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The primary intention of ALBERTIANA is to promote the interdisciplinary collaboration and understanding among the members of the I.U.G.S. Subcommission on Triassic Stratigraphy. Within this scope, ALBERTIANA serves both as a newsletter for the announcement of general information and as a platform for discussion of new developments in the field of Triassic stratigraphy. ALBERTIANA thus encourages the publication of announcements, literature-reviews, progress-reports, preliminary notes, etc. - i.e. those contributions in which information is presented relevant to current interdisciplinary Triassic research.

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Non-members of the Subcommission on Triassic Stratigraphy can obtain ALBERTIANA at the cost of US $ 2.50 per issue (bank-cheque to Mr.A.J.Goslinga,Laboratory of Palaeobotany and Palynology, Heidelberglaan 2, 3584 CS Utrecht, The Netherlands).

IN MEMORIAM

On the 3rd of June 1986 the prominent Slovak geologist RNDr. Jan Bystricky suddenly died at the age of 64. In the Czechoslovak as well as in the international geological world the high standard of his scientific work made him one of the leading authorities in the field of Triassic algae, biostratigraphy and geological science in general. He studied at the Faculty of Natural Sciences in Bratislava and in the meantime he gained a good deal of geological knowledge, also as Prof. Andrusov's assistant at the Geological Institute of the Slovak Technical University. He graduated in 1949 and received his first doctorate - RNDr. - in 1950. Afterwards, he worked in several geological institutions in Bratislava, Spisska Nova Ves and Roznava, where, apart from geological mapping, he was engaged in hydrogeological problems, in the research of ore deposits, ceramic materials, high-percentage limestones, etc.. Thus he gained a lot of experience both in research and in applied geology. From 1955 till 1958 he was head of the Mesozoic department at the D. Stur Geological Institute of Bratislava. Being one of the best experts in the structure and tectonics of the West Carpathians, he became in that period editor for Slovakia of the general geological maps. From 1964 till his death he worked in the Geological Institute of the Slovak Academy of Sciences in Bratislava.

Dr. Bystricky's principal domain was the biostratigraphical research of the West Carpathians Triassic, mainly of the Gemeride area. On the basis of dasycladacean algae and some macrofossils he succeeded in dividing monotonous Middle and Upper Triassic of the Slovak Karst. He gave precision to the terms "Tisovec" and "Furmanec Limestone"; his division of the Upper Triassic in reef facies has also been applied in the Northern Calcareous Alps. The monograph "Stratigraphie und Dasycladaceen des Gebirges Slovensky Kras" (Bratislava, 1964) is considered the basic work for the area up till now. In the Muran Plateau he stated the occurrence of the Dachstein Limestone, and he discovered the Jurassic and Cretaceous in the reef development in the area of Sumiac. Thorough knowledge of Gemeride biostratigraphy helped him to solve tectonic problems as well and to define the Veternik and Havranica nappes in the Malé Karpaty Mts., and the Drienok nappe in the area of Poniky.

Dr. Bystricky's palaeontological research was focused on the Dasycladacea. The results brought him an international reputation, as they were also applied in the stratigraphy of the alpine reef complexes. He was the first to find dasycladaceans in the Upper Triassic of the West Carpathians. In a set of papers the new genus Andrusoporella and a series of new Triassic and also Palaeocene dasycladacean species were established. The majority of Dr.

Bystricky's publications signified something new and momentuous, bringing about stimulations for solving a whole range of serious problems. The results of his scientific work are gathered in about hundred papers and monographs, and in a series of research reports. All of them, being thorough and precise, are of permanent value. One of his last works is a comprehensive "Catalogue of the Triassic Dasycladales from the West Carpathians, on the basis of thin sections", providing a lot of new information on their distribution and zonation.

In "organic" connection with his research Dr. Bystricky became engaged in numerous professional organizing functions. He was a member of the editorial board of several geological periodicals in Czechoslovakia, member of qualification commissions for awarding scientific degrees in palaeontology, member of the Czechoslovak stratigraphic commission on the Czechoslovak Academy of Sciences, head of the Czechoslovak stratigraphic committee of the Carpatho-Balkan Geological Association, from 1969 till 1975 member of the Czechoslovak National Geological Committee etc.. As a member of the Subcommission on Triassic Stratigraphy of the IUGS he contributed much to its activity.

Many of us knew him well as an agile coordinator of the Czechoslovak part of the IGCP Project nr. 4 "Triassic of the Tethys Realm" and as an experienced leader of a group of Czechoslovak specialists on the Triassic.

Being friendly and erudite, Dr. Bystricky was good company. His death means a sad loss to his many friends and colleagues.

Milos Siblik.

SUBCOMMISSION ON TRIASSIC STRATIGRAPHY

REPORT 1986

H. VISSCHER

In 1986 the Subcommission on Triassic Stratigraphy concentrated its activities mainly on (a) the problem of the definition of the Permian - Triassic boundary, and (b) the nomenclature at the level of Stage and Substage of the Lower Triassic.

Both topics were discussed in detail during the 'Field conference on Permian and Permian-Triassic boundary in the South-Alpine segment of the Western Tethys' (July 4-12), organized by the Italian group of IGCP project nr. 203 (Permian and Triassic events of the Eastern Tethys region and their international correlation). Many members of the STS participated in the excursions to various parts of the southern Alps of Italy and Yugoslavia, the scientific sessions at Brescia and the formal meeting of the STS which was held in conjunction with the field conference (Brescia, July 11).

The outcome of the discussion on the Permian-Triassic boundary will be reported by the Permian-Triassic boundary working group. With regard to the subdivision of the Lower Triassic there was no consensus among the STS members present. It was decided to send the various options to all members in order to vote for the most suitable solution. Information will be given by C. Virgili in a separate circular. Thus a recommendation which will be supported by a majority of STS members may be expected to become available in 1987.

After the Italian meeting, another field meeting was held in Turkey. The STS participated in the organization of this 'Late Permian and Triassic workshop meeting in western Turkey' (July 12-23) and a number of members was present. Among other topics, there was an excursion to the type locality of the Bithynian Substage in the vicinity of Gebze.

During the Brescia meeting STS membership was discussed. It was decided that the STS officers should send their proposal for a revised membership list to the present members for ratification.

A table reflecting the current views of the STS officers with regard to the subdivision of the Triassic System is presented by E.T. Tozer in this issue of ALBERTIANA.

FIELD WORKSHOP ON TRIASSIC AND JURASSIC SEDIMENTS IN THE EASTERN ALPS OF SWITZERLAND (August 25-29, 1985) - REPORT

For more than 20 years a research group of the Swiss Federal Institute of Technology (ETH-Zürich) and from the University of Zürich has been working on the geology of the western and of the eastern Alps. In the last years most of the stratigraphy has been reinvestigated. These studies have resulted in a revision of the lithostratigraphical classification and correlation of Triassic and Jurassic sediments in the Austroalpine nappes in Graubünden (eastern Switzerland) and adjacent parts of Italy.

The present state of knowledge was demonstrated during an international field workshop, which was attended by 40 European geologists. The aim of the meeting was to present new results on the Triassic/Jurassic stratigraphy and facies and to discuss stratigraphical correlations, paleo-environments, paleogeographical and palinspastic reconstructions.

The following topics were covered by a series of excursions:

- The sedimentary cover at the western end of the Silvretta nappe.
- Jurassic sediments of the Ela nappe; Albulapass-Gualdauna-Val d'Escha.
- Triassic sediments of the Engadine Dolomites along the Ofenpass road.
- Upper Triassic platform carbonates of the Kössen Formation and Lower Jurassic sediments of the Allgau Formation with turbidites and massflows.
- Triassic and Jurassic formations of the Bernina nappe.
- Upper Triassic platform carbonates, Jurassic condensed sections of submarine highs and basinal massflows and turbidites of the Samedan Zone.
- Damsite Lake Marmorera (South Pennine Platta nappe).

A detailed guide-book on the Triassic/Jurassic field workshop was edited by H. Furrer with contributions of B. Aemissegger, G. Eberli, W. Eichenberger, S. Frank, H. Furrer, H. Naef and R. Trümpy (Mitteilungen aus dem Geol. Inst. der ETH und der Univ. Zürich, Neue Folge, 248, 81 pp.).

FIELD CONFERENCE ON PERMIAN AND PERMIAN-TRIASSIC BOUNDARY IN THE SOUTH-ALPINE SEGMENT OF THE WESTERN TETHYS (July 4-12, 1986) - REPORT

A field conference on the Permian and Permian-Triassic boundary in the southern Alps between Lombardy and Slowenia was presented as an Italian contribution to the IGCP-project nr. 203. Under the direction of Prof. Dr. G. Cassinis, the meeting was organized by geologists of the universities of Bologna, Cagliari, Erlangen, Ferrara, Ljubljana, Milano, Modena, Padova, Pavia, Roma and Siena. There were approximately 100 participants from all over the world.

The field programme included the following general topics:

- Marine development of the uppermost Zazar beds and the lowermost Scythian beds (Slowenia).
- Marine development of the Upper Permian in the type of Karavanke Mountains and the Scythian (Slowenia).
- Trogkofel reef limestone, *Pseudoschwagerina carniolica* beds, Tarvis Breccia and Gröden beds (Slowenia).
- The Tarvisio Breccia and Val Gardena Sandstone: lithostratigraphy and paleo-environments (Carnia).
- The Permian-Triassic boundary (Carnia and Comelico).
- The Upper Permian sequence and the P-T boundary in the Sass de Putia Mountains (Dolomites).
- The Bletterbach-Butterloch section: Val Gardena Sandstone and *Bellerophon* Formation (Dolomites).
- The Permian-Triassic boundary and the Early Scythian sequence, Tesero section (Dolomites).
- The Werfen Formation (Lower Triassic) in the Costabella Mt., Vomo section (Dolomites).
- The continental Permian south of the Adamello Massif (Lombardy).

The participants were largely impressed by the amount of new information from the many localities visited. Notably the many detailed paleontological analyses of the transition between the *Bellerophon* and Werfen Formations became important arguments in the discussion about the position of the Permian-Triassic boundary in the southern Alps.

A detailed guide-book to the excursions was edited by the Italian IGCP 203 group (publication of the Societa Geologica Italiana, 180 pp.).

During the scientific session at Brescia, a large number of research papers was presented. Contributions related to the Permian-Triassic boundary problem and the Lower Triassic included.

- A. Barabas-Stuhl, A. Berczi-Makk, F. Goczan, J. Haas, G. Majoros and A. Oravecz-Scheffer: Permian-Triassic boundary in Hungary.
- A. Baud, W.T. Holser and M. Magaritz: Carbon-isotope profiles in the Permian-Triassic of the Tethys from the Alps to the Himalayas.
- R. Brandner, D.A. Donofrio, K. Krainer, H. Mostler, M.A.Nazarov, W. Resch, V. Stingl and H. Weissert: Events at the Permian-Triassic boundary in the southern and northern Alps.
- C. Broglio Loriga, C. Neri, M. Pasini and R. Posenato: Marine fossil assemblage from Upper Permian to lowermost Triassic in the western Dolomites (Italy).
- K.J. Budurov, V.J. Gupta, R.K. Kachroo and M.N. Sudar: Problems of the Lower Triassic conodont stratigraphy and the Permian-Triassic boundary.
- W. Buggisch, R. Bär and S. Noë: Paleogeography and facies of the *Bellerophon* Formation and lowermost Werfen Formation between Rio Adige and eastern Carnic Alps.
- G.B. Carulli, C. Pirini Radrizzani and M. Ponton: The Permo-Triassic boundary in the Paularo area (Carnia).
- J. M. Dickins: The world significance of the Hunter/Bowen (Indosinian) Mid-Permian to Triassic folding phase.
- Ding, Meihua: Permian-Triassic boundary and conodonts in South China.
- V.J. Gupta and M.E. Brookfield: The Permian section and Permian-Triassic boundary in Kashmir, India. New probably complete sections of the southern Tethys passive margin.
- F. Hirsch and I. Weissbrod: The Permian-Triassic boundary in Israel.
- F. Massari: Some thoughts on the Permo-Triassic evolution of the South Alpine area (Italy).
- C. Neri: Sedimentary events at the *Bellerophon*/Werfen boundary (Dolomites, Italy).
- N.D. Newell: The boundary between the Paleozoic and Mesozoic Erathems?
- A. Nicora: The conodont fauna of the Lower Triassic of Zanskar Range, Himalaya.
- S. Noë and W. Buggisch: Microfauna and microflora in the *Bellerophon* Formation and at the Permian-Triassic boundary in the Southern Alps: ecology and biostratigraphy.
- M. Oddone and R. Vannucci: Geochemical stratigraphy at the P/T boundary in the southern Alps.
- S.C. Shah and D.K. Bhatt: A review of latest Permian - basal Triassic sequences in India with comments on the present status of the Permian-Triassic boundary.
- W.C. Sweet: Graphic correlation of Lower Triassic rocks and development of a high-resolution chronostratigraphic framework.
- E.T. Tozer: Definition of the Permian-Triassic (P/T) boundary: the question of the age of the *Otoceras* beds.
- H. Visscher and W.A. Brugman: The Permian-Triassic boundary in the southern Alps. A palynological approach.
- Yang Zunyi; Advancements of researches on Permo-Triassic events in China.

