No. _____

CANADA

DEPARTMENT OF MINES AND TECHNICAL SURVEYS

GEOLOGICAL SURVEY OF CANADA

TOPICAL REPORT NO. 94

A VISIT TO PALAEONTOLOGICAL INSTITUTIONS IN POLAND AND RUSSIA, SUMMER, 1964

BY

D. J. McLAREN

OTTAWA

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INTRODUCTION

During the past summer I visited institutions in England, Germany, Poland and Russia in order to examine type specimens of Devonian corals, and meet workers in Devonian palaeontology and stratigraphy. During my four weeks in Poland and Russia, however, in addition, I attempted to find out as much as possible about palaeontological research in general. By letter before my visit, and by questioning while I was there, I tried to cover such matters as fields of research of individual workers, disposition and curating of collections, especially type collections, research facilities in general, and the complicated research hierarchy that exists in the USSR, and of the interrelations between the various units in it. The account that follows, which covers Poland and Russia only, will be necessarily slanted to the Palaeozoic, and even Devonian palaeontology, but I have recorded anything that might be of interest to other working palaeontologists in this country. In an Appendix I list the names, field of study, and addresses of all the workers that I was able to meet, or hear of, in the various institutions that I visited, as well as from one or two other institutions that I was unable to visit. Some lists are nearly complete, e.g. Palaeontological Institute, Academy of Sciences, while others are merely the name of the institute and address, which might, however, be of value in understanding the ramifications of their system. The organization and administration of the various institutes are given under the discussion of each unit. A few general remarks are offered here by way of introduction.

In order to visit any institution it is necessary to ask for permission well in advance. All organizations under either the Academy of Sciences or under the Central Geological Committee may be covered by a letter to each headquarters. In my case these letters were written by our Director (at that time, Dr. J.M. Harrison), who also wrote to some institute heads known to him personally. I wrote letters to the institutes concerned, and, in many instances, to scientists that I wanted to meet. Although we received few replies, all arrangements had been made by the time I arrived, and we were met at the airport in Moscow by a member of the Geological Institute of the Academy, and by an interpreter from the Central Geological Committee, both with suggestions for my programme. The Department of External Affairs in Ottawa also proved most helpful, both in assisting with advice and in sending film to the Embassy in Moscow.

There has been a very considerable lessening of tension, and a reduction of suspicion within the last few years between the USSR and the outside world. Everyone I met appeared to be fully aware of this, and was anxious to impress on me his desire to collaborate and cooperate at every level with scientists from other countries. At the present time, they are in a position to carry this out, and I found that most palaeontologists would welcome opportunities to exchange literature and specimens. They have in fact a very real interest in making their mailing lists, both individual or from institutions, as large as possible, because requests from outside for copies of publications allow the institute to demand larger editions of their works. Incidently, all authors receive royalties, or bonuses on everything they publish.

One interesting generalization that can be made concerns competition or duplication of effort among research groups in the USSR. The whole system of administration is apparently designed to ensure that there are at least two individuals or research teams working on any specific problem, fauna, fossil group, etc. This might even occur within the same research institute, although more normally, overlapping work is carried on in different organizations. This is encouraged by the fact that the two geological "empires", the Academy of Sciences, and the Central Geological Committee, communicate only at the highest level and in All-Union committees. To give an example: in the Geological Institute of the Academy in Moscow, there are two independent teams of palynologists studying Proterozoic spores. At the moment they have come to different conclusions regarding the usefulness of such spores in Proterozoic zonation. Also, in the same institute there is a team working on stromatolites in the Precambrian. Another team working on precisely the same problems, also on an All-Union basis, is active in Novosibirsk. V.V. Menner at the Geological Institute, explained to me that in such an important and new field as zonation of Precambrian rocks by fossils, it was essential to have all conclusions tested and checked by more than one worker or team. The same considerations apply in virtually every field of palaeontology, and, I believe, geology.

About two thirds of all the palaeontologists that I met were women, and, although the proportion may vary, women play an important part in other fields of geology. The majority of them do their own field work, and make their own collections, even in the remotest and most difficult areas.

For instance, Dr. Cherkesova regularly carries out field work on Novaya Zemlya using open whale-boats, pack reindeer, rubber dinghies, and back packing. As a party chief, she may have eight or ten assistants, male or female, in her charge. Marriage and family do not appear to interfere with a woman's scientific career for more than a few years, indeed, many of the more senior workers that I met were grandmothers.

There seems little point in mentioning ways and means of visiting countries in Eastern Europe other than very briefly. Accompanied by my wife, we travelled to Poland by train from Berlin, by air to Moscow, train to Leningrad (overnight in the "Red Arrow", and very comfortable), and from Leningrad to London by boat. In planning, no difficulty was encountered in making reservations, or obtaining visas. Russia is expensive, and a would-be visitor should insist on a "business rate" from Intourist, which is a great saving over the official tourist rate. There was some discussion over getting the preferred rate for my wife, but they finally agreed to allow her the business rate when we named her my "technical assistant". All hotel reservations are arranged by Orbis (Poland) or Intourist.

