

**INTERNATIONAL COMMISSION ON THE HISTORY
OF GEOLOGICAL SCIENCES**

INHIGEO

NEWSLETTER No. 35 for 2002

Issued in 2003



INHIGEO is

A Commission of the International Union of Geological Sciences

&

**An Affiliate of the International Union of the History and Philosophy of
Sciences**

**Compiled and edited by David R. Oldroyd
INHIGEO Secretary-General**

Printed in Sydney, Australia

St Martin Church, Étampes, near Paris

Visited during field excursion to the locality of the (now-deceased) *Stampien* stratotype (superseded by the Rupelian) (Oligocene). The *Stampien* stage was proposed in 1852 by Alcide d'Orbigny, in reference to the sediments deposited during the last marine incursion in the Paris Basin (see p. 12).

(The church suffered from ground subsidence not long after its construction, so that its tower became partly detached from its nave.)

Sketch by Efgenji Milanovsky



Saint Martin Church erected in 12 and 13 centuries in Étampes town (50 km to the south from Paris).
Its bell-tower constructed in the beginning of 13 century has soon advised the steep inclination to the west. 2.7.2002
G. Milovanov

CONTENTS

THE INHIGEO BOARD	1
REPORTS	
President's Report	3
Secretary-General's Report	4
Minutes of the INHIGEO Business Meeting, Paris, 2002	6
Geoarchives Progress Report No. 4	7
APPEAL ON GEOARCHIVES	9
EPISODES	10
INHIGEO BUSINESS MEETING, DUBLIN, 2003, AGENDA	10
CONFERENCE REPORTS	
The d'Orbigny Meeting, <i>Muséum d'Histoire Naturelle</i> , Paris, 1–7 July, 2002 (Alcide d'Orbigny, 1802–1857, sa vie et son oeuvre, histoire de la stratigraphie d'Orbigny à nos jours)	10
Hugh Miller at Home, 200 Years On: 'Hugh Miller in Context': International Bicentenary Conference on Aspects of the Life and Times of Hugh Miller. Cromarty, 10–12 October 2002. And other Millerian News	13
NATIONAL COMMITTEES	19
ARTICLES	
'Reflections on the History of Science: Thoughts Developed in Response to the Review 'Homage to Lamarck', Published in the last INHIGEO Newsletter by our Congenial Friend and Active Secretary-General, David Oldroyd, Concerning my Work <i>La naissance du transformisme: Lamarck entre Linné et Darwin</i> ', by Goulven Laurent	19
'The Serbian Mining Codex of 1412', by Alexander Grubic	23
'The 1690s Coalheugh Well at Cromarty, Scotland: A Rare Survival of Upstanding Evidence for Pre-scientific Coal Prospecting', by Michael Taylor & Hugh Torrens	25
AWARDS and HONOURS	
Dennis Dean: History of Geology Award, Geological Society of America	26
Albert Carozzi: The American Association of Petroleum Geologists' Distinguished Educator Award for 2003	27
Kanenori Suwa: The Watanabe Prize	28
Efgenji Milanowsky: The Karpinsky Medal	28
Rudolf Trümpy: The Wollaston Medal	28
David Oldroyd: International Academy of the History of Science and Australian Government Centenary Medal	28
IN MEMORIA	
'Professor Gerhard Regnéll (1915–2002)', by Bjorn Sundqvist	28
'Professor William Anthony Swithin Sarjeant (1935–2002)', by David Spalding	31
'Professor Andrzej Bolewski (1906–2002)', by Wojciech Narebski & Zbigniew Wojcik	33
'Centenary of the Birth of Professor Calamur Mahadevan', by K.S. Murty	34
INTERVIEW WITH DAVID BRANAGAN: David Oldroyd	34

FORTHCOMING MEETINGS	39
BOOK REVIEWS	
'Freiberg and INHIGEO's Werner Celebration Now Published', by Martin Guntau	41
'INHIGEO in Rio de Janeiro', by Paul Mohr	42
The INHIGEO Meeting in Lisbon and Aveiro: 24 June–1 July, 2001, by Ana Carneiro	45
'History of Geological Research in Austria and Neighbouring Countries from the Perspective of the 150 th Year of the Federal Institute of Geology, Vienna', by Peter Krueger	51
'Theoretical Notions from Russia', by Georgi Khomizuri	52
'A Millerian Aperitif', by David Oldroyd	53
'On the Birth of Modern Volcanology', by Albert Carozzi	54
'Alcide d'Orbigny: The Multidisciplinary Scientist and Traveller', by Albert Carozzi	55
'Saussurian Style', by David Oldroyd	56
'The History of Sedimentology: A Japanese View', by Masae Omori	57
'Trouble with the Moines', by Cherry Lewis	57
'A Plea for an 'Open Geoscience'', by Bernhard Fritscher	58
NOTES AND QUERIES	59
PUBLICATIONS RECEIVED	62
COUNTRY REPORTS	
Australia	63
Belarus	64
Bolivia	65
Canada	66
Czech Republic (Brno)	67
France	68
Germany	69
Hungary	72
Ireland	72
Italy (northeast)	73
Japan	75
Lithuania	75
Malta	77
New Zealand	77
Poland	77
Portugal	78
Russia	79
Spain	81
Sweden	83
United Kingdom	83
United States	85
Uzbekistan	88
Yugoslavia	88
INHIGEO MEMBERS	89

THE INHIGEO BOARD

President

Professor Manuel C. S. Pinto
Department of Geosciences
The University of Aveiro
3810 Aveiro, Portugal
Phone: 351 2 34 370 744
Fax: 351 2 34 370 605
Email: mpinto@geo.ua.pt

Secretary-General

Professor David R. Oldroyd
[The University of New South Wales],
28 Cassandra Avenue
St Ives, NSW, 2075, Australia
Phone: 61 2 9449 5559
Fax: 61 2 9402 7635
Email: d.oldroyd@unsw.edu.au

Past President

Professor Hugh S. Torrens
Department of Earth Sciences
Keele University
Staffordshire, ST5 5BG, UK
Phone: 44 1782 75 0689
Fax: 44 1782 75 1357
Email: gga10@keele.ac.uk

Vice Presidents

Dr Ursula B. Marvin (North America)
Harvard-Smithsonian Center for Astrophysics
Cambridge (Mass), 02138
USA
Phone: 1 617 495 7270
Fax: 1 617 495 7001
Email: umarvin@cfa.harvard.edu

Professor Kanenori Suwa (Asia)
1-1020 Umemori-zaka
Meito-ku
Nagoya, 465-0065, Japan.
Phone: 81 52 701 0457
Fax: 81 52 701 0457
Email: suwa@handv.n-fukushi.ac.jp

Professor Nicoletta Morello (Europe)
Institute of Modern and Contemporary History
University of Genoa
Via Balbi 6, 16126 Genoa, Italy
Phone: 39 10 353 8317
Fax: 39 10 209 9826
Email: nicoletta.morello@lettere.unige.it

Latin America
Position vacant

REPORTS

President's Report

1. Because of the death of some INHIGEO members in 2002 it is with a word of sorrow that this report begins, condolences being paid to their families.
2. On the bright side, and as duly pointed out in the Secretary-General's Report, fourteen new members were elected last year, four of them from four countries that were not represented before in the Commission. There are now 169 members, a slight decrease relative to 2001 (171), but the number of their countries of origin has increased from 37 to 41, European and North American members still constitute the majority.
 Honorary status was offered to several members in recognition of former scholarly achievement or notable contribution to the INHIGEO. The Commission wishes to congratulate the Members who have accepted such status and thanks them for what they did for it.
 An appeal is made to all members to fully participate in the life of the INHIGEO, at least in the activities required by its statutes. It is with regret that we realize that the position of Vice-President for Latin America is now regarded vacant and that nine persons lost their membership for failure to participate in the ballots on two consecutive occasions, which means that, according to the statutes they must forfeit their membership.
 In 2004, in Florence, a new INHIGEO Board will be elected and so Members are requested to give some thought to that.
 A number of matters were listed in the *Newsletter* for 2001 about which the present Board would like to have exchanged views with members. Since the success of that initiative was practically nil, one wonders if the Commission should open a forum in the Internet with that in mind.
3. INHIGEO was associated with the holding of the d'Orbigny meeting in Paris, in July, 2002. Addressing the audience at the opening session was an unforgettable experience for me and I wish to thank again Professor Philippe Taquet and his colleagues for their kind attentions.
 Meetings in 2003 (Dublin), 2004 (Florence) and 2005 (Prague, Beijing) were discussed during the business meeting held in Paris. Let us hope that offers for 2006 and following years will come up soon!
4. As seen in the S-G's Report and also in the reports from countries in the present *Newsletter*, publications of the Commission or its affiliates have been quite numerous. All of us are to be congratulated for that. Publication is vital and it is especially important to keep the 'Classic Papers' series in *Episodes* going. Again an appeal is made to all members to participate in such an effort.
5. Contacts were maintained with the IUGS Board about two projects, already referred to in the *Newsletter* for 2001 (one on the history of IUGS and the other on the history of the International Geological Congresses), that were originally presented in a very informal way by me to Professor Ed de Mulder, President of that Union. It is hoped that the subject will deserve further attention. We anticipate that they will be considered in some detail at a meeting between representatives of the INHIGEO Board and the IUGS Board in Dublin.

Contacts have also been made with the IUHPS—Division of History of Science about matters of mutual interest.

6. Many thanks are due to IUGS and to IUHPS for the financial support that they gave to INHIGEO in 2002 and in 2003. Thanks are also due to the institutions where the members of the INHIGEO Board are based for their support, without which their activities could hardly be carried out.

Manuel S. Pinto, Aveiro

Secretary-General's Report

In 2002, a business meeting of the Commission was held in Paris at the time of the D'Orbigny conference, and the minutes are published on p. 6. At this meeting, the decision was made to hold the INHIGEO meeting in the Czech Republic in 2005, with a subsidiary meeting being held in China (Beijing) at the time of the International Congress of the History of Science during the same year, subject to the willingness of our Chinese colleagues to prepare such a meeting. Subsequent to the Paris meeting, I was in correspondence with Professor Zhai in relation to this matter, and he and his colleagues have kindly agreed to organise a session at the history of science congress on the theme of the history of geosciences in East Asia. For my account of the excellent Paris meeting, see p. 10.

Conference proceedings have now been published for our meetings in Freiberg (1999) (see review p. 41), Rio de Janeiro (2000) (see review p. 42), and Paris (2002)—in the *Comptes Rendus de l'Académie des Sciences, Paris—Palevol*. The proceedings of the Lisbon meeting (2001), edited by the President Manuel Pinto, have recently been published, but I have not seen a copy at the time of writing. However, the book is reviewed by Dr Ana Carneiro in the present *Newsletter* (see p. 45).

A ballot was held in 2002 for new Members of the Commission and all persons nominated were duly elected. However, some persons have lost their membership through failure to vote in two successive ballots. I am particularly gratified to see new Members of the Commission being elected for Denmark, Lithuania, Belarus, and Uzbekistan, which are either 'new' countries or have not had representation for some years.

Dr Pedro Gonçalves (Brazil) has resigned from the position of Vice President (Latin America) and the position remains vacant until the next ballot in 2004.

There is a continuing need for the offer of papers for the 'Classic Papers' series in *Episodes*. An item on the Chinese geologist MA Ting Ying has recently been published and arrangements are being made for the translation of a Russian paper by Karpinski; and an offer of a paper on the work of Domeyko in the Andes has been received from Poland and Lithuania. I have also had an indication of a further possible paper on Wegener, but much more is required to keep the series moving. Do please contact me about this matter if you have anything to offer. I sincerely thank Bernhard Fritscher (Germany) and Patrick Wyse-Jackson (Ireland) who provided contributions in 2002.

The IUGS has expressed its intention of reviewing the work of INHIGEO again in 2003, and will do so in Dublin on the day prior to the beginning of our conference in July. INHIGEO will be represented by myself and Professor Pinto, and there will be two external 'referees', as well as Members of the IUGS. I believe that a major topic for discussion will be the consideration of the writing of the history of the IUGS and/or the various International Geological Congresses (which topics are closely linked of course). During the course of the conference, an IUGS representative, Dr Janoschek (Austria), will address the Members of the Commission who are present in Dublin.

During 2002, I travelled to the Czech Republic and Russia. The first journey was undertaken to discuss with Dr Jan Kozak the possible arrangements for a meeting in Czechia in 2005, and preliminary details have been worked out. I was also privileged to be given an historical tour of (pre-flood) Prague by Dr Josef Haubelt, and we all made a visit to Dr Jan Urban in Kutná Hora to see the fine buildings there and view the exhibits on the history of the silver mining industry in that town (which had in part been prepared by Dr Urban). We also saw one of the world's few surviving alchemical laboratories. Additionally there was time to visit some sites of stratigraphic importance associated with the work of Joachim Barrande, and some fine limestone caves. I was also pleased to view Dr Kozak's valuable collection of prints and maps relating to the history of earth science, especially in connection with earthquakes.

Relics of an Alchemical Laboratory at Kutná Hora, Czech Republic

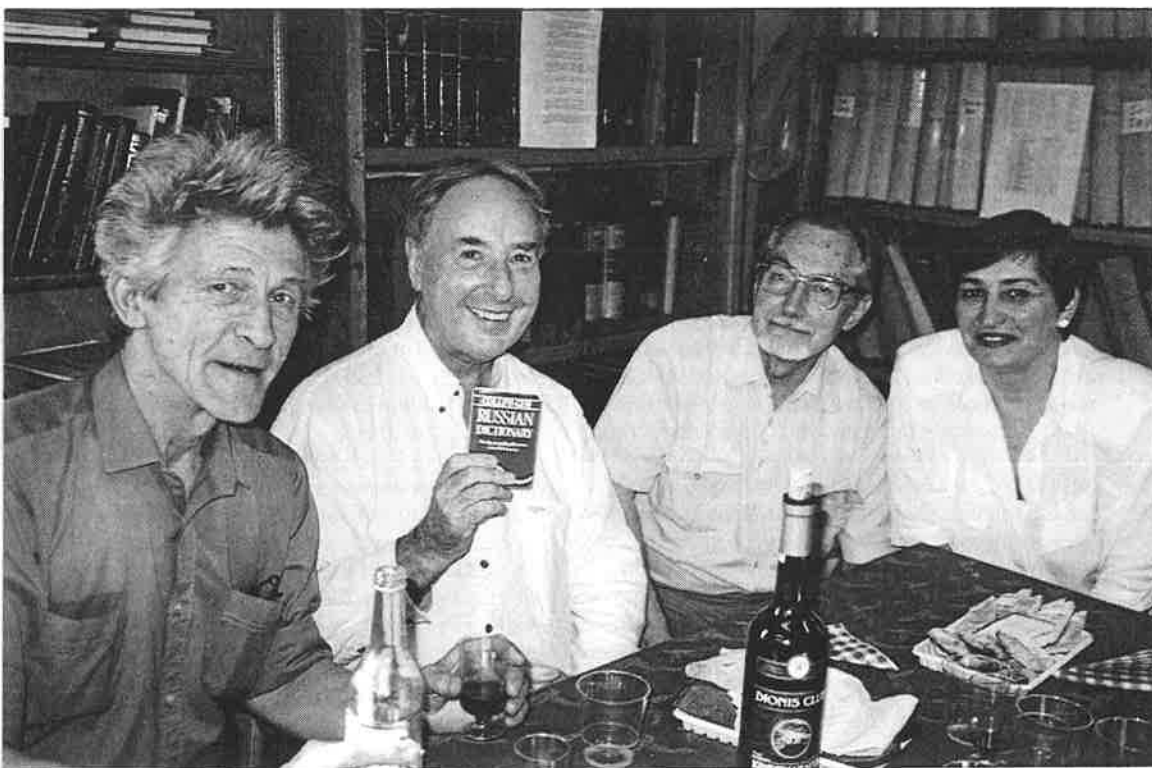


In Russia, I was given personally guided visits to the magnificent mineralogical museums in Moscow, to Moscow State University, and to the Tretyakov art gallery. The latter has the world's finest collection of traditional Russian art, and I was privileged to be conducted round it under the expert guidance of Professor Efgeni Milanovsky. I also had the opportunity to hear some of the world's finest singing in the Kremlin. And I was pleased to be able to meet INHIGEO colleagues Yuri Soloviev and Georgi Khomizouri in their history of geosciences unit at the Vernadsky Museum, along with the geohistorian Zoya Bessudnova (who some Members will remember having met in Portugal in 2001). She was just then completing her PhD on the history of mineralogy in Russia and of the Vernadsky Institute; and I am glad to report that she was awarded the degree towards the end of the year.

Professor Milanovsky standing by a bust of his late father, also a Professor of Geology, at Moscow State University



Part of a small party in the history of geoscience unit at the Vernadsky Institute, Moscow. Left to right: Georgi Khomizuri, David Oldroyd (armed with dictionary), Yuri Soloviev, Zoya Bessudnova



**Minutes of the Business Meeting of INHIGEO, held at the *Museum d'Histoire Naturelle*, Paris, on 2 July, 2002 7.00 p.m.,
with the President, Professor Manuel Pinto in the Chair**

Present

David Branagan (Australia), David Oldroyd (Australia), Silvia Figueiroa (Brazil), Jean Gaudant (France), Gaston Godard (France), Gabriel Gohau (France), Philippe Grandchamp (France), Goulven Laurent (France), Philippe Taquet (France), Bernhard Fritscher (Germany), Martina Koelbl-Ebert (Germany), Manuel Pinto (Portugal)
Efgenji Milanovsky (Russia), Yuri Soloviev (Russia), Beryl Hamilton (UK), Hugh Torrens (UK)

In attendance

Algimantas Grigelis (Lithuania)

1. Apologies were received from: Barry Cooper (Australia), William Sarjeant (Canada), David Spalding (Canada), Martin Guntau (Germany), Wilfried Schroeder (Germany), Istvan Viczian (Hungary), Kottapali Murty (India), Nicoletta Morello (Italy), Giuliano Piccoli (Italy), Ezio Vaccari (Italy), Michael Johnston (New Zealand), Ana Carneiro (Portugal), Bjorn Sundqvist (Sweden), Albert Carozzi (USA), Ursula Marvin (USA), Kenneth Taylor (USA).

2. Arrangement of Agenda

No changes were requested to the provisional agenda, as published in *Newsletter* No. 34.

3. The Minutes of the previous meeting, as published in *Newsletter* No. 34, were accepted *nem. con.*

4. There were no matters arising from the Minutes.

5. In his Report to the Meeting, the President pointed out that a letter from Dr Silvia Figueiroa, referred to in his Presidential Report had not in fact been published (at her request), and he wished this to be made clear to the meeting for otherwise his Report did not make sense at the relevant point.

Regarding the publication of the *Proceedings* of the Lisbon Meeting (2001), Professor Pinto reported that all papers had been received and that the editorial process was under way. He anticipated that publication would be before the end of 2002. He was presently working on the illustrations.

6. In response to a question from Dr Branagan, the President informed the meeting that it was anticipated that all Members of INHIGEO would receive a copy of the publication *gratis*.

7. The Secretary-General, David Oldroyd, reported that during 2001 he had been much occupied with the editing of the papers arising from the Rio Congress (and others), which had now been published as Geological Society Special Publication No. 192, *The Earth Inside and Out: Some Major Contributions to Geology in the Twentieth Century* (2002). Further, he had attended the Congress of the International Association of Geomagnetism and Aeronomy (IAGA) and the International Association of Seismology and Physics of the Earth's Interior (IASPEI) in Hanoi in August 2001 (see *Newsletter* No. 34). He had also been visiting INHIGEO Members in the Czech Republic and Russia, immediately prior to the Paris Meeting.

Regarding the suggestion discussed at the 2001 Business Meeting in Lisbon, about the possible publication of translations of significant texts in the history of geology, the S-G reported that the proposal had not received a favourable response from the Geological Society, since it was its policy only to publish *original* works.

The Annual Report of the Commission, for 2001, had been accepted by the Executive Committee of the IUGS and commended for its 'high quality'. Sums of US\$3000 and \$1000 had been received as grants from the IUGS and the IUHPS respectively for the Commission's activities in 2002. [The S-G had paid himself A\$800 for his expenses during the year and 350 Euros for travel to the Paris Meeting.]

The following matters were reported from the letter to INHIGEO from the Secretary-General of the IUGS, dated 15 May, 2002:

- (a) The Committee [of the IUGS] is interested in both establishing the impact of the International Geological Congress on the development of the Geosciences and in the early history of the IUGS through the first-hand evidence of some of the protagonists. The Commission is asked to decide on who would be the best person(s) to carry out these projects, although the Committee would like to have some relatively detailed information about the person(s)' background.

[The S-G was instructed to communicate further with Dr Janoschek on this matter.]

- (b) The Commissions are strongly encouraged to submit material for Episodes, the IUGS journal, not only to disseminate their scientific work but also to raise their profile within the Earth Science community. Both review articles, IUGS supported projects and programs are requested to submit at least one article o Episodes every four years. It would be appreciated if annual reports from Commissions to IUGS could clearly indicate their contributions in Episodes in the previous year.

8. Future Meetings of the Commission

In introducing this topic, the S-G pointed out that the receipt of grants from the IUHPS was, to an extent, dependent on the Commission making significant contributions to the IUHPS's international congresses. In 2001, when INHIGEO had not organized a session at the Mexico City Congress, no travel money had been received. However, INHIGEO's 'non-appearance' at Mexico had been explained to the IUHPS and funding had been restored in 2002.

Meetings in Ireland in 2003 and in Florence in 2004 were confirmed.

