International Union of Geological Sciences

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MESSAGE FROM SUBCOMMISSION SECRETARY

In the previous Newsletter (6), 1 indicated that activities within the Subcommission were increasing dramatically and that the Newsletter was proving to be an extremely effective medium for communication. I also stressed the importance for Members and Corresponding Members to reveal their various activities in Permian studies by submitting articles for publication in the Newsletter. Many of you responded with enthusiasm arid I am truly delighted With Your important submissions. Once again I encourage each of you to prepare submissions for the next Newsletter, Number 8, scheduled for June 1983.

As indicated elsewhere in this Newsletter and also in earlier Newsletters, activities of interest to Permian specialists will take place in conjunction with the Tenth International Geological Congress in Madrid in September 1983. The Subcommission will meet during the International Geological Congress in Moscow, 1984, and at that meeting a new slate of officers for the Subcommission will be elected in accordance with the Statutes of the Commission on Stratigraphy.

W. W. Nassichuk

ANNUAL REPORT 1982

During 1982 the composition of the Subcommission increased rather dramatically as efforts of the executive body to increase global representation of Corresponding Members continued. Contributions to the Subcommission's Newsletter continued to increase during the year, reflecting improved interest in Subcommission activities. Several statements from Permian specialists in the People's Republic of China who have recently been added to the Subcommission, will be published in the current Seventh (7) Number. Membership on the Perm ian-Triassic Boundary Working Group has been finalized and E.T. Tozer (Canada), Chairman of the Working Group, is preparing plans for an initial meeting. Chairman of the Carboniferous-Permian Boundary Working Group, C.A. Ross (U.S.A.), has advised that membership is being finalized and will be forwarded to the Commission shortly.

During 1982, significant progress was made in the selection of potential Middle Permian stratotypes in the southern United States of America (Texas) and in selection of potential Upper Permian stratotypes in South China and adjacent regions.

Important activities are planned for the Subcommission during the next several years. During 1983 the Subcommission will hold an informal business meeting in Madrid during the Tenth International Congress of Carboniferous Stratigraphy and Geology; C.A. Ross will convene a two-day symposium on the Carboniferous-Permian Boundary in conjunction with the Madrid meeting. The Subcommission will meet in Moscow in 1984, during the International Geological Congress and special attention will be paid to systemic and series boundaries. The Subcommission has requested arrangement of field trips for examination of prospective Lower and Middle Permian stratotypes in the Southern Urals and Transcaucasia before and after the IGC meetings. The agenda for the Subcommission meeting in Moscow is well advanced.

W. W. Nassichuk

UPPER PERMIAN, PERMIAN-TRIASSIC BOUNDARY STUDIES IN IRAN

The following short summary, concerning Upper Permian and Permo-Triassic boundary in Central Iran is the result of the latest investigation by the Iran ian-Japanese Research Group, published in March 1981, and may be interesting for Permian scholars.

A nearly continuous marine sedimentary sequence ranging from Artinskian up to Middle Triassic, consisting of about 1190 m of Permian limestone, about 682 m of Lower Triassic limestone, and over 780 m of Middle Triassic dolomite are well documented in the Abadeh by the writer in 1968 and has mainly been focussed on two different subjects; 1) The Upper Permian stratigraphy, and 2) The Permo-Triassic boundary.

1) The Upper Permian sequence is a complete sequence consisting of marine limestone and shale. Detailed paleontological studies of this sequence confirmed that the range of some of the Upper Permian fossils (such as Leptodus nobilis ‘ Orthotetina dzhulfensis, Pleram lexus, and a few others) should be revised. This revision resulted in a much better correlation between different scattered Upper Permian sections, such as Chhidru Fm., Pamirian Beds, Nesen Fm., Amarassian Fm., and others. This study resulted **21SO** in establishing the Abadehian Stage (PostGuadalupian and Pre-Dzhulfian in age).

2) Permo-Triassic boundary in the Abadeh region is characterized by occurrence of a nearly continuous marine sedimentary sequence. No erosional feature could be observed at this boundary. The basal part of the thick marine Triassic limestone (Anchignathodus parvus Zone) correlates with the upper part of the Otoceras woodwardi Zone of Kashmir, and the uppermost part of the thick marine Permian limestone contains the typical Dorashamian ammonite, Paratirolites. Compared with the conodont zones in Kashmir, however, beds equivalent to the lower part of the Otoceras woodwardi Zone of Kashmir are most probably missing in Abadeh, and therefore the Permian Triassic contact is considered as a paraconformity. The emergence at the Perm ian-Triassic boundary is supported by sedimentological analyses, occurrences of intertidal or supratidal facies, and a sharp change of facies at the boundary.

A detailed description of the Permo-Triassic boundary and paleontological characteristics of the Abadehian Stage are available in the: Iranian-Japanese Research Group, Memoirs of the Faculty of Science, Kyoto University, Series of Geology & Mineralogy, Val. XLVII, No. 2, Kyoto, Japan, March 25, 1981.

To the best of my knowledge the Abadeh section is the only continuous marine sequence ranging from Artinskian to Middle Triassic which has potential to serve as a standard section, however, the magnitude of the paraconformity at the PermianTriassic boundary should be investigated in more detail.

I shall be delighted to guide and accompany my colleagues (in due time) to visit this unique section.