- Ying Hongfu, Yang Fengging, Zhang Kexing and Yang Weiping: A proposal on the Permian-Triassic biochronologic boundary.
- Y. D. Zakharov: Type and paratype of the Permian-Triassic boundary.

Abstracts of all communications were published by the Societa Geologica Italiana.

LATE PERMIAN AND TRIASSIC WORKSHOP MEETING IN WESTERN TURKEY (July 12-23, 1986) - REPORT

Four institutions joined their efforts to organize a workshop and field meeting on the Late Permian and Triassic of western Turkey: (1) the Technical University of Istanbul (with Prof.Dr. K. Kafali, rector of the University), (2) the Faculty of Mines, Istanbul (with Prof.Dr. E. Yüzer, Dean of the Faculty, Dr. A.M.C. Sengör, Dr. N. Ozgül, Dr. R. Akkök), (3) the "Laboratoire de Tectonique" of Paris VII University (with Dr. J. Marcoux) and (4) the Subcommission on Triassic Stratigraphy (with Dr. A. Baud, Vice Chairman).

The meeting was attended by 22 specialists from 11 countries and 4 continents; it was small enough to enable warm and durable contact between the participants.

The scientific conference was held at the Istanbul Faculty of Mines on July 14th. The following communications were presented:

- A.M.C. Sengör: Opening of the Conference and introduction to the geology of western Turkey.
- O. Monod: Triassic of the western Taurus.
- L. Krystyn and J. Marcoux: Hallstatt facies in the Antalya nappes.
- N. Fantini Sestini and A. Nicora: Ammonoid stratigraphy of the Gebze area.
- H. Rieber: Stratigraphy and ammonoids from the Lower Buchenstein beds (Southern Alps).
- K. Nakamura: Late Permian brachiopods in Spitzbergen and Greenland.
- A. Baud, W.T. Holser and M. Margaritz: C-isotopes geochemistry and Permo-Triassic boundary in western Tethys between Greece and Iran.
- E.T. Tozer: Permo-Triassic boundary in the Arctic.

During the field trip (9 days), three main Triassic outcrop areas have been visited:

- An excursion to the Gebze area near Instanbul was organized by N. Görür and Dr. A.M.C. Sengör. The participants had the unique opportunity to study in detail the composite Triassic section in the hills N and NE of Gebze and to compare this section with the type locality of the Bithynian (Early-Middle Anisian) at the coast, SE of Gebze.

- The Antalya nappes W of Kemer (SW Turkey). Here the Permian and Triassic have been investigated for many years by J. Marcoux, who presented with the collaboration of A. Baud and L. Krystyn, four main topics: (1) shallow carbonate Permo-Triassic boundary sections, (2) Early to Middle Triassic shallow carbonate sections, (3) Middle and Late Triassic deep water Hallstatt facies, radiolarites and "pietra verde" in profiles belonging to large scale southward thrusted nappes and each occurring in different palaeostructural positions within the southern margin of the Neotethys, and (4) Late Triassic olistostromes with aragonitic-preserved reefoidal organisms ('Cipit-type boulders').

- The area between Antalya and Seydisehir. This area has been investigated by Dr. O.Monod from the Université d'Orsay (Paris), who showed a selection of Triassic outcrops. Of particular interest was the visit to the highly fossiliferous Middle Triassic limestones described by Assereto and Monod (1976) near Seydisehir.

The logistics of the field trip were excellently organized by Dr. R. Akkök. The excursions have demonstrated the great progress which has been made in the last few years with respect to accumulating knowledge about the Permian and Triassic of this key segment of the Tethys realm.

C.I.M.P. MEETINGS AND TRIASSIC PALYNOLOGY - REPORT

Despite its Palaeozoic connotation the Commission Internationale de Microflore du Paléozoique (C.I.M.P.) has always paid considerable attention to Triassic palynostratigraphy. This is well-demonstrated by the programmes of the two C.I.M.P. meetings which were organized in 1986.

A symposium 'Boundaries and Palynology' was held at Sheffield (April 16-19); it was organized jointly by C.I.M.P. and the Palynology School, Dept. of Geology, Univ. of Sheffield. Contributions on Triassic palynology included:

- G. Warrington: Through the time barrier - Late Carboniferous to Early Jurassic palynostratigraphy.
- P.M. Van Veen: Triassic palynostratigraphy of the Barents Sea: the Permian-Triassic boundary.
- S. Piasecki: The Permian-Triassic boundary of Jameson Land, Central East Greenland.
- W.A. Brugman: The Lower/Middle Triassic boundary in Europe: a quantitative approach to palynology.
- H.H. Ecke: Palynology of the Permian-Triassic transition in the Germanic Basin.
- W. Brenner and W. Wille: Palynology of the Rhaeto-Liassic boundary in SW Germany.

Abstracts were issued by the Palynology School, Dept. of Geology, University of Sheffield.

In New York City, the American Association of Stratigraphic Palynologists (A.A.S.P.) and the C.I.M.P. organized their third joint meeting (October 29-November 1, 1986). The meeting included a symposium on Triassic-Jurassic palynology, during which the following contributions on Triassic topics were presented:

- H. Visscher and W.A. Brugman: Towards a palynological characterization of the standard units of Triassic chronostratigraphical classification in Europe.
- G. Warrington: The Late Triassic and Early Jurassic palynomorph succession in Somerset, England.
- Y. Eshet, H.L. Cousminer and D. Habib: Permo-Triassic palynozonation in Israel - progress report.
- A. Traverse: Closing the semicircle: palynofloras of the Eagle Mills Formation and South Georgia Basin date the initial rifting-precursors of the Gulf of Mexico and Atlantic Ocean.
- V.D. Wiggins: Upper Triassic (Late Carnian - Early Norian) dinocyst assemblages from northern Alaska.

Abstracts published by A.A.S.P..

The one-day field trip scheduled with this meeting concentrated on the terrestric deposits and volcanics of the Newark Supergroup (Late Triassic - Early Jurassic) outcropping in New Jersey. Field trip guide-book published by A.A.S.P..

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In April 1988 the C.I.M.P. and the Laboratory of Palaeobotany and Palynology of the University of Utrecht will jointly organize a symposium on

CIRCUM-MEDITERRANEAN PALYNOLOGY

Of course, the Triassic will not be neglected !

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TRIASSIC STAGE TERMINOLOGY

E.T. TOZER

An objective of the Triassic Subcommmission is to achieve consensus and make recommendations regarding chronostratigraphic nomenclature. The first step is to make recommendations for the nomenclature of stages. Ultimately it is hoped to make more detailed recommendations, along the lines of the synthesis in Zapfe (1983), reproduced in Albertiana 1, pp. 4,5 (Visscher, 1983).

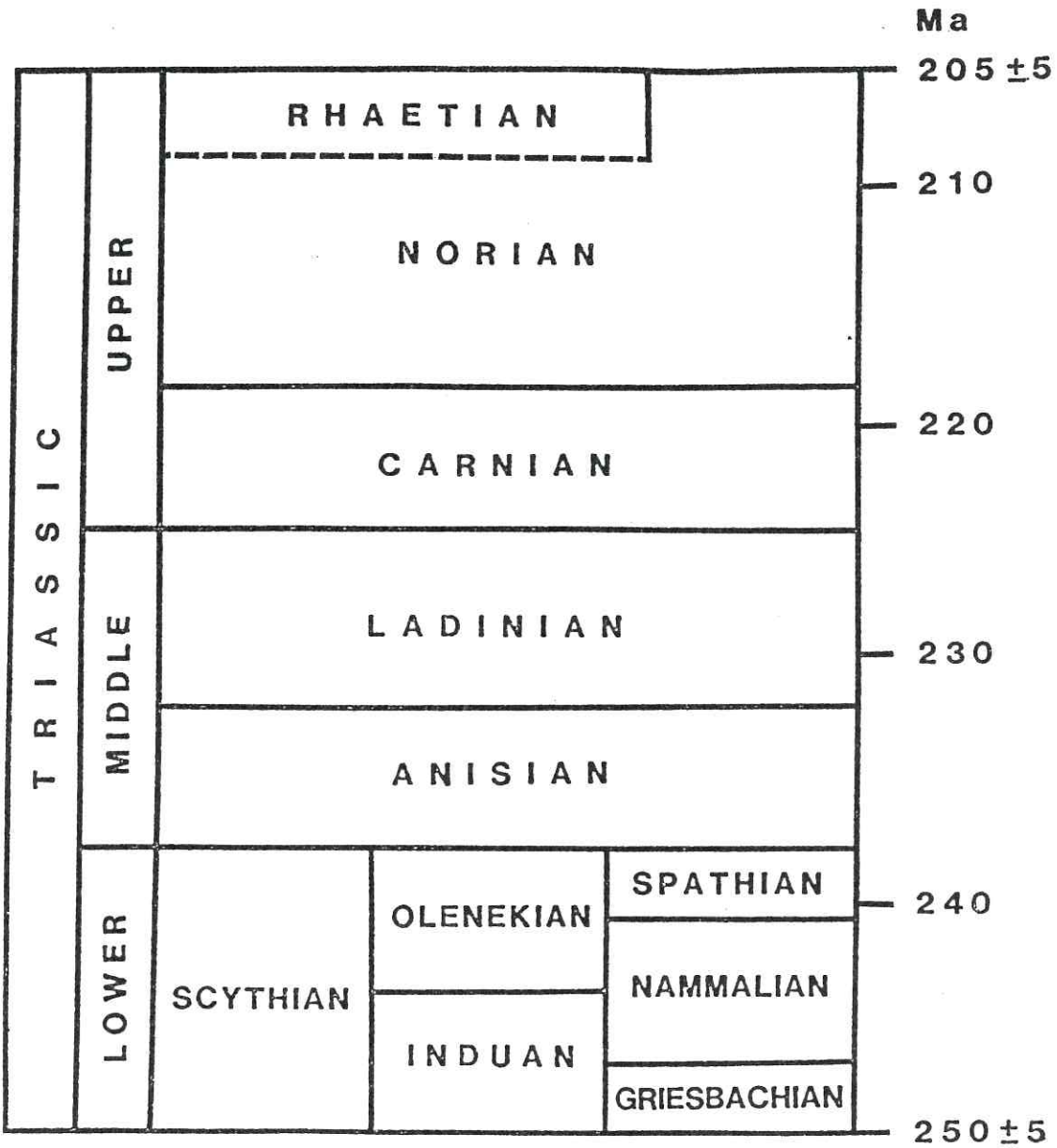
This matter has been discussed at meetings of the Subcommission and has been reviewed and discussed in earlier editions of Albertiana by Henk Visscher. His first review was made in 1984, before the Subcommission meeting held in Moscow at the 27th IGC, the second review, incorporating a few changes proposed at the Moscow meeting, was published in Albertiana 3, pp. 1-2, March 1985 (Visscher 1984, 1985).

On July 11, 1986, a meeting of the Subcommission attended by Chairman Virgili, Secretary General Visscher, and Vice Chairmen Baud and Tozer was held in Brescia (Italy). On July 22 Virgili, Baud and Tozer met again at Seydisehir (Turkey).

The Table accompanying this article incorporates the current views of Baud, Tozer, Virgili and Visscher.

It would seem that everybody agrees that Anisian, Ladinian, Carnian and Norian are acceptable as Triassic stages. There is some disagreement about spelling, namely Karnian versus Carnian. Karnian was favoured at the Moscow meeting; Carnian is favoured by Gaetani (1984, p. 5). The origin of the name is Roman and refers to the mountainous area - Carnia - which is now part of north-eastern Italy, south of the frontier with Austria. To the Romans the Celtic inhabitants were the Carni. Today the mountains on the frontier are the Alpi Carniche to the Italians, the Karnische Alpen to the Austrians. The Triassic exposures in Carnia referred to by Mojsisovics (1869) in his original definition of the "Karnische Stufe", namely the Raibl Beds, are in Italy, south of the Carnic Alps proper, on the frontier with Yugoslavia (Lieberman, 1980). For international use Carnian thus seems correct, as indicated by Gaetani.