There were no difficulties with Customs, in spite of a large camera and a great deal of film. Additional supplies of polaroid film for the camera were sent through External Affairs to the Embassy in Moscow to await my arrival there. All of the many books I was given in Russia and Poland were sent back to me by various institutes at their suggestion. In all, 22 parcels have arrived. Fossils and other specimens I took with me - on their advice.

POLAND

General

Palaeontology in Poland is centered largely under two institutions; the University of Warsaw, and the Palaeontological Zaklad of the Polish Academy of Sciences. These two institutions work in close cooperation, and are housed in the same building. In addition there are a certain number of biostratigraphers in the Geological Institute in Warsaw and its branches in various cities throughout Poland. The Institute would appear to correspond to a Geological Survey. Cooperation between the Institute and the University and Academy appears to be good, several scientists from each are engaged in joint research projects.

Lists of palaeontologists in the University and Academy, with their fields of specialization is given in the Appendix.

A branch of the Academy of Sciences is situated in Poznan, and it was here that I visited first as a guest of Dr. Maria Rozkowska, Chairman of the branch.

Poznan

The Poznan branch is housed in a building together with other branches of the Academy of Sciences. There is a museum of zoology in which there is a small palaeontological hall, which is the responsibility of the branch. Research facilities appear to be good, although accommodation was crowded. The research workers in Poznan depend upon the central library of the Academy for literature

other than their own reprint library. They are therefore most anxious to obtain publications in their field of specialization. They are assisted by a full time photographer and preparator, both of whose work seemed of high quality.

Dr. Rozkowska has worked on the Scleractinian and Rugose Corals, and is an authority on the Middle and Upper Devonian coral faunas of the Holy Cross Mountains. She is currently engaged in monographing a remarkable fauna of corals from the Famennian of the Holy Cross Mountains. This fauna includes plerophyllids, metriophyllids, several Lower Carboniferous genera, the peculiar genus Heterophyllia, and several new genera. Corals that might be considered related to Frasnian types are restricted to a possible Tabulophyllum and one fragment of a Thamnophyllum, which was collected from close to the base of the Famennian deposits. Most of these corals are extremely small, elongate, and tend to have highly developed secondary stereozone. This work, which is of the greatest interest, should appear within two years.

Miss Wolska has been engaged in studies of Ordovician conodonts, but is currently working on zonation of the Famennian deposits of the Holy Cross Mountains by conodonts.

Dr. Brodniewicz has worked on late Tertiary and Pleistocene marine molluses. She is currently engaged in a study of the ecology and distribution of recent mollusc and foram faunas of the Baltic.

Dr. Fedorowski has nearly completed a large monograph on the Permian corals of Spitsbergen. His current research will involve Carboniferous corals of Poland.

Kielce

Accompanied by Dr. Rozkowska and Dr. Biernat, we spent three days in the Holy Cross Mountains collecting and looking at Devonian stratigraphy. Dr. Czeslaw Zak, of the Geological Institute in Kielce, placed a car and driver at our disposal. We were joined by Dr. Maria Pajchlowa and Dr. Maria Russkiewicz, both of the Geological Institute, Warsaw.

Dr. Pajchlowa is a petroleum geologist, concerned with Devonian stratigraphy and palaeogeography. As the outcrop development of the Devonian in the Holy Cross Mountains includes Middle and Upper Devonian bioherms, stromatoporoid banks, and, in some cases, extensive reefs, they are hopeful of favourable Devonian petroleum prospects in the subsurface to the south. Dr. Pajchlowa is especially anxious to obtain literature concerning Western Canadian Devonian stratigraphy, palaeontology, and palaeoecology. In addition to outcrop and subsurface mapping, she is engaged in detailed studies of the ecology of Late Frasnian reefs near Kielce and Jurkowice.

Warsaw

The Palaeontological Section of the Academy of Sciences in Warsaw is housed in the University on the floor above the Department of Geology. The building is new and the facilities are excellent. Each worker has a large office and laboratory combined, and there appears to be no shortage of technical help.

As a matter of policy, all their papers are published in one of the major European languages, most commonly English, with summaries in one or two other languages, e.g. German and Russian, as well as Polish. Authors attempt to write their papers in the language in which it is to be published, but always have them checked by a trained interpreter. Sometimes the paper is translated entirely for them. Because of this system, they are very conscious of possible deficiencies in meaning in their papers. Morphological terms present little difficulty, but stratigraphic terms do, and I was repeatedly questioned about stratigraphic terminology and meaning of such terms as formation, stage, and zone.

The dominant figure in palaeontology in Warsaw is Professor Roman Kozlowski. The large palaeontological research team, as well as the Monographs and "Acta" Palaeontologia Polonica are essentially his creation. Although retired, he is still active as an editor, research director, and in his own field, the Graptolithina. He enthusiastically demonstrated to me etched material representing all six Orders of the Class, as well as their affinities with the Class Pterobranchia, both from Recent and Ordovician material.

Dr. Adam Urbanek, after Kozlowski the leading worker on graptolites in Poland, is Chairman of the Palaeontological Department in the University. The head of the Palaeontological Institute of the Academy is Dr. Zofia Kielan-Jaworowska, who was absent on a collecting trip in Mongolia.