The S-G then read out parts of a letter of 14 June, 2002) from Czech Member, Dr Jan Kozak, proposing that INHIGEO should hold a meeting in Prague in 2005, with a focus on geophysics as well as the history of geology in the Czech Republic. The topics proposed were: History of geophysics and its individual disciplines such as seismology, volcanism, geomagnetism, gravimetry, geothermics, geoelectrics, etc.; as well as the histories of geology, palaeontology, mining, etc. The benefits of holding a meeting in the beautiful city of Prague were outlined, and it was stated that an excellent place to hold the meeting was available by the Vltava River at a low cost. A certain amount of subsidized or even free accommodation might also be available. The conference fee could be small (about 150 Euros), which could cover publication costs, etc. The meeting would receive the full support of the Geophysical Institute of the

Czech Academy of Sciences (whose Director the S-G had recently met with in Prague and discussed possible plans and arrangements), Charles University, and the Geological Institute of the Czech Academy of Sciences. Contact had already been made with German Member Dr Wilfried Schroeder, who has a strong interest in the history of geophysics. INHIGEO would be expected to supply some supporting funding. It was noted that INHIGEO had never held a meeting in Czechia or Slovakia, and that it had not previously had one that focused on the history of geophysics.

Given these considerations, the Meeting was much in favour of the proposal. However, the S-G pointed out that there was the consideration that INHIGEO should, in the normal way of things, participate in the IUHPS Congress that will be held in Beijing in 2005. He was instructed to make contact with the Commission's Chinese Members to see whether it might in fact be possible to hold two meetings in 2005, with Chinese colleagues being chiefly responsible for a Beijing symposium.

9. Archives

Professor K. S. Murty was thanked for his work in this regard, with three reports in successive *Newsletters*. The S-G was instructed to write to him in this regard. Both he and Professor Murty had been in touch with Professor Peter Barker, University of Bath, Director of the national Cataloguing Unit for the Archives of Contemporary Scientists, and Chairman of the Biography and Documentation Commission of the IUHPS (History of Science Division) (see *Newsletter* No. 34, p. 7), which indicated that the most useful function for INHIGEO Members was that of encouraging geoscientists of note to ensure that their papers were suitably preserved after their decease. The S-G was requested to write to all Members of the Commission concerning this important matter.

10. *Episodes* and the histories of IGCs and the IUGS.

As noted above, the IUGS is anxious that all of its Commissions should, from time to time, provide contributions to *Episodes*, and at least once every four years. In fact INHIGEO is already doing more than that through its 'Classic Paper' series. However, the S-G was finding difficulty in keeping up a supply of contributions. He would circulate a further notice about this matter to Members. He would also pass on ideas developed after further discussion with Dr Janoschek.

11. The President also spoke briefly on his ideas about a history of geological work in Africa.

12. Honorary Senior Members.

The following persons were nominated as Honorary Senior Members, and the suggestions were accepted *nem. con.*, subject to the agreement of the persons concerned: Professor Gordon Craig (UK), Professor William Sarjeant (Canada).

13. New Members.

The S-G reported that all nominations for membership in the 2002 ballot had been successful, and accordingly the following persons were declared elected as Members of the Commission: Valeri Ermolenko (Belarus), Jens Hansen (Denmark), Gottfried Hofbauer (Germany), Miklos Kazmer (Hungary), Horoshi Hirai (Japan), Algimantas Grigelis (Lithuania), Kerim Djafarov (Russia), Rodolfo Gozalo (Spain), Jorge Ordaz (Spain), Lora Lordkipanidze (Uzbekistan), Michael Taylor (UK), Victor Baker (USA), Gregory Good (USA), Rogelio Altez (Venezuela).

14. Business without notice.

(a) Matina Koelbl-Ebert (Germany) reported that she had been collecting 'geological songs' and so far had received 2 from Japan, 1 from Poland, 2 from Australia, 3 from Germany, and 1 from Portugal. She hoped to receive at least 25, in which case they might be issued by INHIGEO, or some other body, as a booklet. Submissions were requested, and the S-G undertook to circulate the request to Members again. [Subsequently, in conversation, Professor Taquet suggested the inclusion of cartoons, which idea the S-G undertook to pass on to Dr Koelbl-Ebert.]

(b) Professor Torrens reported that the geological bookseller Stuart Baldwin, in England, had begun work on a PhD on the history of amateurs in geology. INHIGEO undertook to give what assistance it could in this project.

(c) Professor Torrens further reported the death of Professor G. Regnell from Sweden, a former INHIGEO Member. The S-G undertook to try to find an obituarist for him for the *Newsletter* [and subsequently he received an offer from Bjorn Sundqvist to write one: see p. 28].

15. Vote of thanks

A warm vote of thanks to Professor Taquet and all the other organizers of the d'Orbigny Symposium was moved by Professor Torrens, seconded by the S-G, and carried by acclamation.

The meeting closed at 8.10 p.m.

David Oldroyd, Secretary-General

Geoarchives Progress Report No. 4

Progress Report No. 3 on Geoarchives was published in INHIGEO *Newsletter* No. 34 for 2001, issued in May 2002. It covered the period May 2001 to April 2002.

Of the information and material received, the major one was from Poland. The information, by country, is as follows:

Australia

The personal archives of Tannatt William Edgeworth David (1858–1934) who worked as Assistant Geological Surveyor to the NSW Government, and later as Professor of Geology in the University of Sydney (May 1891 till retirement in 1924 and as Emeritus Professor he worked on a treatise on the geology of Australia which he, however, could not complete. More information on his works can be obtained from Sydney University Archives and the *Australian Dictionary of Biography*; also from Suzy Nunes, who responded to the announcement on the ICA-CST e-mail listserve, STAMA. Dr Gavan McCarthy, Chairman, International Council on Archives/Committee of Science and Technology Archives very kindly assisted in this matter. He also provided information on the Australian science and Technology Heritage Venture, at The University of Melbourne,

about which more information is available on website: www.austehc.unimelb.edu.au. Also the archives of Australian scientists may be located via the Australian Science History Archive (<http://www.asap.unimelb.edu.au/bsparcs/bsparcshome.htm>).

Germany

The Archive for the History of Geology (Geologenarchiv) in Freiburg has close links with the *Geologische Vereinigung* was re-established in 1958, after the earlier one was destroyed in Berlin during the war, by Max Pfannenstiele, a geologist-cum-librarian. He handed over all the collections in 1972 to the University library. The archive owns about 70,000 documents now, apart from 700 photos. The bulk of this material has been catalogued. In the last two decades, the archive received bequests of Andre Cailleux, Eugen Wegmann, Hans Stille, Hans Cloos and gifts from Curt Teichert and Georg Knetsch. Archive news is published annually in the *Geologische Rundschau*. Contact address: Geologenarchiv (Professor Dr. Eugen and Dr. Ilse Seibold), Universitätsbibliothek, Werthmannplatz 2, D-79098, Freiburg, Germany.

Iceland

Dr Sveinn Peter Dakobasson of the Icelandic Institute of Natural History (formerly the Museum of Natural History) states that they have built up a data file on publications dealing with the mineralogy, petrology and geochemistry of Iceland, using the Filemaker Pro application. This file now counts 2,799 publications and reports published since 1840. It is connected to a data file on the mineral and rock collections of the Institute (21,745 entries) and a file on Pleistocene and Holocene volcanic eruption units in Iceland (1,375 entries). These files have not yet been published and are not yet accessible to scientists outside the Institute. Dr Jakobsson can provide information on certain topics to those interested. His contact address is: Icelandic Institute of Natural History, Hlemmur 3, P.O. Box 5320, IS-125 Reykjavik, Iceland. Tel: +354 562 9822 Fax: +354 562 0815 ni@natffs.is

International Council on Archives (ICA)

The ICA formed a committee on Archives of Science and Technology, following the International Congress on Archives held in September 2000 on a number of areas over the four-year period from 2000 to 2004. Their key project is to publish a bibliography of archival literature relating to records of science, technology and medicine with in particular emphasis to literature concerning the appraisal of these records. The mandate given to this committee is:

To undertake study and research, to draft guidelines concerning all aspects of science, medicine and technology archives, to provide professional advice on relevant training programmes, to promote exchange of views and experience in this area, and to advise on the creation of international guide to institutions holding archives of science, medicine and technology worldwide.

The committee's Full Members are:

Ms Anne Barrett, College Archivist, Imperial College, London, Room 455 Sherfield Building, London SW7 2AZ, UK
(a.barrett@ic.ac.uk; Tel: 44 171 594 8850).

M. Lakhdar Amrani, C/o Direction Générale des Archives Nationales d'Algérie (Tel 34 91411 13 28; Fax 34 91 564 50 78;
[email: dgan@wissal.dz](mailto:dgan@wissal.dz))

Ms Juana Molina, Servicio de documentación, Archivo, Museo Nacional de Ciencias Naturales, Jose Gutierrez Abascal 2, 28006 Madrid, Spain (Tel: 34 91 411 13 28; Fax: 3491564 5078; juana@mncn.csic.es)

Ms Lubov A. Dubrovina, National Academy of Sciences of Ukraine, Vernadsky National Library of Ukraine, 24 Volodymyrska Str., 03680 Kiev, Ukraine (Tel: 380 44 244 4418; Fax: 380 44 244 20059; dubrov@i.com.ua)

Ms Alicja Kulecka, Instytut Historyczny, University of Warsaw, ul Krakowskie Przedmieście 26/28, 00-325 Warszawa, Poland (Tel: 48 22 65 72 788; Fax: 48 22 826 81 30; archiwum@apan.waw.pl)

Mr Giorgio Tori, Archivio di Stato, Piazza Guidiccioni 8, 55100 Lucca, Italy (Tel: 39 0583 491 465/587 Fax: 390583 469396;
aslu@archivi.beniculturali.it)

Dr Gavan McCarthy, Australian Science and Technology Heritage Centre, The University of Melbourne, 203 Bouverie Street, 3053 Carlton, VIC Australia (Tel: 61 3 8344 9364; Fax: 61 3 9349 4630; gavan@austehc.unimelb.edu.au)

Corresponding Members

Ms Björk Ingimundardóttir, National Archives of Iceland, P.O. Box R5-5390, 121 Reykjavik Iceland (Tel: 354 56 233 93; Fax: 354 55 257 20; bjorki@archives.is)

Mr Roelof Hol, State Archivist, Rijksarchief in Noord-Holland to Haarlem, Kleine Outweg 18, 2012 CH Haarlem, Pays-Bas/The Netherlands (Tel: 31 23 517 2700; Fax: 31 23 517 2720)

Mme Françoise Le Guet Tully, Observatoire de la Côte d'Azur B.P. 4229, 06304 Cedex 4, Nice, France (Tel: 33(0)4 9200 3043 Fax: 33(0)492 00 31 21; leguet@obs-nice.fr)

Bin Zhang, Archives College, Beijing, China, 175 Haidian Road, Haidian District, 100872, Beijing, China (Tel/Fax: 86 10 62511463; Zhangbinym@hotmail.com)

Poland

Dr Alicja Kulecka, who is a Full Member of the ICA/CST, has sent valuable and detailed information on Geoarchives in Poland. The main place is the Polish Geological Institute–The Central (Warsaw) Geological Archive with branches: The Marine Geology Branch, The Świętokrzyski Branch, The Carpathian Branch, The Upper Silesian Branch, located at Gdansk, Kielce, Krakow, Sosnowiec, Szczecin and Wrocław respectively. The Institute itself was created in 1919; the Archives of Geological Drilling in 1927; and the Archives of Manuscripts and Documentation of Geological Drilling of the Central Geological Archives in 1957. The Museum of the Earth of the Polish Academy of Sciences was established in Warsaw in 1948 (mzpeleo@warman.com.pl).

There are many private papers of geologists.

1. The Geological Materials in the Academy of Sciences, Warsaw, created in 1953, has the records of geological institutions, private papers of geologists, inventory and bibliography (archiwum@apan.waw.pl).
2. Archive Sciences of the Polish Academy of Sciences and the Polish Academy of Arts and Sciences, Krakow (archiwum@pau.krakow.pl), created in 1957, houses records of geological institutions, private papers, and has a published bibliography.
3. The Poznan Branch of the Archive of Polish Academy of Sciences, created in 1956, contains private papers and has a published bibliography.
4. The Archive of the Wrocław University, Wrocław, contains private papers and has a published bibliography.

Information about Polish archives is available from the Head Office of the State Archives, Dr Anna Laszuk (ndap@archiwa.gov.pl; www.archiwa.gov.pl). The Polish archival geological materials in libraries and museums are in:

1. The Scientific library of the Polish Academy of Arts and Sciences and the Polish Academy of Sciences in Cracow (biblioteka@biblioteka@biblioteka.pan.krakow.pl) which has private papers and bibliography;
2. The Museum of Cracow Salt Mines, Wieliczka (podziemne@museum.wieliczka.pl)

The Geological Institutes in Poland having archival materials are:

1. The Institute of Geological Sciences of the Polish Academy of Sciences (www.ing.pan.pl)
2. The State Geological Institute, Warszawa (speczik@pgi.waw.pl; <http://www.pgi.waw.pl>)
3. The University of Gdansk, Gdansk, Silesian University, Sosnowiec
4. A. Katedra Geologii Stosowanej Sosnowiec
Katedra Hydrogeologii i Geologii Inżynierskiej, Sosnowiec (rozkowski@us.edu.pl) (zuberek@uscfoxford.us.edu.pl)
5. Jagellonian University, Krakow, Krakow (slaczka@ing.uj.edu.pl www.if.uj.edu.pl/uj/ing)
Archives of Jagellonian University, Krakow (archiwum@cicero.law.uj.edu.pl; <http://www.law.uj.edu.pl/-archiwum/>)
6. University of Maria Curie, Lublin, Lublin
The Archive and Museum of the Maria Curie-Skłodowska University, Lublin
7. The Adam Mickiewicz University, Poznan
Archives of the Adam Mickiewicz University, Poznan (archiwum@amu.edu.pl)
8. Warsaw University, Warszawa (deg@geo.uw.edu.pl; www.geo.uw.edu.pl)
Archives of Warsaw University, Warszawa
9. University of Wrocław, Wrocław
10. Silesian Polytechnic, Gliwice (gabzdyl@geo.gom.polsi.gliwice.pl)
11. Academy of Mining and Steel Industry, Krakow.

The problem of the conservation of state archival material belongs to Naczelna Dyrekcja Archiwów Państwowych, The Head Office of State Archives, 00-950 Warszawa, Poland (ndap@archiwa.gov.pl; www.archiwa.gov.pl).

In Poland there is a system for collecting scientists' private papers. In the future, the main method of information storage will be the databases and inventories on-line.

USA

Dr Joe Anderson, Center for History of Physics, American Institute of Physics, College Park, MD 20740-3843 (<http://www.aip.org/history>) reports that the Center has an online catalogue, the International Catalog of Sources for History of Physics and Allied Sciences (ICOS), which includes descriptions of many collections of papers, organizational records, oral history, interviews, and other primary sources in geophysics. Most of the collections are held at the other repositories around the world, although the Center holds the records of the IUGG and a fair number of oral history interviews in the field

UK

Professor Peter Harper, University of Bath, in association with the Royal Society of London has sent Progress Report No. 30 covering the period 1 October 2001–31 March 2002. It has completed collections of William Joscelyn Arkell (1904–1958, geology), Sir Edward Penley Abraham (1913–1999), Stanley Keith Runcorn (1922–1995, geophysics), Sir Neville Francis Mott (1905–1996, physics). There are many collections in progress. See: www.bath.ac.uk/ncuas.

The National Archives Register is growing rapidly and is becoming a useful tool in locating material even if it is not comprehensive as yet. The imminent merger of the Public Records Office and the Historical Manuscripts Commission will accelerate the growth of the index. The present website of the Commission is: www.hmc.gov.uk. It provides information about a vast number of British archives. But also still useful is: D.R. Bridson, V.C. Phillips and A.P. Harvey, *Natural History Manuscript Sources in the British Isles*, Mansell, London and R.R. Bowker, New York, 1980; and more generally, R.J. Cleevely, *World Palaeontological Collections*, British Museum (Natural History) and Mansell, London, 1983.

A separate letter of appeal to all INHIGEO Members seeking their help in obtaining information on Geoarchives in their respective countries appears below. Others are also requested for their cooperation in this project. It is earnestly hoped that more and more information would become available in the months to come. I am grateful to all those who have provided the information included in this report as also in the earlier three reports.

K.S. Murty, Nagpur, India, 31 March 2003

APPEAL ON GEOARCHIVES

At the INHIGEO Business Meeting in Freiberg in 1999, I was requested to co-ordinate the collection of information on geoarchives on behalf of INHIGEO to assist the work of the Archives Commission of the International Union of History and Philosophy of Science (Division of History of Science).

During the last three years, I have despatched some 700 copies of the circular to various institutions, geoscience organisations, and some individuals. Four progress reports have now been published.

While I am happy to continue with the work assigned to me, I need more assistance from INHIGEO Members, in order to achieve the main objectives of the effort. In particular, I ask them to encourage individuals and institutions in their countries to make appropriate arrangements for the preservation of their papers.

Any information that Members may have in relation to this kind of request should, please, be passed on to me for inclusion in the next *Newsletter* (2004 for 2003), and in subsequent issues. Also, if you have not done so previously, please supply me with information that you may have about the existence of geoarchives in your country, or publications or websites about such matters.

The twentieth century's contribution to research and other activities in geoscience was more than that which was achieved in all the earlier periods put together, but it is almost certain that the twenty-first century will outstrip the twentieth. Materials must be preserved for posterity. Advantage can be taken of the vast strides being made in information technology, and

this is already being done with many archives now making information about their holdings available on the internet. Information about relevant websites is thus particularly useful.

K.S. Murty, Nagpur

EPISODES

Members will be aware that the IUGS requested INHIGEO to take responsibility for the supply of articles on the history of geology to the Union's quarterly journal *Episodes*, which is published most efficiently in Beijing. The series is called 'Classic Papers'. Contributions consist of summaries (in English) of the arguments of, and/or extracts from, important papers in the history of geology (or parts of books), which may be regarded as having been 'benchmarks' or 'turning points' in the history of the geosciences. The papers, which may be illustrated, provide background information about the authors of the papers or books, and also discuss the general historical influence of the papers. Contributions are of the order of 7,000 words in length.

So far, there have been contributions on James Hutton, Charles Lapworth, Andrija Mohorovicic, Inge Lehmann, Alfred Wegener, Kiyoo Wadati, John Joly, and Ting-Ying Ma. Further contributions are urgently requested. Please contact me if you wish to contribute to this important INHIGEO activity.

David Oldroyd, Sydney

INHIGEO BUSINESS MEETING, DUBLIN, 2003, PROVISIONAL AGENDA

1. Apologies
2. Arrangement of Agenda
3. Minutes of the previous Business Meeting (see the present *Newsletter*, pp. 6-7).
4. Matters arising
5. President's Report
6. Matters arising
7. Secretary-General's Report
8. Matters arising
9. Report on meeting of Board representatives with the Review Committee of the IUGS, Dublin, 13 July, 2003
9. Future meetings of the Commission
 - Florence 2004
 - Prague 2005; Beijing 2005
 - Lithuania 2006?; Germany 2006?; Other possibilities? 2007?
10. Call for nominations for Honorary Senior Members
11. Business without notice
12. Vote of thanks to Irish hosts

CONFERENCE REPORTS

The d'Orbigny Meeting, *Muséum d'Histoire Naturelle*, Paris, 1-7 July, 2002

Alcide d'Orbigny, 1802-1857, sa vie et son oeuvre, histoire de la stratigraphie d'Orbigny à nos jours

The INHIGEO meeting for 2002 was held in association with the d'Orbigny Colloquium, named above, which was organised by the *Muséum d'Histoire Naturelle*, in association with the French Committee for the History of Geology (COFRHIGÉO). The grand and genial master of ceremonies was Professor Philippe Taquet, formerly the Museum's Director, with the substantial, willing and able assistance of Marie-Thérèse Venec-Peyre, who started proceedings with a general account of d'Orbigny's life and work. The other papers presented (over three days) were:

Gabriel Gohau, 'Aux commencements de la stratigraphie'

Christian Ravanne, 'Sequence Stratigraphy History' (in French)

Jere Lips, 'Alcide d'Orbigny and American Micropaleontology'

Léna Dauphin, Lue Bulot, Bernard Beaudon & Gerard Fries, 'Modernité de la notion d'étage chronostratigraphique de d'Orbigny à nos jours (Partie I): biostratigraphie, cyclostratigraphie, chemostratigraphie de l'Aptien du Sud-Est de la France'

Goulven Laurent, 'Alcide d'Orbigny entre Cuvier et Lamarck'

Jean-Claude Fischer & Marie-Thérèse Venec-Peyre, 'Le "créationnisme" d'Alcide d'Orbigny et les fondements de la théorie biostratigraphique'

Jean Gaudant, 'Le manuscrit du cours de Paléontologie professé par Alcide d'Orbigny en 1854-1855 au Muséum Nationale d'Histoire Naturelle'

Jean-Claude Fischer, 'Conception et suites de la Paléontologie française d'Alcide d'Orbigny'

Jean-Louis Hartenberger, 'Evaluation des rythmes et des vitesses d'évolution chez les mammifères'

Philippe Legrand, 'Bâtir une stratigraphie: les leçons de l'étude du Paléozoïque saharien'

François Guillocheau, 'Le laboratoire naturel du bassin de Paris: état des connaissances'

Jean-Louis Rubino, Gérard Fries, Olivier Parize, Léna Dauphin, Jean-Noël Ferry & Nicolas Fiet, 'Modernité de la notion d'étage chronostratigraphique de d'Orbigny à nos jours (Partie II): analyse séquentielle de l'Aptien et d'Albien du sud-est de la France'

Bernhard Fritscher, 'Alcide d'Orbigny and the Germans: A Comparative Case Study in the History of French and German Stratigraphy in the Nineteenth Century'

Jean-Claude Fischer & Agnès Lauriat-Rage, 'Les voyages biostratigraphiques d'Alcide d'Orbigny en France et dans les régions limitrophes'

Wolfgang Berger, 'Cesare Emiliani, Pioneer of Isotope Stratigraphy' (in French)

Paul Taylor & Dennis Gordon, 'D'Orbigny's Work on Recent and Fossil Bryozoa'

Annie Dhont & Suzanne Freneix, 'Cretaceous Bivalves and Alcide d'Orbigny' (in French)