At present consensus has not been achieved on two questions: (1) whether or not the Rhaetian should be regarded as the final Triassic stage; (2) whether the Lower Triassic should be divided into one, two, three or four stages. The Table provides some alternatives for the Lower and the latest Triassic.


Ma
205 ±5
210
220
230
240
250 ±5
TRIASSIC
UPPER
MIDDLE
LOWER
RHAETIAN
NORIAN
CARNIAN
LADINIAN
ANISIAN
SCYTHIAN
OLENEKIAN
INDUAN
SPATHIAN
NAMMALIAN
GRIESBACHIAN

There is now general agreement that the ages of stratotype Rhaetian and Norian overlap. The dashed line defining the base of the Rhaetian indicates that its beginning, in terms of divisions within the Norian, has not been satisfactorily determined.

Treatment of Norian as the ultimate Triassic stage appears to be acceptable to a majority of the contemporary workers concerned with the question Baud, 1977, Dagys and Dagys, 1984; Fabricius, 1974; Hallam, 1981; Palmer, 1983; Rostovstev and Zhamoida, 1984; Taylor, Smith, Laws and Guex, 1983; Wang, Chen, He and Chen, 1981; Tozer, 1980, 1984).

A minority (albeit a substantial one!) would rank the Rhaetian as the ultimate Triassic stage (Gazdzicki, Kozur and Mock, 1979; Kovacs, 1984; Kozur, 1985; Krystyn, in Zapfe, 1983; Visscher and Schuurman, 1979; Warrington, in Forster and Warrington, 1985; Wiedmann, 1974; Yang, in Yang et al., 1986).

The Rhaetian problem was discussed in some detail by Wiedmann, Frabricius, Krystyn, Reitner and Urlichs (1979). A majority favoured recognition of Rhaetian as the final Triassic stage but the only proposal acceptable to all five authors was the reduction of Rhaetian to a substage of the Norian.

For the Lower Triassic a large number of divisions has been proposed as stages in the last 30 years. Most are listed in Tozer (1984, pp. 144-149). Several overlap in scope. This is not the place to review the long and complicated history of Lower Triassic chronostratigraphic nomenclature. The Subcommission meetings revealed that some workers, particularly those concerned with the non-marine Triassic, favoured no divisions within the Lower Triassic. Their requirements are satisfied by treating the Scythian as a stage, although this procedure is hard to justify in terms of the original definition (Tozer, 1971; Dagys, 1985). Most Russian workers recognize two stages, Induan and Olenekian. In North America recognition of four Lower Triassic stages has proved feasible (Silberling and Tozer, 1968) but for world wide use it now seems more appropriate to treat the middle divisions (Dienerian and Smithian) as substages of the Nammalian (Tozer, 1981, p. 405). The Table thus provides three alternatives for the Lower Triassic, namely one, two or three stages.

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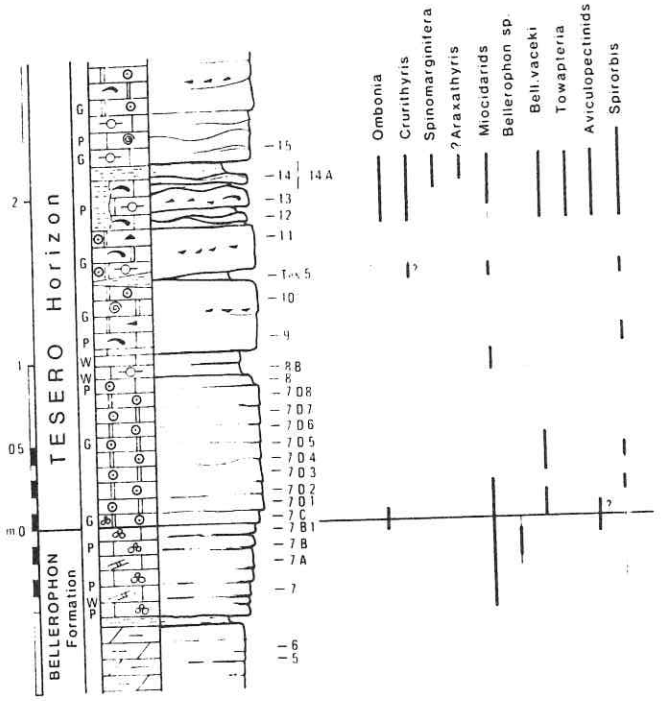

One of the topics of the Field Conference on the Permian and the P/T boundary in the Southern Alps: the study of the boundary between the Bellerophon and Werfen Formations in the Tesero section

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MUTUAL RELATION BETWEEN AMMONOID AND CONODONT ZONES IN THE SALT RANGE AND TRANS-INDUS RANGES, PAKISTAN

K. NAKAZAWA

The Lower Triassic System of the Salt Range and the Trans-Indus Ranges in Pakistan has been considered to represent the most important reference section in the Tethyan Province since the studies of Waagen (1889, 1895), Noetling (1901) and Spath (1934). The detailed stratigraphical and biostratigraphical research had, however, not been performed until Kummel (1966) and Kummel and Teichert (1970) gave full descriptions of the succession and a new classification which was adopted by the Pakistani organization. Sweet (1970) succeeded to establish the conodont zonation throughout the Lower Triassic and Guex (1978) reexamined several sections and proposed new ammonoid zones. The mutual relation between conodont and ammonoid zones, which is important for the international correlation and hence for the Triassic standard classification is, however, not clear. This is accomplished by the joint survey of Japanese scientists and staff of the Geological Survey of Pakistan, the Pakistani-Japanese Research Group (PJRG) on the marine Permian and Lower Triassic. The results have recently been published (PJRG, 1985).

I wish to introduce the essential part of this study to the STS members for further discussion.

1. The identification of Waagen's original classification in the field is not easy due to vague definitions without detailed columnar sections. Kummel (1966) disregarded the Waagen's scheme and proposed a new classification. He named the Lower Triassic strata collectively the Mianwali Formation, comprising the Kathwai, Mittiwali and Narmia Members in ascending order. The Kathwai Member occupies the uppermost part of the Upper *Productus* limestone of Waagen, but the Lower Triassic ammonoid, *Ophiceras connectens*, was discovered by Schindewolf (1954) and included in the Triassic. Guex (1978), on the other hand, recognized most of the Waagen's stratigraphic units, but substituted them for Unit II to Unit VII.Unit I corresponds to the Kathwai Member and Unit V includes the Bivalve beds and Dolomite beds of Waagen, but designated as intermediate horizons. This part of Waagen is difficult to identify, because Bivalve beds seem to include different horizons and the definition of the Dolomite beds is unclear. PJRG (1985) revived the Kummel's nomenclature, but divided the Mittiwali Member into five units which correspond from Unit II to Unit VI of Guex (Table 1).

2. Guex (1978) distinguished six ammonoid zones and correlated them with those of North America established by Silberling and Tozer (1968), i.e. the *Ophiceras connectens**, *Gyronites frequens**, *Meekoceras gracilitatus*, *Anasibirites pluriformis**, *Tirolites-Columbites* and *Tozericeras pakistanum** Zones (*clearly defined zone). There were found very few ammonites

from Units III and IV (Ceratite marls and Ceratite sandstone of Waagen) and no ammonoid zones could be recognized in this part, although many species were reported by Waagen and five ammonoid zones by Mojsisovics et al. (1985),and three by Noetling (1901) are proposed. PJRG also failed to collect many specimens from this part except from the lowermost horizons. Actually ammonoids are not common, and more materials from stratigraphically controlled horizons will be required to evaluate the ammonoid zones reported. PJRG recognized the *Koninckites davidsonianus* Zone in the lowermost part of Unit 1 of the Mittiwali Member (Unit II of Guex and Ceratite marls of Waagen). *Paranorites* is found in the lower half of Unit 3 and *Flemingites* sp. in the middle and upper parts of Unit 4.

The *Tirolites-Columbites* Zone represents the lower part of Unit VI (Unit 5 of the Mittiwali Member). *Eophyllites* sp. was newly found in the upper part of Unit 5. *Nordophiceras* sp. was newly found in the uppermost part of the Narmia Member, i.e., above the uppermost *Tozericeras pakistanum* ammonoid Zone of Guex.

3. Nine conodont zones were distinguished by Sweet (1970) in the Lower Triassic Mianwali Formation, i.e., the *Typicalis*, *Carinata*, *Kummeli*, *Dieneri*, *Cristagalli*, *Pakistanensis*,*Waageni*, *Jubata* and *Timorensis* Zones. All these zones were also confirmed by PJRG. The *Neospathodus homeri - N. triagularis* Zone of PJRG roughly corresponds to the *Jubata* Zone of Sweet. PJRG further recognized the *Gondolella elongata* Zone between the *Waageni* Zone below and the *Homeri-Triangularis* Zone above in the uppermost short interval of Unit 4.

   The lowermost *Anchignathodus typicalis* (= *Hindeodus minutus*) conodont Zone of Sweet was named the *Hindeodus parvus* - Isarcicella *isarcica* Zone. Noticeable is that the Kathwai Member was divided into three units by PJRG instead of the twofold division -dolomite unit and limestone unit- of Kummel and Teichert (1970). The lower unit is referred to as Permian based on the occurrence of Permian brachiopods and foraminifers with no Triassic fossils. It is also mentioned that the lower part of the middle unit is characterized by the association of *parvus* and *minutus* without *isarcica*, but the separation of this part as a distinct zone is premature due to poor specimens.

4. The correlation of ammonoid and conodont zones is given in Table 1. Guex referred to the *Ophiceras connectens* Zone as Upper Griesbachian, but, based on the correlation with conodont zones, it covers, at least, a part of the Lower Griesbachian (*Otoceras* Zone). A discovery of *"Glyptophiceras" himalayanum* from the basal part of this zone (Kummel,1970) supports this conclusion.

Table 1.

Correlation of the Lower Triassic classification, ammonoid and conodont zones in the Salt Range, Pakistan.

Waagen, 1895		Guex, 1978	Pakistani-Japanese Research Group, 1985					
Dolomite group	Topmost limestone	Unit VII	Mianwali Formation	Narmia Member		*Nordophicer.* sp. Zone	*Neospathodus timorensis*	Spathian
Dolomite group	Topmost limestone	Unit VII	Mianwali Formation	Narmia Member		*Tozericeras pakistanum* Z.	*Neospathodus homeri*– *N. triangularis* Zone	Spathian
Dolomite group	Dolomite beds ?	Unit VI	Mianwali Formation	Mittiwali Member	Unit 5	*Eophyllites* sp.	(*Neospathodus homeri*– *N. triangularis* Zone)	Spathian
Bivalve limestone	Bivalve beds ?	Unit VI	Mianwali Formation	Mittiwali Member	Unit 5	*Tirolites-Columbites* Zone	(*Neospathodus homeri*– *N. triangularis* Zone)	Spathian
Bivalve limestone	Upper Ceratite limestone	Unit V	Mianwali Formation	Mittiwali Member	Unit 4	*Anasibirites pluriformis* Z.	*Gondolella elongata* Z.	Smithian
Bivalve limestone	Upper Ceratite limestone	Unit V	Mianwali Formation	Mittiwali Member	Unit 4	*Meekoceras gracilitatus* Z.	*Neospathodus waageni* Zone	Smithian
Ceratite beds	Ceratite sandstone	Unit IV	Mianwali Formation	Mittiwali Member	Unit 3	*Flemingites* sp.	(*Neospathodus waageni* Zone)	Smithian
Ceratite beds	Ceratite sandstone	Unit IV	Mianwali Formation	Mittiwali Member	Unit 3	*Paranorites* sp.	*Neospathodus pakistanensis* Zone	Dienerian
Ceratite beds	Ceratite marls	Unit III	Mianwali Formation	Mittiwali Member	Unit 2	*Koninckites davidosonianus*	*Neospathodus cristagalli* Zone	Dienerian
Ceratite beds	Lower Ceratite limestone	Unit II	Mianwali Formation	Mittiwali Member	Unit 1	*Gyronites frequens* Zone	*Neoapathodus dieneri* Zone	Dienerian
Ceratite beds	Lower Ceratite limestone	Unit II	Mianwali Formation	Mittiwali Member	Unit 1	*Gyronites frequens* Zone	*Neospathodus kummeli* Zone	Dienerian
		Unit I	Mianwali Formation	Kathwai Memb.	Upp.	*Ophiceras connectens* Zone	*Gondolella carinata* Zone	Griesbach.
		Unit I	Mianwali Formation	Kathwai Memb.	Mid.	(*"Glyptophiceras" himalay.*)	*Hindeodus parvus*– *Isarcicella isarcica* Zone (*H. parvus-minutus*)	Griesbach.
		Unit I	Mianwali Formation	Kathwai Memb.	Low.		(*Hindeodus minutus*)	

The uppermost part of the Narmia Member which is included in the *Nordophiceras* sp. Zone is correlated with the uppermost Lower Triassic ammonoid zone, i.e., the *Subcolumbites* Zone, judging from the association with the *Neospathodus timorensis* conodont assemblage.