Hooshang Taraz

NORTH AMERICAN FRIENDS OF THE PERMIAN MEETING, OCTOBER 18, 1982

Minutes:

Charles Ross asked for names of Permian workers who would serve an Carboni f erous-Perm ian Boundary Stratotype Committee. Approximately 30 names were presented.

According to B.F. Glenister, this committee will submit its recommendation to the Permian Subcommission for action.

Dr. Glenister reported on the composition and planned activities of the PermianTriassic boundary Working Group which is chaired by E.T. Tozer.

Dr. Glenister reported on the International Geological Congress meeting to be held in Moscow; there will be a major symposium an the Permian System with Dr. Glenister and V.I. Ustritsky serving as co-chairmen.

Dr. Glenister asked R. Grant for a report an the Middle Permian stratotype; Grant has had few replies on his requests for input for Middle Permian stratotypes. Grant plans to make presentation at forthcoming Permian Basin Symposium in Texas and will remind participants of their opportunity to participate in a major stratotype decision of international significance.

E. Gilmour

PERMIAN ACTIVITIES IN INDIA

Dear Dr. Nassichuk:

Through Newsletter No. 6 1 am aware that the Commission on Stratigraphy has estabished a Perm ian-Triassic Working Group.

In my view it would be most appropriate that the group include a few members from the Indian Subcontinent -mainly due to work being done on important sections in the Salt Range, Kashmir, Nepal. Prof. Nakazawa and myself carried out studies on the problem of the boundary with a team of Japanese workers on the classic section of Kashmir; this work has now been extended to other areas of Kashmir, Spiti, Central Himalaya, etc. and also on Gondwana terraine by our Indian colleagues. I am sure members of subcommissions will review and consider this point. On hearing from you, I will approach authorities Of Our Dept. for formulation of Indian Working Groups in different parts of the country. Under IGCP 106, we are already investigating many parts of Himalaya and are looking at the problem of continental deposits to resolve the same problems.

I am also happy to inform you that Memoir of Geol. Soc. India, Palaeont. Indica, N.S. (vol. 46, pl. 2.1, pp. 204) on the "Upper Permian and Lower Triassic Faunas of Kashmir" edited by Nakazawa and Kapoor was released in 1981. This special volume has three parts, one on stratigraphy (Kapoor & Nakazawa), two on faunas (Foraminifera Okimura & Ishii, Coral-Kato; Bryozoa - Sakagami, Brachiopod - Schumizu, Bivalves Nakazawa, Gastropoda -Murata, Ammonites - Bando, Conodonts - Murata & Matsuda) and three on conclusions Nakazawa). We have already dispatched a copy to you which I hope will be you reaching soon.

You are well familiar that in our country distribution of both continental and marine Permian is very extensive and have innumerable problems of correlation due to structural and other reasons; we are attempting to review all the basins and developing reference sections to resolve the problems. At the moment work has already been initiated in the Painkhand area of Central Himalaya, the Pin valley of Spiti, and several sections in Kashmir, Raniganj coalfield.

Yours sincerely,

K. M. Kapoor

POTENTIAL MIDDLE PERMIAN (GUADALUPIAN) STRATOTYPE IN WEST TEXAS

In 1970 the West Texas Geological Society and Permian Basin Section (PBS) of the SEPM jointly organized a Permian Committee. The long-range purpose and function of the committee is to establish and document (through sample collecting, field and lab studies, etc.) stratotypical reference sections of the Permian in both the surface and subsurface for both basinal and shelf facies in the general Permian Basin area, which is the classic area for the North American Permian. I am a charter member of the committee and am presently its chairman. To date the committee has established and documented a Wolfcampian shelf reference section in the Hueco Mountains (documented in Permian Exploration, Boundaries, and Stratiqraphy, published in 1975 by the West Texas Geological Society and PBS-SEPM) and is in the finishing stages *of* establishing and documenting a Leonardian lectostratotype section in the Glass Mountains (for preliminary documentation see my abstract on p. 14 of 1977 GSA abs. with Programs, vol. 9). Among the long range plans on the committee is to establish and document a Guadalupian lectostratotype section in the Guadalupe Mountains area. This has direct bearing on Dr. Grant's Middle Permian stratotype proposal.

The Guadalupe Mountains is the type area for the Guadalupian Series and is the most complete, best exposed, most fossiliferous, and best studied Guadalupian sequence in North America *of* which I have any knowledge (either direct or indirect). If a middle Permian stratotype is to be designated and represented by the Guadalupian. I would recommend the Guadalupe Mountains as the type locality of the stratotype. Because of the aforementioned Permian Committee plans in the area I (and the other committee members) definitely want to become involved in your middle Permian stratotype project. Because of my long involvement in Permian work I would very much like to become a corresponding member of the Permian Subcommission.

There are two problems with a Guadalupian stratotype section which I should like to point out. First, is the problem of the age assignment of the Cutoff Formation. Depending on what fossil group is used, it can be assigned either a Leonardian or Guadalupian age. This conflict needs to be resolved. Or, do we circumvent, the problem by assigning the Cutoff to Furnish's Roadian Stage which he excludes from the Guadalupian and Leonardian by assigning it equal rank? For obvious reasons it is best to have a major biostratigraphic or chronostratigraphic boundary within a fossiliferous sequence so that boundary can be defined as precisely as possible. This forms the basis of the second problem which is the top of the Guadalupian (in which I believe the Lamar should be included) is at the top of a fossiliferous sequence above which are no diagnostic fossils in the type area. I can envision problems of defining a boundary in an area (if one exists) where the Guadalupian-Ochoan boundary is within a gradational fossiliferous sequence.