Daniele Gaspard, 'Brachiopodes de la craie de Meudon: collection d'Orbigny'

Jacqueline Mace-Bordy, 'D'Orbigny et les Rudistes'

Didier Merle & Jean-Michel Pacaud, 'D'Orbigny: un précurseur dans l'étude de la faune Danien de Bassin de Paris'

Miguel Griffin, 'The Tertiary Molluscs Collected by Alcide d'Orbigny in Argentina' (in French)

Daniel Dory, 'Alcide d'Orbigny et la Bolivie (1825-1857)'

P. Bearez, M. Desoutter, M.L. Bauchot, P. Pruvost & F.J. Meunier, 'Les poissons rapports par A. d'Orbigny: statut actuel et anecdotes'

Roger Bour, Ivan Ineich, Jean Lescure, Annemarie Ohler & Juan Carlos Ortiz, 'Liste inédite des amphibiens et reptiles récoltés par d'Orbigny'

Efgenji Milanovsky, 'First Steps in Development of Stratigraphy in Russia'

Algimantas Grigelis, 'History of Stratigraphy in Lithuania'

Hugh Torrens, 'Alcide d'Orbigny and the History of the 'Stratotype' Concept'

David Branagan, 'Australian Stratigraphy and Palaeontology: Contributions by French Geologists'

Miguel Telles-Antunes & Philippe Taquet, 'Le Roi Dom Pedro V, Alcide d'Orbigny et la paléontologie: un exemple de rapports scientifiques entre la France et le Portugal'

Filomena Amador & Manuel Serrano Pinto, 'Two Portuguese students of the d'Orbigny Fossil Collection in Portugal'

Radoslaw Tarkowski, 'On Contacts and Ties between French and Polish Geologists in the Middle of the XIX Century'

Yuri Soloviev, 'The Contribution of A. d'Orbigny and H.A. Trautschold to the Study of the Jurassic Stratigraphy and Cartographic Palaeogeography in Russia'

Johannes Seidl, 'Ami Boué (1794-1881): un géoscientifique du XIXe siècle'

Wolfgang Berger & Edith Vincent, 'Frances Parker: Pioneer of Planktonic Foraminifera'

Martina Koelbl-Ebert, 'Crocodile Lady: The Stratigraphic Work of Barbara Marchioness of Hastings (1810-1858)'

Daniel Angetter, 'Geological Aspects Concerning Tactics and Logistics during World War I'

Agnes Lauriat-Rage, 'La collection d'invertébrés fossiles d'Alcide d'Orbigny et la salle d'Orbigny'

In addition, the following poster papers were presented:

Sven Nielsen, 'The Chilean Tertiary gastropods described by d'Orbigny and Huppé'

Paul Brito & F.J. Meunier, 'South American Polypterids and Gars: a Case of Tertiary Local Extinction'

Bernhard Hubmann, Tillfried Cernajsek & Johannes Seidl, '"You are the Native Home of Great Sons"'

Peter Frenzel & Marie-Thérèse Venec-Peyre, 'The Upper Cretaceous Foraminifera from the White Chalk of the Paris Basin described by Alcide d'Orbigny in 1840' (in French)

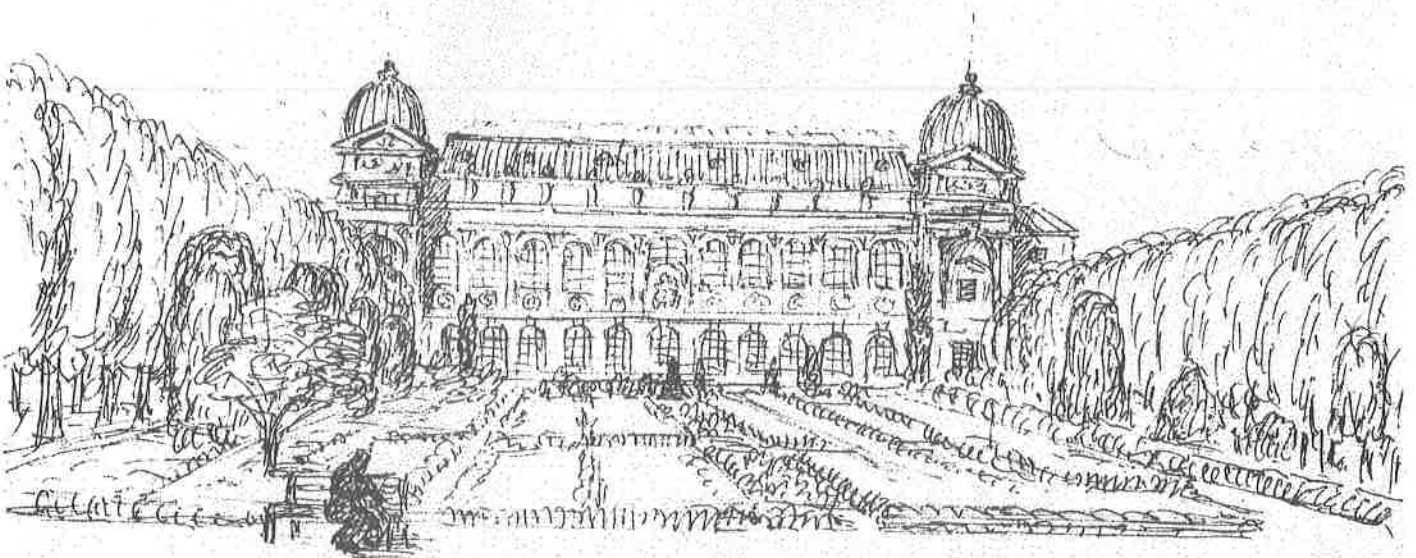
John E. Whittaker, Andrew S. Henderson, Richard Hoskinson & C. Giles Miller, 'Some Important d'Orbigny Manuscripts: the Heron-Allen Connection'

It will be seen, then, that detailed attention was given to d'Orbigny's manifold accomplishments as traveller, collector, systematist, zoologist and botanist, anthropologist and ethnographer, and above all as palaeontologist and stratigrapher. In palaeontology, his studies of foraminifera were of special significance, the organisms being recognized by him as a special fossil group, different from cephalopods. D'Orbigny prepared beautiful models of his forams, which are still both useful and admired. Forams were used in the stratigraphic work involved in the construction of the Channel Tunnel, and are, of course, important in oil geology. They provide perhaps the most detailed and persuasive evidence today for the occurrence of gradualist evolutionary change and speciation processes, though d'Orbigny himself was not an evolutionist.

Following his epic seven-year journey in South America, there followed the publication of d'Orbigny's monumental *Voyage dans l'Amérique méridionale*, with its seven tomes, eleven volumes, 4,747 pages and 555 plates. Subsequently, d'Orbigny undertook extensive stratigraphic work in France and beyond, which led to his establishment of his well-known twenty-seven stages, which (while not in any way minimizing the importance of William Smith) arguably served as the foundation of modern stratigraphy, though his underlying theory for the stratigraphic subdivisions was catastrophist. D'Orbigny collected 100,000 specimens, described in his *Paléontologie française* (which was not completed because of the author's early death) and in his *Cours élémentaire de paléontologie et de la géologie stratigraphique*. All this constituted a truly formidable achievement, but his ideas met with opposition, from zoologists, botanists, and geologists, who contended that palaeontology was not an independent science, but merely the zoology and botany of fossil organisms. D'Orbigny eventually gained his deserved chair in palaeontology at the *Muséum*, but his nomination to the *Académie des Sciences* was repeatedly blocked and he was never elected to that august body.

As can be seen from the list of conference papers, given above, the Colloquium ranged thoroughly through and over the vast terrain of d'Orbigny's work and participants were privileged to be present at the opening of a new exhibition prepared in his honour, which revealed some of his magnificent specimens, collections, and illustrations. We were also privileged to inspect a number of his manuscripts, as for example the original page for the opening of his *Voyages*, all put on display in the museum's central library. Other important manuscripts on display, such as some of Cuvier, were also displayed (and even touched!). A visit was also (later) paid to d'Orbigny's palaeontological collections, and the *Muséum*'s magnificent displays of the skeletons of fossil vertebrates (including a monster fossil crocodile collected by a youthful Philippe Taquet in Niger). We also paid a visit to the vast repository of animals preserved in the museum's basement. Your correspondent was delighted to see the large collection of Australian marsupials acquired by the Baudin exhibition at the beginning of the nineteenth century, and would like readers to know that some of the 'archived' bird types are still to be found in his garden in Sydney.

Sketch of the Exterior of the Muséum d'Histoire Naturelle, Jardin des Plantes, Paris by Efgenji Milanovsky



Paris, National Museum of Natural History in the Jardin des Plantes. On the background—the Great gallery of Evolution
17.2002
E. Milanovsky

The meeting was rounded off by an excellent dinner in the Muséum's '*Grande Galerie de l'Évolution*', a product of the period of Professor Taquet's directorship. This exhibition is now one of the wonders of Paris. Though consisting chiefly of stuffed animals, which might be thought rather dull things today, they are displayed with extraordinary skill as to lighting and posture, so that the 'march of animals' on a central stage in the old balconied exhibition chamber (now entirely renovated) reminds one of the animals going into (or out of?) the Ark, and attracted universal admiration. A stuffed giraffe leans out from the topmost balcony, surveying the scene below. The overall effect is *charmant*, and the scene provided a memorable backdrop to the excellent repast (French cuisine of course).

But the main issue of the conference was perhaps the question of stages (*étages*), stratotypes, and GSSPs (global stratotype sections and points). A within-conference excursion was made to Étampes, near Paris: the type-locality for d'Orbigny's 'Stampian' (Oligocene). Six sites, well conserved, together gave a 'conspectus' of that d'Orbignian Stage, as defined by him. The exposures, carefully kept clear and fenced off, but supplied with explanatory notices for the benefit of the public, are valuable to those interested in d'Orbigny's fieldwork and the geology of the Paris Basin, since much of the flat countryside in the district is now poorly exposed. So the 'cuts' provided a good opportunity to view the beds and the fossils that d'Orbigny described. They also provided opportunity to understand the modern efforts to 'reconstruct' the 'conditions of existence' in the Paris Basin during the Oligocene—the kind of work that has been conducted in the region since the times of Lavoisier, Brongniart, and Cuvier.

The visit did, however, raise problems in the minds of some participants. The fact of the matter is that the 'Stampian' is now obsolete, being superseded by the Rupelian, based on a more complete profile elsewhere. The demise of the 'Stampian' was mentioned somewhat 'unobtrusively' in the excursion guide, but not in the notices we saw in the field. Some participants doubted the value of stratotypes, which may be incomplete and subject to revision or replacement (as in the case at Étampes), and therefore they advocated the use of 'golden spikes', marking the separation of two important units. But even 'spikes' have problems and must necessarily be subject to possible revision. This raises the question of the utility and conceptual status of standard boundaries, consensually agreed by international commissions and conventions. Can it be that the establishment of 'stratigraphic definitions', either in the form of stratotypes or GSSPs—'set in stone', so to speak—may be inimical to the progress of stratigraphy?

Following the Colloque in Paris, sixteen persons, led by Patrick De Vever of the Muséum d'Histoire Naturelle, and Myette Guimomar of the Geological Reserves of Luberon Haute-Provence (which is doing outstanding conservation and education work in the area), undertook a three-day excursion to the mountainous southeast of France, visiting first the great limestone quarries of Orgon (for d'Orbigny's Urgonian [Lower Cretaceous], but now approximating the Barremian), with their well-known Rudist molluscs. We then moved to the exposures near Apt (for the next stage, the Aptian), and finished the day at the fine geological museum overlooking the town of Digne (home of the famous seventeenth-century atomist philosopher Pierre Gassend) and endowed with a magnificent collection of ammonites, many large and 'uncoiled'.

The following day a visit was made to the Triassic rocks at Champourcin, the route of d'Orbigny from Digne to Chaudon being followed. We were able to view a world-famous 'ammonite slab', with thousands of specimens of *Coronoceras*

multicostatum, large and small. These had not been uncovered in d'Orbigny's day, but he named the Sinemurian Stage (Lower Jurassic) on the basis of exposures seen near Sémur.

Our group then moved to visit the exposures of the Toarcian (top of the Lias, Lower Jurassic), established by d'Orbigny and named by him after the town of Thouars (in west-central France). Ichthyosaurs (associated with the Upper Lias ammonite *Hildoceras bifrons*) have been found around Digne and specimens were viewed in the museum there. Also, a considerable number of stromatolites were observed in the field.

Moving up to the Lower Cretaceous, viewed near Barrême and Sisteron, the excursionists entered the area where d'Orbigny had proposed the Neocomian and Urgonian stages and where Coquand (after d'Orbigny's decease) defined the Barremian; and later he divided the Neocomian into the Valanginian, the Neocomian, and the Barremian (though subsequently he agreed that the Barremian and the Urgonian represented the same period of time). In fact, the Barremian stratotype was only proposed in 1963 and published in 1965. Along the side of a road to Angles, one may see a remarkable sequence of alternating hard and soft sediments (218 of each), within which have been 'recognised' the Hauterivian, the Barremian, and the Bedoulian stages, as characterised by their respective faunas. It would be exceedingly helpful to know the time that elapsed between each cycle of sedimentation, and thereby try to link the observations with the theory of Milankovitch cycles. Unfortunately, however, only one thin layer of interbedded bentonite had been found, so that there was insufficient means to estimate the period of the sedimentary cycles. The village of Barrême was, we found, proud of its geological significance. Excellent replicas of the 'uncoiled' ammonite *Crioceras* were on display in the street; and there were ammonite-shaped loaves in the baker's shop!

The second night of the excursion was spent at the old village of Castellane, which sported another excellent museum: the *Maison des Sirènes et Siréniens* (fossils related to manatees, dugongs, or possibly mermaids). The display showed the interesting history of ideas about these mammals, the idea of mermaids probably having arisen as a result of the mothers holding their young above the water to suckle them (Cuvier's suggestion). The display, which contained much information about manatees, was prompted by the occurrence of fossil 'siren' bones in the Tertiary deposits in the neighbourhood (which the group visited the following morning).

D'Orbigny had visited this area also, and recognised the Tertiaries around Castellane (characteristically a yellowish nummulitic limestone). However, he did not sort out the structure successfully: it is complex, with thrusting causing the Tertiary to lie at a lower elevation than the grey Upper Cretaceous limestone on the tops of the hills. D'Orbigny followed the 'route Napoléon' from Barrême to Castellane, by the Taulanne Ravine, but the rare sirens escaped his attention and were only discovered in the 1930s by l'abbé Albert de Lapparent, who criss-crossed the region in a vast cartographic project. The 'siren' fossils were found in an obscure ravine near Taulanne. Subsequently, from the '60s, the bones have been closely studied by geologists and palaeontologists, and the locality now forms the centre-piece of an important geological reserve. The group visited the site where the fossils are located and observed the numerous pinkish-coloured bones *in situ* in a conglomerate deposited on a karstic erosion surface of Jurassic limestone. The bones are now well covered and protected (and visible) and the remains provided materials for the models on display in the Castellane Museum. The good preservation of the almost intact skeletons within a conglomerate in an area that has undergone considerable tectonic disturbance, including thrusting, is remarkable.

Following the pleasant morning in the sun with the 'sirens', the group lunched under the trees and then picked up the correctly named *Train de Grande Vitesse* at Aix-en-Provence (with Cézanne's Mont Saint Victoire indistinctly visible in the distance) and was quickly whisked back to Paris, thanks to modern French technology. The journey made your correspondent think of the grand effort and time that would have been needed by d'Orbigny to investigate, in some detail, the region that we had been visiting in such comfort. He would, however, have had the advantage that the region was seriously deforested in the nineteenth century, and therefore more convenient for the activities of the stratigrapher. Thankfully, southeast France is now one area of the world where forest is on the increase today, and some of the party, who had worked in the region forty years previously, remarked the considerable increase in vegetation.

The group was privileged to have such an ebullient and well-informed guide as Myette Guimar, and the thanks extended to her were warm and effusive. We were able to purchase her postcards too, which explain how ammonites became 'uncoiled' by air being blown into them at their narrow ends!

David Oldroyd, Sydney

References

- Colloque International Alcide d'Orbigny*. Paris, 1–7 July, 2002. *Alcide d'Orbigny, 1802–1857, sa vie et son oeuvre, histoire de la stratigraphie d'Orbigny à nos jours*, Muséum d'Histoire Naturelle, Paris, 2000, Programme and Abstracts.
- Patrick De Wever, Annie Cornée, Jean-Yves Reynaud, Jean-Pierre Roucan, Emmanuelle Vennin, Didier Merle, Blandine Cassagne & Didier Poncet, *Excursion Stratotyps Stampien & Toarcien Juillet 2000*, Muséum National d'Histoire Naturelle, Société Géologique de France, Réserves Naturelles de France, PPF Patrimoine Géologique National, 2002.
- Bicentenaire de la naissance d'Alcide d'Orbigny 1802 2002. Colloque organisé par le Muséum d'Histoire Naturelle. Excursion dans le Sud Est de la France 5–6–7 Juillet 2002 Organisée par les Réserves Naturelles Géologiques du Luberon et de Haute-Provence*. Coordination Christine Balme and Myette Guimar, 2002.

Hugh Miller at Home, 200 Years On

'Hugh Miller in Context': International Bicentenary Conference on Aspects of the Life and Times of Hugh Miller. Cromarty, 10–12 October 2002. And other Millerian News

Cromarty is a town on the northernmost tip of the 'Black Isle', a peninsula demarcated by the Beaully and Cromarty Firths to the north of Inverness, Scotland. In the eighteenth century Cromarty was an important trading and manufacturing centre, but it became, as it were, fossilised in the early nineteenth century by a slump in trade and its bypassing by the new railways. Now carefully conserved for the eighteenth- and nineteenth-century vernacular architecture of its townscape, it is of course best known to historians of science as the birthplace of Hugh Miller in October 1802. Lester Borley, Secretary of the Cromarty Arts Trust, and John Nightingale, Chairman, and their collaborators organized an excellent bicentenary conference in the autumn of 2002, held by the Cromarty Arts Trust with the Elphinstone Institute (University of Aberdeen) and Highland Theological College,

Dingwall, with financial support from Scottish Natural Heritage, Ross and Cromarty Enterprise, the Highland Council, the Cromarty Firth Port Authority, and others.

Geology and Natural History

Practicalities and the breadth of Miller's interests meant that the conference was organised as concurrent sessions with several plenary lectures. The session on 'Geology and Natural History' was chaired by Philip Hamilton-Grierson of the Cromarty Arts Trust, with *rapporteur* Peter Tilbrook of the John Muir and Scottish Wildlife Trusts. Appropriately enough for a backdrop of several oil platforms temporarily moored in the Firth, Hugh Torrens (University of Keele) started proceedings with 'William Smith (1769–1839) and the Search for English Raw Materials: Some Parallels with Hugh Miller and with Scotland'. He emphasised the importance of the stratigraphic column to Miller and Cromarty, for it was theoretically vital to understanding local geology, and economically crucial to locating any coal reserves. In pre-Smithian days, all one could do was go by lithological similarity to genuine Coal Measures, and so any likely-looking lignite-bearing dark clay or shale might be explored, often expensively and abortively. There was a lot of mineral prospecting in Scotland, and Cromarty was not spared, for it has two likely-looking strata—the Devonian Old Red Sandstone, and the Jurassic of the Moray Firth coast outside the Sutor headlands at the mouth of the Cromarty Firth. (See p. 25 for discussion of the 1690s Coalheugh [coalpit] Well.) The last known trial hereabouts was in the Jurassic at Eathie in 1852, against the advice of Miller himself.

Simon Knell (University of Leicester) and I assessed 'Hugh Miller: Fossil Discoverer and Collector'. Miller's writings and specimens give an insight into the practices of an energetic but careful collector willing to collect, not merely *décor* fossils, but fragmentary remains that could be put together, analytically if need be. What made Miller stand out from all other nineteenth-century collectors was that, in the final analysis, he was a literary man, unwilling to be confined by the metropolitan scientists to a 'provincial contributor' niche. He wrote about his finds at all levels and in all ways from sober analysis to poetical visions of deep time, very much in the Victorian literary mainstream, though always in touch with the reality of the evidence in the actual specimen or landscape. His collection is now mostly in the National Museums of Scotland, with some specimens in his birthplace cottage at Cromarty.

In 'The Culture of Science: Hugh Miller's Dealings with Contemporary Scientists', Michael Collie (York University, Toronto) considered the scientific culture of the early nineteenth century. He noted the solidity of the geological section of George and Peter Anderson's *Guide to the Highlands of Scotland*—the first modern geological book that the young Miller saw. It was much more substantial than one might think from its title. This was a critical period in Miller's geological development. Collie outlined the sequence by which Miller made contact with the local geologists of the Moray Firth and the metropolitans further afield, such as Murchison and Agassiz, who used his finds in their own work. He suggested, interestingly, that Miller had in fact met Agassiz in the Highlands in 1840, and that Miller would come to regard his own fossils as dangerously subversive of respectable Christian beliefs.

Ralph O'Connor (University of Cambridge) spoke on 'Hugh Miller and Geological Spectacle'. He emphasized how important it is not to interpret Miller in terms of the modern era, where popular science, history, and biography, for instance, are not considered 'literature', for Miller was above all a literary man in a culture where science writing played a prominent part in 'literature'. Like other geological writers of the time he appealed to the public taste for antiquity and sublimity, exploring the past with the literary equivalent of the new technology of 'spectacle'—exhibitions, theatres, and panoramas—in 'Virgil-with-Dante-like' guided tours of deep time. Miller's was a theatre of the mind, and indeed this scientific poet was to explain Genesis as Moses's 'vision of creation'. Above all, the poetical imagination was needed to explain science to everybody, and Miller had this quality above any geologist before or since.