The *Gyronites frequens* Zone, the lower Gyronitan of Spath, is most probably comparable to the *Proptychites candidus* Zone of the Boreal province, the lower Dienerian, based on the common occurrence of *Neospathodus kummeli*. Accordingly, the Otoceratan /Gyronitan boundary is considered to coincide with the Griesbachian/Dienerian boundary.

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LATE SCYTHIAN AND MIDDLE TRIASSIC PALYNOSTRATIGRAPHY IN THE ALPINE REALM

W.A. BRUGMAN

As an integral part of a palynostratigraphical research-project in the Alpine Triassic, the investigation of core-samples from reconnaissance wells in the Transdanubian Central Range and outcrop sections in the Vicentinian Alps has resulted in a palynological characterization of the Upper Scythian (Spathian) and the Anisian. (Brugman, 1986).

Six characteristic phases in the compositional development of palynological assemblages have been reconstructed, the *nejburgii-heteromorphus* phase (Upper Smithian-Lower Spathian), the *heteromorphus-conmilvinus* phase (Upper Spathian), the *conmil-vinus-crassa* phase (Spathian-Anisian transition), the *crassa-thiergartii* phase (Lower Anisian), the *thiergartii-vicentinense* phase (Upper Anisian) and the *vicentinense-scheuringii* phase (uppermost Anisian).

On the basis of quantitative information (local) subphases may be recognized. Quantitative compositional changes are largely related to environmental changes.

The new palynostratigraphical information, in combination with earlier data on the Ladinian from the Western Dolomites (Van der Eem, 1983) is here reproduced in the form of a generalized semi-quantitative range-chart of selected palynomorphs (Table).

The phases recognized are tentatively placed alongside the Alpine/Tethyan ammonoid zonation of Krystyn (in Zapfe, 1983; in Visscher, 1983) as well as the standard stages and substages.

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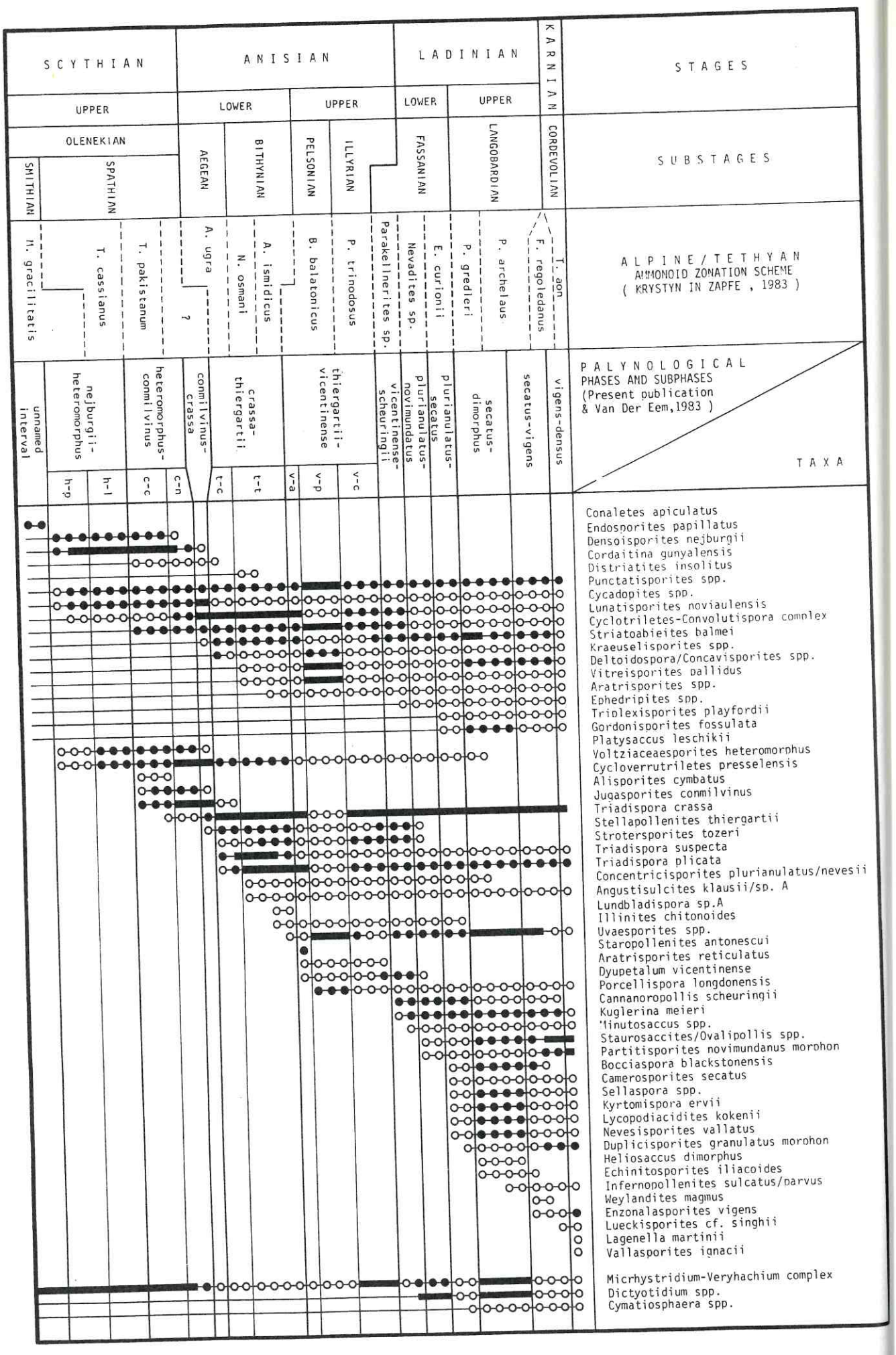
SCYTHIAN
ANISIAN
LADINIAN
KARNIAN
STAGES
UPPER
LOWER
UPPER
LOWER
UPPER
SUBSTAGES
OLENEKIAN
SMITHIAN
SPATHIAN
AEGEAN
BITHYNIAN
PELSONIAN
ILLYRIAN
FASSANIAN
LANGOBARDIAN
CORDEVOLIAN
M. gracilitatis
T. cassianus
T. pakistanum
A. ugra
?
A. ismidicus
N. osmani
B. balatonicus
P. trinodosus
Parakellnerites sp.
Nevadites sp.
E. curionii
P. gredleri
P. archelaus
F. regoledanus
T. aon
ALPINE/TETHYAN AMMONOID ZONATION SCHEME (KRYSTYN IN ZAPFE , 1983)
PALYNOLOGICAL PHASES AND SUBPHASES (Present publication & Van Der Eem,1983)
TAXA
unnamed interval
nejburgii-heteromorphus
heteromorphus-conmilvinus
conmilvinus-crassa
crassa-thiergartii
thiergartii-vicentinense
vicentinense-scheuringii
plurianulatus-novimundatus
plurianulatus-secatus
secatus-dimorphus
secatus-vigens
vigens-densus
h-p
h-l
c-c
c-n
t-c
t-t
v-a
v-p
v-c
Conaletes apiculatus
Endosporites papillatus
Densoisporites nejburgii
Cordaitina gunyalensis
Distriatites insolitus
Punctatisporites spp.
Cycadopites spp.
Lunatisporites noviaulensis
Cyclotriletes-Convolutispora complex
Striatoabieites balmei
Kraeuselisporites spp.
Deltoidospora/Concavisporites spp.
Vitreisporites pallidus
Aratrisporites spp.
Ephedripites spp.
Triplexisporites playfordii
Gordonisporites fossulata
Platysaccus leschikii
Voltziaceaesporites heteromorphus
Cycloverrutriletes presselensis
Alisporites cymbatus
Jugasporites conmilvinus
Triadispora crassa
Stellapollenites thiergartii
Strotersporites tozeri
Triadispora suspecta
Triadispora plicata
Concentricisporites plurianulatus/nevesii
Angustisulcites klausii/sp. A
Lundbladispora sp.A
Illinites chitonoides
Uvaesporites spp.
Staropollenites antonescui
Aratrisporites reticulatus
Dyupetalum vicentinense
Porcellispora longdonensis
Cannanoropollis scheuringii
Kuglerina meieri
Minutosaccus spp.
Staurosaccites/Ovalipollis spp.
Partitisporites novimundanus morphon
Bocciaspora blackstonensis
Camerosporites secatus
Sellaspora spp.
Kyrtomispora ervii
Lycopodiacidites kokenii
Nevesisporites vallatus
Duplicisporites granulatus morphon
Heliosaccus dimorphus
Echinitosporites iliacoides
Infernopollenites sulcatus/parvus
Weylandites magmus
Enzonalasporites vigens
Lueckisporites cf. singhii
Lagenella martinii
Vallasporites ignacii
Micrhystridium-Veryhachium complex
Dictyotidium spp.
Cymatiosphaera spp.

CARNIAN-NORIAN BOUNDARY IN THE JULIAN ALPS, SLOVENIA, NW-YUGOSLAVIA

A. RAMOVŠ

In a number of areas of the northern Julian Alps (eastern part of the Southern Alps, Slovenia, NW-Yugoslavia), the Carnian-Norian boundary was established paleontologically in the cephalopod bearing Hallstatt development. Dark grey, yellowish and reddish grey distinctly platy biomicritic limestone which overlies light grey bedded Carnian limestone contains two cephalopod horizons. The lower one occurs on the base of platy limestone, and it contains numerous very well preserved cephalopods of the Hallstatt facies. The most abundant are *Projuvavites jaworskii* (Diener) and several species of the genus *Arcestes*; less frequent are *Discotropites plinii* (Mojsisovics), *Barrandeites turbina* (Dittmar), *Gonionotites* cf. *noricus* Diener, *Hypocladiscites* cf. *subtornatus* (Mojsisovics), and *Proclydonautilus* sp. . The genus *Barrandeites* is an indication of the upper part of the *Plinii* subzone (= Tuvalian 3/II, written communication by L. Krystyn, who determined most of the cephalopods). About 140 m above the lower cephalopod horizon lies the upper cephalopod horizon which consists of a single bed. In this horizon no *Discotropites plinii* was found, it contains large specimens of the genus *Arcestes*, as well as nautilids. This cepha-lopod horizon probably belongs to the uppermost Tuvalian (the *Gonionotites italicus* subzone).

An assignment to the highest *Anatropites* domain of the cephalopod limestones is proved also by the conodonts *Neogondolella polygnathiformis* Budurov & Stefanov and *Epigondolella nodosa* (Hayashi). Both species appear in the northern Julian Alps together in the lower and upper cephalopod horizons. *N.polygnathiformis* reaches up to the Carnian-Norian boundary, and *E. nodosa* starts in the lower *Anatropites* domain. In the lighter grey limestone just above the upper cephalopod limestone only *E. nodosa* was found, and nowhere *N. polygnathiformis*.

In the lower cephalopod horizon also occur brachiopods quite frequent; both *Terebratulida* and *Rhynchonellida*, pelecypods (rare), foraminifers (abundant), holothurian sklerites (rare) and remains of floating crinoids (rare).

The short interval of cephalopod facies was developed in a West-East trending channel in the northern Julian Alps. This Julian channel represents a side branch of the South Juvavian Hallstatt channel (= South channel). The existance of the Julian branch leads to the hypothesis of proximity of depositional areas with the Hallstatt-type Upper Tuvalian sedimentation of the Northern Limestone Alps and the Julian Alps (= Southern Alps).

The presence of the Hallstatt facies in the Julian Alps has been proved only in the Upper Tuvalian (the upper *Anatropites* domain). Already at the Carnian-Norian boundary the Julian carbonate platform again became stabilized, and remained unchanged until the end of the Triassic period.

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TRIASSIC - JURASSIC BOUNDARY WORKING GROUP

Chairman: R. Moutarde
Secretary: J. Guex

The first step of our project is to contact a few specialists working on different fossil groups and which are the best potential co-ordinaters within their own fields of research.

Our working plan is as follows:

1. to select the best stratigraphic sequences where the boundary between the Triassic and the Jurassic can be studied for the most important fossil groups
2. to establish range charts of the species represented in these sections
3. to establish an adequate bibliography

If most of the co-ordinaters are successful in gathering data within their domain, we will organize a general meeting on the topic.

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THE ANDERSONS DID IT AGAIN

Miente Boersma

While studying the second volume of the series "Palaeoflora of southern Africa" I caught myself humming the song "I do it my way" interpreted by Frank Sinatra. And, indeed, as in the first volume, the Andersons certainly do it their way. This has already resulted in a severe attack, in my opinion unnecessarily sharp, by a South African colleague in the IOP Newsletter, 28: 12-13. See also IOP Newsletter, 30: 7-8.