Dr. Stasinska, an authority on Lower and Middle Palaeozoic tabulate corals, is currently working on the superbly preserved Silurian tabulates from Gotland, and will be happy to exchange material and publications. She knows

many of the workers on tabulates in the Soviet Union and is thoroughly familiar with the Russian literature, and would be willing to advise anyone on it. She is also collaborating with Dr. Pajchlowa in her studies on Frasnian reefs in the Holy Cross Mountains.

Dr. Biernat continues her studies on Middle Devonian brachiopods from the Holy Cross Mountains, and wishes to exchange publications and material.

The Geological Institute in Warsaw is the headquarters of the equivalent of our Geological Survey as well as all prospecting and economic geology. The petroleum geology division is headed by Dr. Jan Czerminski, and includes sedimentationists, stratigraphers, and biostratigraphers. Dr. Pajchlowa is in charge of the Devonian section.

USSR

Geology is divided into two main empires, controlled by the Academy of Sciences of the USSR, and by the Central Geological Committee (previously known as the Ministry of Geology). There appears to be little or no communication between members of one organization and the other, except at the highest level in All-Union committees. The headquarters of both are in Moscow, although the main institutes and museum of the Central Geological Committee are located in Leningrad. Within these two organizations there is a complicated hierarchy of central and regional institutes, semi-autonomous, but answerable to headquarters for major policy.

Palaeontology flourishes under each organization. There are about one thousand palaeontologists under the Central Geological Committee, about five hundred under the Academy, or affiliated Academies of the various republics within the USSR, and about another five hundred working in direct geological consultation within the fields of petroleum, engineering geology, etc. There appears to be a dichotomy into palaeobiology on the one hand, responsible for the monographing of specific animal groups and regional research into morphology, taxonomy and evolution, and biostratigraphy on the other, concerned with the use of fossils for geological age determination and correlation.

I learned more about the functioning of the Central Geological Institute in Leningrad, than I did about any of the institutes in the Academy of Sciences. The former will be dealt with in the discussion under Leningrad and the latter under Moscow.

Moscow

Academy of Sciences

Palaeontological Institute

The Institute is housed in a large and rather old building together with other biological sciences in the Academy. Accommodation is poor, cramped, and is badly lit. There is an atmosphere, however, of single-minded emphasis on research. I was met with great courtesy and interest. My main purpose in the Institute was to examine and photograph Soshkina's rugose coral types, and these were made available to me promptly. Their collections seem to be extremely well curated, and arranged by monograph. The Institute is responsible for publication of the Russian Palaeontological Journal, under the editorship of Ruzhentsev.

During the course of several days I met and talked with some members of the Institute. The most interesting conversation was with Dr. Sarycheva, a senior worker on Carboniferous and Permian brachiopods, who showed me the completed manuscript of a memoir entitled "Changing of Marine Organisms Across Palaeozoic Mesozoic Boundary" edited by Ruzhentsev and Sarycheva. It will appear as a publication of the Palaeontological Institute, volume 108, in 1965. In this paper the complete section from Permian to Triassic at Dzhulfa is described, together with every class of organism found in the section. They claim a transition series containing Palaeozoic brachiopods and corals within the earliest Triassic ammonite zone.

Sarycheva talked of the large volume of work they are doing on fossil insects and claims that their remains are widespread in rocks of all ages from Upper Palaeozoic on, and are valuable in correlation. She considered that we should find them equally widespread in Canada, but had failed to do so because we had not looked for them.

A list of the palaeontologists in the Institute is given in the Appendix, excluding the names of those working on Insects and Vertebrates.

Geological Institute

The biostratigraphic and palaeobiogeography unit of the Institute is directed by V.V. Menner. It is housed, together with other units of the Institute, in an old building which is, however, better appointed than the Palaeontological Institute. They seem to work under very crowded conditions, but here again, technical assistance and laboratory facilities appear to be good. Part of my time was spent with Dr. Rozman, examining her collections of Famennian Rhynchonellids, and part with Dr. Menner, who took me around his unit and introduced me to many of the professional staff at work in their laboratories. I was asked to give a talk, through an interpretor, on Devonian biostratigraphy in Canada, and this was followed by a prolonged discussion period. I also gave a demonstration to the whole unit of the Polaroid Plate Camera that I used for photographing thin sections of corals. A list of the professional staff in Menner's unit is given in the Appendix. Some of the main points of interest are given below.

Dr. Rozman, who has been working on Devonian brachiopods, is now engaged in biostratigraphic studies of Upper Ordovician brachiopods, especially Rhynchonelloids. Her first manuscript on these faunas will appear this year, published jointly with two other authors who cover trilobites and ostracods. She is particularly anxious to obtain specimens of Ordovician brachiopods from northwestern Canada, especially any that are associated with graptolite faunas. She is in a good position to reciprocate on any exchanges, and gave me good specimens of all her Famennian brachiopods.

Dr. Pergament is working on Cretaceous Inocerami and ammonites from the Pacific Coast of northeast Siberia and Kamchatka. He would welcome the exchange of material and publications from the North American Pacific Cretaceous. Dr. Pergament was responsible for translating Dunbar and Rogers' textbook into Russian.