John M. Cys

A COMMENT ON GUADALUPIAN STRATOTYPE

In my view, John Cys has i30lated two most critical problems in defining the Guadalupian stratotype, namely the Cutoff and the paucity of fossils towards the top of the section. However, each is susceptible to ultimate resolution. The base is a matter of selecting a Mutually accepted horizon that is recognizable through the greatest number of the numerous fossil groups that are present. Ammonoid workers would probably be comfortable with any one of several possible levels, although the bottom of the Pipeline shale Member of the Brushy Canyon Member in Guadalupe Pass is probably most appealing. Tethyan affinities of the Lamar fusulinaceans offer prospects of correlation to the base of the Dzhulfian. Additional help is available from the ammonoids although it may be necessary to effect correlations with Soviet Transcaucasia and Iran through the La Difunta sections in Coahuila.

Brian F. Glenister

PALYNOLOGICAL INVESTIGATIONS, CANADIAN ARCTIC

Rock samples were collected for palynological investigations from the type sections of the Otto Fiord (Pennsylvanian), Hare Fiord (Pennsylvanian and Lower Permian), van Hauen (Lower Permian), Degerbols (Upper Permian) and the Otoceras bearing Blind Fiord (Lower Triassic) Formations in Ellesmere Island, Canadian Arctic. Due to the relatively thin soils and vegetation cover in this part of the Arctic, the exposure at these type sections is excellent, and some 2,500 m of section was sampled. it is hoped to establish a palynological zonation which will have relatively good biostratigraphic control provided by macrofossils such as ammonoids and brachiopods, and microfossils such as formaminifers and fusulinids. Such a zonation should prove invaluable when attempting to date samples of cuttings from the western Sverdrup Basin where hydrocarbon exploration is actively in progress but where rock outcrop is more limited.

Macrofossil and microfossil samples were also collected by W.W. Nassichuk and K.G. Osadetz from certain of the above-mentioned formations. For example, brachiopods were collected from the lowermost Upper Permian (Wordian) Degerbols Formation, and the Nansen Formation (Lower Carboniferous - Lower Permian) was sampled for fusulinids; some of the former are currently being studied at the Geological Survey of Canada in Calgary by Liao Zhuoting of the Nanjing Institute of Geology and Palaeontology, and the latter are being investigated, in Calgary, by Rui Lin also from Nanjing.

J. Utting

RESEARCH ON THE UPPER PERMIAN IN ITALY

Samples gathered from the Bellerophon Formation (Upper Permian) and from the oolitic horizon of Tesero (which is the Lower Member of the Werfen Formation), in the central-western part of the Dolomites (central-eastern Southern Alps), have yielded very interesting associations of Foraminifera.

In the highest levels of the Bellerphon F. the following genera are present:
Reichelinia, Nankinella, Staffella, Chenella (?), Dagmarita, Paradagmarita, Paraglobivalvulina, etc.

In the oolitic horizon of Tesero, which many recent Authors consider to be the base of the Werfen F., small Globivalvulinae and Paraglobivalvulinae, which do not seem to be reworked, are still abundant. Fusulinids of the genus Nankinella appear in some localities.

In at least one succession, near Moena in Val di Fassa (Trento), small Biseriamminidae also occur in the immediately overlying level the Tesero horizon.

These scattered data suggest that the oolitic horizon of Tesero, at least in certain localities, is attributable to the Upper Permian. Further sampling will be done in the next few months to obtain a more certain picture of the Perm ian-Triass ic boundary in this region.

At present I am also examining the Fusulinids present in a sample from the Monte Facito Formation (Middle Triassic(?) of the Southern Apennines). I presented the results of this study at the Congress of the Italian Geological Soc., which will take place in Bologna (September 1982).

M. Pasini

MAIN ACHIEVEMENTS IN PERMIAN - TRIASSIC BIOSTRATIGRAPHY OF SOUTH CHINA DURING RECENT TWO YEARS

Based on studies of ammonoids collected from the trench section at Longtan near Nanjing of Jiangsu as well as from the "unnamed ammonoid zone "at Changxing of western Zhejiang, a paper entitled "On Earliest Triassic Ammonoid Fauna from Jiangsu and Zhejiang with Reference to Definition of Permo-Triassic Boundary" written by Dr. Y.G. Wang has recently been completed with two important conclusions as follows:

1) The "unnamed ammonoid zone "proposed by Zhao, Liang and Zheng in 1978 and referred to as the uppermost zone of the Changhsingian Stage, was later (1981) suggested by Zh20, Sheng et 21. to be placed in the lowest Triassic. In the light of studies on ammonoids collected from this zone during these two years seven cephalopod forms have been recognized, namely Gryposeras sp., Pseudosageceras sp., Pseudogastrioceras sp., Otoceras sp., Hypophiceras changxinge - se Wang sp. nov., H. cf. martini Trumpy, Tompophiceras sp. and Metophiceras sp-, among which the genus Hypophiceras is fairly well preserved and rather abundant in individuals, but Otoceras is quite few in number. Therefore, Dr. Wang suggests the name "Hyp oph ic eras" fauna "to represent the earliest Triassic ammonoid assemblage of South China.