If one finds oneself confronted with thousands of fossil plant remains there are two possibilities: either do it the hard way resulting in a book somewhere in 2000, or do it one's own way and produce a book within a reasonable amount of time.

What the Andersons have done again is astonishing,and, for palaeobotanists not having the possibility to visit South Africa, they have succeeded in giving an insight in the wealth of information buried in southafrican soil. The work includes no less than 226 photographical plates of fossil plant remains, apart from all the maps, charts, schemes, etc., to be expected in a publication by the Andersons.

For the readers of "Albertiana" it is important to know what they say about Triassic plant localities. I may quote from the review by G. RETALLACK (IOP Newsletter, 28: 10-12):

> "The early Triassic flora of the Burgersdorp Formation is described comprehensively for the first time. Among the new taxa recognised is a Pleuromeia"-like lycopod. The flora of the late Triassic Molteno Formation is treated briefly, considering the Andersons' prior* and planned publications, but there are notable photographs of newly discovered and almost miraculously complete fructifications." See my review in Albertiana, 2: 11-12. MB.

I sincerely hope that the Andersons will continue their work the way they have planned to do it, in order to enrich the palaeobotanical community with beautiful and scientific highly interesting works like this one.

Bibliographical information:
Anderson, J.M., Anderson, H.M., 1985. Palaeoflora of Southern Africa Prodromus of South African Megafloras, Devonian to Lower Cretaceous, 423 pp., 233 pls., 22 tables, ISBN 90-6191-575-9.
A.A. Balkma, P.O. Box 1675, 3000 BR Rotterdam, The Netherlands.
P.O. Box 230, Accord, MA 02018, USA.
Price: $ 55 (IOP members 32,50).

ANNOTATED TRIASSIC LITERATURE

MIENIE BOERSMA

Achilles, H., Schlatter, R., 1986. Palynological investigations in the "Rhät-Bonebed", Hallau (Kt. Schaffhausen) with a contribution on the ammonoid faunas of the basal Lias. Eclogae geol.Helv., 79(1): 149-179, 1 fig., 6 pls., 65 refs.. Basel, Switzerland (in German with German and Enlish summaries).

A microflora consisting of 21 genera with 24 species is described from the Triassic/Liassic boundary section at Hallau (Kt. Schaffhausen). The dominance of *Vallasporites ignacii* and *Ovalipollis pseudoalatus* on the one hand, and the absence of characteristic Rhaetian spores on the other allow an upper Middle Keuper dating (Knollenmergel). Mammal teeth material collected and described by PEYER (1956) from the "Mergelbonebed, Schicht e" in the Hallau section has, in all probability, an upper Middle Keuper age too.

The Liassic marine transgression can be placed biostratigraphically in the upper part of the *psilonotum* Zone (sensu LANGE 1931, 1941) by the presence of *Psiloceras (Psiloceras)* ex gr. *plicatulum* (Quenstedt).

The possible events during the Triassic/Liassic transition are discussed and interpreted.

In the text-figure the Hallau section is shown. 5 Plates hold figures of the microflora; on one plate the specimens of *Psiloceras* are depicted.

Adloff, M.-C., Doubinger, J., Massa, D., Vachard, D., 1985. Trias of Tripolitania (Libya) - New Biostratigraphic and Palynological Data (First Part). Rev.Inst.Francais Pêtrole, 40(6): 723-753, 13 figs., 2 pls., Paris, France (in French with French, English and Spanish summaries).

Adloff, M.-C., Doubinger, J., Massa, D., Vachard, D., 1986. Trias of Tripolitania (Libya) - New Biostratigraphic and Palynological Data (Second Part). Rev.Inst.Francais Pêtrole, 41(1): 27-72, 10 figs., 7 pls., 9 tables, 167 refs., Paris, France (for summaries see first part).

The outcrops of the Trias of North-West Libya (Tripolitania) have been studied in great detail. Several oil exploration wells provided the material for the investigation.
Five units have been defined for the Trias, based on electrofacies and on lithological sequences. These units can be easily correlated in the region despite important thickness variations.

A satisfactory Triassic biostratigraphy is proposed combining the micropalaeontological and palynological results with the above-mentioned units. Since there is no evidence for gaps, the Trias in the investigated area is apparently complete.

The transgressive Upper Scythian has a characteristic microfauna, including *Meandrospira pusilla*. The Middle Trias is palynologically dated. The Karnian contains a rich assemblage of spores, pollen grains, foraminifers, algae and coprolites. A well developed Norian appears to be present in between the Upper Karnian and the Lower Lias, although the palynological assemblage is not very significant.

Reconstruction of the successive environments of deposition has been attempted. The tripolitanian Trias is compared with that of the German, Alpine and Mesogean areas.

23 Figures elucidate the written information. On seven plates pollen grains and spores are figured, on the remaining two foraminifers, algae and coprolites. In the tables the results of the quantitative analysis are given.

Bayerisches Geologisches Landesamt München (Editor, 1985). Die Forschungsbohrung Obernsees (westlich von Bayreuth). Geologica Bavarica, 88: 161 pp., 35 figs., 6 tables, 3 enclosures. München, G.F.R..

See: Beres, J. and Soffel, H.
Emmert, U.
Emmert, U., Gudden, H., Haunschild, H., Meyer, R.K.F., Risch, H., Schmid, H., Schuh, H. and Stettner, G.
Gudden, H.
Gudden, H. and Schmid, H.
Haunschild, H.
Salger, M.
Schnitzer, W.A. and Mahadjer, D. (two papers)
Schwarz, H.-U.

Beres, J., Soffel, H., 1985. Magnetostratigraphie und Anisotropie der magnetischen Suszeptibilität von Proben aus der Forschungsbohrung Obernsees zwischen Bohrmeter 1341,15 und 1170,40 (Perm-Trias-übergang). Geologica Bavarica, 88: 153-161, 5 figs., 6 refs. München, G.F.R. (in German with German and English summaries).

Samples of the Obernsees boring in the time interval Permian-Lower Triassic were studied with regard to their magnetic properties. The anisotropy of magnetic susceptibility was well developed and the axes of minimum susceptibility are closely packed and perpendicular to the sedimentation plane in the center.

The study of the remanent magnetization resulted in a magnetic polarity sequence. Compared with the results of investigations in the U.S.S.R. the polarity sequence proved to be similar. A discrepancy of 5 million years, however, was observed with regard to the age of the Permian-Triassic boundary.

For the Lower and Middle Buntsandstein an average sedimentation rate of 13 m/million year could be established.

Bizzarini, F., Laghi, G., Russo, F., Urlichs, M., 1986. Preliminary biostratigraphic correlation between Ampezzo Basin sections and the Cordevolian stratotype (Late Triassic, Italian Dolomites). Lavori Soc. Ven. Sci. Nat., 11: 151-158, 2 figs., 1 table, 14 refs., Venice, Italy. (with Italian and English summaries).

Investigations of the S. Cassiano Fm. in the Ampezzo Basin (eastern Italian Dolomites) resulted in important biostratigraphic data on the S. Cassiano Fm..

Hitherto the S. Cassiano Fm. had been studied in the Val Badia only, the upper part of the sediments being the stratotype of the Cordevolian. However, in the Ampezzo Basin two ammonoid zones, viz. the *aonoides* and *austriacum* zones, have been recognized which are generally considered to have a Julian age. Perhaps even the still younger *sirenites* zone is present.

Therefore, in the enlarged type-area - Ampezza and Badia valley - the age of the discontinuous sediments of the S. Cassiano Fm. ranges from Longobardian (Upper Ladinian) to Upper Julian (Upper Karnian).

In table 1 a bio- and chronostratigraphical scheme is presented for the S. Cassiano Fm. in the eastern Dolomites. In fig. 2 the chrono- and biostratigraphical correlation is shown between sections of the enlarged type area of the S. Cassiano Fm..

Bortoluzzi, C.A., Guerra Sommer, M., Cazzulo Klepzig, M., 1985. Tafoflora Triassica da Formacao Santa Maria, RS, Brasil: 1. Equisetales, Ginkgoales, Coniferales e Pteridophylla. MME-DNPM, sér. Geol., 27: 539-549, 4 figs., 4 pls., 19 refs. Rio de Janeiro, Brazil (in Portuguese with English and Portuguese summaries).

A nicely illustrated paper on plant remains from two outcrops in the Santa Maria Fm. (Upper Triassic) of Rio Grande do Sul (Parana Basin), Brazil.

It is the first paper in a planned series on the results of the palaeobotanical investigations dealing with *Neocalamites* sp., *Sphenobaiera* sp., cf. *Podozamites* sp., *Cladophlebis mendozaensis* and *Taeniopteris* sp..

According to the authors the taphoflora of the Santa Maria Fm. represents an important phase in the palaeofloristic succession within the Parana Basin.

Brack, P., Rieber, H., 1986. Stratigraphy and ammonoids of the lower Buchenstein Beds of the Brescian Prealps and Giudicarie and their significance for the Anisian/Ladinian boundary. Eclogae geol. Helv., 79(1): 181-225, 10 figs., 5 pls., 83 refs.. Basel, Switzerland (with German, English and Italian summaries).

On the basis of the complete stratigraphic section of the Middle Triassic at Bagolino (Romanterra), several stratigraphic columns of the lower Buchenstein Beds (Livinallongo Fm.) are described. The characteristic sequences of volcanoclastics and fossils (ammonoids) permit a subdivision and correlation of the investigated profiles, and indicate an extensive, uniform pelagic sedimentary environment.

A new genus, *Chieseiceras*, is defined on the basis of *Trachyceras chiesense* MOJS. The latter has been found in all stratigraphic sections of the Brescian Prealps and Giudicarie and enables a comparison with other southern Alpine sequences ("Grenzbitumenzone" Monte San Giorgio; Val Gola) straddling the Anisian/Ladinian boundary.

A description of the most important ammonoid finds is given, including *Chieseiceras perticaense* n.sp.. The temporal distribution of ammonoids suggests a notable faunal change corresponding to the appearance of *Eoprotrachyceras curionii* and therefore, a correlation of the Anisian/Ladinian boundary with that between the *reitzi (nevadites)* and the *curionii* Zones is proposed.

Available absolute radiometric age determination of the Middle Triassic volcanoclastic layers of the southern Alps are correlated with the studied Anisian/Ladinian boundary sections.

Brandner, R., Poleschinski, W., 1986. Stratigraphie und Tektonik am Kalkalpensüdrand zwischen Zirl und Seefeld in Tirol (Exkursion D am 3. April 1986). Jber.Mitt.oberrhein.geol.Ver., N.F.68: 67-92, 12 figs., Stuttgart, G.F.R. (in German).

Report of an excursion along the southern margin of the Alps between Zirl and Seefeld in Tirol. Received copy too incomplete for a review.

Brunner, H., Simon, T., 1985. Lithologische Gliederung von Profilen aus dem Oberen Muschelkalk im nördlichen Baden-Württemberg anhand der natürlichen Gamma-Strahlungsintensität der Gesteine. Jber.Mitt.oberrhein.geol.Ver., N.F. 67: 289-299, 3 figs., 10 refs., Stuttgart, G.F.R..

A selection of 12 Upper Muschelkalk profiles is used to investigate whether or not γ-ray logs can be used for stratigraphical correlation. It is concluded that they give information comparable to that provided by the lithological description of cores. Therefore, -ray logs might be helpful in cases of incomplete or non-existent profiles.

Cornet, B., Olsen, P.E., 1985. A summary of the biostratigraphy of the Newark Supergroup of eastern North America with comments on Early Mesozoic provinciality. Mem.3.Congr.latinoamer.Paleontol., Mexico. Simp.Floras Triasico Tardio Fitogeogr. Paleoecol.: 67-81, 6 figs., 1 table, 58 refs., Mexico City, Mexico (with English and Spanish summaries).

The Newark Supergroup of eastern North America (see figs. 1,2; table 1) consists of rocks judged to range in age from early Middle Triassic through late Early Jurassic. Dating is principally based on the recognition of seven palynological zones correlated with the European standard stages and on correlation of vertebrates and megafossil plants. The basic floristic trends are a decrease in diversity into the Early Jurassic and the rise to strong dominance of the cheirolepidaceous conifers. See figs. 3,4.

Based on publishhed radiometric scales, the Newark depositional episode lasted roughly 45 million years and was antecedent to the actual separation of the North American and African Plates. Correlation of other Early Mesozoic continental areas with the Newark allows the conclusions that there was a shift from Late Triassic floral and faunal provinciality to Early Jurassic homogeneity, and that this shift was synchronous with a widening of the equatorial arid zone. See Figs. 5,6.