Nigel Trewin (University of Aberdeen) explained past and present thinking on 'Hugh Miller's Fish: the 'Winged *Pterichthys*', and the environment of its life and death in Lake Orcadie, the major freshwater lake of this region in Devonian times. There were real problems for Miller in studying the eponymous *Pterichthyodes* (as it is now called) *milleri*—the fish that perhaps more than any other made his reputation as a discoverer of new fossil animals, for it is a placoderm fish with no living relatives. Trewin showed slides of really fine modern specimens, sometimes with the sequence of decay and disintegration clearly visible. These cogently made the point that the specimens available to us, after two centuries of collecting from a wider range of sites, are far better and more complete than those which Miller had to study. (I can personally attest to this, for—contrary to expectation—we used not one of Miller's Old Red fishes in the geology gallery of the recent Museum of Scotland; in this exhibition, each fossil's visual clarity, rather than its historical connections, was the sole criterion of use.)

Philippe Janvier (*Muséum National d'Histoire Naturelle*, Paris) reflected on 'Armoured Fish from Deep Time: From Hugh Miller's Insights to Current Questions of Vertebrate Evolution', with an outstanding delivery. He outlined the work of Louis Agassiz and Miller himself in sorting out the anatomy and classification of the Devonian fishes, with mistakes of reconstruction typical of the investigation of such novel faunas, and the progress, such as it is, which has since been made. Miller's descriptions, antedating Agassiz's, were excellent, as was his literary style. The speaker reflected on the implications of Agassiz's 'threefold parallelism'—the fossil record, ontogeny [embryonic development] and natural classification—of a group of animals, and Agassiz's special meaning of 'high' for the earliest and most generalised fishes. Further change would, essentially, be a 'degradation'. Miller was to pick up and expound these ideas. Such issues have returned to the core of modern debates, for example in cladistic systematics, and the very new, or rather revived, idea of the meaning of 'loss'—Miller's 'degradation' shorn of its moral and cultural background—as a major factor in evolution.

In the ensuing discussion, the point was made (following Brooke in Shortland 1996) that Miller's emphasis on degeneration—or 'degradation'—was not merely a strategy to kill off evolutionary theories, or at least their pre-Darwinian manifestations which assumed a simple progress. It notably reflected Miller's Calvinist beliefs, under which, of course, humanity—thanks to the Fall in Eden and Original Sin—has itself degenerated from its full moral potential. By contrast, the speaker suggested, in reply, that a Roman Catholic might be more inclined to believe in evolution as a steady upward progress.

John Hudson (University of Leicester) considered Miller's visit to an Inner Hebridean island in 'Hugh Miller's Geological Discoveries and Observations on the Isle of Eigg, as Shown in *Cruise of the Betsey* and in the Light of Modern Knowledge'. Miller came over well as a geologist but his journalistic writing did not follow formal scientific conventions, excellent exposition notwithstanding, and it is difficult to be certain what sources he used. Moreover, his finds and interpretations

have not always had the credit they deserve. One reason was publication in *The Witness* newspaper, which he edited. Another was the change of interest from palaeontology to structure and petrology. Thus Miller's mainly palaeontological work on Eigg, including the successful location and recognition of 'estuarine' (including lagoonal) faunas, remained largely ignored and certainly unexploited till the speaker took it up in the 1960s. In its mixture of delight in the landscape, and outrage at man's intolerance and inhumanity, Miller's *Cruise* is, in the speaker's view, the finest book ever written about Scottish geology.

Alison Morrison-Low (National Museums of Scotland) and Bob Nuttall (Research Associate, NMS) examined 'Miller in an Age of Microscopy'. The evidence in his writings is that Miller himself normally used the naked eye, a hand lens, and a 'botanical microscope', a cheap but still serviceable and compact single-lens instrument, for general and field work. However, he lived during the time when the microscope was transformed from a gentleman's toy to a true scientific instrument, with the introduction of the achromatic microscope and the polarizing microscope, and the development of methods to make polished thin sections of geological material. The last two of those developments involved significant contributions by Scots, notably William Nicol (of the 'Nicol Prism') and David Brewster, and the Edinburgh lapidary George Sanderson, who was the first to make thin sections for microscopic purposes. Miller was keen to examine his own finds using the new techniques and commissioned Sanderson to cut sections of fossil plant and fish material for him.

This was a pleasingly coherent and interesting set of papers, complementing and extending David Oldroyd's study of Miller's geological work and other chapters in Shortland (1996). The authors all had new points to make, and their conclusions meshed well in content and mood. What came over very strongly was the cumulative assessment of Miller as a competent geologist, an exceptionally acute observer, and of course a superb collector—but also a careful analyst and reconstructor. He did such work at all scales, from the landscape of Eigg to the microscopic structure of fossils, from current geological phenomena to the evocation of deep time. But it must not be forgotten that Miller was also a literary man.

Plenary Papers and Wider Issues

Miller, of course, was much more than a geologist; above all, he was a writer and the editor of the major Edinburgh newspaper *The Witness*. Among other things, it provided vital support for the new Free Church of Scotland, formed in a major dispute over interference by the secular powers—that-be (national and local) in Church of Scotland matters. The establishment of the Free Church was a major event, given the religious and social importance of the Kirk. Miller also commented freely on social and political issues, and, not least through his autobiography, encouraged the good old Scots tradition of education and self-improvement.

Indeed, in a plenary paper, 'Caring for Nature: the Transatlantic Canvas of the Nineteenth Century', David Lowenthal (University College, London) reviewed the changing attitudes to 'Nature' on the other side of the Atlantic, and how the British and Americans came to love Nature and, eventually, to become concerned with its conservation. He examined the work of George Perkins Marsh, American polymath, pioneering environmentalist, and, like Miller, a major writer on nature for the wider community. The rise of popular natural history in the US is surprisingly poorly known, but it has its similarities with Britain's, as also its differences, such as a much more egalitarian tone, and of course the natural wildness of America. Lowenthal pointed out the characteristic Scottish combination of high levels of literacy with a worldwide diaspora. This raises the question of Miller's influence—for instance on John Muir, the expatriate Scot and pioneer American conservationist.

Miller was not primarily a political animal, but preferred to speak direct to the reader. This at once poses problems for the historian trying to assess his importance, especially as many of his overtly anonymous articles lie almost forgotten in the files of *The Witness*. In the final, and appropriately reflective, plenary paper, 'From Miller to the Millennium', James Secord (University of Cambridge) considered the historiographic problems of studying Miller—notably the many conflicts which arise when we try to force him into modern categories. Miller was an old-style liberal Whig, who believed in industrial progress, hand in hand with religion and morality. He was a serious writer who published in newspapers. He was a scientist who didn't believe in science as being separate from other things—least of all in something for the new professionals to control and for him to 'popularise'—and in this respect had more in common with Robert Chambers of *Vestiges* than one might suspect. All this is difficult to understand today. Secord concluded with some reflections on Miller's meaning to us, his resonance in a new era of the dissolution of old certainties. Miller poses hard and often uncomfortable questions even now, for instance on the role of a spiritual life, and on the nature of knowledge and who controls it. Above all, one must consider Miller as a whole to understand his life and work. However, the effort is now being made to see Miller in his true context, and he is beginning to emerge as a remarkably unified and consistent character.

Reflections on the Conference, and some New Publications

Miller poses serious problems to the historian because of the breadth of his interests, which cut across disciplinary boundaries again and again as they interacted. Even the scientific session covered a remarkable range; and, as I could not be in three places at once, I am regrettably unable to report on the concurrent sessions on 'Church and Society' and 'Ethnography and Folklore'. Fortunately, the proceedings of the conference are being published (which is just as well as my report above of the science session is purely a personal one). I shall report on this when I have more to hand: it will be a most important volume on Miller, to go alongside Shortland (1996) and Borley (2002) (this last comprises the proceedings of two earlier and complementary meetings, which should not be confused with the October 2002 event).

One way I could sum up this meeting—at least in the session and plenary papers I attended—was my feeling that Jim Secord is quite right in suggesting that a new consensus on Miller is being forged, completing—or at least carrying on—the process that the studies in Shortland (1996) started. In recent decades, it had become almost common to portray Miller as a man driven to madness and suicide by contradictions, whether psychosexual, political, or intellectual ('science versus religion'), or some permutation of them. This makes a fine story but I cannot but feel that it owes rather too much to the good old Scots tradition of novels about the divided self, such as James Hogg's *Confessions of a Justified Sinner* or Robert Louis Stevenson's *Dr Jekyll and Mr Hyde*. In fact, when seen in context, Miller comes over as a much more impressive and unitary figure.

Another important reappraisal, for me anyway, is that Miller is a *literary* figure (and I don't mean 'literary' in the modern, 'as opposed to science', sense). He comes over as a good geologist and a great writer *about* geology. No wonder he is so loved and respected by geologists today. Yet it is too narrow to speak of Miller as a geologist (especially as he published little in the scientific mainstream), or as a mere 'popularizer', much as the likes of Murchison would have wanted it that way. (As Secord

commented, Miller was a literary man, a writer, who wrote about geology as he did about the world, who made it part of that world.) Now, Miller was no political animal, in the sense of frequenting the corridors of politics, whether secular or ecclesiastical: he was a private being, who spoke and fought with his pen. This means that he spoke, and indeed still speaks, directly to the reader. This poses the possibly impossible task of reconstructing his impact on his reader—or rather his very diverse readers, ranging from, say, a Birmingham Quaker to an American naturalist such as Marsh (that he owned some of his books is all we might know about Miller's influence on Marsh, as David Lowenthal noted). Yet Miller's impact cannot be ignored, as we are warned by his success in propagandizing for the Free Church, and by the lasting appeal of his autobiography *My Schools and Schoolmasters*.

The Miller family itself was well represented at the conference. Marian McKenzie Johnston, Hugh and Lydia Miller's great-great-granddaughter, has herself done considerable research on the family, much of which has been incorporated into a new biography of Lydia Miller by Elizabeth Sutherland, which throws much light on Hugh himself (Sutherland 2002).

Another welcome, and appropriate, feature of the conference was the strong interest of local people, by no means always the case at such meetings.

It was undoubtedly a brave decision to hold the meeting in Cromarty, given the limited space available, but it was amply justified. In fact, it wasn't as risky as one might imagine for such a small town. Thanks to the Cromarty Arts Trust and Robert Gordon University, the facilities in the old Brewery and in the converted stables of Cromarty House are much better than those in the average town of that size. Thus the disadvantages were negligible, but the benefits enormous. It was not just the psychological effect of getting away from everyday cares, or seeing Miller's actual rocks (important as this is for historians of geology—few historians of science can see their subject's 'laboratory' as well preserved as Miller's is). It is because the town of Cromarty itself is vital to understanding Miller: one of those Scots deeply imbued with the values of their Lowland Presbyterian upbringing in a small burgh. Indeed, W.M. Mackenzie, a local man and perhaps for this reason the author of what is still one of the best critiques of Miller's work (Mackenzie 1905), asserted that Miller 'in his heart . . . never left Cromarty'. The programme allowed time to look around the burgh, while those participants who arrived early could attend the memorial service to commemorate Miller's birth, 200 years before. This was held in the East Church, a superb example of a traditional Presbyterian kirk, an austere but not grim building. Outside are some of the gravestones, which he carved as a mason. Inside, the T-shaped and altarless church is richly provided with pews and benches, and everything is focused architecturally and spiritually on the pulpit, as might be expected of a church where preaching dominated the service. Here one may gain deep insight into Miller. Further understanding is to be had by a visit to Hugh Miller's thatched cottage birthplace, on the occasion of the conference hosted by Martin Gostwick, the acting Property Manager, on behalf of his wife Frieda, the Property Manager. The delightful cottage is preserved by the National Trust for Scotland. As well as the restored rooms it has displays in a couple of bedrooms and a most useful study room with a collection of books and papers about Miller. The Trust also hold 'Miller House' next door, the fine house built by Hugh Miller's father. Here the Trust plans to set up a new museum and display centre to explain Miller's life and work, enabling the current displays to be removed from the cottage, which can in turn be restored more fully to its original state.

The programme of social and cultural events included a musical evening and a *ceilidh* (an evening of traditional dancing and music) in the community hall, and a buffet supper in Cromarty House, by kind courtesy of the Nightingale family. This superb eighteenth-century mansion offered yet another insight, if perhaps one from another angle, into Miller's mindset, insofar as he was always the burgher watchful of his independence and keeping a wary eye on the 'lairds' (major landowners) lest they abdicate their social responsibilities.

Out and About in Miller Country

There was a choice of two conference field trips, a mainly historically oriented one to the Tain and Tarbat areas, and a geological one to Miller's classic site of Eathie near Cromarty. Eathie is a relatively isolated stretch of the Moray Firth seacoast, accessible down a steep path on a hillside located on the line of the Great Glen Fault. Here, Miller, as a young stonemason working in a quarry a little way up the coast, first became really interested in fossils, thanks to the ammonites, belemnites and other fauna that caught his attention in the Jurassic rocks that crop out on the coast here. The tectonic disruption of the strata means that the Jurassic outcrop is physically lower than the Old Red Sandstone fish-bearing beds which he later located here. Eathie is also notable for extraordinary 'dykes' of sandstone, which attracted attention early in the nineteenth century and puzzled many, including Miller. (They are now interpreted as the remains of unconsolidated beds of sand, liquefied by earthquakes and injected upwards under pressure in Jurassic times, when the Great Glen Fault was active.)

Presumably because of timetabling practicalities and unhelpful tides, there was no organized trip to Miller's other, and older, classic Old Red Sandstone site at Cromarty where he first found fishes on the beach, in any case only a few hundred yards' diversion from the walk up to the conference facility in the former stables of Cromarty House, the venue for the geological session. The tides only really became favourable on the Sunday morning, after most delegates had gone home, when Simon Knell, Jim Secord, Lyall Anderson and I paid a visit to the beach to consider the rocks in the light of Miller's own description in *The Old Red Sandstone*, with only herons and oil rigs for company. The strata can have eroded only slightly since Miller's time (except for over-collecting of the fish nodules themselves, a problem even during his lifetime). We even found the boulder Miller must surely have used as a worktable. The fine panorama of firth, town, and mountain reminds the visitor of the sheer density of the virtual landscape of Miller's imagination, which emerges from a reading of his writings, but nevertheless maps precisely onto the physical landscape in front of the viewer. Miller's description of the rocks was excellent within its length and literary style and even where he deviated from modern understanding one can see why, notably in his catastrophist interpretation of the way in which the Devonian sediments are faulted down against the 'granitic gneiss' of the Sutor headlands to the Firth of Cromarty (or, as he would put it, the gneiss was forced up through the Old Red Sandstone). Yet most of Miller's work on local geology was written long after the event, in his highly literary way, and questions still remain about the precise development of his understanding over time. One problem, which Lyall Anderson had previously noticed, is the presence of Old Red fishes at Eathie. They lie close to the Jurassic beds which Miller exploited for years—and yet he apparently did not find these fishes for something like a decade, until after he had learnt to spot and identify them at Cromarty.

The Cromarty Arts Trust, Scottish Natural Heritage and other bodies have taken steps, together with the landowners, to improve public access and provide introductory interpretation of the geological sites. Local history, architecture, and folklore are already well interpreted to the public, notably by the Courthouse Museum and in David Alston's publications.

Other Millerian Events

The October conference was just one of many events in that bicentenary year of 2002. There were special events all over Scotland, not just Cromarty, and Lester Borley and the Cromarty Arts Trust coordinated and publicised them in an excellent pair of publicity leaflets. It is inevitably invidious to single out events, such as the remarkably good opera of Miller's life involving all Cromarty's primary schoolchildren, whose making inspired a charming BBC TV programme, but there is just not room to name all of them or the organizations involved, so I can only give examples! Commemorative plaques were placed on the site of *The Witness* office in Edinburgh's High Street, and on his last house, Shrub Mount, in Portobello a few miles away; Portobello's local library and Historical Society contributed their own local exhibition and events. We at the National Museums of Scotland executed a temporary exhibition *Testimony of the Rocks: Hugh Miller* for spring 2002 in Edinburgh, with its associated talks, study day and guided walk, which had as a highlight a special visit to the Free Church College, Edinburgh, to see the famous 'Disruption Picture' by David Octavius Hill, *The Signing of the Deed of Demission*, with Miller portrayed as one of the most prominent figures at the foundation of the Free Church. The Edinburgh exhibition is now finished, except for a small display of Miller fossils, but Susan Seright of Groam House Museum in Rosemarkie near Eathie joined forces with us at the National Museums of Scotland to carry out another exhibition there, *Hugh Miller—Local Hero* (which closed on 27 April 2003).

I cannot, however, omit mention of two personal highlights, both on the Isle of Eigg in the Inner Hebrides in August 2002, a geological residential field-week with a strong Millerian flavour organized by John Hudson (Leicester University), and the immediately following Millerian weekend, organized by local historian Camille Dressler (Isle of Eigg Heritage Trust). Like Miller's own visits in *Cruise of the Betsey*, this weekend of walks and talks by John, Camille, David Brown (University of Newcastle), and myself was a combination of plesiosaur hunting, the volcanic butte of the Sgùrr, and the miserable remains of the ordinary people's huts on which Miller wrote so scathingly. It threw a most interesting light on Miller's geology to compare the actual rocks with his writings, as discussed by John in his conference paper mentioned above. As it happens, this was my first visit since the community recently bought out the island from the last laird (Scots: principal landowner), ending a long period of disputes between the locals and the successive lairds, which generated newspaper coverage in the most uncanny parallel with Miller's own journalism attacking lairds of an earlier generation. This reminds us that Miller was also active in the debate over what to do with the Gaelic Highlanders, its relevance to historians of science being that this was in part founded on assumptions of the inherent racial superiority of the Lowlander Scots or 'Saxons' over the Gaelic 'Celts'. Miller would have none of this—to him, environment and upbringing overrode racial differences, real as they were to him—and he was one of the few Lowlander journalists to oppose the 'Clearances' of the Highlanders to make way for sheep and game reserves.

As Hugh Torrens recently complained to me, one reason for the neglect of Miller today is, quite simply, the difficulty of finding specific references within his books, none of which have an index, and which are often in dense, looping and recursive prose. Therefore it is excellent news that a group from the Cromarty History Society and Friends of the Cromarty Courthouse Museum is preparing indices to his collected works. I will report further when more information is to hand on this important step in making Miller's work more widely used, but if you want to be notified of the publication date and price of these indices you can write to Dr Janet Fyfe, Shoremill Cottage, Cromarty, Ross and Cromarty IV11 8XU, Scotland, or email thalia@shoremill.u-net.com.

By happy coincidence, 2002 was also the bicentenary of David Octavius Hill of Hill and Adamson, the pioneering Edinburgh photographers. Using Fox Talbot's technique of the calotype (the first negative/positive process of photography), they created some of the most popular images of Miller—and incidentally many other scientists of the day. Hill received his own due share of attention in exhibitions, events and books, among which Stevenson (2002) makes some most interesting comments on Miller, not only how he was portrayed in calotypes, but also on his writing and his critique of the new art form.

Cromarty for the Visiting Historian of Science

As Michael Shortland noted in his 1996 book, it is extraordinary to see a geologist—indeed, any natural scientist—as well commemorated as Miller is in Cromarty, and of course Shortland was not thinking of the 2002 celebrations, which saw the town placarded in striking banners expressing the townsfolk's affinity with Miller. Of course, this famous son of Cromarty was not 'just' a scientist but also an archetypal Scot, tongue of the nation's conscience in a way; but he is certainly the only British palaeontologist I know with his very own Nelson's Column-style monument, his statue on top, looking out to the Cromarty beach of his discoveries, with a stylized *Pterichthys* at his feet.

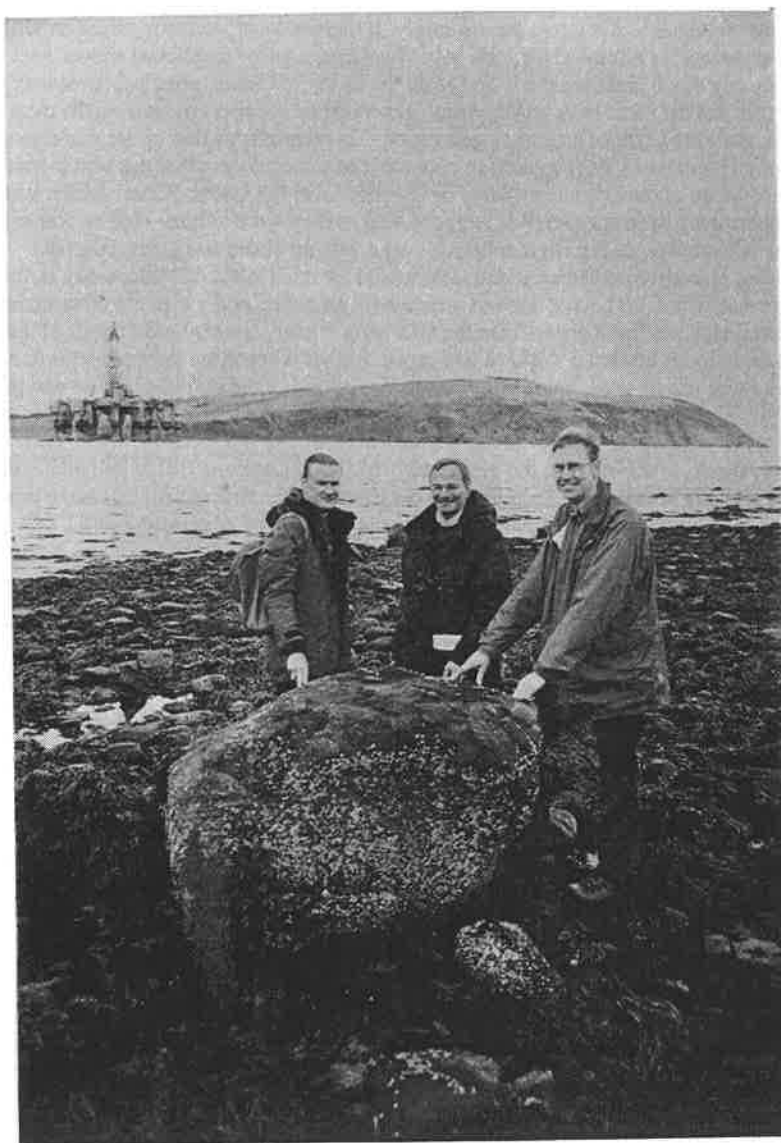
Cromarty and the adjacent parts of the Black Isle, including Rosemarkie, therefore have much to interest INHIGEO members, whether on a personal holiday or research visit, or even leading a study group (in which last case I recommend the Cromarty Centre in the old Brewery). Inverness nearby has good transport links (including air). Accommodation and meals are available locally in Cromarty, although one or two facilities may be closed or open only on request in the winter. More information can be had from Martin Gostwick's website www.hughmiller.org and the Courthouse Museum's on www.cromarty-courthouse.org.uk and the links therein, which include a virtual tour of the town (though a much fuller one, and an excellent architectural introduction, can be had on the Museum's *Generations in Stone* multimedia CD-ROM). For guides and information, the Cottage and Museum have a good range in stock—and see also Miller's own writings, notably the recently reprinted *My Schools and Schoolmasters* and *Scenes and Legends of the North of Scotland*, the still out of print *The Old Red Sandstone*, and *Cruise of the Betsey* which National Museums of Scotland Publishing is due to reissue, with introduction and notes.