2) In the trench section at Longtan, we found that the original level bearing Hsu's "Otoceras cf. woodwardi" fauna is about 42 m above the Perm ian-Triassic boundary. By studying the ammonoid specimens collected from this level and reexamining Hsu's original specimens, we have recognized several forms of Pseudosageceras sp., Koninckites sp., Paranorites sp. and Flemingites sp. The original specimen of Hsu's "Otoceras cf. woodwardi" has been now re-identified as Kaninckites sp.. but not a real species of Otoceras. Among these forms, the presence of the genus Flemingites is most important and also most significant. For this reason, Dr. Wang suggested to move Hsu's "Otoceras fauna" to the "Koninckites fauna" belonging to the Dienerian age.

J. Z. Sheng

SYMPOSIUM; PERMIAN GEOLOGY OF QUEENSLAND

Dear Dr. Nassichuk:

Thank you for your letter of April 14. Please forgive my delayed reply, but I have recently resigned from the Geological Survey of Queensland to take up a senior appointment as a palynologist with Western Mining Corporation Limited, an Australian petroleum and mineral company, based in my home state of South Australia. My research will now be directed to the Permian of the Canning and Perth Basins of Western Australia. Except for the obvious glacial features of U-shaped valleys, tills, striate pavements, etc., in the Adelaide region, the South Australian Permian is mostly subsurface, in the Arckaringa, Cooper and Pedirka Basins. There is a wealth of palynological information yet to be tapped.

My new position also involves some joint supervision of post graduate students at the Geology Department, University of Adelaide.

Brisbane last July. As Chief Convener, it was my swan song for the Queensland Permian. The diversity of Papers will be of importance to the International Community. Prices for the volume only, particularly for overseas purchasers, have not been finalized. However, it would be helpful if people interested in buying a copy of the papers could notify the Secretary of Division* of their intention. I shall keep you informed of progress.

*Western Mining Corporation, Exploration Division - Petroleum, P.O. Box 409, Unley 5061, South Australia

Yours sincerely,

C.B. Foster

FIELD ACTIVITIES IN IRAN, ITALY, AUSTRIA

Dear Dr. Nassichuk:

As I announced in my last letter, I want to give you a short view on our activities concerning the Permian:

1. Field activity in Iran: especially in the Albourz and in Dzulfa and Abadeh. In Dzulfa only the highest part of the Permian, especially the Permian/Triassic boundary was investigated. The main activities concern the treatment of the echinodermata (holothurians, ophiurs and crinoids). The papers on conodonts are already finished, at the moment foraminifers and porifers are being studied.

   In the Albourz, especially in the eastern and central part, the Permian sedimentation is interrupted, as at this time often uplifts took place, where laterites and bauxites were formed. Sedimentology, microfauna as well as mineral deposits, i.e. in basalts are investigated.
2. Field of activity in Northern Italy: The point of main effort is the “Bozener Quarzporphyr” (rhyolites, rhyodacites, dacites and scarcely andesites), which is investigated petrologically, geochemically and isotope-geochemically. Furthermore the lacustrine sediments of the Upper Permian are examined lithostratigraphically as well as with regard to mineral deposits. The Upper Permian Bellerophon formation (marine) is studied.

3. Field of activity in Austria: in the western part fluviatile-lacustrine sediments which are investigated with the help of flora, spores and pollen, regionally by marine ingressions (algae, foraminifers). In addition, the Permian rhyolotic volcanites in connection with the forming of mineral deposits are regarded. A point of main effort is the widespread Permian paleokarst which also increased the forming of mineral deposits. In the eastern part especially the taphrogenesis is being studied.

I hope to have given you a little view of our activities and remain with best wishes,

Yours sincerely,

H. Mostler

PERMIAN AND TRIASSIC ROCKS IN TASMANIA

Late Palaeozoic and Early Mesozoic rocks are extensively developed in Tasmania, and they are exceptionally well-suited to detailed biostratigraphic analysis. They are almost everywhere subhorizontal and exceed one thousand metres in thickness. Late Carboniferous to Kazanian rocks are predominantly glacigene or shallow-water glaciomarine, and almost certainly represent the finest example of their type anywhere in the world. Late Permian and Triassic rocks are exclusively freshwater. Well-preserved faunas and floras occur abundantly throughout. They are exceedingly rich in numbers of individuals, but taxonomic diversity is low. They display very strong Gondwanan affinities with only rare more cosmopolitan elements. Detailed correlation with the world standard is extraordinarily difficult, and currently, well-established local stage nomenclature and faunal subdivisions are in use. Dr. E.M. Truswell, Bureau of Mineral Resources, Canberra, has provided, and continues to provide important palynological data on samples from an ongoing stratigraphic drilling programme. The palynological information dovetails most satisfactorily with zonations based on the marine invertebrate faunas. Following recent recommendations concerning the recognition and placement of the Carboniferous/Permian boundary in the Gondwanan Realm (Balme, 1980), Eurydesma and its associates were well-established in Tasmania by Late Carboniferous times. This is contrary to the traditional Australian view of using the appearance of the Eurydesma fauna to identify the base of the Permian System. Both the Kingborough and Maria Island 1:50 000 colour-printed geological map sheets, which embrace some of the most spectacularly fassiliferous I-ate Palaeozoic sequences in Tasmania, have been published recently.