Cros, P., Freytet, F., 1985. Emersion traces and pedogenesis in the Triassic Formations of the southern Alps (Italy, Austria). Palaeogeographic interest. Bull.Soc.géol.France, 1985(4): 481-490, 5 figs., 1 pl., 1 table, 37 refs. (in French with English summary).

In the Triassic marine basins of the southern Alps two main episodes of emersion can be shown: one in the Anisian and another in the Middle-Upper Carnian. Carbonated and terrigenous fluvial sediments, more or less affected by pedologic transformations, are described. Associated palaeokarsts are mentioned. The studied sections are widely distributed from the Karawanken (Austria) in the East to Vicentin (East of the Lago di Guardia) in the West.

The dolomitization, affecting continental and peritidal carbonates, is contemperaneous or later than pedogenesis. It is interpreted as resulting from the ionic dilution mechanism. Silicification occurs in various continental environments. Reworked products of silicification are not infrequent in fluvial channel fills and coarse littoral deposits.

The sedimentogenesis allows a precise description of the palaeogeography. The tectonic instability (volcanism, block tectonics and horst karstification) of the whole region during the Triassic is confirmed.

The illustrations elucidate the sedimentological and tectonic processes in the investigated area.

Demathieu, G.R., 1985. Trace fossil assemblages in Middle Triassic marginal marine deposits, eastern border of the Massif Central, France. In: H.Allen Curran (Editor), Biogenic Structures: their Use in Interpreting Depositional Environments. Spec.Publ.Soc. Econ.Paleont.Mineral., 35: 53-66, 5 figs., 6 tables, 24 refs..

The paper presents the results of an integrated study of trace fossil assemblages from Middle Triassic deposits of the eastern border of the French Massif Central. See figs. 1,2. The investigations included primary sedimentary structures, impressions of plant megafossils, invertebrate trace fossils and vertebrate trackways (fig.3) and enabled a reconstruction of the depositional environments.
Statistical methods are used to support morphological observations, thus permitting a better definition of the reptilian ichnotaxa. See tables 1-6. In addition, by applying the concept of "Euclidian distance", population sizes have been estimated for the relevant reptile taxa. The data allow a palaeoecological reconstruction. See fig. 4.
Lithology, primary sedimentary structures and trace fossils indicate that the trackway areas of this Triassic borderland were large sandy shores at the edge of a sea or lagoon. The succession of footprintbearing beds in the lower sandstones, or "Grès inférieurs du Lyonnais", suggests cycles of deposition due to repeated marine transgression. See fig. 5.

The plates are of good quality (pl. 2, fig. D!) figuring trails formed by worm-like animals (pl. 1) and footprints of reptiles (pl. 2).

Dobruskina, I.A., 1985. The Madygen flora (USSR, Middle Asia) as a typical representative of Keuper floras. Mem.3.Congr.latinoamer.Paleontol., Mexico. Simp.Floras Triasico Tardio Fitogeogr. Paleoecol.: 11-19, 2 figs., 3 pls., 1 table, 20 refs.. Mexico City, Mexico. (with English and Spanish summaries).

A synthesis is given of the investigations in the Madygen area (southern Fergana, USSR) since 1949. The flora, originally considered to be Late Permian - Early Triassic in age, is now generally accepted to be Ladinian-Karnian in age.

The Madygen flora resembles time-equivalent floras of the USSR, northern China, Japan and western Europe.

In table 1 a species list is given indicating the amount of specimens collected per species. The plates are of good quality; some figures might have been printed on a somewhat larger scale.

Dobruskina, I.A., 1985. Questions regarding the systematics of Triassic lycopods. Paleontol.Zh., 1985(3): 90-104, 1 fig., 6 tables, 22 refs.. Moscow, USSR. (in Russian).

A review is given of Triassic lycopod remains, including recent new finds and the results of the investigations of old collections. The data have been arranged in 6 tables, showing, e.g., the present knowledge of *Pleuromeia*, *Annalepis*, *Tomiostrobus* and *Austrostrobus*.

Within the Pleuromeiaceae *Lycomeia* nov.gen. is established, based on *Pleuromeia rossica* Nejburg. A new species of *Pleuromeia*, viz. P. jokunzhica is described and figured.

Dobruskina, I.A., Yaroshenko, O.P., 1985. The relationships between the Triassic floras of both sides of the northern Atlantic Ocean. Mem.3.Congr.latinoamer.Paleontol., Mexico. Simp. Floras Triasico Tardio Fitogeogr. Paleoecol.: 21-31, 3 figs., 1 table, 103 refs.. Mexico City, Mexico. (with English and Spanish summaries).

A stratigraphic correlation chart is given of palynomorph-bearing rock units of the Triassic of the northern hemisphere. Six miospore asseblage zones have been recognized:

Rhaetipollis germanicus zone	(Rhaetian)
Camerosporites secatus zone	(Karnian)
Concentrisporites nevesii zone	(Anisian p.p.)
Densoisporites nejburgii zone	(Anisian p.p. -Olenekian)
Taeniaesporites zone	(Induan p.p.) and
Protohaploxypinus zone	(Induan p.p.).

With plant megafossils correlation is only possible in the Upper Triassic. Four megafloristic units ("sectors") are proposed, viz. North American, West European, Mid Asian and East Asian. Because of the similarity of the North American and West European sectors it is concluded that no barrier of major importance separated them.

Figs. 1-3 show the geographic position of studied miospore assemblages in, respectively, North America and Greenland; western Europe (first half of the Triassic) and western Europe (second half of the Triassic).

Emmert, U., 1985a. Der Muschelkalk in der Forschungsbohrung Obernsees. Geologica Bavarica, 88: 97-102, 1 fig., 1 enclosure, 6 refs., München, G.F.R..

The Muschelkalk sequence has a thickness of 178.35 m (801.35-623 m). Intercalations of fine sand, especially at the base and in the uppermost part of the profile, indicate sedimentation near to the seashore.

The Untere Muschelkalk (56.35 m thick) is composed of grey, dolomite-containing "Schluff"- and marl-deposits. The Mittlere Muschelkalk (57.60 m thick) consists of an alternation of anhydrite sediments (about half of its thickness) and dolomitic marls. The Obere Muschelkalk (64.40 m thick) is still mainly composed of calcareous sediments.

Emmert, U., 1985b. Das fränkische Wort "Keuper". Jber.Mitt. oberrhein.geol.Ver., N.F., 67: 173-175, 8 refs., Stuttgart, G.F.R..

The origin of the word "Keuper" is discussed.

Emmert, U., Gudden, H., Haunschild, H., Meyer, R.K.F., Risch, H., Schmid, H., Schuh, H., Stettner, G., 1985. Bohrgut-Beschreibung der Forschungsbohrung Obernsees. Geologica Bavarica, 88: 23-47. München, G.F.R..

Lithological description of the boring Obernsees (0-1390.00m) west of Bayreuth (Bavaria, G.F.R.).

Farabegoli, R., Jadoul, F., Martines, M., 1985. Stratigraphy and Palaeogeography of the Anisian in the western Julian Alps (southern Alps, Italy). Riv.Ital.Paleontol.Strat., 91(2): 147-196, 13 figs., 2 pls., 58 refs.. Milano, Italy (in Italian with English summary).

The paper deals with the stratigraphy, palaeogeography, palaeotectonics and sedimentology of Anisian outcrops in North West Friuli (western Julian Alps, Italy).

Detailed studies of the stratigraphy of the terrigenous facies of the Braies Group have been carried out. The lithostratigraphic units have been arranged in three tectonosedimentary cycles of the second order.

The palaeogeographic and structural evolution of the studied area was almost undisturbed up to the base of the Upper Anisian. Then, all through the Upper Anisian, repeated tectonic movements caused the breaking up of the peritidal carbonate platform (lower Serla Fm.), with the emersion of the northern part of the area (Anisian Paleocarnic Ridge) characterized by terrigenous fluviatile deposits.

In the Lower Illyrian the A.P.Ridge was divided into two parts by a NNE oriented sea-arm. In the Upper Illyrian the depth of the southern basin increased and it assumed the character of a turbiditic basin; on the ridge intense volcanic activity could be observed.

Forster, S.C., Warrington, G., 1985. Geochronology of the Carboniferous, Permian and Triassic. In: N.J. Snelling (Editor), The Chronology of the Geological Record: 99-113, 1 fig., 158 refs., Blackwell Sci.Publ..

Criteria concerning sample and analytical data and stratigraphic control have been used in a critical assessment of the suitability, for use in construction of a Phanerozoic time-scale, of radiometric data relevant to the Carboniferous, Permian and Triassic periods. Few of the age determinations available in 1982 satisfy these criteria and many of those used previously as a basis for time-scales for this part of the Phanerozoic are considered unacceptable by present standards.

On the basis of this review, ages of 365 ± 5 Ma, 290 ± 5 Ma and 250 ± 5 Ma respectively, are proposed for the beginning of the Carboniferous, Permian and Triassic periods, and 205 ± 5 Ma for the end of the Triassic. Radiometric ages are related, where possible, to the principal chronostratigraphic divisions of the rock successions representing those periods.

In fig. 1 45 age data are used for the Carboniferous-Triassic time-scale.

Gaetani, M., Casnedi, R., Fois, E., Garzanti, E., Jadoul, F., Nicora, A., Tintori, A., 1985. Stratigraphy on the Tethys Himalaya in Zanskar, Ladakh. Initial report. Riv.It.Paleontol. Strat., 91(4): 443-478, 16 figs., 1 table, 42 refs., Milano, Italy.

The preliminary results of the 1984 Italian Geological Expedition to Zanskar (NW Himalaya) (fig.1) are given as a general account of the stratigraphy of the Tethys Himalaya succession. The sedimentary sequence has been subdivided in three parts:

Late Pan-African Episode (Late Precambrian-Ordovician)
Epicontinental Stage (Late Ordovician-Late Carboniferous)
Passive Continental Margin Stage (Permian-Eocene) (fig.7)

The Triassic starts with pelagic and condensed nodular limestones (Tamba Kurkur Fm., Scythian-Anisian) (figs. 8-11). Important clay influx occurred during the Ladinian, when a thick marly-limestone unit was deposited (Hanse Fm., Ladinian-?Karnian) (figs. 8-11). The latter is overlain by peritidal carbonates (Zozar Fm., Karnian-Norian) (figs. 8, 10-13), followed by terrigenous sedimentation prograding on a shallow inner shelff ("Quartzite Series", Norian-Rhaetian) (figs. 8, 11-13).

Gudden, H., 1985. Der Buntsandstein in der Forschungsbohrung Obernsees. Geologica Bavarica 88: 69-81, with 2 enclosures, 40 refs., München, G.F.R..

In the boring Obernsees (1983) the Buntsandstein is represented by 484.6 m thick deposits. On the basis of an almost complete core and "bohrlochphysikalischen Messungen" a controlable stratigraphic sequence could be established. The results are in agreement with the regulations issued by the "Arbeitsausschusz Buntsandstein der Geologischen Landesämter (1974)" with regard to the division of the West German Buntsandstein.

It was confirmed that the "Kulmbacher Konglomerat"is situated at about halfway up the sequence and not - as assumed since long by comparison with the "ECKschen Konglomerat" - immediately above the "Bröckelschiefer".

The boring Obernsees allows a revision of and correlation with former borings in the neighbourhood, viz. Mürsbach 1, Rodach (1972) and Staffelstein (1975).

Gudden, H., Schmid, H., 1985. Die Forschungsbohrung Obernsees - Konzeption, Durchführung und Untersuchung der Metallführung. Geologica Bavarica, 88: 5-21, 10 figs., 1 table, 1 enclosure, 33 refs., München, G.F.R..

The boring Obernsees (west of Bayreuth, G.F.R.) was effectuated in 1983 for the investigation of metal content in "randnahen" Triassic and Permian sediments. The boring, 1390m deep, has been drilled through postvaristian (Dogger alpha-Zechstein) sediments and up to 48 m into Palaeozoic basement.

The profile allows a well documented stratigraphic division as well as a correlation with the sequences in neighbouring borings.

Within the Triassic and Zechstein various horizons hold distinct synsedimentary enrichments of metals confirming observations in previous borings, e.g. Kallmünz (1982), Eschertshofen (1981), Berching (1977).

Additionally, the boring provides material for palaeogeographical, tectonical, palynological, sedimentpetrological, palaeomagnetical and hydrogeological investigations.

Hahn, G.G., 1984. Palaeomagnetic investigations in the Schilfsandstein (Triassic, Km2) of western Europe. Geol.Rundschau, 73(2): 499-516, 10 figs., 22 refs.,Stuttgart, G.F.R. (in German, with German, English, French and Russian summaries).

