMAN PERSONNEL IDENTIFIED AT SUNCUL

Ardenne, Renate von

Becker, Dr. Herbert
Physicist

Beier, Dr.
Physicist

Born, Dr. Hans
Chemist

Catsch, Dr. Med. Alexander
Medical and Biology

Froewis, Dr. Walter
Chemist

Henschel, Dr. Herbert
Chemist

Hoffman, Dr. Andreas
Chemist

Hohorst, Dr. Wilhelm Behrend

Jung, Prof. Dr. Gerhard
Chemical Physicist

Koch, Dr. Edgar
Chemist

Lange, Hannalore

Lange, Willi
Mechanic

Menke, Dr. Wilhelm
Biologist

Ortmann, Heinrich

Pany, Dr. Johannes

Praetorius, Dipl. Ing. Gerhard

Riehl, Dr. Nikolaus

Riewe, Frau
(Widow of Dr. Karl Riewe)

Rintelen, Dr. Med. Kurt
Medical Doctor and Biologist

Ruppick, Dr. Herbert
Metallurgist

Schintlmeister, Dr. Josef Peter
Physicist

Schmidt, Dr. Mathias
Chemist

Schmitz, Friedrich

Schmitz
Physics Student

Schulte-Overberg, Dr. Helmut
Chemist

Stuhldreher, Dr. Helmut
Chemist

Zimmer, Dr. Karl G.
Biochemist

NON-SOVIET PUBLICATIONS AVAILABLE AT SUNGUL

These periodicals were available to all in the Institute Library. Back copies (prior to 1947-49) were available upon request by order. There was a time lag of approximately two to three months before current magazines became available. Few Soviet periodicals were available in the Institute Library.

Acta Pharmacologica et Toxicologica (Copenhagen)
Acta Physiologica Scandinavica
Acta Physiologica Scandinavica Supplementum (Stockholm)
Acta Radiologica (Swedish)
Advances in Biological and Medical Physics
Advances in Genetics
Advances in Protein Chemistry
American Journal of Botany
American Journal of Pathology
American Journal of Physiology
American Journal of Roentgenology, Radium Therapy and Nuclear Medicine
Anatomical Record
Annual Review of Biochemistry
Annual Review of Medicine
Annual Review of Physiology
Archives of Biochemistry and Biophysics
Archives of Industrial Hygiene and Occupational Medicine
Archives of Pathology
Australian Journal of Experimental Biology and Medical Sciences

Bacteriological Reviews
Berichte fuer die gesamte Wissenschaftliche Biologie (West Germany)
Biochimica et Biophysica Acta (Amsterdam)
Biochemical Journal (British)
Biochemische Zeitschrift (West Germany)
Biological Abstracts
British Journal of Radiology
British Medical Bulletin

Cancer
Cancer Research
Chemical Abstracts
Chemical and Engineering News
Cold Spring Harbor Symposia on Quantitative Biology
Comptes Rendus Hebdomaires des Seances de L'Academie des Sciences, Paris
Comptes Rendus de la Societe Biologique de France

Die Naturwissenschaften (West Germany)

Experientia (Swiss)
Experimental Cell Research

Federation Proceedings (Federation of American Soc. for Experimental Bio.)
Genetics

Helvetica Chimica Acta
Helvetica Physica Acta
Hereditas

Journal de Radiologie et d'Electrologie et Archives d'Electricite Medicale (F)
Journal of Bacteriology
Journal of Biological Chemistry
Journal of Cellular and Comparative Physiology
Journal of Clinical Investigation
Journal of Experimental Medicine
Journal of Laboratory and Clincial Medicine
Journal of Pharmacology and Experimental Therapeutics
Journal of Physiology (British)
Journal of the American Medical Association
Journal of the Chemical Society (British)

Klinische Wochenschrift (West Germany)

La Cellule (Belgian)

Nature (British)
Nucleonics

Physical Abstracts
Physical Reviews
Physiological Reviews
Plant Physiology
Proceedings of the Washington Academy of Sciences
Proceedings of the Royal Society, Series A and B (British)
Proceedings of the Society for Experimental Biology and Medicine

Radiology
Reviews of Modern Physics

Science
Science Newsletter
Stain Technology
Strahlentherapie (West Germany)

The Review of Scientific Instruments
Transactions of the Faraday Society (British)
Virchows Archiv fuer pathologische Anatomie und Physiologie (West Germany)
Zeitschrift fuer Krebsforshung (West Germany)
Zeitschrift fuer Naturforschung (West Germany)
Zeitschrift fuer Physik (West Germany)

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Suite 701, Gelman Library, The George Washington University,

2130 H Street, NW, Washington, D.C., 20037,

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