M.J. Clarke

CARBONIFEROUS - PERMIAN BOUNDARY WORKING GROUP

The Permian Subcommission of the International Commission on Stratigraphy (IUGS) has asked me to organize and chair a new, revised and reconstituted "Working Group on the Carboniferous-Permian Boundary". This I shall be pleased to do.

One of the first tasks is to locate about twenty-five to thirty experienced persons in the field who are willing to be active Members of the Working Group. The number is not fixed so that Members may be added to or reduced from the Working Group as the work progresses. Also, many of the members will. know one or two persons who would like to know *of* the deliberations of the Working Group and who may wish to contribute to those discussions from time to time. These persons I propose to include as Corresponding Members. The distinction between these two "classes" of members will probably remain vague, except that Members may be called upon now and then to communicate with "Corresponding Members" and to locate new corresponding members in their area.

I propose that we communicate to one another through a newsletter which I shall compile once or twice a year, through written articles in journals, talks, organized symposia, and Working Group discussion sessions. In this regard, the organizers of the Tenth International Carboniferous Congress have set aside two half-day sessions for discussion *of* this particular boundary.

Also, the Permian Subcommission is planning an extensive discussion on the stratigraphy of the Permian, including the lower boundary of the Permian, at the 1984 International Geological Congress in Moscow. If you are planning to attend, abstracts from you and your colleagues would help in planning that program.

I am currently gathering short (one or two paragraph) statements of various view points conerning the criteria and problems that relate to locating a satisfactory Carbon if erous-P er a ian boundary and hope to distribute these in Newsletter No. 1 early in 1983.

Please let me know if you are willing to serve as a Member of this important Working Group. Also, please send the names and addresses of I or 2 corresponding members that you may be proposing. If you plan to submit abstracts about tile Carboniferous-Permian boundary for the XICC or Keith IGC, please let me know as quickly as possible.

Charles A. Ross

CARBONIFEROUS-PERMIAN BOUNDARY IN CHINA

The demarcation line between the Carboniferous and the Permian in China is not quite alike with that in Europe and America. In almost all the strata at the top of the Carboniferous in China, Pseudoschwagerina is found, upwards to the contact with the Lower Permian, there is a discontinuity. Generally, the Carbon if erous-P arm ran boundary is placed upon the Pseudoschwagerina zone, but abroad, the Carboniferous-Permian boundary is placed downwards beneath the Pseudoschwagerina zone.

At present, the outstanding disputing problem in Carboniferous and Permian in China is probably referring to the geologic age of the formaminifera Pseudoschwagerina zone. At the All-China Stratigraphic Congress (1959), an agreement was reached to put it in the Carboniferous. But now at the 2nd All-China Stratigraphic Congress (1979),

some proposals have been submitted to place it in the Permian. In my opinion, to put Pseudoschwagerina zone either in the Carboniferous or in the Permian is a problem of reaching unanimity through international consultation, but not a theoretical problem.

Recently, many sections of continuous sedimentation from Upper Carboniferous to the Lower Permian are found in Guizhou, China, the region is promising for finding candidate localities for establishing a boundary-stratotype.

Zhang Shouxin

CARBONIFEROUS-PERMIAN BOUNDARY, CARNIC ALPS

Several proposals have been made concerning the Carboniferous/Permian boundary. In one of these the first occurrence of Pseudoschwagerina (fusulinid foraminifera) is used to define the base of the Permian. This genus meanwhile has been split into several new genera which include a great number of species.

In the Carnic Alps the first pseudoschwagerinids are found in the upper limestone beds of the "Lower Pseudoschwagerina Limestone" which are well exposed in the section at the western flank of the Schulterkofel. Facies studies by E. FLUGEL (1968, 1974) and W. HOMANN (1968, 1972) reveal the existence of four assymetrical cycles (DUFF et al., 1967), each consisting of a transgressive phase, a culmination phase rich in fusulinids, and a regressive phase.

The Lower Pseudoschwagerina Limestone is a well-defined unit within the Upper Paleozoic sequence of the Carnic Alps, composed of about 150 m of limestones and intercalations of sandstones up to 10 m in thickness. Deposition took place within an unstable, morphologically and bathymetrically differentiated, shallow subtidal inner-shelf environment (E. FLUGEL, 1974).

All the sections indicate an uninterrupted, normal marine sedimentation pattern. In the Schulterkofel section occurrence of Occidentoschwagerina alpina F. & G. KAHLER, 1941 starts with the third sedimentation cycle and ends with the deposition of the last carbonate beds; the species is not found in the overlying "Grenzland Beds".

The Carboniferous/Permian boundary as defined by the first occurrence of pseudoschwagerinids therefore lies between the second and third sedimentation cycle of the Schulterkofel section, more exactly within the limestone overlying an about one meter thick sandstone bed of transgressive phase of the third cycle.

Other fusulinid genera like Rugofusulina are found below and above this boundary.