In the Schilfsandstein of western Europe 41 sections with 343 units and 1897 cores were sampled for palaeomagnetic investigations. The methods and terminology used are explained.

Assuming normal polarity for the magnetic field during deposition of the Schilfsandstein in the Weserbergland and Franken and assuming reversed polarity in Schwaben and northern Switzerland a palaeonorthpole is estimated at 111 E

28 N. This poleposition is at about the Triassic polar wandering curve of western Europe according to McELHINNY (1973). See fig. 8.

During the sedimentation of the Raibler Sandstein (Bergamasker Alps, southern Alps) the palaeonorthpole was situated at 128 W 48 N.

In the Triassic magnetostratigraphic time scale (BUREK, 1970) the Schilfsandstein has to be positioned in the highest Upper Karnian starting with normal polarity and followed by reversed polarity. See fig. 9.

The illustrations give information on the geographical position of the investigated sections and on palaeomagnetic details.

Hahn, G.G., 1986. Reversed polarity during the sedimentation of the Schilfsandstein (Die Umpolungen des Erdmagnetfeldes zur Zeit der Schilfsandsteinsedimentation). Jber. Mitt. oberrhein. geol. Ver., N.F. 68: 197-215, 13 figs., 14 refs., Stuttgart, G.F.R. (in German).

40 Profiles, 340 units and 2093 cores have been used for palaeomagnetic investigations. A virtual north pole may be reconstructed at 123 E 33 N, which fits in at about the Triassic north pole on the European wandering curve (McELHINNY, 1973). See fig. 13. The position of the pole implies for the investigated area a clockwise rotation of 60 and a drift in northern direction of 35 .

The sequence of polarity changes in a North-South direction can be well explained with the sedimentation model of WURSTER (1964).

Given the chronostratigraphical position of the Schilfsandstein in the Upper Julian (Middle Karnian) and the estimated 400.000-500.000 years for its deposition the changes in polarity can be reasonably explained with the magnetostratigraphical time scale for the Triassic by WIEGANK and MENNING (1964). See fig. 12.

The illustrations give information on the geographical position of the investigated areas and palaeomagnetic details.

Haunschild, H., 1985. Der Keuper in der Forschungsbohrung Obernsees. Geologica Bavarica, 88: 103-130, 7 figs., 1 table, 1 enclosure, 93 refs., München, G.F.R..

The boring Obernsees has firstly provided a continuous and coherent profile of the whole, here 483.00 m thick, Keuper of the Obermain fault block areas.

It enables a lithological comparison with adjacent regions, and stratigraphically bridges the gap with Keuper deposits in northern Württemberg and western Franconia. Palaeogeographically, the boring Obernsees represents a transition zone in between the more clayish deposits of the northwestern basin and the sandy deposits in the South-East.

All lithostratigraphical units within the Keuper are described, measured and correlated with outcrops in the Bayreuth area. The Lower Keuper, nowhere completely exposed in the fault block area, has been given special attention.

Heunisch, C., 1986. Palynologie des unteren Keupers in Franken, Süddeutschland. Palaeontographica, B, 200(1/6): 33-110, 23 figs., 11 pls., 8 tables, 124 refs., Stuttgart, G.F.R. (in German with English and German summaries).

In Lower and Middle Franconia, southern Germany, the Lower Keuper and the boundary layers to the Upper Muschelkalk and the Lower Middle Keuper (Gipskeuper) have been palynologically investigated. For comparison two Lower Keuper sequences from northern Baden-Württemberg and two samples of the higher part of the Gipskeuper have been taken into consideration.

115 Taxa have been distinguished. *Franconispora laevigata* n.gen. et n.sp. is newly introduced. Four new combinations have been made, viz. *Conbaculatisporites varius* (Starke 1971), *Leptolepidites conferteornatus* (Pautsch 1971), *L. diverseornatus* (Pautsch 1971) and *Striatoabieites multistriatus* (Balme et Hennelly 1955).

The lithostratigraphical boundary Muschelkalk/Keuper does not coincide with a notable change in the palynospectrum. Changes of composition of the palynoflora are indicated in the Grenzdolomit and in the Lower Myophorienschichten.

The microfloral association of the Franconian Lower Keuper is comparable with those of the Germanic Basin. Following ORLOWSKA-ZWOLINSKA (1983) the highest part of the Upper Muschelkalk and the Lower Keuper below the Grenzdolomit belong to "assemblage I-*Heliosaccus dimorphus*. The Grenzdolomit and the basal part of the Lower Gipskeuper belong to "assemblage IIa- *Echinitosporites iliacoides*".

The Franconian Lower Keuper can be correlated with the Longobardian (Upper Ladinian) in the Alpine region. It belongs palynostratigraphically to the *secatus-dimorphus* phase (VAN DER EEM, 1983).

On the basis of quantitative analysis the depositional environments could be recognized. Marine influence decreases from the boundary layers to the Estherienschiefer (Lower Keuper 1, phase 1). The superposed Werksandstein (phase 2) has been deposited in a brackish to supratidal environment.

In the Lower Keuper 2 a northern and a southern part can be distinguished, the northern part showing brackish depositional conditions (phase 3a) and the southern part an environment with increasing marine influence (phase 3b). The deposition took place under hypersaline conditions (phase 4).

Hinkelbein, K., (Editor), 1985. Jahresberichte und Mitteilungen des Oberrheinischen Geologischen Vereines, N.F., 67 (für das Jahr 1985): 329 pp., 99 figs., 16 tables, 1 photograph. Stuttgart, G.F.R..

See Brunner, H., Simon, T.
Emmert, U.
Jungbauer, H., Simon, T.
Kürmann, H., Dietrich, R.
Leitz, F., Schröder, B.
Mader, D.
Seufert, G., Schweizer, V.

Jungbauer, H., Simon, T., 1985. Die Tauberbarre im Gebiet der Hohenloher Ebene und des Taubergrunds zur Zeit des höheren Unteren Muschelkalks. Jber.Mitt.oberrhein.geol.Ver., N.F., 67: 187-197, 5 figs., 12 refs., Stuttgart, G.F.R..

The "Tauberbarre" sensu VOLLRATH (1923) is traditionally considered to be a large, uniform zone of low sealevel in Franconia. In the higher Lower Muschelkalk, however, this does not hold for the investigated area.

The area around Tauberbischofsheim should be considered as the "Tauberbarre" s.str., whereas to the South-East the sediments show deposition in deeper water. Here the "Tauberbarre" is comparable with the "Boxberger Schwelle". In between the "Boxberger Schwelle" and the southeastern part of the "Tauberbarre" a very narrow area of sedimentation in somewhat deeper water could be established. In the extrene southeastern part of the investigated area (south of the line Künzelsau-Röttingen) (fig. 1) the deposits point to distal sedimentation in greater depth and relatively far away from elevated regions.

Krystyn, L., Wiedmann, J., 1986. A *Choristoceras* precursor Ceratitina, Ammonoidea) from the Norian of Timor. N.Jb.Geol. Paläontol.Mh., 1986(1): 27-37, 6 figs., 21 refs., Stuttgart, G.F.R. (in German with English and German summaries).

From the *Halorites macer* Zone (fig. 3), late Middle Norian of Timor, the new ammonite species *Pseudothetidites praemarshi* n.sp. is described and figured (fig. 4,5). It is to be regarded as the direct ancestor of the up to now cryptogenous and heteromorphous species *Choristoceras marshi* HAUER, generally regarded as index species for the Rhaetian Stage.

The discovery of its direct ancestor in the late Middle Norian (Alaunian) is a further proof of the synchroneity of Upper Norian (Sevatian) and Rhaetian (WIEDMANN et al., 1979). Evolution and systematics of Late Triassic choristoceratids are briefly discussed (fig. 6).

Kürmann, H., Dietrich, R., 1985. Neue Gesichtspunkte zur Bohrung Bindlach 1980. Jber.Mitt.oberrhein.geol.Ver., N.F., 67: 125-128, 1 fig., 10 refs., Stuttgart, G.F.R..

Published data with regard to the boring Bindlach 1980 (EMMERT, 1982) are reconsidered. It is argued that the lowermost portion of the boring (162.0-221 m) represents the Sandsteinkeuper and not, as EMMERT asserts, the Zechstein. An interpretation as Sandsteinkeuper is supported by geochemical investigations (OTT, 1982) and recent mapping (KÜRMANN,1982). Moreover, K-Ar dating of Palygorskite - found by SALGER (1982) at 206.6-209.35 m - provides values (BONHOMME, 1982), that point to an Upper Triassic age.

Leitz., F., Schröder, B., 1985. Die Randfazies der Trias und Bruchschollenland südöstlich Bayreuth (Exkursion C am 11. und 12. April 1985). Jber.Mitt.oberrhein.geol.Ver., N.F., 67: 51-63, 7 figs., 45 refs., Stuttgart, G.F.R..

A detailed description with elucidative illustrations is given of the Triassic of the area SE of Bayreuth (Oberfranken, G.F.R.).

Liao, Zhuo-ting, 1984. New genus and species of Late Permian and earliest Triassic brachiopods from Jiangsu, Zhejiang and Anhui provinces. Acta Palaeontol.Sinica, 23(3): 278-284, 2 figs., 2 pls., 2 tables, 10 refs. (in Chinese with English summary).

New brachiopod taxa are described and figured from the Longtan, Changhsing and Dalong Formations (latest Permian) and the Yingkeng Formation of Chinluing Limestone (earliest Triassic).

The following new taxa are described and figured from the Triassic: *Paranorellina ? changxingensis* Liao
Paryphella sparsiplicata Liao
Paryphella sparsiplicata undata Liao
Haagenites longtanensis Liao
Few articulate brachiopods are known from earliest Triassic sediments in the world. Therefore, the finding of new taxa from the early Lower Triassic of Jiangsu, Zhejiang and Anhui is of great importance.

The new taxa of *Paryphella* are compared with three earlier established ones. Two figs. show the position of the collecting localities and a generalized columnar section with the position of the Triassic new taxa, respectively. Table 1 shows the stratigraphical distribution of the Permian and Triassic new taxa.

Mader, D., 1985. Aspekte der Stratigraphie und Ablagerungsgeschichte des Buntsandsteins in der Eifeler Nord-Süd-Zone (Deutschland und Luxembourg). Jber.Mitt.oberrhein.geol.Ver., N.F., 67: 199-242, 12 figs., 69 refs., Stuttgart, G.F.R.. (in German with German and English summaries).

The Buntsandstein (Lower Triassic) in the Eifel North-South-zone (Germany and Luxembourg) was deposited within an elongate pre-Triassic depression in the Variscan basement by axially flowing streams and downvalley blowing winds. An inner axial facies and a marginal facies can be distinguished, the latter being especially developed in the western edge of the southwestern Eifel.

The upper part of the Middle Buntsandstein, which overlaps the Devonian basement in the West Eifel, consists in all areas of an interfingering of aeolian dunes and braided (not meandering) rivers.

In the Upper Buntsandstein conglomerates and sandstones are deposited in braided river systems with horizontally and vertically varying degree of braiding. Arguments are given in favour of an interpretation as braiding and not meandering river systems.

The vertical and lateral sequence of facies associations is palaeogeographically interpreted with (1) a southwestwards shift of the marginal centre of lateral gravel supply, (2) progressive extension of the basin and (3) the sedimentological model of an evolution of fluvial style during the depositional history.

Nicora, A., Gaetani, M., Garzanti, E., 1984. Late Permian to Anisian in Zanskar (Ladakh, Himalaya). Rend.Soc.Geol.It., 7: 27-30, 1 fig., 13 refs., Milano, Italy.

Zanskar represents the NW extension of the Spiti area, the classic area for the Early Permian and Triassic in the Himalaya. The investigation of the Triassic was concentrated on the Tamba Kurkur Fm. (Scythian to Anisian). A lithological description is given.

In the investigated sections the conodont fauna is very rich in the Scythian, while it is poor in the Anisian. Ammonoids are regularly found in the Tamba Kurkur Fm., but often deformed and tightly adhered to the matrix. Conodont and ammonoid assemblages are described. Brachiopods and bivalves are, respectively, very rare and rare.

Paevskaya, E.B., Olejnikov, A.N. (Editors), 1985. Late Triassic Molluscs of the Genus Monotis Bronn (based on logical-mathematical analysis). Trudy Minist.Geol.SSSR. Vses.Ordena Lenina Nauch.-Issled.Geol.Inst.im. A.P. Karpinskogo, nov. ser., 324: 144 pp., 12 figs., 11 pls., 13 tables, 50 refs.. "Nedra", Leningrad, USSR (in Russian).

A richly documented monograph on the genus *Monotis* Bronn (Molluscs). Unfortunately, my Russian is not too good, so, please be tolerant. The plates are of good quality.