Dr. Mikhailov, a worker on Jurassic ammonites, was one of the translators of Arkell's World Jurassic into Russian.

Dr. Menner gave me a lightning tour of his unit's work on zonation of the Proterozoic with stromatolites. Several teams of workers at several institutes throughout the USSR are working on this problem, which has been closely coordinated with a major program of age determination from glauconite. Semikhatov, Krylov, and others claim a definite coarse zonation of their Rifean, --which roughly corresponds to our Middle and Upper Proterozoic. There are three zones between about 1,600 million years and the base of the Cambrian. They are based on increasing complexity of stromatolite form, and first appearance of new structures. The zonation appears to have been checked at a large number of sections from European Russia to Eastern Siberia.

The preservation of the material that they showed me was excellent, and they gave me specimens and thin sections of the commoner forms. A number of works have already been published, describing the stratigraphy and morphology of the stromatolite zones, and many more will follow. It appears that they are fully aware of all arguments against why stromatolite zones cannot be expected to work, but point out that they have established a succession of forms empirically, which appears to work at least one third of the way around the world, and in a variety of successions. Recognition of the different forms depends on morphology recognizable in the field, by thin section study, and by laboriously building up a three-dimensional structure from serial sectioning.

Early Cambrian fossils are receiving considerable attention, especially Archaeocyathids and primitive molluscs that occur below the Olenellus zone. A publication is in press on Late Proterozoic, "Eocambrian" forms some of which are similar to those described recently from Australia.

The palynologist, Dr. Naumova, described to me recent work on Devonian palynology, and claims a very accurate zonation (60 or 70 distinct zones), for the Russian platform. She also demonstrated Proterozoic "spores", which are apparently widespread. There are conflicting claims concerning the stratigraphic value of Precambrian spores. Dr. Naumova considers that as yet they cannot be used for sub-dividing the Proterozoic, although she can differentiate Cambrian from Precambrian. Other workers maintain that a coarse zonation may be detected throughout the Proterozoic. Naumova gave me slides containing specimens of Proterozoic, Devonian, and Carboniferous spores to take to palynologists on the Geological Survey.

While at the Geological Institute of the Academy I met a Bulgarian palaeontologist called J. Stephanov of the Bulgarian Academy of Sciences, Geological Institute, Sofia 13. He is anxious to exchange material and publications concerning Jurassic ammonites and stratigraphy.

Dr. Menner's unit is particularly anxious to obtain foreign fossil material, including stromatolites, Precambrian spores, Devonian and Carboniferous spores, and Upper Devonian and Lower Carboniferous foraminifera, especially from the Cordillera.

Moscow University

As it was out of term, there were few people remaining in the Geology Department. I was able to meet Professor Litvinovich, who gave me a list of palaeontologists in their Department, which is given in the Appendix. Dr. Litvinovich is a specialist on Carboniferous brachiopods, and wishes to exchange material and publications. Any of their staff would be happy to supply photographs of type specimens, or to send duplicate material.

Leningrad

All-Union Scientific-Research Geological Institute (VSEGEI)

Introduction

I was given a lot of information on the organization of geology within VSEGEI, which is the central agency for geology under the Central Geological Committee. While in Moscow, I was taken to the headquarters of the

Central Geological Committee, and introduced to various officials in the Committee. The Committee acted as my host while in the Soviet Union, and provided me with an interpreter for the whole time that I was in the country. It was in Leningrad, however, that I had most to do with organizations under the Committee. The information below is pieced together from various interviews and discussions.

General

The Geological Institute in Leningrad was the first purely geological organization founded in Russia in 1882. It has had such illustrious directors as Karpinsky, and Chernyshev. It moved into the present buildings in 1914, and was made responsible for all geological work in Russia, with the exception of special tasks such as engineering geology, gold prospecting, etc., in Siberia.

Under the present system, however, each region of the USSR has an established department or institute, corresponding to a Geological Survey, answerable to the Central Geological Committee headquarters in Moscow. The Leningrad Institute is a headquarters research institute, confining itself to complex problems met with anywhere in the USSR, and for summarizing and collating information from all other establishments. They prepare summary and specialist maps, e.g. tectonic, geomorphologic, pleistocene, etc. and monographs on the geology of the USSR or of specified separate regions.

The Institute has two broad tasks; (1) to provide the stratigraphic basis for all geological surveys within the USSR, (2) to provide the scientific basis for all geological research designed to assist prospecting, i.e. applied economic geology. Although they do no prospecting themselves, which is the responsibility of special departments and institutes.

Stratigraphic basis

There is a special interdepartmental stratigraphic committee which is charged with the unifying of all points of view concerning stratigraphic classification and subdivision. The Commission has recently published a report in English entitled Stratigraphic Classification and Terminology, second edition, edited A. P. Rotay, Moscow, 1960.

The interdepartmental committee has appointed commissions each charged with a specific System. These commissions are responsible for supplying all geological establishments with the necessary stratigraphic information required for mapping, and with information concerning what materials have been studied and published on in any particular area. They define the boundaries between Systems and between subdivisions of Systems; hold special sessions to discuss correlation; define a unified stratigraphic scheme for the whole country; and review working schemes, and local correlations. The Committee solicits representation from all geological institutes in the country, and ensures that all points of view are presented. They have appointed a special Bureau concerned with matters of terminology, nomenclature, etc.