The Lower Pseudoschwagerina Limestone of the Carnic Alps is already studied in detail: lithology, sedimentary structures, fossil inventory, communities, microfacies, and geochemistry. The unit yields abundant fusulinids (e.g., Occidentoschwagerina alpina, the index fossil of the Lower Asselian, Lower Permian, of Southern Fergana), and calcareous algae, as well as brachiopods and corals, but no cephalopods.

In case the Subcommission for Permian Stratigraphy could agree with the arguments described above, a standard section for the Carboniferous/Permian boundary, defined by the first occurrence of pseudoschwagerinids, may be established by a new and intensive study of the Schulterkofel section.

The correlation chart no. 3, Leningrad 1980, is outdated concerning the lower part of the Permian of the Carnic Alps. I include a table showing our interpretations. New data concerning the uppermost part of the Permian of the Southern Alps (based on studies by M PASINI, Siena, Italy) will follow.

Mittel-Perm	Grödener Stufe	Karnische Alpen	russisch-uralische Gliederung		alpine Zonen	russisch-/mittelasiatische/uralische Zonen	mittelasiatische Stufen
Unter-Perm	Trogkofel-	Tarviser Brekzie	Cisjansk	Saranin	fossilleer	Misellina-Zone	Darvas
		tiefe Bänke im Süßwasser		Sarga	Süßwasser-Algen		
		Goggauer Kalk	Artinsk (neu)	Irgin	Parnirina Pseudofusulina vulgaris	Pseudofusulina vulnaris – Zone	
		Treßdorfer Kalk		Burchev	Pseudofusulina lutugini		
		Lücke ?	Sakmar	Sterlitamak		Pseudo-schwagerina schellwieni – Zone	Sakmar
		nur als Gerölle			Pseudofusulina tschernyschewi		
		Trogkofel-Kalk		Tastub	Forni-Fauna		
	Rattendorfer-	Oberer Pseudoschwagerinen- Kalk	Assel		Zellia	Schwag. (russ.) glomerosa	Assel
		Grenzlandbänke			Pseudoschwa-gerina confinii	Schwag. (russ.) moelleri	
		Unterer Pseudoschwagerinen- Kalk			Occidento-schwagerina alpina	Occidento-schwagerina alpina	

Franz Kahler

PERMIAN BIVALVE STUDIES

With Donald W. Boyd I am continuing the monographic studies of Permian bivalves with the objectives of documentation and revision of the American representatives, their place in the world biostratigraphic system, and their evolution. Because of our concern with the mass extinction that terminated the Paleozoic we are giving due attention to the earliest marine Triassic.

For several field seasons we and Roger Batten have been examining all of the more promising Lower Triassic areas in the Rocky Mountains and Great Basin. Although the rocks are not very productive of benthonic fossils, we are acquiring much new information that should help us understand the Permian-Triassic transition.

Dr. Yin Hongfu of the University of Wuhan, in China, has finished two years with Newell and Yochelson in the U.S. He has helped us interpret Chinese Permo-Triassic molluscs.

During May and June, 1982, Newell and Boyd visited strategic Permo-Triassic localities in Nevada, Utah and Idaho.

Norman Newell

LOWER PERMIAN CONODONTS FROM THE WESTKARAVANKE MOUNTAINS (SLOVENIA, N.W. YUGOSLAVIA)

The most interesting new results in research on Permian in Slovenia has resulted in a significant discovery of a Lower Permian conodont association. Neogondolella solvenica n.sp. is described as a platform element with enantiognathiform, hibbardelliform, hindeodelliform, prioniodiniform, ozarkodiniform and ? pollognathiform elements. This assemblage is accompanied by Anchiqnathodus minutus and A. cf. latidentatus.

These conodonts were found only in one locality in beds of upper Lower Permian (Chihsian), which is represented by dark grey sandstones and shells with small black limestone lenses. Highly developed Pseudofusulina (Pseudofusulina cf. rakoveci) accompanied by crinoid Palermocrinus togatus in white and reddish limestones and marls prove that the total section is of the Misselina-zone.

In press in: N.Jb. Geol. Palaont. Abh., Stuttgart.

A. Ramovs

PERMIAN SYMPOSIUM, MOSCOW, 1984

Dear Dr. Glenister:

As a co-convenor of the Symposium of the Permian to be held at the IGC in Moscow in 1984, 1 inform you that the following three problems are to be discussed:

1. Stratigraphic sections of the Permian stages.

2. Stage subdivision of the Upper Permian.

3. Correlation of deposits in the major biogeographic units.

I would appreciate if you could prepare papers presented by foreign participants for the items 2 and 3.

Abstracts are supposed to be sent in August 1983 and their discussion in October 1983.

V. Ustritsky

STRATOTYPES FOR THE STAGES OF THE PERMIAN

Obtaining a worldwide scale for the Permian has caused considerable difficulty and this reflects features of the Permian which distinguish it from most other systems. These features are considered in some detail in a paper I am preparing for the 15th Pacific Science Congress to be held in Dunedin, New Zealand, in February 1983. In this paper I have contrasted the Permian with the Triassic.

Basically, difficulties in the Permian World Scale reflect the climate contrast in different regions of the Lower Permian and resulting biological provincialism. In the Upper Permian on the other hand, although there was a widespread warm to hot climate (papers in press), compressive orogenic activity beginning at the mid-Permian resulted in continuing regression, hampering correlation by decreasing the extent of marine deposits.