References

- Borley, L. (ed.) 2002. *Hugh Miller in context. Geologist and Naturalist: Writer and Folklorist: A collection of papers presented at two conferences The Cromarty Years (2000) and The Edinburgh Years (2001)*. Cromarty Arts Trust, Cromarty, in collaboration with the National Trust for Scotland, National Museums of Scotland and Scottish Natural Heritage.
- Mackenzie, W.M. 1905. *Hugh Miller: A Critical Study*. Hodder & Stoughton, London.
- Shortland, M. (ed.) 1996. *Hugh Miller and the Controversies of Victorian Science*. Oxford University Press, Oxford.
- Stevenson, S. 2002. *The Personal Art of David Octavius Hill*. Yale University Press, New Haven.
- Sutherland, E. 2002. *Lydia, Wife of Hugh Miller of Cromarty*. Tuckwell, East Linton.

Michael Taylor, Edinburgh

Lyall Anderson (left), James Secord (centre), and Simon Knell (right) fingering what must be one of the erratic boulders that Miller used as a convenient work-table at his classic fish-bearing outcrop of the Old Red Sandstone at Cromarty. North Sutor headland and a moored oil platform in the background. As Miller liked to comment, at one time this beach was the northernmost boundary of Lowland Scotland—the other side of the Firth falling within the region of the Gaelic language and culture of the true Highlands.



NATIONAL COMMITTEES

At the request of Professor Martin Guntau (Germany), I have compiled a list of the countries that have National Committees for the History of Geology, and the names of the appropriate contact persons, who will normally be responsible for writing the Country Reports for the INHIGEO *Newsletters*. The information available to me appears below. If any additions or emendations are required, please let me know. Postal and email addresses are available in the INHIGEO Membership list at the end of the *Newsletter*. If there are other committees not known to us, we should be most grateful if people from the countries concerned would contact us. Relevant addresses and other contact details may be found in the Members' list at the end of the *Newsletter*.

Australia	Dr Neil Archbold
China	Professor Yusheng Zhai
France	Dr Gabriel Gohau/Dr Jean Gaudant
Germany	Dr Martina Koelbl-Ebert/Dr Bernhard Fritscher
Hungary	Ms Teréza Póka
Japan	Dr Yasumoto Suzuki
New Zealand	Dr Michael Johnston
Portugal	Professor Manuel Pinto
Russia	Dr Georgi Khomizuri
Serbia (Yugoslavia)	Professor Alexander Grubic
Spain	Dr Professor Leandro Sequeiros
The Netherlands	Secretary: Professor R. P. W. Visser, Inst. voor Geschiedenis en Grondslagen van de Natuurwetenschappen, Princetonplein 5, 3584 GC Utrecht (r.p.w.visser@phys.uu.nl); Chairman: Professor K. van Berkel (kvberkel@let.rug.nl)
United Kingdom	Dr Cherry Lewis
United States	USHIGEO has not been operative for several years. The INHIGEO Vice President, Dr Ursula Marvin, has been handling administrative matters to do with the United States. David Oldroyd, Sydney

ARTICLES

Reflections on the History of Science: Thoughts developed in response to the review 'Homage to Lamarck', published in the last INHIGEO *Newsletter* by our congenial friend and active Secretary-General, David Oldroyd, concerning my work *La naissance du transformisme: Lamarck entre Linné et Darwin*.

Dear David,

As my work is that of an historian of science; it is not a 'homage' to Lamarck but an exposition of his writings and hence of the place he occupies in the history of science and the history of ideas. Since the basis, or 'material', for the work of an historian of science is the texts of the time or of the author that he is studying, I have provided the written documents that underpin the solidity and objectivity of the exposition. Too many texts in your view—since for you the role of the historian is rather to give evaluations and points of view regarding the past: 'For the writing of history, I rather prefer a 'digested' narrative based on primary sources, suitably referenced for the benefit (or silencing) of 'doubting Thomases'. Of course, if the objective is *primarily* to provide a source of primary sources, then I should be the last to object'. A small question: is there not, David, a certain contradiction in reproaching me on the one hand for giving too many of Lamarck's texts, while thinking, on the other hand, that this collection of texts produces, by itself, without accompanying commentary, a 'homage' to Lamarck, better than than a 'digested narrative' would have been? . . .

It's on this point where we differ: is history made *fundamentally* (or 'primarily') of texts or *fundamentally* ('primarily') of ideas [*points de vues*] about texts?

To see the matter more clearly, it's perhaps a good idea to offer some epistemological principles, and some illustrative examples.

(A) *Principles*

1. History of science is a discipline *sui generis*—in French we say a '*discipline à part entière*' [a 'wholly distinct discipline']. Its fundamental material consists of the *written texts* of the authors being studied, just as the basic material of palaeontology consists of bones, etc. Without bones or fossilised remains there can be no palaeontology; without written documents there is no history. There can be prehistory or archaeology; but they are different disciplines.

2. There is no need to create a hierarchy between the different disciplines. History is not 'superior' to other disciplines (economics, art, etc.). History of science has no precedence over geology or palaeontology, and these disciplines have no precedence over history of science. They are all university disciplines, giving rise to particular developments in the universities. History is an academic discipline of the same status as that of all the other academic disciplines; and history of science has just the same academic status as other kinds of history.

3. Each discipline has its own field and appropriate epistemology. History of science is distinct from every other discipline (law, science, literature, poetry, etc.), just as every other discipline lays claim to its own characteristic features. The only common characteristic that each must have and that can be seen in all of them is *rigour* (scientificity, if one may use this term!) in the utilisation of their fundamentals: the texts that the historian cites must match the originals (not approximate citations made from memory), and should be cited with their precise references (not citations that have as their sole reference a work of five or six hundred pages! . . ., and there are cases like this!), so that the reader can check their accuracy in the original documents. Even research of the meanings of scientific words as used in the past is a matter for the historian, for words have often changed their meaning through the history of a discipline.

4. History of Science is part of history, not of science: history of geology belongs to history, not to geology; it's the same for history of palaeontology: it belongs to history, not to palaeontology. The two cannot and must not be confused with one another.

5. One cannot be a 'specialist' in more than one discipline. Someone who regards himself as a 'specialist' in a discipline thereby declares himself as a non-specialist in all other disciplines. The days are too short and 'life is too short to enable us to become masters of multiple fields. The economist will remain an economist, the sociologist a sociologist, the geographer a geographer, and so on. It is better thus. May everyone speak his mother tongue and talk about what he knows: his own business, his own profession . . .', as Fernand Braudel, one of the recognised masters of the discipline of history, commends (*Écrits sur l'histoire, L'histoire et les autres sciences de l'homme*, 1969, p. 87). Somewhat severe, but sound and clear advice!

6. Each discipline has its professionals and its amateurs. The latter have their place in every discipline and can render important assistance to the specialists. A geologist or palaeontologist who does history of geology or palaeontology is thus an 'amateur' historian, with the limitations, both epistemological and temporal, that that entails (he can only give a small amount of his time to historical work). Besides, there is no discredit in being in the category where one belongs.

7. The historian of geology or palaeontology obviously never takes himself to be a competent geologist or palaeontologist. At the very most (and rarely!) he can pretend to the title of 'amateur' in these disciplines. Conversely, and by the same reasoning, a professional geologist or palaeontologist can't pretend to be a competent historian, not even of geology or palaeontology.

8. The specific epistemology of history of science consists in that its objective is to bring a scientific author back to life again by presenting the objective documents that are the texts he has written. ALL the texts: the worst fault for an historian is to select texts, and to cite only those that have one interpretation (his own!). It is known that this happens with 'revisionist' histories! The historian does not try restore the past as he would like it to have been (as do the 'revisionists', cf. 'Practical Matters' below), but as it was. In this lies the objectivity of history. Indeed, the early authors knew their intended meanings at least as well as—and doubtless even better!—than we do, so it is better to let them speak for themselves rather than trying to do it for them. Thus we should give *their* discourse, that is to say *their* texts, and not our own. François Ellenberger, a friend of many of us, and our 'master' on everything in the history of science, affirmed that for the historian of science: 'The first task is to read carefully what authors have actually written: there and only there lies the solid foundation of all history of science. The learned dissertations must only come afterwards. All come from texts' (*Histoire de la géologie*, Vol. 1, 1994, p. 3). And further: 'My aim has been to provide readers with fresh documentation, always verified at source, and which can be used with confidence in future syntheses. Let us reiterate: it is essential to rely only on original texts read in their original languages' (*Histoire de la géologie*, Vol. 2, 1994, p. 2). As an historian, what interests me first and foremost is to know an author's texts, and not what so and so has said about them or understood them. It is thus as regards Cuvier, or even Darwin (Ernst Mayr mourns the fact that many Darwinian evolutionists have not even made the effort to read his text[s]!), and above all Lamarck, for whom many who speak about him have not read his works (cf. the example of Michel Foucault), or have done so with the intention of understanding him wrongly, so as better to denigrate him!

The texts of those who are the object of our study in question are, besides, generally perfectly clear, as we shall see in the section on 'practical matters' [below]. And why wouldn't they have had the same concern as we have, to speak clearly? If there are some passages that appear ambiguous to us, the historian's principle is always the same: explain the obscure passages by means of the ones that are clear, rather than the other way round—becoming deliberately confused—thus presenting the authors of whom we are speaking as people who don't really know what they want to say!

9. The historian must not judge a past author. His sole task is to restore his thought, closely reproducing his texts, not saying that they are good or bad but only whether or not they are authentic! One should understand them, not judge them.

François Ellenberger, once again, urges us to 'understand that their debates were not frivolous'; to:

'renounce condescension, to show people respect, and above all to understand the reasons for the existence, in their times, of the outmoded opinions and theories . . . Thought of in this way, history of science can have great educational virtues, helping to awaken that which is more than ever needful for present science: the critical mind. It is the indispensable antidote to a scientism infatuated with arrogant certainties, and an urgently needed protection against the temptation, more common than ever, to raise theories to doctrines, hypotheses to infallible dogmas. Why should we be qualitatively superior to our predecessors, recent or distant? They made mistakes; and so do we. They have not had the knowledge to avoid mistakes; nor have we. May they provide us with this lesson! And, in some cases, let us be inspired by their modesty' (*Histoire de la géologie*, Vol. 1, 1988, p. 2).

'I have tried to read my authors in a spirit free of prejudice, to take the trouble to listen to them attentively, and with sympathy. Understand before making judgment. Assume the principle that if they make mistakes their errors proceed from a logic whose links we must retrace, taking account of the total context' (*Histoire de la géologie*, Vol. 2, 1994, p. 2).

(B) Practical Matters

To illustrate these principles, let us consider some examples taken from the history of geology and palaeontology in the nineteenth century (with which I am most familiar):

1. The Case of Cuvier

a) Well supported (in a 'digested narrative'): he was not a pure catastrophist.

Provision of texts

Cuvier specifically expressed the idea of 'partial revolutions' (*Discours sur les révolutions de la surface du globe*, edition of 1830, p. 300); but he also expressly envisaged 'general revolutions' (*ibid.*, p. 293), and 'universal inundations' (*ibid.*, p. 339). It is impossible to understand the expressions 'general revolutions' and 'universal inundations' as designating 'partial revolutions', the more so as Cuvier himself envisaged the two cases when he invoked in the same stroke of the pen 'partial or general revolutions' (*Recherches sur les ossements fossiles de quadrupèdes*, Vol. 1, 1812, Introduction, p. 111; *Discours sur les*

révolutions de la surface du globe, edition of 1830, p. 293). Besides, his contemporaries understood these expressions in their obvious sense, and one can't see why they would not have understood Cuvier as well as we do.

b) Well supported (in a 'digested narrative'): he was not a creationist.

Provision of texts

The word 'creation' can have several meanings in French. Fortunately, the historian of science has a, so to speak, ideal tool to understand the meaning that Cuvier gives to it: namely the *Dictionnaire de la langue française*, Vol. 1, 1863, by his contemporary Littré (1801–1881). Littré remains a master of definitions in French (he has just been re-edited). For that with which we are concerned, he gives definitions closest to that of the author that we are studying: 'Creation: 1. Action of God the creator. The creation of the world . . . 2. The visible universe. The marvels of creation'.

Cuvier regularly uses the word 'creation' in the second sense as defined by Littré, as is witnessed by the following texts.

Recherches sur les ossements fossiles de quadrupèdes, 1812, Vol. 1, Introduction, p. 2: 'I have thus had to prepare myself for these researches by lengthy examination of extant animals: an almost complete review of the present creation [*création actuelle*] was the only possible way to provide a demonstrative character to my results on this ancient creation [*création ancienne*]'.

Recherches sur les ossements fossiles, Vol. 2, Part 1, 1825, p. 222: 'In consequence the genus of lophiodons links with those of the palaeotheriums and anoplotheriums as well as other unknown genera that I shall shortly describe, to show the certainty of [the existence of] a former world, of an animal creation that occupied the surface of our present continents, and particularly that of France, and that an irruption of the sea came to destroy [it], and covered their debris by rocks of a new origin'.

Cuvier also clearly stated that this way of understanding the word 'creation' was familiar to him: see the article 'Nature', *Dictionnaire des sciences naturelles*, Vol. 34, 1825, pp. 261–268, at p. 262: 'Nature is . . . the ensemble [totality] of beings, or the universe, or the world, and when it is regarded as contingent, as opposed to the necessary being, God, it is called 'creation': Nature, the world, the creation, the totality of created beings, are thus synonyms'.

The problem of Cuvier's 'creationism' is not thus far resolved. The historian of science cannot be satisfied that such passages all have a single meaning [for the word]. It's not because Cuvier used the word 'creation' in the sense of the 'visible universe' that he was a 'non-creationist'. Thus one must consult *all* Cuvier's texts, even, and above all, those where the problem of creation in Littré's first sense is evoked, and even if the word itself is not used. For example:

'Extract of a work on quadruped species whose bones have been found in the earth's interior . . .', *Journal de physique*, Year 9 (1801), Vol. 52, p. 266: 'How were these ancient beings destroyed . . . , how were those that succeeded them formed? . . . Is not metaphysics itself even more embarrassed by these facts than simple physics? And is not this new production of organised beings perhaps more inconceivable than all the other parts of the phenomenon?'

Recherches sur les ossements fossiles . . . , Vol. 5, Part 2, 1824, p. 8: 'Mammals are the last and most perfect products of the creative power.'

Discours sur les révolutions de la surface du globe, 1830, p. 338: 'Thus one may not question whether this population, which could be called of the middle age, this first great production of mammals, has been entirely destroyed . . . '

p. 362: 'So where was then the human genus? Did this last and most perfect work of the Creator exist somewhere?'

Here Cuvier uses the words 'production', 'product', which he ascribes to a 'creative power', and even to the 'Creator'. He specifies clearly that he rejects any understanding that confounds God, the Creator, with Nature: 1825, article 'Nature', *Dictionnaire des sciences naturelles*, Vol. 34, p. 262: in this understanding 'one evidently represents to oneself under the name of Nature the Creator Himself. It is His works, His cares, His wisdom and goodness that are involved . . . '

Further:

p. 263: 'We see . . . how puerile are philosophers who have ascribed to Nature a kind of individual existence, distinct from that of the Creator, and from the laws that He has imposed on motion, and from the properties or forms given by Him to all creatures, and which have caused bodies to act as with a power and specific rationality.'

p. 265: 'There is, then, in the world, as in the human body, that which is necessary, and nothing more. What law would have been able to constrain the Creator to produce unnecessary useless forms, uniquely to fill the gaps in a scale [the 'Great Chain of Being'], which is only a mental speculation . . . '

p. 267: 'Indeed, if one ascends as far as the Author of all things, what other law could have hindered Him than the necessity to accord to each being that is to last, the means to ensure its existence, and why wouldn't He have been able to vary His materials and His agents? Certain laws of coexistence among the organs were therefore necessary, but that was all: to establish others it would have been necessary to prove the insufficiency of freedom in the action of the organizing principle, which we have seen to be nothing but a chimera . . . Beauty, richness, abundance have been in the eyes of the Creator no less [important] than simplicity.'

In this article, Cuvier reveals the fundament of his thinking about the 'production' of beings:

p. 268: 'We thus conceive Nature simply as a production of the all-powerful, ruled by a wisdom, the laws of which we can only ascertain by observation . . . '

And by this 'all-powerful' we know that Cuvier means to refer to the being who is present throughout the discourse: 'God', whose 'nature' or 'essence' is to be 'the being of beings, that in which and by which all things are' (p. 261).

2. The Case of Lamarck

a) Well supported (in a 'digested narrative'): after his death 'he was completely forgotten'.

Provision of texts

In my work I gave several examples that prove the contrary. In particular, I gave the example of Asa Gray—there you have not understood my work as an historian. I don't suggest that Gray was right or wrong (that was not my concern, qua historian) to recall the name of Lamarck concerning Darwin, but simply that he did so; that is to say to mention the objective fact that he knew Lamarck's work and that Lamarck was therefore not completely forgotten. That's all I wanted to show. It is the same as regards William Smith, who announced in 1817, in p. iii of the Introduction to his *Stratigraphical System of Organized*

Fossils, that he had utilized Lamarck (among others, as he said) in his work: 'Lamarck's system, which is an expansion and improvement of that of Linnaeus, has been preferred, as most applicable to the arrangement of organized Fossils . . .'. Thus Lamarck was neither 'forgotten' nor despised. Neither for one nor the other, nor for other cases; obviously I did not intend to place them among the Lamarckians. And I am not one myself!

b) Well supported (in a 'digested narrative'): Lamarck did not provide any scientific basis for his transformist ideas, that he never utilized fossils in his demonstrations.

Provision of texts

It is necessary to remember that Lamarck has rightly been considered to be the founder of invertebrate zoology (with more than 6,000 species studied) and of their palaeontology (more than 1,000 species) and that he used them as 'justificative pieces' (according to his way of speaking) to support his transformism, placing emphasis on 'analogous species'—a procedure that all palaeontologists and evolutionists have used ever since. I refer readers to all the proofs founded on texts that I have developed in the work that you kindly referred to as my *magnum opus*.

(3) *The Case of Darwin.*

Well supported (in a 'digested narrative'): he never supported the idea of inheritance of acquired characteristics.

Provision of texts

1880 (two years before his death in 1882): a letter by Darwin to the journal *Nature*, a very important document for its content . . . and its forcefulness:

'Can Sir Wyville Thomson name anyone who has said that the evolution of species depends only upon natural selection? As far as concerns myself, I believe that no one has brought forward so many observations on the effects of use and disuse of parts as I have done in my *Variation of Animals and Plants under Domestication*, and those observations were made for this special object.'

Ernst Mayr (*The Origin of Species*, facsimile of 1st edn, 1981, p. xxv) affirms that Darwin always frankly upheld the inheritance of acquired characteristics: ' . . . in addition to natural selection, Darwin admits use and disuse as an important evolutionary mechanism. In this he is perfectly clear.'

For comparison, a 'digested narrative':

The article on Lamarck in the *Encyclopedia Britannica* (edition of 1990):

'[P]ioneer French biologist, who is best known for his idea that acquired traits are inheritable, an idea known as Lamarckism, which was controverted by Charles Darwin.'

This is a good example of 'revisionism'! You will understand, David, in reading this 'point of view', why I prefer to take first the texts of Darwin himself. And in this case I even permitted myself to think that I am more Darwinian than those who distort Darwin's thought! (To what end do they do that?)

We should not project our ideological opinions of today on the authors of the past, as do, unfortunately, a number of 'amateur' historians, who want to develop some 'digested narrative' out of the texts of their choice.

Besides, their contemporaries have understood them well, according to their own and common sense; there was no ambiguity for them. Trying to 'rehabilitate' past authors by seeking to change the sense of their convictions is an unwholesome activity. Historical truth is preferable to ideological truth. Besides, the history of science provides numerous examples of scholars who have upheld 'erroneous' views about the world (according to today's opinion) and have been eminent scientists.

To conclude—and I think that as an historian I shouldn't need to say it—I want to make it clear that I am not a Lamarckian and nowhere do I suggest that it is necessary to be one in order to study Lamarck. In doing the historical work of bringing an author to life again, it's not necessary to adopt his ideas. Indeed, it is better not to, and better not to be attached to some theory as an 'ism', when one's goal is to establish the objective historical facts, obviously independent (by their antiquity) of the subjectivity of a modern commentator. I know that there are some people who, on the pretext that I expound Lamarck's ideas and that I re-establish certain historical facts, infer that I am a Lamarckian, whereas I am simply doing my work as an historian! They demonstrate thereby that they don't know what it is to be an historian. In fact, they are not themselves historians, since they have neither the appropriate mental attitude nor the outlook of an academic! To assume that the practice of displaying historical documents (which apparently displease them) amounts to upholding an ideology reveals intellectual confusion!