Palaeontological Department, VSEGEI

The emphasis is on biostratigraphy, -- study of fossils from a stratigraphic point of view. The Department operates in the same way as others in VSEGEI, that is, in coordinating and consulting with palaeontological centers and institutes throughout the country. Regional centers of research, both under the Committee and the Academy, tend to work on faunas developed within their own region. Palaeontologists from VSEGEI, however, collect and study fossils from all regions of the USSR, especially from those considered to be of more than regional importance in age determination and correlation.

All palaeontologists are united in the Palaeontological Society under the chairmanship of Akad. I.I. Gorsky, an authority on Carboniferous corals and coal deposits, and also Chairman of the National Committee of Geologists, and Vice-President of the Stratigraphic Commission of the International Geological Congress. The Palaeontological Society meets annually at the end of January in Leningrad. Regional Commissions of the Society meet more frequently throughout the country, in order to coordinate all palaeontological research. I do not have a list of all the palaeontologists in VSEGEI, but a few of those that I met are named in the Appendix.

Central Geological Museum

The Museum is named after Akad. F.N. Chernishev, who was responsible for its establishment. The building was begun in 1914, but the organization of a Museum staff began in 1923. The Museum was opened to the public in 1930. The present Director, P.N. Varfolomeev, has been associated with

the Museum since its beginning. The Museum is charged with three principal tasks; (1) to illustrate the regional geological structure of every part of the USSR; (2) to illustrate the occurrence and use of economic minerals throughout the country; (3) to store and curate palaeontological type collections, and make them available to all experts. To perform these tasks, the Museum has a staff of 37, 20 of whom have advanced degrees. Although they make many collecting expeditions to all areas of the country for fossils and minerals, in addition, all geological institutes throughout the USSR are charged with the responsibility of sending material to the Central Geological Museum as required. In return the Central Museum must assist all regional museums with curatorial advice, and collections as they are needed. It is also responsible for all exchanges of collections with foreign countries, within the framework of the Central Geological Committee.

The display area covers 3,750 square metres, and to examine every display one would have to walk 3 1/2 kms. The exhibits on regional geology are exhaustive and superbly prepared with maps, sections, photographs and illustrations, as well as a large number of rocks, minerals, and fossils both from the surface, and when relevant, from bore holes.

The type specimens are kept locked in halls separate from the main exhibits, but nevertheless on display. They are curated according to the monograph, and were made readily and immediately available to me. As soon as a palaeontological manuscript is completed in any institute under the Central Geological Committee, the type specimens must be sent to the

Central Geological Museum, or to a regional museum as stipulated. The Central Museum has by far the largest type collection in the whole country. Finally, the Museum contains the largest and oldest geological library in the USSR.

Academician Dmitri Vassiliyevich Nalivkin

Nalivkin is now 82 years old, but is still a man of astonishing vigour, and is still actively working. He took an active part in planning my program in Leningrad, and, as an Academician, appears to have entry to all institutes. He acted as chairman at a talk I had to give on Devonian biostratigraphy, and led the discussion. He was also present at a conference with various members of VSEGEI, at which they outlined their organization to me, and where I had to deliver an impromptu talk on the organization of geology in Canada. He appeared to be equally at home in the Institute of the Geology of the Arctic, and was anxious to discuss problems of Devonian faunal provinces and correlation across the Arctic Basin. His nephew (O. V. Cherkesov) and niece (Svetlana Cherkesova) are both members of the Arctic Institute.

Nalivkin's son, V. D. Nalivkin, is one of the leading petroleum geologists of the USSR. He is interested in reef ecology, and is anxious to correspond with and receive papers from anyone working in this field. He is particularly keen on obtaining information about Canadian Arctic Permian reefs and carbonates in general.

Institute for the Geology of the Arctic

Dr. B.V. Tkachenko, Director of the Institute, visited the Geological Survey of Canada in 1962. He appears to have been well satisfied by his visit, as my reception at his Institute was exceedingly cordial. I was introduced to the Chiefs of several divisions, and then to many of the palaeontologists or biostratigraphers. All their collections of corals and brachiopods from Novaya Zemlya, Severnaya Zemlya, and the Taimyr Peninsula were collected together in one large room for my convenience, and various Arctic geologists and palaeontologists placed themselves at my disposal for discussion or information. From everyone I met the utmost keenness to exchange information and answer any questions. In addition to the fossils and geology, I was given very full descriptions of methods of field work in their Arctic Islands, including transport, logistics, length of season, etc. There is no restriction whatsoever on women in field geology, and many of their palaeontologists and geologists, working under the most rigorous and remote conditions, are women.

Bondarev is head of their Palaeozoic Section, and works on Ordovician brachiopods from the Arctic Islands. He has a large work in press, jointly authored with two others, on brachiopods, corals and trilobites from Novaya Zemlya and the Northern Urals.

Smirnova, who works on tabulate corals, claims that she is now in a position to be able to differentiate between Silurian and Devonian species of Favosites, on the basis of microstructure of corallite walls. This work will apparently be published shortly.