In these circumstances attention is needed to the following requirements:

a) Description of all the faunas.

b) Choice of stratotypes in regions where stratigraphical rock relations can be examined and correlations from widely separate parts of the world widely debated.

a) in warm water region commonly correlations (and time relationships are based on fusulinids and ammonites. Unfortunately, fusulinids are confined to the warm water region (tropical and sub-tropical in the main) and ammonites are relatively rare outside this same region. Conodonts are even more limited in distribution than fusulinids and apparently do not extend to the limit of sub-tropical waters. Even in the Tethyan region there is difficulty with fusulinids and this represents particularly a lack of strict super-positional studies and errors in the scale due to the building in or hypothetical time relationships not based on stratigraphy. In order to achieve a satisfactory world scale much more information is needed on other groups of organisms, as many as possible, but especially from brachiopods pelecypods and gastropods.

b) Choice of areas in which a number of stratotypes are represented and where the faunas are good could be of considerable significance. For the Lower Permian, the Ural-Russian platform area has considerable merit for choice of stratotypes in which super-positional relationships can be studied and marine faunas are good. Even though in the Kungurian the faunas are poorer they can be examined in relation to the underlying beds and even in relationship to the overlying Kazanian. This has considerable advantages as a basis for a World Scale. Similar possibilities exist for the sequences of Texas, USA, but these have the disadvantage of being less centrally placed as far as world faunal relationships are concerned. The value perhaps of the Carnic Alps for understanding the Upper Carboniferous and Lower Permian has been overlooked. The Pamirs sequence has the disadvantage of structural complexity combined with inaccessability.

For the Upper Permian the Ural/Russian platform sequence can be held unsatisfactory because of the poor development of marine deposits. The two areas which have a -fairly continuous development of marine Upper Permian are the Transcaucasus and southern China. I would suggest that southern China might be considered for the choice of stratotypes for stages of the Upper Permian. The stratigraphical and biological sequence is well established but needs to be more closely related to the sequence elsewhere and in particular Kazanian, Guadalupian and Kungurian (Roadian) relationships need to be established. The southern China sequence has the advantage that the Lower Triassic is well represented.

In the Transcaucasus, Djulfian and Dorashamian are well established but the underlying sequence including the "Guadalupian" is less well known. In particular, the Kazanian needs to be clearly identified. The Lower Triassic is not well represented. In this context use of Guadalupian as a stage of the World Scale with a stratotype in USA is likely to introduce unnecessary ambiguities.

DICKENS, J.M. (in press). Late Palaeozoic climate - with special reference to the invertebrate faunas. Compt. Rendu. 9th Int. Congr. Conf. Strat. Geol.
DICKENS, J.M. (in press). Permian to Triassic changes in life. Alcheringa.

J. M. Dickens

PERMIAN BRACHIOPODS IN THE HIMALAYAS

Permian brachiopods from different parts of Kashmir, Ladakh, Spiti of the Tethys Himalaya and Bijni Tectonic unit of the Lesser Himalaya have been described in a series of papers published under our joint authorship.

Recently we have been studying new faunas from the Shyok Valley, Karakoram. The occurrence of Permian faunas from this region were first reported by Italian geologists in the 1920s. We found that we could recognize two distinct faunas of slight different ages, one of "Punjabian" age - matching the Kalabagh-Lower Chhidran faunas of the Salt Range, Pakistan, and one of "Djulfian" or Lower Djulfian Abadehan age. This prompted us to re-examine faunas and studies of these ages widely through central and south Asia, in the light of recent Japanese joint studies with Iranian and Pakistanian geologists. The Japanese studies claimed that the "Punjabian was about the same as Abadehan-Djulfian". But we have traced through Armenian, Iran, Karakoram, Salt Range and Himalayas these faunas in sequence. They are not equivalent. The "Abadehan" and "Djulfian" faunas are in fact developed in the Salt Range in sequence, clearly separate from, and stratigraphically above the "Punjabian". Our results compare much better also with the Chinese sequences.

V.J. Gupta
J.B. Waterhouse

LIST OF PUBLICATIONS ON PERMIAN STRATIGRAPHY OF HIMALAYAS

1. Permian faunal zones from the Himalaya. Bull. Ind. Geol., Vol. 10, No. 2, pp. 1-19, 1977 by JOB. Waterhouse and V.J. Gupta.

2. Early Permian fossils from the Bijni Tectonic unit, Garhwal Himalaya. Rec. Res. in Geol., Vol. 4, pp. 410-437, 1978 by JOB. Waterhouse and V.J. Gupta.

3. Early Permian faunas from the Ralakung Volcanics, Ladakh Himalaya. Race Res. in Gear. Vol. 5, pp. 31-79, 1979 by V.J. Gupta and JOB. Waterhouse.

4. Permian invertebrate faunas from Lamnimarigus himalayensis. Zone of Spiti and Ladakh regions. Contr. Him. Geol., Vol. I., pp. 5-19, 1979, by V.J. Gupta and J.B. Waterhouse.

5. Late Middle Permian brachiopods from Marbal Pass, Kashmir. Bull. Ind. Geol. Assoc., Vol. 12, No. 1, pp. 1-42, 1979, by J.B. Waterhouse and V . Gupta.