An historian does not regard any 'truth' as absolute, as we are reminded by François Ellenberger. The historian is by his profession a 'relativist': he writes about such-and-such epoch, such-and-such author, such-and-such truth of the time. A scientist is likewise, as when he says: 'according to the present state of scientific knowledge'. Moreover, the counter of 'relativism' is 'dogmatism'. The historian knows from experience that yesterday's truth is today's error, and that today's truth will be tomorrow's error. The grand master of experimental science, Claude Bernard (*Introduction à l'étude de la médecine expérimentale*, 1865, edition of 1963, p. 68), maintained that:

'The theories that we possess are far from immutable truths. When we make a general scientific theory in our sciences, the only thing of which we are certain is that all these theories are, strictly speaking, false. They are only partial and provisional truths, which are necessary to us as steps on which we must rely to advance further in the investigation; they only represent the present state of our understanding, and consequently must be modified with the development of science.'

Without necessarily subscribing to Claude Bernard's view, the historian can usefully recall the words of Blaise Pascal: 'Truth on this side of the Pyrenees; error on the other'—an aphorism that one can apply from the dimension of space to that of time, the latter being, especially for an evolutionist, more likely to bring about overturns of 'truth' that are more important than those occasioned by the obstacle of the Pyrenees . . . You will thus understand, David, why, as an historian, I can't be a Lamarckian any more than I can't, for the same reason, be a 'for ever' Darwinian.

I remain convinced that if all those who propose 'digested narratives' spent more time researching texts, and less on commentaries, they would not have been guilty of so many false histories. To repeat, in conclusion, I prefer to be provided with texts rather than commentaries. I mistrust those who cite three pages of texts and make thirty pages of commentary out of them, and I value those who cite thirty pages of text and make three pages of commentary, preferring to leave the 'speech' to the original authors. If amateur historians continue to ignore or corrupt the writings of earlier authors, either wholly or in part,

serious historians will still have plenty to do providing the complete and authentic texts that, by their publication alone, re-establish objective historical truth, without the need for numerous commentaries.

Best wishes to you, David.

Goulven Laurent, Brest

The Serbian Mining Codex of 1412

According to archaeological findings, the oldest traces of mining on the Balkan Peninsula were discovered in eastern Serbia. They originated in the lower Neolithic and early Aeneolithic and are ascribed to the Vinca Culture. Primitive mining artifacts have been found at Rudna Glava, where traces of the earliest copper mining date back to the middle of the fifth millennium BC. Thereafter, metallurgical work was continued with varied intensity. During the following centuries, autochthonous Slavic populations continued to use the original primitive mining techniques, handing down knowledge from generation to generation. Especially well organized work was done during the period of the Roman Empire, from the first to the fourth centuries AD. But mining almost ceased during the large movements of peoples from the fourth to the sixth centuries.

During the waves of movements of Slavic peoples after the 6th century, Serbs brought improved knowledge of mining to the Balkan Peninsula, and old abandoned mines were reopened. Mining gradually gained importance, especially after the foundation of Serbian Nemanic state in 1168. Silver, gold, and iron were important for the economy and for state income. Mining increased suddenly and modernization occurred with the arrival of Saxon miners (about 1241). They came from Saxony (East Germany) and Erdelj (today Transylvania, in Romania), bringing their extensive knowledge, new technology, equipment, terminology, organization, and legal customs. Mostly they were invited to come by the mediaeval kings of Serbia, and were thus allowed to work in Serbia, their activities being regulated by special decrees from the times of King Milutin (1282–1321). Unfortunately, those acts have not been preserved, but they were mentioned in the Introduction of the Codex described here.

The 13th century was a time when the exploitation of ores started in many parts of Europe (Germany, Poland, Czechia, Hungary, Bosnia, Serbia, etc.). It was accompanied by the reorganization of work in the mines. Mining rights and freedoms were in question, and mining became an occupation of the free population, and had certain associated privileges. That status of miners and their business was sanctioned by kings, first by the contracts (in Germany known from 1208) and by charters (among the first of which was one of 1249, for the mining city of Jihlava), and then with laws. Especially famous was the first law for Kutná Hora (Czechia) from 1300, which has been described by Jan Urban in this *Newsletter* (No. 30, pp. 30–31). In the same way, it was accepted by Serbian Mediaeval kings.

On 12 February (29 January), 1412, the *Codex Concerning Mines of Despot Stefan* was promulgated, as mentioned in old manuscripts, such as *Codex of the City of Novo Brdo*, which was the mining codex that regulated life in the city of Novo Brdo and its surrounding mines. The Codex had fifty-two articles about mining and twenty-three laws governing city life. In relation to the mining work in 'pits', it regulated exploration for mineral ores and mining work (digging out the ores, ventilation, irrigation, transport, taxes, etc.). A special chapter regulated the work in smelting houses. The Codex also regulated practical aspects of life in the city (marketing of food and craft products, market prices, privileges of miners in the market, etc.), as well as lawsuits, justice, and some aspects of multiconfessional relations.

Without going into too many details, it is interesting to note that the Codex included special terms for the exploration of ore deposits (*uzboj*) and for a man doing such work (*uzbojnik*). Another term denoted a kind of medieval 'exploration geologist' who probably performed his job in much the same way as described 150 years later by Agricola in his famous work *Bergwerck Buch* (pp. 27–29 and illustration on p. 31).

The *Despot Stefan Codex* had not survived as an original document. Only three later hand transcriptions are known: one in old Serbian (from the 16th century); one in Turkish (from the fifteenth century); and one in Latin (from the seventeenth century). The last two are kept in libraries in Paris and Split and are abbreviated versions of the original manuscript. The old Serbian transcription remains in excellent condition. By good fortune, it was purchased in 1959 at an auction of antiquities in Vienna. Subsequently, it was presented to the Serbian Academy of Science and Arts in Belgrade, where it still remains. In 1962, the text of the Codex was transcribed and published by Dr Nikola Radojčić. In 1999, a new translation with commentary was published by Biljana Marković, with a foreword by Dr Nikola Pantić, in a popular edition 'for school and home'. Thus this ancient document has become widely available to scientists and the general public.

One may conclude with few words about the 'Despot'.* Stefan Lazarević was son of the famous Duke Lazar Hrebeljanović, who commanded the Serbian army in the celebrated battle with the Turks in Kosovo in 1389. Stefan was a successful ruler and a courageous soldier in numerous bloody battles; but he was also an enlightened and intelligent person, endowed with many virtues. He was able in diplomacy, author of laws, founder of cities and monasteries, writer, poet and 'one of the most able monarchs and among the most intelligent men in Serbian history'. With him, a new period in Serb history began, which lasted until their cultural revival in the eighteenth century. Under Despot Stefan, Belgrade became the capital of Serbia and there was economic prosperity and a flowering of literature, art, etc. It is not surprising that at the time Novo Brdo became one of the largest mining cities in the world with 40,000 inhabitants, and that life and work there had to be organized according to law. Fortunately, the book has been preserved in the battered land of the Balkan Peninsula.

Aleksandar Grubić, Belgrade

* The term 'Despot' is of Byzantine origin. In Byzantine civilization, it was used to refer to a sovereign of rank between King and Emperor (Tzar). Thus, at the time with which we are concerned here, the word 'Despot' did not have its later meanings, such as 'tyrant' or 'dictator'.

Illustration from the Stefan Mining Codex



The 1690s Coalheugh Well at Cromarty, Scotland: A Rare Survival of Upstanding Evidence for Pre-scientific Coal Prospecting

The architectural and historic associations of the old burgh of Cromarty (ca 30km northeast of Inverness) are well known and rightly publicised, but, with a few notable exceptions such as Alston (1999), undeservedly little attention has apparently been paid to the Coalheugh Well. The Well will be familiar to readers of *The Old Red Sandstone* by Hugh Miller, the geologist and writer born in the town in 1802 (see pp. 13 & 53), but it may not be widely known that it still exists in good condition as a rare, and possibly unique, upstanding survival of a failed coal prospecting venture dating from the 1690s (Alston, 1999), a century and more before William Smith's time. Moreover, the local geology is such that it is easy to appreciate how it misleadingly attracted the prospectors, using what Smith would later show, with the aid of the new concept of the use of fossils in stratigraphy, to be faulty methodology.

Location

The Well, more correctly an aquifer source, lies just east of the modern town and to the south of the now largely vacant site of mediaeval Cromarty. The wellhead is tucked under the wooded slope forming the old coastline below the site of St Regulus's Chapel, where Hugh and Lydia Miller's eldest child Eliza is buried. It can now be found easily, with a little searching in the seasonal vegetation, where the road to a new water-processing plant crosses the small Old Chapel Burn which debouches here from a 'den' or wooded ravine in the old sea-cliff (Ordnance Survey National Grid Reference NH 795 672).

The Well now consists of a moss-covered dome of stone masonry about chest-high to an adult, with an outlet on one side. Today the spring water flows with only a gentle pressure, but certainly enough to produce a head of at least a metre or so above ground, 'one of the finest specimens of a true Artesian well which I have anywhere seen', as Miller described it (Miller 1841, p. 181). The water runs from the well to a nearby stream, and has stained the channel and surrounding vegetation brown and orange with iron-rich precipitate. As Miller put it (p. 182): '[t]he waters are not strongly tintured,—a consequence, perhaps, of their great abundance; but we may see every pebble and stalk in their course enveloped by a ferruginous coagulum, resembling burnt sienna, that has probably been disengaged from the dark red sandstone below, which is known to owe its colour to the oxide of iron'. The colour, as well as the traditional depth of the bore, suggests that the water is passing through Old Red Sandstone rather than solely through the Quaternary strata.

As Miller himself did, one can infer the solid geology of the immediate locality from the outcrops reported by Miller himself in the stream bed, of bedded sandstones with plant remains, and along the nearby beach which includes Miller's classic Old Red Sandstone fish locality. This solid geology is of Old Red Sandstone nodular mudstones and shales (including Miller's famous fish bed, which is above the level of the rocks at the well), eastwards to what Miller called (p. 108) the 'granitic gneiss' of the South Sutor headland. On the flat field between the present beach and the well, raised beach sands could be seen in temporary excavations in spring 2002. Behind this raised beach is the old coastline, cut back into the thick cover of Quaternary deposits into which the den of the stream is incised.

Origin

George Mackenzie, first Earl of Cromartie (1630–1714; elected Fellow of the Royal Society, 1692), gained control of the estate of Cromarty in the late seventeenth century. He was a man of wide interests, publishing for instance on the formation of peat. Miller plausibly, and acutely, suggested (1841, pp. 180–181) that the abundant plant remains and occasional bitumen in the grey shales visible in the bed of the stream had misled 'the sagacious nobleman into the belief that coal might be found on his new property. He accordingly brought miners from the south, and set them to bore for coal in the gorge of the ravine'. But, given the local geology as Miller knew it, 'there might be some possibility of their penetrating to the central fire, but none whatever of their ever reaching a vein of coal'.

What had happened, of course, was that the coal prospectors were going on the basis of the lithological similarities of the Cromarty shales to the normal coal measures of Britain. But without the use of fossil evidence—indeed, without the very concept of using it in stratigraphy—there was nothing to show them that they were digging into strata *below* the Carboniferous Coal Measures, or, for that matter, the Jurassic near-coal of Brora on the coast to the north of Cromarty, which they might have had in mind. Calcareous sandstones exposed on the shore today do show bitumen as a vein filling phase with calcite; indeed a hydrocarbon, but not the right one (Lyll Anderson, pers. comm., 2003).

Miller continued (pp. 181–182), as a local historian recording oral tradition about the miners' activities:

From a curious circumstance, however, they were prevented from ascertaining, by actual experience, the utter barrenness of the formation . . . They had bored to a considerable depth, when, on withdrawing the kind of augre ['auger'] used for the purpose, a bolt of water, which occupied the whole diameter of the bore, came rushing after like the jet of a fountain, and the work was prosecuted no further; for, as steam-engines were not yet invented, no pit could have been wrought with so large a stream issuing into it; and as the volume was evidently restricted by the size of the bore, it was impossible to say how much greater a stream the source might have supplied. The spring still continues to flow towards the sea between its double row of cresses, at the rate of about a hogshead per minute—a rate considerably diminished, it is said, from its earlier volume, by some obstruction in the bore . . . A Greek poet would probably have described the incident as the birth of the Naiad [in Greek myth, the maiden who was the spirit of a river or spring]; in the north, however, . . . the recollection of it is merely preserved by tradition, as a curious, though by no means poetical fact, and by the name of the well, which is still known as the well of the *coal-heugh*—the old Scotch name for a coal-pit.

Heuch or *heugh* is Scots for a pit or mine—but also for a cliff or high bank (*Concise Scots Dictionary*), and the word is therefore doubly appropriate to use in reference to the Coalheugh Well, whatever the original intention. Generally *heuch/heugh* is pronounced in the Scots manner, with the final consonant as in Scots 'loch', unvoiced in the first variant, voiced in the second. (David Alston has kindly informed me that the modern local pronunciation of Coalheugh is 'callie-shoch'.)

It is particularly interesting that Miller's reportage of oral tradition should specifically refer to the well as a 'bore' drilled by an 'augre'. A coal trial could indeed be a 'bore' drilled by an auger or rod, but it could also be executed by digging a 'shaft' big enough for at least one man, and accounts of old trials often confuse bores and shafts. It is not clear whether Miller always realised the difference, but the small size of the Coalheugh Well's capping tends to point to a bore. (Miller did speak

elsewhere of a shaft, more precisely a 'wide pit', being dug in another coal trial, but he referred to it as a 'boring' in a letter [Torrens 2003 in press]—but of course it could well have been first one then the other.) As for the flow of water which he recorded, a 'hogshead' is an old English measure of capacity. Its precise volume depends on the context, but by 1825 it had been standardised as 52.5 gallons, just under 200 litres, and Miller presumably had this value in mind. From what little observation we have made of it, the flow today is sometimes little more than a trickle, though in the decidedly damp June and October of 2002 it was flowing well if not lavishly. We have not (yet) measured it to check if it is still running at Miller's rate.

If the Coalheugh Well was indeed drilled as a bore, then this may be an early example in Scotland. Smith (1989, p. 57) has suggested that such equipment was used around Nottingham by 1574 and that the technique migrated northwards first to north-eastern England (Newcastle, etc.) and thence to Scotland. Such 'boring' was a crude technique. It consisted essentially of banging a chisel-ended tool, extended by as many screw-ended rods as necessary, into the bottom of the hole, much as a 'jumper' was used in a stone quarry or Welsh slate mine. The wet rock dust formed a paste that had to be removed periodically, and examined, no doubt hopefully, for traces of coal. This was, of course, a fatally unreliable business when carbonaceous plant material such as lignite was present in the strata, as it so often is in the dark shales of the British geological sequence. The resulting powdered black debris might be confounded with true coal by the eye of optimism—or true coal might be missed completely. The only way to recover large samples that could be properly examined was to dig a shaft, at least before the development in 1805 of drilling apparatus that could recover a solid core (and this still did not solve the problem as it cost more than old-style borings, whose false economy continued to beguile many prospectors).

In the case of the Coalheugh Well, of course, hitting the aquifer rendered the question moot. But other surveyors would visit Cromarty and other trials for coal would be carried out in the district, for, as well as the Old Red Sandstone, the Jurassic black shales were also temptingly lignite-bearing, as at Eathie on the Moray Firth coast south of Cromarty. One wonders exactly how often the fundamental error of the Coalheugh Well was repeated in the area. However, except for the trials carried out in the teeth of Miller's advice at Eathie about 1852, which post-dated William Smith's work and are therefore not our concern here, we know little about those other trials which have come to notice (Torrens 2002, Chapters 1, 3–8, Torrens 2003 in press). The historical record of failed trials is always much poorer—indeed, much less knowable—than that of successful ones. Nevertheless, the famous Scot and engineer, James Watt Senior, later rightly said that one learnt most from studying the history of such failures (Smiles 1884, p. 339).

David Alston has kindly pointed out to us that the Well appears to have found a later use. From the Minute Book of the Commissioners of Police [i.e. in the Scots sense, which includes services such as water and refuse disposal as well as law and order] for the Burgh of Cromarty (Highland Council Archive HCA/C154/1), it seems that it was used to supplement the then unsatisfactory town supply, through an iron pipe run from the well at some time around 1859–1963. Today, however, it flows freely to the burn and thence to the sea.

A Final Comment

As so often, a comment by Miller (1841, p. 183) serves admirably as the last word:

[G]eology, in a peculiar manner, supplies to the intellect an exercise of . . . [an] ennobling character. But it has also its cash value. The time and money squandered in Great Britain alone in searching for coal in districts where the well-informed geologist could have at once pronounced the search hopeless, would much more than cover the expense at which geological research has been prosecuted throughout the world.

Acknowledgements

We are grateful to Lyall Anderson for discussion of local geology, Alison Morrison-Low for advice on hogsheads, and David Alston and John Nightingale for local information.

References

- Alston, D., *Ross and Cromarty. A Historical Guide*, Birlinn, Edinburgh, 1999.
 Miller, H., *The Old Red Sandstone, or, New Walks in an Old Field*, John Johnstone, Edinburgh, 1841.
 ———, *The Cruise of the Betsey . . . or, Rambles of a Geologist . . .*, Constable, Edinburgh, 1858 [reprint edition in preparation, National Museums of Scotland Publishing, Edinburgh].
 Smiles, S., *Self-help*. Murray, London, 1884.
 Smith, R.S. 1989. *Early Coal Mining around Nottingham 1500–1650*, Department of Adult Education, University of Nottingham.
 Torrens, H. S., *The Practice of British Geology, 1750–1850*, Ashgate, Aldershot, 2002.
 ———, 'William Smith (1769–1839) and the Search for English Raw Materials: Some Parallels with Hugh Miller and with Scotland', in: L. Borley (ed.), *Proceedings of the Hugh Miller in Context International Bicentenary Conference, Cromarty, 2002*, in press.

Michael Taylor, Edinburgh & Hugh Torrens, Keele

AWARDS AND HONOURS

History of Geology Award, Geological Society of America, to Dennis Dean, 2002

Citation by Robert H. Dott Jr

I first met our awardee in 1965 when a PhD candidate in English literature named Dennis Dean showed up in the first class that I taught on the history of geology. I may well have gained more from our classroom experiences than he, for Dennis introduced me to a wealth of 19th Century literary allusions to geology. One example that particularly delighted me, and which he later published, was how Edward Hitchcock's celebrated Connecticut Valley trackways inspired Henry Wadsworth Longfellow's famous passage 'Footprints on the sands of time' from the *Psalm of Life* (published in 1838). Dennis' Master's thesis at Stanford had been about *Emerson and Geology*, and when he joined my class, he was working on his Ph.D. dissertation about *Geology and the British Romantic Poets*. After graduate school, Dennis joined the humanities faculty of the University of Wisconsin at Parkside, where he taught for 25 years. He gradually expanded his duality of interests, which has made him unique among historians of geology.

Over the years, Dennis has researched and written increasingly about the history of geology, and his work has gained much authority. His efforts have culminated with outstanding scientific biographies of James Hutton published in 1992 and Gideon Mantell published in 1999, which are now the definitive references for these two important figures. Dennis made a coup in his serendipitous discovery of a rich store of Mantell resources in New Zealand, where one of Gideon's sons had emigrated, but I leave it for him to tell that story.

Those two books alone would justify our award for Dennis Dean, but he also has published important articles about the history of geology in such journals as *Isis*, *Annals of Science*, *Modern Geology*, and the *Journal of Geological* (now *Geoscience*) *Education*. These have concerned not only Hutton and Mantell, but also Erasmus Darwin, Playfair, Lyell, Hitchcock, Mallet, Benjamin Franklin, and William MacLure. He has published important essays about Sir Walter Scott and the Neptunist–Vulcanist dispute; Tennyson and geology; the controversy between Muir and Whitney about the origin of Yosemite Valley; the age of the earth controversy; and the San Francisco Earthquake of 1906. He has contributed to symposium volumes and encyclopedias, notably 14 entries for the new *Dictionary of National Biography*. For the 1997 Hutton–Lyell bicentenary, Dennis edited an augmented reprint edition of James Hutton's Volume III of *Theory of the Earth*—the long lost volume, which was first published in 1899. He is presently the General Editor for a History of Earth Sciences reprint series and frequently participates in both national and international conferences on the history of geology.

In all of his work, Dennis Dean is one of the most thorough and rigorous scholars active in the history of geology. He single-mindedly pursues relevant source materials, and has made a number of important factual discoveries in the process. Dennis subjects his material to the strictest scrutiny before he draws his often novel conclusions. With his unique background, he is able to analyze subtleties of linguistic expression and to see interdisciplinary relationships between science and the humanities that would go unnoticed by most of us. I am honored to present Dennis Dean for the History Division's 2002 Award.

Response by Dennis Dean

Thank you, Bob, my friend and mentor, for nominating me to receive the same History of Geology Award that has in the past been presented to so many worthy scholars. If any among us still doubts the appropriateness of its going to a humanist like myself, I hope that he or she will ready my books.

Though reading has always been one of my greatest pleasures in life, I began to collect rocks even earlier, before I could read. In 1941, when my family was living in northern Illinois (not far from where I live now), my mother and two of her sisters took my older brother and me on a lengthy car trip through Canada and New England. We stopped at a place called the desert of Maine, at which colorful sands were exposed. While there my Aunt Bea saw how fascinated I was with some of the pegmatite minerals on sale in the gift shop and bought a few specimens for me, one of which I still have. My rock collection began on that date and has continued ever since—for more than sixty years.

Having started at age three, I had plenty of time to expand my original interest in rocks to include fossils, artifacts, and geological and cultural history. I discovered the history of science as a graduate student at Stanford, but only through private reading (in March 1961). A book called *The History of Science and the New Humanism*, by George Sarton, showed me how I could put the scientific and humanistic sides of my mind together. I began to write literary term papers emphasizing the cultural influence of science, and later did a Master's thesis on Emerson and geology (1962), explaining that writer's numerous allusions to earth science.