Rogozov, works on Carboniferous corals from the northern Urals and the Arctic Islands, although his main claim to fame lies in the fact that he was in the Russian eight that won the Grand Challenge at Henley in 1958.

During the course of discussions, I mentioned the "two-holed" crinoid stems from our Eifelian in the Yukon and Northwest Territories. I was informed that crinoid stems from all Palaeozoic Systems have proved of value in correlation. R.F. Yelteisheva of Leningrad University, and G.A. Stukalina of VSEGEI, have already published on Ordovician and Silurian crinoid columnals, and further work is contemplated in all Systems.

Cherkesova is working on the Devonian brachiopods of Novaya Zemlya, where there is a complete succession from Gedinnian (?) to Famennian. She was very generous in giving me specimens, many of which bear close resemblance to forms from the Devonian of Ellesmere Island. She is interested in further exchange of material.

Before leaving Dr. Tkachenko showed me a four-sheet circum-Arctic structural map in final draft, which will be presented at the International Congress in India. The physiography and structural geology of the Arctic Ocean is included, based, I was told, from information gathered by scientific stations on Ice Islands.

Novosibirsk

While working in the Central Geological Museum, I met a palaeontologist, Dr. A.I. Sidyachenko, from the Institute of Geology and Geophysics, Siberian Branch of the Academy of Sciences in Novosibirsk. He wished to exchange

lists of workers with their field of specialization, as they are a new and rapidly growing institute, and wish to establish contacts on as wide a base as possible. Both their library and individual workers are particularly anxious to receive publications. They are equally willing to send publications to anyone who may be interested in them; I was told several times that they welcomed requests to add people to their mailing lists. A list of the names that were given me by Sidyachenko will be found in the Appendix. He emphasized that this list is not complete, and was compiled from memory. Apparently the Novosibirsk Research Institute is being built up into one of the largest in the USSR.

Husband and wife teams are fairly common, and in Novosibirsk there are several: Alexeeva, who works on Silurian and Devonian brachiopoda is Sidyachenko's wife, and the leading worker on tabulate corals, Sokolov is married to Polenova, who studies the Silurian-Devonian boundary and Lower Devonian ostracods of the Arctic.

APPENDIX

Department of Palaeontology, University of Warsaw

(al. Zwirki i Wigury 6, Warsaw 22)

Prof. Dr. Roman Koslowski (Emeritus) ..... Graptolithina, Pterobranchia

Palaeozoological Section

Dr. Adam Urbanek (Chairman) ..... Graptolithina

Dr. Franciszek Adamczak ..... Ostracoda

Dr. Halina Pugaczewska ..... Belemnoidea

Mgr. Magdalena Borsuk ..... Mammalia

Micropalaeontological Section

Prof. Dr. Wladyslaw Pozaryski (Chairman) ..... Foraminifera, Stratigraphy

Dr. Hanna Gorka ..... Flagellata, Hystrichosphaerida

Mgr. Henryka Wolanska ..... Foraminifera

Palaeobotanical Section

Prof. Dr. Mikolaj Kostyniuk (Chairman) ..... Palaeobotany

Mgr. Jadwiga Karczewska ..... Palynology

Mgr. Ewa Adamoczak ..... Algae

Palaeozoological Section of the Polish Academy of Sciences

(al. Zwirki i Wigury 6, Warsaw 22)

Prof. Dr. Zofia Kielan-Jaworowska (Chairman) ..... Trilobita, Annelida

Prof. Dr. Krystyna Pozaryska ..... Foraminifera, Stratigraphy

Dr. Anna Stasinska ..... Corallaria Tabulata

Dr. Gertruda Biernat ..... Brachiopoda

Dr. Halszka Osmolska ..... Trilobita

Dr. Wanda Szymanska ..... Echinoidea

Mgr. Ewa Roniewicz ..... Corallaria

Dr. Maria Kiepura (= Moenke) ..... Bryozoa

Mgr. Andrzej Sulimski ..... Mammalia

Mgr. Janina Szczechura ..... Ostracoda

Mgr. Janusz Blaszyk ..... Ostracoda

Poznan Branch

(ul. Swierczewskiego 19)