6. Early Permian fossils from southern Tibet, like faunas from Peninsular India and Lesser Himalaya of Garhwal. Jour. Geol. Soc. Ind., Vol. 20, No. 9, pp. 461-464, 1979, by J.B. Waterhouse and V.J. Gupta.

7. Permian fossils from Sikkim and Bhutan. Bull. Ind. Geol. Assoc. Vol. 12, No. 2, pp. 253-260, 1979 by V.J. Gupta and J.B. Waterhouse.

8. Early Permian palynomorphs from the Bijni Tectonic unit of the Garhwal Himalaya. Bull. Ind. Geol. Assoc., Vol. 13, No. 5, pp. 63-66, 1980, by V.J. Gupta and A. Visscher.

9. Upper Permian fossils from the Tidong Valley, Kinnaur District, Himachal Pradesh, India. Publ. Cent. Adv. Stud. Geol., Vol. 12, pp. 303-307, 1980, by V. Chopra, V.J. Gupta, K.K. Bassi and A.D. Ahluwalia.

10. Sulcispiriferina new spiriferinid genus from Permian of Himalayas. Rec. Res. in Geol., Vol. 8, pp. 389-396, 1981, by J.B. Waterhouse and V.J. Gupta.

11. A faunule from the Lamnimargus himalavensis Zone in the Shyok valley, Southern Karakoram Range. Contr. Him. Geol.., Vol. 2, by J.B. Waterhouse and V.J. Gupta.
12. An early Djulfian (Permian) brachiopod faunule from Shyok valley, Southern Karakoram Range, and the implications for dating of allied faunas from Iran and Pakistan. Contr. Him. Geol., Vol. 2, 1982, by J.B. Waterhouse and V.J. Gupta.

V.J. Gupta

COMMENT ON PERMIAN BRACHIOPOD STUDIES IN CHINA

Dear Dr. Glenister:

A symposium on Permian Brachiopoda of South China sponsored by PSC was held in Chongqing, Sichuan Province in late September 1981. Thirty-five Chinese Brachiopoda research workers especially interested in Permian attended the meeting. With great interest they spent three days visiting Permian sections in Huayinshan Mt., to the north of Chongqing, which is famous in geologist's circles of China for its fully developed Permian deposits with abundant brachiopods. Eighteen papers dealing with Permian brachiopods and biostratigraphy in China were presented in the symposium.

Distribution of brachiopods around the Perm ian-Triassic boundary, a discussion you had suggested in the symposium, was just a topic of common interest there. As early as 1965, Crurithyris from the basal Triassic was recorded in "Permian Stratigraphy and Fossil Atlas of Huayinshan Mt.", a paper for domestic distribution. Participants to that symposium investigated the boundary between Permian and Triassic there and collected specimens of Crurithyris from a bed four feet above the top of Permian together with Lingula and Claraia. So far as we know, Crurithyris and Paracrurithyris from basal Triassic were found in a number of localities in South China and almost have been regarded as a common element of the earliest Triassic fauna. It was reported that Crurithyris appears in the upper part of the Yilong Formation of Scythian stage in two localities in Guizhou Province. An Anisic species of Crurithyris was described by Dr. Xu Q. J. (1980) from Western Sichuan. It seems that appearance of Crurithyris in Triassic deposits is no longer a surprise to Chinese Brachiopoda research workers.

The marine early Triassic deposits in South China mainly consist of three facies. The Feishienkuan Formation dominated by purple siltstone and bivalves such as Pteria, Unionites usually yields Lingula but very few articulate brachiopods. The Taiyeh Formation is characterized by a dominance of ammonoids and comprised calcareous shale and argillaceous limestone. A mixed one of the former two facies has abundant bivalves such as Claraia wangi except the bed immediately above the boundary. The latter two facies contain constantly one or more beds of argillaceous limestone of 5-25 cm thick in their lowest part. Articulate brachiopods common in the underlying Permian deposits were repeatedly found in those beds and totally amounted to 17 species of 9 genera (Liao, 1981). As a rule, very few species always represented by individual specimens range up and over those beds.

The attendants share a view which we outlined in a paper (Zhang and Jin, 1976) based on a primary survey of Permian-Triassic boundary in Changxing area, i.e., a considerable amount of Permian-looking brachiopods appears in the lowest beds of Triassic; only a few of them reappear above those beds; Crurithyris may go up to the much higher horizon. Results of more extensive work in the same area by Zhao and others later on show that this is an essential fact.

Jin Yu-gan

INTEREST IN PERMIAN-TRIASSIC BOUNDARY

I read on Lethaia 15/2 the announcement of the First IPA Research Programme. Our research group in Milano has been involved for a number of years in Triassic stratigraphy and paleontology. Concerning more closely the Permo/Triassic event, we recently published a paper on the nature and evolution of Middle carbonate buildups (Marine Geology, 44/1-2, 25-57). Another paper on the first carbonate mounds will be lectured at the IV Fossil Cnidaria Symposium in New York, next year. Both papers consider the Anisian, because encrusting and carbonate trapping communities are virtually unknown during the 5-7 MY span of the Scythian. They recovered only with the Anisian.

Our research will continue along this way, i.e. “tempo and modo” of the recovering of major benthonic groups after the Permo/Triassic event. It is somewhat marginal to the main topic; however we would be interested to have connection and information about the working group activity.

Maurizio Gaetani