Following two years in the army, I returned to graduate school at Wisconsin, where I was the first ever to pair a doctoral program in English with a minor in the history of science. As part of that unique curriculum, I undertook three credits of work with Bob Dott, who was then the same 'peach of a fellow' (as someone assured me) that he still is today. My dissertation topic, as he mentioned, was 'Geology and the British Romantic Poets'—in other words, the literary contemporaries of Hutton, Playfair, and the early Lyell.

In 1977, while on my way home from a Senior Fulbright lectureship in Korea, I stopped off in Wellington, New Zealand, to see four letters by Mary Shelley, wife of the poet and the author of *Frankenstein*; I knew two of the letters to be unpublished. All four were to Gideon Mantell, of whom I had heard by reason of my work on Emerson and the *American Journal of Science*. But I was entirely unprepared for the previously unknown riches of the Alexander Turnbull Library's superb Mantell collection. Revising my schedule of the spot, I spent four days—as much time as I could spare—researching two essays, one on Mary Shelley and Gideon Mantell, the other on the Mantell collection itself. Someone, I was convinced, really ought to write a biography of the fascinating and greatly underrated British discoverer of dinosaurs. It took me several months to figure out who that someone had to be. Eventually, I returned to New Zealand for a more extended stay of nine weeks, funded by the National Science Foundation—this with a doctorate in English literature—and the book itself (my third) took twenty-two years in all. My current book-length project has to do with Charles Lyell and won't, I hope, take as long.

Thank you very much.

[Reproduced by courtesy of the Geological Society of America]

Albert Carozzi: The American Association of Petroleum Geologists' Distinguished Educator Award for 2003
INHIGEO is pleased to congratulate Professor Carozzi for his award on May 11, 2003, at the Association's Annual Meeting in Salt Lake City in recognition of his lifelong academic teaching of petroleum geology and exploration for new fields all over the world. The citation reads:

To Albert V. Carozzi, scientist, scholar, and mentor, for emphasizing the fundamental importance of meticulous microscopic observations to unraveling large-scale geological processes.

Recognized leader in the petrology and petrography of carbonate rocks, through over 300 publications and textbooks, culminating in his 1993 text, *Sedimentary Petrography*.

During his tenure at the University of Illinois, he supervised 34 PhD and 16 MS theses, the majority concerning the microfacies of Paleozoic carbonate rocks.

Carozzi served as an AAPG distinguished lecturer, instructor for AAPG short courses, and as a consultant in the international petroleum industry, teaching over 60 workshops and courses. He worked with over 20 petroleum and engineering companies on the development of petroleum and mineral resources and engineering geology projects in

South America, Africa, Europe, the South China Sea, and the Philippines. His international stature is also indicated by his invited professorships in Brazil and in France.

As a Professor Emeritus he was able to dedicate more time to his passion for the history of geology. He is a recognized authority on the history of 18th century geology, shown by his English translations of the works of de Maillet, Werner, de Saussure, Lamarck, and others such as Agassiz and Cayeux. His contributions have won him the History of Geology Award from the Geological Society of America in 1989, the first Marc-Auguste Pictet Medal for excellence in the history of geology from the Société de Physique et d'Histoire Naturelle of Genève in 1990, and the Prix Wegmann of the Société Géologique de France in 1999.

The Watanabe Prize

On 2 October, 2002, Professor Kanenori Suwa received the 17th Manjiro Watanabe Prize from the Japanese Association of Mineralogists, Petrologists and Economic Geologists. Professor Watanabe (1891–1980) was a famous Japanese mineralogist and economic geologist, who served as President of JAMPEG, President of Geological Society of Japan, and President of Akita University.

The Karpinsky Medal

INHIGEO congratulates Professor Efgenji Milanovsky for his award of the prestigious Karpinsky Medal, which is only presented once every five years. The certificate accompanying the Medal reads in translation:

Russian Academy of Sciences

DIPLOMA

The Presidium of the Russian Academy of Sciences, by its resolution of 21 February 2001, has awarded Academician Eugenij Eugenievich Milanovsky the A. P. Karpinsky Gold Medal for his series of fundamental scientific works on 'Problems of Regional Geology of Russia and adjacent countries, tectonic structure and development of continents, Orogenesis and riftogenesis'.

President of the Russian Academy of Sciences
Academician Yu. S. Ossipov

The Wollaston Medal

INHIGEO is pleased to congratulate Professor Rudolf Trümpy, of Switzerland, for his receipt in 2002 of the Wollaston Medal from the Geological Society of London, its highest honour. His citation reads:

Trümpy, in whose family geology has been a tradition of several generations, is revered all over the world for his work on the classic Alpine chains of Switzerland—especially on the Helvetics. This work was always rooted in the meticulous fieldwork, structural mapping and stratigraphy that have been his trademark. He has been the prime researcher in unraveling the relationship between nappe structure and sedimentary facies belts, and was responsible for disproving the idea that individual nappes corresponded with individual facies belts in a series of works characterised by superb and detailed field observations and grand synthesis.

Trümpy seems to know every outcrop in Switzerland, and what it means. Not only has he proved himself a genuine genius at outcrop, but a master of grand tectonic synthesis. He has a breadth of geological knowledge that is perhaps unrivalled. His contagious enthusiasm for his chosen subject, combined with the wit, brilliance, and clarity of his exposition, has made him an expert teacher of profound influence. His scientific expertise has not been confined to the theoretical. He has been active in international science policy as Treasurer and then President of the International Union of Geological Sciences (IUGS) and has lately researched and written authoritatively upon the history of ideas on Alpine mountain building.

INHIGEO was privileged to have Professor Trümpy as one of its leaders for our conference in Switzerland in 1998, and those who were fortunate enough to attend can certainly attest to his 'genius at outcrop', 'his breadth of geological knowledge', and the 'wit, brilliance and clarity of his exposition'. Moreover, he did seem to 'know every outcrop in Switzerland'; and there are a lot of them!

David Oldroyd

has been elected a Corresponding Member of the International Academy of the History of Science and has also been awarded a Centenary Medal by the Australian Government for his 'Service to Australian Society and the Humanities in the Study of the History of Science'.

IN MEMORIA

Professor Gerhard Regnéll (1915–2002)

Emeritus Professor Gerhard Regnéll, Lund, Sweden, died suddenly in his home from a heart attack on 14 June, 2002. He was professor of Historical Geology and Palaeontology at Lund University, Lund, Sweden, 1956–1980. A highly respected palaeontologist and world authority in the field of fossil echinoderms, Regnéll also published numerous papers dealing with the history of the geological sciences, mainly concerning Sweden and the other Scandinavian countries. He was one of the founding fathers of INHIGEO in 1967, and a Member for more than thirty years. He is survived by his wife Ulla and their two sons.

Regnéll was born in Lund 19 June, 1915, the first-born child of the university treasurer Otto Regnéll and his wife Agnes (née Pählman). He went to school in Lund, matriculated in 1933, and entered the university there, studying zoology, botany, and geology. He received a BSc in 1939 and a licentiate in philosophy (PhD) in 1941. In 1945, he was awarded a DSc in geology at Lund University, and was appointed Docent, on the thesis *Non-Crinoid Pelmatozoa from the Paleozoic of Sweden: A Taxonomic Study*. While studying and working on this thesis he was employed as an amanuensis at the then so-called

Geological–Mineralogical Institute in Lund 1936–1945. Also in 1945, he married Ulla Hadding, daughter of Assar Hadding, the then Professor of Geology and later *Rector Magnificus* or President of Lund University, and his wife Visen (née Jacobsson).

In 1946, Regnéll was appointed assistant keeper, and subsequently museum keeper at the Department of Palaeozoology of the Swedish Museum of Natural History in Stockholm. He left Stockholm on leave of absence early in 1949 to be acting professor of geology in Lund till the end of that year, and again from late 1954 to the summer of 1956, when he was appointed Professor of Geology, especially Historical Geology, at Lund University. He was a member of the university's finance commission 1963–1964, Dean of the Faculty of mathematics and natural sciences 1966–1968, and Pro-Rector (Vice President) of the university 1968–1970. He retired from the chair in the summer of 1980 as Emeritus Professor, when he received, as a parting gift from all his students, seven heavy, half-calf bound volumes containing one copy of every scientific publication in historical geology and palaeontology published during his years in the chair, altogether about forty students and 130 copies, including thirty-two dissertations. Eleven of his former students have been appointed professors.

Regnéll's list of scientific publications is not large as to number, but it reveals his broad knowledge of, and wide interests in, the geological sciences. His first paper (1939) was a note on *Ceratopyge forficula* (Sars) and his last, published early in 2002, was a brief review of a mining dictionary, published in 1788–1789 by Sven Rinman, one of the best known figures of the Swedish iron industry in the eighteenth century. Regnéll's thoroughness, accuracy, and reliability as a researcher, in combination with his analytical skill and brilliant stylistic capacity, made many of his papers outstanding. His basic interests were in palaeontology, in which field he published about thirty papers, mainly on echinoderms, but also on graptolites, trilobites, corals, hystricospheres, and problematic microfossils. He made a significant compilation of the Phanerozoic stratigraphy of Sweden in the 4th edition of the long-standing textbook *Sveriges geologi* [*Geology of Sweden*] in 1963, in collaboration with Nils Harald Magnusson and Gösta Lundqvist, and published a large number of minor articles (in Swedish) in journals, year-books and newspapers, often written in a popular way. Using well-chosen titles, he wrote for a broader public about geologically interesting people, localities, and areas. In many of these articles he also drew attention to the importance of geological knowledge for elucidating various problems in today's society.

Professor Regnéll's major influence on geological education, as well as geological research issues in Sweden, was in the 1960s and 1970s. In that period he was a board member of the Swedish National Committee for Geology (1959–1982); the Faculty Planning Board for Mathematics and Natural Sciences (1967–1973); the Swedish Natural Science Research Council (1968–1974); and the Swedish Committee for Man and Biosphere (1974–1975). Moreover, he was President of the Geological Society of Sweden (1963); a member of the geo-delegation of the Swedish Natural Science Research Council (1971–1974); of the Swedish Committee of the Geodynamics Project (1972–1975); and the Swedish Committee of the International Geological Correlation Programme (1973–1976). Additionally, he was one of the founders, and a board member, of the Lethaia Foundation 1966–1981 (Chairman 1970–1974). In the sixties and seventies, he also served on several committees for professorial appointments in geology, zoology, palaeontology, and palaeozoology, for example at Harvard University, Uppsala University, the University of New England (Armidale, NSW, Australia), the Swedish Museum of Natural History in Stockholm, and the University of Texas at Austin.

Regnéll was also deeply engaged in cultural and nature conservation matters, and for many years he held directorships in a number of local as well as regional organizations devoted to that purpose. He was a member of the Royal Physiographic Society in Lund (elected 1955, Secretary 1970–1980, Chairman 1981–1982), the Royal Danish Academy of Sciences and Letters (elected 1969), the Royal Society of Science at Uppsala (elected 1971), the Royal Swedish Academy of Sciences (elected 1971), and the Royal Society of the Humanities at Lund (elected 1974). He received many other tokens of appreciation, medals and awards: for example in 2001 a silver medal from the Swedish Academy for a forty-year appointment as geological expert to the editorial offices of the Academy's Dictionary project.

Regnéll was always helpful, kind, and considerate. As my tutor (in the 1970s) during my doctoral studies in Lund he was not the one who decided how the work should be planned, nor did he deliver definite instructions. But he was ever-ready to assist and give advice, once you asked for it. He always had time for discussion, but he thought that the basic work should be carried out oneself—a division of work with which I was in sympathy.

Many palaeontology colleagues honoured Regnéll by giving his name to new species, genera, and a family: *Glyptocystites regnellii* n. sp. – G.W. SINCLAIR, 1948; *Regnellcystis* n. gen. (fam. Regnellcystidae n. fam.) – R.S. BASSLER, 1950; *Cyathochitina regnellii* n. sp. – A. EISENACK, 1955; *Triacrinus regnellii* n. sp. – J. BOUSKA, 1956; *Monachocrinus?* *regnelli* n. sp. – H. WIENBERG RASMUSSEN, 1961; *Ginkgoites Regnellii* sp. nov. – H. TRALAU, 1966; *Balantiocystis regnellii* n. sp. – J. CHAUVEL, 1966; *Catentopora regnellii* n. sp. – A. STASINSKA, 1967; *Baltisphaeridium regnellii* n. sp. – G. KJELLSTRÖM, 1971; *Regnellia camera* n. gen., n. sp. – Ø. LAURITZEN, 1974; *Regnellicrinus* gen. nov. – S.V. ROZHNOV, 1981.

Professor Regnéll's Contributions to the History of Geological Sciences

The history of the geological sciences deeply engaged Gerhard Regnéll throughout his academic life, and was manifested already in 1949 in his 64-page paper 'On the Position of Palaeontology and Historical Geology in Sweden Before 1800'. This was a genuine pioneer work, also the first on the subject written in the English language. One must keep in mind that, in Sweden, there was—and still is—no academic tradition as regards the study of the history of geology, and what had been achieved at that time was the outcome of a few, dedicated scholars, viz Alfred G. Nathorst (1850–1921), Arvid G. Högbom (1857–1940), and Nils Zenzén (1883–1959). Regnéll became one of their equals.

At the outset of this paper, Regnéll clearly declared what led him to take on a laborious work such as this:

Every scientist . . . owes an eternal debt of gratitude to a long series of precursors, men who contributed towards assembling the fund of experience on which he, the scientist of today, draws daily and hourly. It should therefore be a matter of importance for him to acquaint himself in some measure with the history of his science, in other words, to investigate the foundations of the edifice which he himself is helping to build.

The paper undoubtedly formed Regnéll's most important historical contribution because of its thoroughness and accuracy in elucidating and translating (into English) crucial parts of the original texts. Following two opening sections on earlier opinions regarding the nature of fossils and the length of geological time, the paper treated the palaeontological writings of Olaus Magnus (1555), Sigfrid Aron Forsius (1643), Emanuel Swedenborg, and Lars Roberg (both during the early decades of the

eighteenth century), and Johan Dalman (1827). Then, in separate chapters, Regnéll discussed in substantially more detail the palaeontological contributions of Magnus von Bromell (1727–1730), Kilian Stobaeus (1730–1752), and Carl von Linné (Carolus Linnaeus) (1732–1768). In another section, Regnéll discussed the contributions of Johan Abraham Gyllenhaal (1772) and Adolph Modeer (1785–1797). There followed one on the 'Treatment of fossils in the so-called 'Mineralogiae'', including mainly works by Johan Gottschalk Wallerius (1747) and Torbern Bergman (1782). The paper ended with a section on the development of regional and stratigraphical geology in Sweden up to 1800, and discussed the works by Anders Jahan Retzius, Daniel Tilas, Wilhelm Hisinger, and others. Finally there was a very useful biographical index and a bibliography.

In between this paper and Regnéll's last one (on Sven Rinman's *Mining Dictionary* from 1788–1789)—published only a few months before his death—there were fifteen publications, dealing with the holotype of *Echinoencrinites senckenbergii*; Nils Angelin's *Palaeontologia Svecica*; Leopold von Buch's works on cystoids; recent results and current lines of research within phytopalaeontology, invertebrate palaeontology, and historical geology in Sweden; the history of geological studies in Scandinavia up to 1900; Joachim Barrande's connection with contemporary Swedish geologists and palaeontologists; the history of geologic research in Scandinavia; currents of geological ideas between Scandinavia and the rest of Europe; the primaeval Earth according to Swedish eighteenth-century naturalists; Charles Lyell's contacts with Scandinavian men of science; the knowledge of Arctic geology by Swedish nineteenth-century explorers; Swedish geologists in China; and three centuries of Scandinavian stratigraphy in a European context. A manuscript entitled 'Palaeontological Research and Palaeontological Collections in Sweden' submitted to the XVIth INHIGEO Symposium in Dresden, 1991, was not published (nor were others from that meeting).

Regnéll's interest in the history of geology included many of the people involved in that history. Hence, a significant part of his contribution to the history of geology was a fairly large number of, mostly concise, biographical articles about prominent Swedish scientists and geologists, many of which were given several accounts. These included Nils Peter Angelin (1805–1876; pioneer in Swedish palaeontology and stratigraphic geology, author of *Palaeontologia Svecica* [1851] and later Professor and Director of the Palaeontological Department of the Swedish Museum of Natural History in Stockholm); Assar Hadding (1886–1962; geologist and mineralogist, famous for his seven descriptive petrological monographs on the Phanerozoic sedimentary bedrock of Sweden); J. Ernhold Hede (1890–1977; invertebrate palaeontologist, known for his significant stratigraphical descriptions of the Silurian bedrock of Gotland for the Geological Survey of Sweden); Wilhelm Hisinger (1766–1852; a wealthy manufacturer, famous for his regional geological descriptions of middle and south Sweden and one of the founders of geological research in Sweden); Gerhard Holm (1853–1926; an outstanding invertebrate palaeontologist, world authority on trilobites, and Professor of the Palaeozoological Department of the Swedish Museum of Natural History in Stockholm); Henrik Munthe (1860–1958; Quaternary geologist, known, *inter alia*, for his researches on the evolution of the Baltic Sea during the Late Quaternary); Alfred Nathorst (1850–1921; geologist and palaeobotanist, famous for his monographs on fossil floras of Sweden, Japan, and the Arctic, and Professor and Director of the Palaeobotanical Department of the Swedish Museum of Natural History in Stockholm); Sven Nilsson (1787–1883; zoologist, archaeologist, geologist, and palaeontologist, known for his geological descriptions of southernmost Sweden); Erik Norin (1895–1982; geologist and mineralogist, particularly known for his works on Asian geology, who travelled with the famous explorer Sven Hedin in Central Asia and was later Professor at Uppsala University), and the famous Danish physician and scientist Niels Stensen (Nicolaus Steno, 1638–1686; renowned for 'Steno's law' and the 'principle of superposition').

Regnéll was an amiable, low-voiced and somewhat reserved, slenderly-built gentleman. His lecturing style was a bit old-fashioned: he read loudly and slowly from his manuscript, expecting the students to write everything down, word by word. However, his deep knowledge and interest in the subject caught his listeners, and transferred his own commitment to his students. Many of us remember him as a meticulous teacher, a model researcher, and a sincere friend.

[A more comprehensive obituary of Professor Regnéll is in preparation by Dr Sven Laufeld and myself.]

Papers by Gerhard Regnéll Related to the History of Geology (literature reviews, newspaper articles, etc., excluded)

'On the Position of Palaeontology and Historical Geology in Sweden Before 1800', *Arkiv för Mineralogi och Geologi*, 1949, 1, 1–64.

'Über den Holotypus von *Echinoencrinites senckenbergii* Meyer 1826', *Senckenbergiana*, 1950, 31, 259–267 (in German).

'Centenary of 'Palaeontologia Svecica'. With a Sketch of the Work and Life of N.P. Angelin', *Geologiska Föreningens i Stockholm Föreläsningar*, 1951, 73, 619–628.

'Die Erscheinungsjahre der Arbeiten L. von Buch's über Cystoideen', *Paläontologische Zeitschrift*, 1955, 29, 119–125 (in German).

'The Pre-Quaternary Fossil-Bearing Systems Outside the High Mountains. Recent Results and Current Lines of Research within Phytopalaeontology, Invertebrate Paleontology, and Historical Geology in Sweden', *Geologiska Föreningens i Stockholm Föreläsningar*, 1958, 80, 407–422.

'A Summary of the History of Geological Studies in Scandinavia up to 1900', *Earth-Science Reviews*, 1967, 3 (Atlas News Supplement), A69–A70.

'Grönwall, Karl Anders Axel', *Svenskt Biografiskt Lexikon*, 1968, 17, 388–389 (in Swedish).

'Hadding, Assar Robert', *Svenskt Biografiskt Lexikon*, 1968, 17, 695–697 (in Swedish).

'Joachim Barrande's Connection with Contemporary Swedish Geologists and Palaeontologists', *Casopis pro mineralogii a geologii*, 1970, 15, 31–35.

'Iz Istarii Geologicheskikh Issledovaniy w Skandinavii', in: *Istoriya Geologii*. Akademii Nauk Armenskoj SSSR, Yerevan, 1970, 225–235 ('The History of Geological Research in Scandinavia' [in Russian]).

'Geologiska Idéströmningar Mellan Norden och Övriga Europa', *Dansk Geologisk Forening, Årsskrift for 1970*, 1971, 23–38. ('Currents of geological ideas between Norden and the rest of Europe' [in Swedish]).

'The Primaeval Earth, According to Swedish 18th-Century Naturalists', *International Geological Congress 24th Session, Abstracts*, 1972, 530–531 (Montreal).

'Hisinger, Wilhelm', *Dictionary of Scientific Biography*, 1972, 6, 436–437 (New York, Charles Scribner's Sons).

'Holm, Edvard Johan Gerhard', *Svenskt Biografiskt Lexikon*, 1973, 19, 206–208 (in Swedish).