Prof. Dr. Maria Rozkowska (Chairman) ..... Corallaria

Dr. Jerzy Fedorowski ..... Corallaria

Dr. Irena Brodniewicz ..... Foraminifera

Mgr. Zdzislawa Wolska ..... Conodonta

Geological Institute

ul. Rakowiecka 4, Warsaw

Jan Czerminska ..... Devonian stratigraphy and sedimentary petrology

Dr. Maria Pajchlowa ..... Devonian stratigraphy and reef ecology

Palaeontological Institute USSR Academy of Sciences

Moscow

Invertebrate Specialists

E. A. Ivanova ..... Palaeozoic brachiopods & ecology

A. N. Sokol'skaya ..... Palaeozoic (mostly Carbon. -Permian) brachiopods

T. G. Sarycheva)
G. A. Beznosova) ..... Carboniferous-Permian brachiopods
A. D. Grigor'eva)

T. A. Grunt ..... Permian brachiopods

G. G. Astrova ..... Lower Palaeozoic Bryozoa

I. P. Morozova ..... Devonian-Permian Bryozoa

N. A. Shishova ..... Carboniferous-Permian Bryozoa

T. A. Dobrolyubova ..... Carboniferous-Permian Rugosa

N. V. Kabakovich ..... Carboniferous Rugosa

T. G. Il'ina ..... Permian-Triassic Rugosa

L. M. Ulitina ..... Devonian Rugosa

T. A. Saitina ..... Carboniferous Rugosa

I. I. Chudinova ..... Devonian-Silurian tabulata

S. E. Rozovskaya ..... Carboniferous-Permian Foraminifera

V. A. Ivanova ..... Palaeozoic ostracoda

N. P. Suvorova ..... Cambrian trilobites

N. N. Kramarenko ..... Cambrian-Silurian trilobites

O. I. Arkhipova ..... Carboniferous-Permian trilobites

A. G. Vologdin ..... Precambrian & Cambrian Archaeocyathean

V. D. Fonin ..... Cambrian Archaeocyathean

A. N. Vlasev ..... Cambrian Archaeocyathean

Yu. I. Voronin ..... Cambrian Archaeocyathean

K. B. Korde ..... Palaeozoic Algae

Yu. A. Arendt ..... Carboniferous-Permian crinoids and blastoids

A. N. Solov'ev ..... Mesozoic, Echinida

R. F. Gekker ..... Palaeoecology

V. E. Ruzhentsev ..... Carboniferous-Permian Ammonoidea

B. I. Bogoslovskii ..... Devonian Ammonoidea

M. F. Bogoslovskaya ..... Carboniferous Ammonoidea

A. A. Shevyrev ..... Triassic Ammonoidea

V. N. Shimanskii ..... Nautiloidea mostly Carboniferous and Permian

F. A. Zhuravleva ..... Devonian Nautiloidea

G. K. Kabanov ..... Belemnites

N. I. Novozhilov ..... Phyllopods

A. G. Eberzin ..... Tertiary, pelecypods

L. A. Nevesskaya ..... Tertiary, pelecypods

N. P. Paramonova ..... Tertiary, pelecypods

L. B. Il'ina ..... Tertiary, pelecypods

R. L. Merklin ..... Tertiary, pelecypods

O. V. Amitrov ..... Tertiary gastropods

Not listed: Specialists on Insects and Vertebrata.

Geological Institute of the USSR Academy of Sciences

Moscow, B-17, Pyzhevskii Pereulok, 7

V. V. Menner ..... Biostratigraphy & Palaeobiogeography

Biostratigrapher-palaeontologists

N. V. Pokrovskaya ..... Cambrian trilobites

M. N. Chugaeva ..... Ordovician trilobites

M. N. Semikhatov)
M. E. Raaben)
V. A. Komar) ..... Stromatoliths (Archaean and
S. V. Nuzhnov) Proterozoic)
I. N. Krylov)

A. Yu. Rozanov ..... Cambrian archaeocyathids

Z. A. Zhuravleva ..... Precambrian and Cambrian micro-problematica

V. V. Missarzhevskii ..... Lower Cambrian gastropods and hyolithids

V. N. Krestovnikov ..... Devonian brachiopods and conodonts

Kh. S. Rozman ..... Ordovician and Devonian brachiopods

D. M. Rauzer-Chernousova)
E. A. Reitlinger) ..... Devonian and Carboniferous
M. N. Solov'eva) foraminifera
E. A. Lipina)

T. P. Bondareva ..... Cretaceous foraminifera

V. G. Morozova ..... Cretaceous and Tertiary foraminifera

M. Ya. Serova) ..... Tertiary foraminifera
V. A. Krasheninnikov)

K. I. Kuzentsova ..... Jurassic foraminifera

N. P. Mikhailov ..... Jurassic ammonites

M. A. Pergament ..... Cretaceous inocerami and ammonites

I. N. Krasilova ..... Silurian and Devonian pelecypods

V. N. Sinel'nikova ..... Tertiary pelecypods

Biostratigraphers-palaeobotanists

N. A. Bolhovitina ..... Jurassic and Cretaceous spores and pollen

V. A. Vakhrameev ..... Jurassic and Cretaceous microflora

E. D. Zaklinskaya ..... Upper Cretaceous, Paleogene and Neogene spores and pollen

S. N. Naumova ..... Precambrian and Palaeozoic spores and pollen

R. E. Giterman) ..... Pollen from Quaternary deposits
L. V. Golubeva)

N. A. Volkova ..... Precambrian and Cambrian spores and phytoplankton

V. P. Maslov ..... Algae

S. V. Meien ..... Upper Palaeozoic flora

M. P. Doludenko ..... Jurassic and Cretaceous flora

O. P. Yaroshenko ..... Triassic and Jurassic spores and pollen.

Moscow University

V. V. Drustchits ..... Lower Cretaceous ammonites

O. P. Obrutcheva ..... Devonian fishes

N. J. Maslokova ..... Cretaceous and Paleogene Foraminifera

O. B. Bondarenko ..... Ordovician and Silurian Tabulates

A. L. Jurina ..... Devonian and Lower Carboniferous flora

T. A. Jacubovskaja ..... Mesozoic and Cenozoic flora

T. N. Smirmova ..... Cretaceous Brachiopods

T. D. Troitskaja ..... Devonian Bryozoa

M. V. Martinova ..... Frasnian and Famennian Brachiopods

N. V. Litvinovich ..... Carboniferous Brachiopods

M. M. Smelovskaja..... Silurian and Devonian Rugosa

(Note: The above list was given to me already transliterated and is not consistent with the American (A. G. I.) system used elsewhere in this report)