The book contains 5 chapters:
1. Historical study of the Late Triassic genus *Monotis* Bronn
2. Detailed account on the systematical components of the genus *Monotis* Bronn.
3. Phylogenetic position of the genus *Monotis* in the system of bivalve Molluscs.
4. Stratigraphical importance of Late Triassic Monotidae.
5. Description of Norian bivalve Molluscs of the genus *Monotis* Bronn.

The figures and tables mainly deal with details of the logical-mathematical approach, e.g. dendrograms, matrices. Apart from this information three schemes are given (tables 12,13; fig. 12) dealing, respectively, with (a) a comparison of Norian sediments in Primor'ye and synchronous Formations in the Tethyan and Boreal Realm with Monotidae, (b) the stratigraphical distribution of Monotis and (c) the distribution of bivalve Molluscs in the Upper Triassic sediments of Primor'ye.

Rigby, J.F., 1985. Some Triassic (Middle Gondwana) floras from South Victoria Land, Antarctica. In: R. Cooper (Editor), Extended Abstracts Hornibrook Symp., 3-5 Dec.1985, Christchurch, New Zealand: 78-79, 1 table, 11 refs., New Zealand Geol. Surv., Lower Hutt.

Triassic (Middle Gondwana) taphofloras occurring at Mt. Shapeless and Horseshoe Mountain, South Victoria Land, Antarctica are compared with those of similar age (Middle-Late? Triassic) from elsewhere in Gondwanaland.

Rui Lin, Jiang Na-yan, 1984. Lithofacies and biofacies of Latest Permian and Earliest Triassic at the bordering regions of Jiangsu, Zhejiang and Anhui provinces. Acta Palaeontol. Sinica, 23(3): 286-298, 2 figs., 2 pls., 14 refs. (in Chinese with English summary.

In the Latest Permian and the Earliest Triassic the geographic unit mentioned in the title was situated on the northeastern margin of the South Chinese Sea. At the beginning of the Triassic the platform, slope and basin persisting from the latest Permian were combined into an open, shallow shelf sea with an evenly submarine topography.

The lithofacies of many continuous Permian-Triassic sections, holding rich and varied faunal assemblages, has been studied. Details on lithofacies and biofacies are given. The relation between specific sedimentary environments and the alternation of biotas is dealt with.

Figs. 1 and 2 deal with sedimentary subprovinces and the pattern of sedimentation in the Latest Permian of the geographical unit mentioned in the title, respectively. Since the legend to the plates does not hold Latin namens, and since neither in the Chinese nor in the English text the reader is referred to the plates, the latter seem to have value for a rather restricted incrowd only.

Salger, M., 1985. Schwer- und Tonminerale des Keupers in der Forschungsbohrung Obernsees. Geologica Bavarica, 88: 143-147, 1 table, 1 enclosure, 4 refs., München, G.F.R..

A list is given of the mineral assemblages in the Keuper. Percentages are given of minerals per lithological unit.

Schnitzer, W.A., Mahadjer, D., 1985a. Vergleichende sedimentologische Untersuchungen an Proben aus dem Zechstein und dem Buntsandstein in der Forschungsbohrung Obernsees (Schwermineraluntersuchungen und Bestrahlungsanalyse). Geologica Bavarica, 88: 137-141, 1 fig., 4 refs., München, G.F.R..

The presence of several stratigraphical boundaries in the boring Obernsees can be affirmed by means of heavy minerals and irradiation analysis.

It is concluded that the deposits of the "Bröckelschiefer- and Gelnhausen-Folge" (lower Lower Buntsandstein) (fig. 1) either originate from regions with more metamorphic rocks or from redeposited sediments. Also the "Soling-Folge" (uppermost Middle Buntsandstein) shows metamorphic tendencies. The sediments in between come from granite areas. In the Upper Buntsandstein the sediments originate from areas with metamorphic rocks as well as from granite regions.

Schnitzer, W.A., Mahadjer, D., 1985b. Ergebnisse der Bestrahlungsanalyse an Quarzen aus dem Keuper in der Forschungsbohrung Obernsees. Geologica Bavarica, 88: 149-152, 1 fig., 11 refs., München, G.F.R..

Quartzes in 20 Keuper samples from the boring Obernsees have been analysed by means of radioactive irradiation. Following the stratigraphic sequence given by HAUNSCHILD (see above) it is concluded that sediments below the Lower Buntsandstein originate from areas with metamorphic rocks, whereas those from the Middle and Upper Buntsandstein come from granite regions. The data from the Lower Buntsandstein are influenced from the presence of uranium in the investigated samples. The results are compared with those obtained by SALGER (see above).

Schwarz, H.-U., 1985. Das Profil des Unteren Muschelkalkes in der Forschungsbohrung Obernsees und seine paläogeographische

Stellung. Geologica Bavarica, 88: 83-95, 2 figs., 43 refs., München, G.F.R..

The Lower Muschelkalk of the boring Obernsees, 59.92 m thick, has been sedimentologically analysed (fig. 1). An extensive description is given. The sediments are interpreted as a marginal facies of the Lower Muschelkalk basin.

The results of recent deep drillings form the basis of a new isopach map for the eastern part of the marine Lower Muschelkalk basin (fig. 2). On this map the Bayreuth-Weiden Bay appears more distinct and with larger dimensions than hitherto assumed.

Seufert, G., Schweizer, V., 1985. Stratigraphische und mikrofazielle Untersuchungen im Trochitenkalk (Unterer Hauptmuschelkalk, mo 1) des Kraichgaues und angrenzender Gebiete. Jber. Mitt.oberrhein.geol.Ver., N.F., 67: 129-171, 9 figs., 27 refs., Stuttgart, G.F.R..

In the Kraichgau and adjacent areas (South of Heidelberg, Baden-Württemberg, G.F.R.) (fig. 1) stratigraphical and microfacial investigations have been carried out in the Trochitenkalk (Upper Muschelkalk, mo. 1).
The lithological sequence is described in detail (pp. 131-161, fig.2). Successively, the Zwergfauna-Schichten (fig. 3), Haszmersheimer Horizont (fig. 4), Blaukalkhorizont (fig. 5), Horizont der Wellenkalkbänke, Splitterkalkhorizont and *Spiriferina*-Bank (fig. 6) are dealt with, plus unnamed lithological units in between them.

On the basis of the stratigraphical results and the microfacial analysis views are expressed regarding the palaeogeography and facies development of the Trochitenkalk.

Tuzhikova, V.I., 1985. Miospores and Stratigraphy of Reference Sections in the Triassic of the Urals, 232 pp., 6 figs.,62 pls., 18 tables, 200 refs.. Akad.Nauk SSSR Ural'sk.Nauchn.Tsentr., Sverdlovsk, USSR (in Russian).

The book holds 6 chapters:
1. Survey of palynological investigations in Late Permian and and Early Triassic sediments;
2. Brief lithological-palaeontological characterization of Lower Triassic reference sections in the Urals;
3. Materials and methods of investigation;
4. Characteristic miospore complexes in the Upper Permian and in Lower Triassic reference sections of the Urals;
5. Systematical part;
6. Palynological sequence and some peculiarities regarding the investigated associations in the Permo-Triassic palynofloras of the Urals.

In the systematical part 45 taxa are described and figured, including 3 new genera, 25 new species, 1 new variety, 2 new forms, 4 new combinations and 3 new emendations.

Urlichs, M., Mundlos, R., 1985. Immigration of Cephalopods into the Germanic Muschelkalk Basin and its influence on their suture line. Lecture Notes Earth.Sci., 1: 221-236, 8 figs., 67 refs., Heidelberg, G.F.R..

Only few, probably more tolerant, genera of the stenohaline group of cephalopods have menaged to get established in the Germanic Basin. These include *Germanonautilus*, *Serpianites* and *Paraceratites* as well as *Ceratites* which evolved from the latter in this new province.

In *Serpianites* (Lower Muschelkalk / Upper Anisian) and the early ceratites (Upper Muschelkalk / Upper Anisian) an iterative reduction of sutural complexity can be observed.

Radiation of ceratites from the ancestral *Paraceratites (Progonoceratites) atavus atavus* took place during the *atavus* and *pulcher/robustus* Zones of the Upper Anisian.

Figs. 1-4 present the ranges of nautiloids, Ceratitaceae and ceratids in the Muschelkalk of the Germanic Basin. In figs. 5, 7, 8 external sutures of various taxa are shown. Fig. 6 elucidates the phylogeny of the external sutures of *Paraceratites (Progonoceratites)*.

Utting, J., 1985. Preliminary results of palynological studies of the Permian and lowermost Triassic sediments, Sabine Peninsula, Melville Island, Canadian Arctic Archipelago. Geol.Surv.Canada, Paper 85-1B: 231-238, 4 figs., 17 refs. (with English and French summaries).

Well preserved palynomorphs have been found in several Permian Formations and in the lower Bjorne Fm. (Early Triassic). In the Bjorne Fm. acritarchs are absent.

The Early Triassic assemblages contain abundant striate disaccate pollen (*Protohaploxypinus* spp. and *Taeniaesporites* spp.), non-striate disaccate pollen (*Falcisporites* sp. and *Klausipollenites* spp.), colpate pollen (*Gnetaceaepollenites* spp.) and trilete spores (*Kraeuselisporites* spp. and *Lundbladispora* spp.). Present also is the cyst-like microfossil *Tympanicysta stoschiana*.

The assemblages are unlike those of Gondwana and Cathaysia. They appear to be more similar to those described from the northeast European part of Russia than to those of western Europe.
The Thermal Alteration indices of the palynomorphs are low (2- to 2+ on a five point scale), suggesting suitable conditions for the generation of liquid hydrocarbons.

The illustrations give information on the location of the study area and the sample localities; the approximate ages of beds sampled. In fig. 4 a summary is given of the palynomorph assemblages.

Varyukhina, L.M., 1986. Triassic Miospores of the Pechora Syncline and their Importance for Intercontinental Correlation. Ser. Preprintov "Nauchnye Doklady", 144: 34 pp., 3 figs., 2 charts. Akad.Nauk Komi Filial, Syktyvkar, USSR. (In Russian with English summary).

In the Triassic deposits of the Pechora Syncline thirteen spore and pollen complexes are recognized which are based on the quantitative occurrence of certain combinations of species. These species either occur throughout the Triassic, or have a shorter range.

Analysis of data from literature on miospore complexes from numerous Triassic deposits of various continents enables a correlation with the Pechora Syncline, thus stressing the importance of the use of miospore complexes for long-range correlation and detailed biostratigraphic zonation.

Wang Yi-gang, 1984. Earliest Triassic ammonoid faunas from Jiangsu and Zhejiang and their bearing on the definition of Permo-Triassic boundary. Acta Palaeontol. Sinica, 23(3): 257-269, 8 figs., 3 pls., 21 refs., (in Chinese with English summary).

The base of the *Otoceras woodwardi* zone is traditionally accepted as the Permo-Triassic boundary. However, in China *O.woodwardi* is only known from S.Xizang (Tibet). Earlier records of *Otoceras* cf. *woodwardi* by Hsü proved to be misidentified specimens of *Koninckites*.

In the author's opinion the base of the *Otoceras* zone alone is not suitable to represent the Permo-Triassic boundary, since this zone can neither be found in the Tethyan area of low latitude nor in the Himalayas. In his view the *Hypophiceras* zone is time-equivalent with the *Otoceras* zone and the bases of both zones should be used, therefore, to define the base of the Triassic.

In South China the uppermost Permian is represented by the Changhsingian with many Permian index fossils such as *Rotodiscoceras*, *Pleuronodoceras*, *Paleofusulina sinensis*, *Neondolella deflecta* and *N. subcarinata changhsingensis*.

In a section near Meishan, Changxing, W.Zhejiang, the *Hypophiceras* zone is found lying conformably on top of the Changhsingian. Therefore, in the author's view, this section should be regarded, at least for the time being, as an ideal Permo-Triassic boundary stratotype.

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In the light of the Laboratory's role as one of the few training centres for stratigraphical palynology in Europe, and as a result of the expanding need for accurate palynostratigraphical data, the Laboratory of Palaeobotany and Palynology has become engaged in a wide range of services which assist universities, government agencies and companies in their geological research.

It is not the objective of the programme of Special Services to supplant the work of professional consultants. However, palynological information is frequently required from stratigraphical intervals and/or geographical areas where palynological consultants are not yet operating on a routine basis. Material from such areas may be accepted for detailed analysis by the Laboratory of Palaeobotany and Palynology. The funds raised from the special services will be exclusively used to support the various educational activities of the Laboratory."

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INTERNATIONAL UNION OF GEOLOGICAL SCIENCES (IUGS)