Organizations Under the Central Geological Committee

All-Union Scientific-Research Institute (VSEGEI)
V. O. Srednii Prospect, 72b, Leningrad B. 26

M. A. Rzhonsnitskaya ..... Devonian brachiopods

E. Z. Bulvanker ..... Devonian Corals

E. A. Madzolevskaya ..... Silurian and Devonian Brachiopods

N. M. Petrosyan ..... Devonian plants

T. V. Nikolaeva ..... Silurian corals

G. A. Stukalina ..... Palaeozoic crinoids

L. D. Kiparisova ..... Triassic Ammonites

The Central Geological Museum Named for

F. H. Chernishev

V. O. Srednii Prospect, 72b, Leningrad B. 26

Director: Petr Nicolajevich Varfolomeev

Nadezhda Sergeevna Volkova ..... Neogene Molluscs

Lidiya Vasil'evan Romanovskaya ..... Inoceramus and Upper Cretaceous pelecypods.

Scientific-Research Institute for the Geology of the Arctic

Leningrad, nab. r-Moiki, 120

E. N. Kara-Murza ..... Spores and Pollen from Mesozoic deposits

A. F. Dibner ..... Spores and Pollen from Upper Mesozoic deposits

A. A. Gerke ..... Upper-Paleozoic and Mesozoic Foraminifera

Yu. N. Popov ..... Cephalopoda and Pelecypods from Permian and Triassic deposits

N. S. Voronetz)
N. I. Shulgina) ..... Pelecypods and Mesozoic Cephalopoda

R. V. Solomina)
V. I. Ustritzkii) ..... Carboniferous and Permian Brachiopoda

S. V. Cherkesova ..... Devonian Brachiopoda

M. S. Zhizhina ..... Ordovician and Silurian Tabulata

N. P. Lazarenko ..... Cambrian Trilobites

N. A. Shvedov ..... Upper Paleozoic foliate flora

N. D. Vasilevskaya ..... Mesozoic foliate flora

V. I. Bondarev ..... Ordovician Brachiopods

M. Smirnova ..... Tabulate corals

Yu. G. Rogozov ..... Carboniferous corals

Mining Institute of Leningrad

B. O. 21 Lenin, Dom no. 2, Leningrad

N. Ya. Spassky ..... Devonian corals

All-Union Petroleum Scientific-Research Geological Prospecting Institute (VNIGRI)

39 VNIGRI, Liteiny, Leningrad 104

V. D. Nalivkin ..... Petroleum Geologist, Permian reefs, reef ecology.

All-Union Scientific-Research Geological and Prospecting

Petroleum Institute (VNIGNI)

Shosse Entusiastov 124, Moscow, E-275

A. I. Liashenko ..... Devonian stratigraphy and brachiopods

Institute of Geology and Geophysics, Siberian Branch

of the Academy of Sciences USSR

Novosibirsk 72, Akademgorodok

B. S. Sokolov ..... Ordovician and Silurian tabulata

V. N. Saks ..... Jurassic & Cretaceous Belemnitida

A. M. Obit ..... Graptolithina

I. T. Zhuravleva ..... Archaeocyathids

L. N. Repina ..... Lower Cambrian trilobites

N. P. Meshkova ..... Cambrian Hyolithoidea

Yu. I. Tesakov ..... Ordovician Tabulata

A. B. Ivanovskii ..... Ordovician-Silurian Rugosa

E. I. Myagkova ..... Ordovician Nautiloidea

A. I. Sidyachenko ..... Ordovician-Silurian graptolithina

A. V. Kanygin ..... Ordovician Ostracoda

E. N. Polenova ..... Devonian Ostracoda

T. A. Moskalenko ..... Ordovician Conodonta

R. E. Alexeeva)
N. P. Kul'kov) ..... Silurian-Devonian Brachiopoda

E. A. Elkin ..... Devonian Trilobites

Yu. A. Dubatolova ..... Devonian Crinoidea

V. N. Dubatolov ..... Devonian Tabulata

A. I. Bogush)
C. V. Yuferev) ..... Carboniferous Foraminifera

L. A. Bushmina ..... Carboniferous Ostracoda

A. S. Dagis ..... Triassic Brachiopoda

A. A. Dagis ..... Triassic Ammonoidea

A. F. Khlonova ..... Jurassic-Cretaceous spores & pollen

T. F. Vozzhenikova ..... Mesozoic Diatomaceae

V. I. Gudina ..... Quaternary Foraminifera

Siberian Sci-Research Institute of Geology, Geophysics, and Mineral Raw Materials (SNIIGGIMS)

Novosibirsk

This is the other main geological Institute in Novosibirsk; it is under the Central Geological Committee, and has an important palaeontological department.