- 'Nathorst, Alfred Gabriel', *Dictionary of Scientific Biography*, 1974, 9, 617–618 (New York, Charles Scribner's Sons).
- 'Kungliga Fysiografiska Sällskapet 1772–1972. Kungliga Fysiografiska Sällskapet i Lund, Årsbok 1972–73, 111–118, Lund 1975 ('History of the Royal Physiographic Society in Lund 1772–1972' [in Swedish]).
- 'Charles Lyell's Contacts with Scandinavian Men of Science', in: D.A. Bassett (chairperson), *Charles Lyell Centenary Symposium; Programme and Abstracts. Scientific Symposium - International Committee on the History of Geological Sciences, IUGS*, 1975, 6, 33.
- 'Contributions to the Knowledge of Arctic Geology by Swedish 19th Century Explorers', *25th International Geological Congress, Abstracts*, 1976, 3, 926–927 (Canberra).
- 'The Primaeval Earth as Conceived by Swedish 18th Century Naturalists', in: W.O. Kupsch & W.A.S. Sarjeant (eds), *History of Concepts in Precambrian Geology. Geological Association of Canada Special Paper*, 1979, 19, 171–180 (Toronto).
- 'J. Ernhold Hede. Minnesteckning', *Kungliga Fysiografiska Sällskapet i Lund, Årsbok* 1978, 1979, 61–71 (obituary, in Swedish).
- 'J. Ernhold Hede, 1890–1977, in memoriam', *Geologiska Föreningens i Stockholm Förhandlingar*, 1980, 100, 404–406 (obituary, in English).
- 'Av Stubböten Rot', in: G. Regnéll (ed.), *Sven Nilsson. En Lörd i 1800-talets Lund*, Kungliga Fysiografiska Sällskapet i Lund, Lund, 1983, 11–21 (biography of Sven Nilsson, in Swedish).
- 'Zoologen och Arkeologen som var Geolog, in: G. Regnéll (ed.), *Sven Nilsson. En lörd i 1800-talets Lund*, Kungliga Fysiografiska Sällskapet i Lund, Lund, 1983, 23–83 ('On Sven Nilsson's Geological Works' [in Swedish]).
- 'Erik Norin 15/3 1895–16/1 1982', *Kungliga Fysiografiska Sällskapet i Lund, Årsbok* 1984, 1985, 59–65 (obituary, in Swedish).
- 'Sven Nilsson. Minnesteckning', *Levnadsteckningar över Kungliga Vetenskapsakademiens Ledamöter*, 1988, 189, 1–16 (obituary [in Swedish]).
- 'Niels Stensen. Anatom, Naturvetare och Hans Väg till den Katolska Kyrkan', *Sydsvenska Medicinhistoriska Sällskapet Årsskrift* 1988, 1988, 7–35 (Lund; with C.G. Ahlström & P. Ekström; on Nicolaus Steno [in Swedish]).
- 'Munthe, Henrik Vilhelm', *Svenskt Biografiskt Lexikon*, 1989, 26, 55–60 (in Swedish).
- 'Nilsson, Sven', *Svenskt Biografiskt Lexikon*, 1990, 27, 2–9 (in Swedish).
- 'Swedish Geologists in China', XVth International Symposium INHIGEO, Abstract, 1990 (Beijing).
- 'Wilhelm Hisinger, Geologist (1766–1852)', *Striae*, 1990, 31, 17–24 (Uppsala; also as *Uppsala Studies in History of Sciences* 8).
- 'Sven Nilsson (1787–1883) on Graptolites', *Geologiska Föreningens i Stockholm Förhandlingar*, 1991, 113, 25–33.
- 'Swedish Geologists in China', in: Wang Hong-zhen, Yang Guang-rong & Yang Jing-yi (eds), *Interchange of Geoscience Ideas Between the East and the West. Proceedings of the XVth International Symposium of INHIGEO, October 25–31, 1990, Beijing*, 1991, 87–94 (Beijing).
- 'Nicolas Sténon, Anatomiste, Naturaliste, et son Cheminement vers l'Église Catholique', *Stenoniana*, 1991, new series, 1, 19–58 (Copenhagen; with C.G. Ahlström & P. Ekström; on Nicolaus Steno [in French]).
- 'Three Centuries of Scandinavian Stratigraphy in a European Context', in: G. Giglia, C. Macgagni & N. Morello (eds), *Rocks, Fossils and History, Proceedings of the 13th INHIGEO Symposium, Pisa–Padova (Italy) 24 September–1 October 1987*, 1995, 157–167 (Florence).
- 'Sven Rinmans Bergwerks Lexicon (1788–89)', in: *Alla ord är lika roliga. Festskrift till Lars Svensson 28 februari 2002*, Svenska Akademien (the Swedish Academy), Stockholm, 2002, 136–141 ('On Sven Rinman's Mining Dictionary from 1788–89' [in Swedish]).

Björn Sundquist, Uppsala

Professor William Anthony Swithin Sarjeant (1935–2002)

William Antony Swithin Sarjeant, DSc, FRSC, was born in Sheffield, England, on 15 July, 1935, and died of liver cancer on 8 July, 2002, in Saskatoon, Saskatchewan, Canada. He achieved eminence in his chosen fields of palynology, trace fossils, and earth sciences history, and contributed to numerous other fields both inside and outside geology.

Bill Sarjeant took his BSc (1956) and PhD (1959) at the University of Sheffield. After teaching high school, he took positions at Keele, Reading and Nottingham (where he established his own research school), and was visiting professor at Norman, Oklahoma, in 1967–1968. He received the first DSc awarded to a geologist at Nottingham in 1972, and then moved to the University of Saskatchewan in Saskatoon, Saskatchewan, Canada, remaining a professor there until his death.

Sarjeant was married to Margaret (Peggy) Crowe in 1966. Their family comprises three daughters, Nicola (born 15 April 1967), Rachel (born 1 August 1969), and Juliet (born 4 November 1973), and two grandsons. Outside his profession, Sarjeant was extensively engaged in the folk music, nature, and heritage movements, and also wrote extensively on crime fiction and (using his middle names Antony Swithin), authoring a ten-volume epic fantasy. Some of the place names from his novels have been used for submarine geological features in the North Atlantic.

Sarjeant's PhD thesis, supervised by Charles Downie (1923–1999), began the modern study of Jurassic dinoflagellates and established their stratigraphic significance. Sarjeant extended this work stratigraphically and internationally, making important contributions to the development of dinoflagellate taxonomy, publishing the first textbook on the group in 1974, and extending his studies to other groups of microfossils.

While at Nottingham, Triassic footprints kindled Sarjeant's interest in fossil trackways. Further studies of British fossil tracks brought extensive forgotten material to light. Sarjeant then explored the North American track record, pioneering development of new analytical tools for taxonomic and palaeoecological interpretation, and working on reptiles, mammals and birds.

Sarjeant also published on numerous other aspects of geology, including mineralogy, economic geology, and stratigraphy. He taught extensively, supervised more than nineteen post-graduate students, and travelled to forty-five countries.

He helped create the Peak District Mines Historical Society, East Midlands Geological Society, and the American Association of Stratigraphic Palynologists.

Sarjeant was the second recipient of the Sue Tyler Friedman Medal of Geological Society of London (1990), and was also awarded the History of Geology Division Award of the Geological Society of America (1991), the Founder's Medal, Society for the History of Natural History (1991), and the Golden Trilobite Award of the Paleontological Society (1995). He became a fellow of the Royal Society of Canada in 1995 and was a fellow or honorary member of numerous other organizations.

It is appropriate here to discuss in a little more detail Sarjeant's work in the history of earth sciences. Only autobiographical, biographical and major historical papers are referenced here; a full bibliography of Sarjeant's 400 or so publications is in preparation.

Bill's passion for books began in childhood, and led to his choice of geology as a career. Sarjeant and I met in July 1956 at a meeting of the Sorby Natural History Society, the name of which commemorates the notable Sheffield born geologist Henry Clifton Sorby (1826–1908), now remembered for pioneering the study of thin sections of rocks with the microscope. Sarjeant's published reminiscences of his association with the society (Sarjeant 1989) do not mention an interest in the history of geology. However, Sarjeant credited his parents for arousing his interest in archaeology and history, and he recalled that 'Even as an undergraduate, I was already consciously collecting early works on geology . . .' (Sarjeant 1980, p. 1). Certainly when we both studied geology at the University of Sheffield in 1956–1959 we shared an interest in the history of the subject. Bill's collection of biographies of geologists and other historical works grew into a passion that continued through the rest of his life.

Many rare volumes were picked up from used bookshops on his endless travels, were received for review, purchased from catalogues, and in recent years were acquired through the internet. His personal library eventually included some 85,000 volumes, most of which have been donated and bequeathed to the University of Alberta. The history of geology (around 30,000 books) was his most notable collection, which is forming the nucleus of a special collection in the history of science. He also collected in support of all his other interests, particularly detective and fantasy fiction. I have written elsewhere about Sarjeant's library (Spalding, 1997). His extensive papers and collection of photographs are deposited in the University of Saskatchewan Archives.

I remember discussing with Bill during student days the possibility of compiling some sort of checklist of titles of geological biography; we envisaged maybe sixty volumes. I remained an occasional contributor to the growing list, and his librarian wife Peggy also provided assistance when it gradually evolved from a collectors' checklist into a draft publication. At a 1969 meeting with fellow historian George W. White in Ann Arbor, Sarjeant was urged to include works in other languages, and journal contributions as well as independently published books. Sarjeant began planning travels to visit specialized libraries to locate rare volumes and index obscure journals, and he built a network of correspondents who provided otherwise inaccessible material. Sarjeant eventually produced the ten volumes of his remarkable bibliography, *Geologists and the History of Geology*. The first five of these appeared in 1980, with supplements in 1987 and 1996, totalling more than 8,000 pages. At his death enough references had been accumulated to make a further supplement possible.

Sarjeant also contributed to the history of almost all the areas of palaeontology and geology in which he was active. His undergraduate mapping study had been on a Precambrian outlier in Shropshire, and this led him to collaborate with Walter Kupsch, a colleague at the University of Saskatchewan, on a history of concepts in Precambrian geology (Sarjeant & Kupsch, 1979).

As he began work on dinoflagellates, Sarjeant restudied type material and interviewed surviving pioneer researchers in the field. He also began to photograph and interview contemporaries at conferences and other meetings. This led to numerous biographical studies and histories, in which women pioneers were not neglected. In 1969, he translated a paper on d'Orbigny's fundamental work on stages. Eventually he published two histories of his experience of two different aspects of palynology (Sarjeant, 1998, 2002).

Sarjeant's footprint research began at a time when this field was generally regarded as scientifically negligible, so that he was a pioneer of the recent revival of interest. Initial descriptions of new tracks led to a detailed history and bibliography of the study of fossil vertebrate footprints in the British Isles (Sarjeant, 1974), which was followed by supplements and other related papers. This led him into the general field of trace fossils. Sarjeant published a brief history of track-way studies (Sarjeant, 1987b), and later collaborated with Geoffrey Tresise in a study of Triassic track ways of northwestern UK (Tresise & Sarjeant, 1998). A *Festschrift* in preparation for *Ichnos* will celebrate Sarjeant's work on dinosaur and other tracks.

Before leaving the UK, Sarjeant came across correspondence of the then little known figure Joseph Pentland (1797–1873), and was able to arrange its purchase by the University of Nottingham. He published a transcription of twelve years' letters in 1979 with Justin Delair (Sarjeant & Delair, 1979). Pentland played a key role in Cuvier's correspondence with English geologists, and the letters yielded new information about the research on what became the first named dinosaur, *Megalosaurus*. His work with Delair continued to explore the early history of dinosaur science, on which they published a number of papers. Sarjeant also lectured on Pentland's work in South America, but was unable to complete a proposed publication.

The untimely death of the British palaeontologist Beverly Halstead (1933–1991) led Sarjeant to edit a *Festschrift* volume (Sarjeant, 1995), to which he contributed a substantial biographical account of his friend, and (with his then secretary and frequent collaborator Linda Dietz) a bibliography. In later years Sarjeant wrote valuable obituaries of his teachers and some of his associates, and (with detail based on his extensive diaries) he documented his own involvement in the creation and advancement of societies and journals. He made many contributions on eminent geologists to biographical encyclopaedias. He also reviewed biographies and histories for a number of journals. Here he did not hesitate to criticize where he felt the author had failed in accuracy, emphasis or interpretation, and some of his more stringent reviews have been followed by energetic correspondence in print.

Sarjeant also bridged the two cultures in his studies of the folklore of geology (with various collaborators) and the use of geology (and particularly dinosaurs) in the works of various authors of detective fiction and fantasy. He was also a devotee of folk-song.

Peggy Sarjeant has assisted in gathering some of the information in this obituary, the initial part of which is based on one written for the Geological Society of London.

References

- Sarjeant, W.A.S., 'A History and Bibliography of the Study of Fossil Vertebrate Footprints in the British Isles', *Palaeogeography, Palaeoclimatology, Palaeoecology*, 1974, 16, 265–379.
- _____, & J.B. Delair, 'An Irishman in Cuvier's Laboratory. The letters of Joseph Pentland, 1820–1832. Transcribed by W.A.S. Sarjeant, with introduction and notes by W.A.S. Sarjeant and J.B. Delair', *Bulletin of the British Museum of Natural History, Historical Series*, 1979, 6, 245–319.
- _____, & W.O. Kupsch (eds), *History of Concepts in Precambrian Geology*, Geological Association of Canada, Special Publication No. 19, 1979, 292 pp.
- _____, *Geologists and the History of Geology: An International Bibliography from the Origins to 1978*, Macmillan, London & Arno Press, New York, 1980, 5 vols, 4,526 pp.
- _____, *Geologists and the History of Geology: An International Bibliography from the Origins to 1978. Supplement 1979–1984 and Additions*, Robert E. Krieger Publishing Company, Malabar (Florida), 1987, 2 vols, xxxii + 1,691 pp.
- _____, 'The Study of Fossil Vertebrate Footprints: A Short History and Selective Bibliography', in: G. Leonardi (ed.), *Glossary and Manual of Tetrapod Footprint Palaeoichnology*, Departamento Nacional da Producao Mineral, Brasilia, 1987, 1–19.
- _____, 'Sorby on the Rocks: Reminiscences of the Geological Section between 1950 and 1960', *Sorby Record*, 1989, 26, 10–19.
- _____, (ed.), *Vertebrate Fossils and the Evolution of Scientific Concepts: Writings in Tribute to Beverly Halstead, by Some of his Many Friends*, Gordon & Breach Publishers, Reading, 1995, xiii + 622 pp.
- _____, *Geologists and the History of Geology: An International Bibliography from the Origins to 1978. Supplement 2: 1985–1993 and Additions*, Krieger Publishing, Malabar (Florida), 1996, 3 vols., xxxiv + 2,317 pp.
- _____, 'From Excystment to Bloom? Personal Recollections of Thirty-five years of Dinoflagellate and Acritarch Meetings', *Norges Teknisk-naturvitenskapelige Universitet Vitenskapsmuseet: Rapport Botanisk*, 1998, Series 1998–1982, 1–21.
- _____, "As Chimney-Sweepers, Come to Dust": A History of Palynology to 1970', in: Oldroyd, David (ed.), *The Earth Inside and Out: Some Major Contributions to Geology in the Twentieth Century*, Geological Society of London Special Publication No. 192, 2002, 273–327.
- Spalding, David A.E., 'Discovering the Earth', *Biblio*, 1997, 2, 52–55.
- Tresise, G. and W.A.S. Sarjeant, *The Tracks of Triassic Vertebrates: Fossil Evidence from North-west England*, The Stationery Office, London, 1998, xii + 204 pp.

Professor Andrzej Bolewski (1906–2002)

The senior Polish INHIGEO member and outstanding geoscientist and academic teacher Professor Andrzej Bolewski, Fellow of the Polish Academy of Sciences and the Polish Academy of Arts and Sciences, died in Cracow on 29 October, 2002 at the great age of 96.

Graduating from the Mining University in Cracow in 1930, Bolewski first investigated the sulphur deposits near Cracow and, after supplementary studies in France and Belgium, he carried out petrographic studies of hard coals, phosphorites, feldspars and clay raw materials, as well as of magmatic and metamorphic rocks.

All through his life, Bolewski was associated with the Mining and Metallurgical University in Cracow, where he has obtained the degrees of doctor (1935), docent (1939) and professor (1946). In the years 1945–1976 he occupied the Chair of Mineralogy and Petrography, being considered the founder of the Cracow mineralogical school.

Bolewski was the author or coauthor of several academic handbooks of petrography, mining, and economic geology, but he was particularly renowned for his excellent modern manuals of general and descriptive mineralogy (1982, 1993). As an expert in this field he was for many years (1960–1987) the Polish representative with decisive voice in the Commission on New Minerals and Mineral Names of the IMA. During the years 1952–1957, he was the first president (with the rank of Minister) of the Central Office of Geology.

Together with numerous academic teachers of Cracow universities, Bolewski was arrested by the Gestapo on 6 November, 1939, in the action against Polish intellectuals (called *Sonderaktion Krakau*) and was imprisoned in the Nazi concentration camps at Sachsenhausen near Berlin and Dachau near Munich. After his release, he returned to Cracow and started to collect the documents, evidencing the extermination of Poles by Nazi Germany during the World War II. This work resulted in several significant publications, the most important being *Martyrdom of Professors of Mining University in Nazi Prisons and Concentration Camps* (Cracow, 1985, 153 pp.) and *Adversity of Polish Scientists in the Years 1939–1945: Personal Losses* (Wrocław, 1989, 750 pp.) (co-authored with Henryk Pierzchala). (It is understandable why that the last book could not contain the data on the painful losses inflicted upon Poles and Poland by Soviet authorities.) In addition, Bolewski published several papers on the secret activities of Cracow universities during the Nazi occupation 1939–1945. During the war, Bolewski was already elaborating a programme for the utilization of the mineral deposits in eastern Germany. And thus, in 1945, he took part in the takeover of industrial works in this region by the Polish administration. Additionally, he was an adviser to the Polish Government in establishing the western frontier of Poland. These problems he discussed in several publications, mainly in autobiographic book *On my Career to Potsdam* (Cracow, 1977, 1987).

When investigating the sulphur deposits in southern Poland during the interwar period, Bolewski was already interested in the history of exploration of mineral raw materials. After World War II, as Minister of Geology, he initiated the re-issue of classic books on Polish geology, starting with Stanislaw Staszic's pioneer monograph of 1815 *On the Geology of Carpathians and other Polish Mountains and Lowlands*, with an atlas containing a geological map of central Europe. Simultaneously, Bolewski paid particular attention to economic geology, tending to promote the exploration of abandoned mineral deposits and mines, necessary for restoration of our country resulting from the heavy destruction due to the war. This activity was documented in several papers, such as 'The History of Exploitation of Carpathian Sandstones' (1954) and 'The Contribution of Practical Geology to the Economic Development of Poland during the last Thirty Years' (1975). Besides this, he was editor of the *Encyclopedia of Mineral Raw Materials* and co-editor of the series *Mineral Raw Materials of the World*.

Bolewski was also an excellent promoter of science. One of his significant achievements was the formation of the Commission on Mineralogical Sciences of the Cracow Branch of the Polish Academy of Sciences (1964) and of the Mineralogical Society of Poland (1969). He was its first President and Honorary Member, as well as the first editor in chief of the *Transactions* of the aforementioned Commission and of *Mineralogia Polonica*, the official organ of the Society.

More than fifty of Bolewski's papers referred to the history of geosciences *sensu lato*. All academic handbooks written by him or with his coworkers contain exhaustive historical chapters. As far as the mineralogical sciences are concerned, his papers on the history of the Chair of Mineralogy and Petrography of the Mining and Metallurgical University in the years 1919–1969 (1971), the output and experience of the Commission of Mineralogical Sciences in Cracow (1975) and on the mineralogical sciences in Poland after the World War II (1988) deserve special mention. Bolewski was also the author of numerous biographies of geoscientists and of autobiographical works: *My Life—My Work* (1996) and *Recollections of the Old Thatched Cottage of the Mining University* (1999).

Professor Bolewski's exceptional gifts were greatly appreciated by both academic and state authorities. He was an honorary doctor of the Mining and Metallurgical University (1984) and of the Silesian Polytechnic University (1984), and he was awarded the Order *Polonia Restituta*, 1st class, and received numerous other decorations.

Many representatives of various Polish academic and geological centres, including his numerous pupils and co-workers, as well as a group of our historians of geosciences, with sorrow paid our last homage to Professor Andrzej Bolewski, who was buried at the monumental Rakowice Cemetery in Cracow.

Wojciech Narebski, Cracow & Zbigniew Wojcik, Warsaw

Centenary of the Birth of Professor Calamur Mahadevan

Calamur Mahadevan was born on 6 May, 1901, at Buchireddipalem, in the Nellore District of Madras Province, in what is now Andhra Pradesh. He took a BA (hons) in Geology in 1925 and an MA in Geology in 1927 from Madras University. He worked under Dr C.V. Raman at the Indian Association for the Cultivation of Science, Calcutta, and was awarded a DSc by Madras University in 1931 for his thesis on the constitution of coal. It was considered a pioneering work, involving the use of X-ray analysis. Mahadevan then joined the Hyderabad Geological Survey of Nizam State in 1931 as an assistant superintendent and became Superintending Geologist in 1943. His work on the Pakhals of the Godavari Valley was a classic in several respects, and formed the basis of his Presidential Address to the Geology & Geography Section of the Indian Science Congress in Allahabad in 1949. Dr Mahadevan joined the Andhra University as Professor and Head of the Department of Geology, and during his period of tenure (1944–1962) he developed the Department, trained hundreds of students, and was responsible for starting new courses in Applied Geology (1952), Nuclear Geology, Oceanography, Marine Geology, etc. He conducted investigations into the natural gas deposits in East Godavari District, and copper deposits in Khammam district. Many of his students rose to high positions, not only in geology but also in other services such as the Indian Administrative Service. He was UNESCO expert in Brazil during 1955–1956. Mahadevan had admirers not only among his students and staff, but also in other areas. Celebrations for the centenary of his birth began in May 2001 with an international symposium on 'Challenges of Water Resources Management in Developing Countries in the 21st Century' and an endowment fund was established to award prizes to students who distinguished themselves in postgraduate courses in Geology at Andhra University. An annual lecture in his name was endowed. The celebrations concluded with a workshop on 'Water Resource Management in Hyderabad and its Environs' on 29 December, 2002, jointly organised by Professor Mahadevan's Students' and Admirers' Association and the Salar Jung Museum, Hyderabad. Hydrology was one of the professor's 'pet' subjects.

I had the good fortune to be one of Professor Mahadevan's students and received his constant encouragement when I worked under him, and subsequently in other institutions.

K.S. Murty, Nagpur, 4 March, 2003

INTERVIEW WITH DAVID BRANAGAN*

David Oldroyd

To start things off, I know you came from Broken Hill [a remote mining town, a major centre of mining activity, in the arid west of New South Wales], a place I've never been to. Could you tell us, please, what the place was like in your early days, and what you did?

David Branagan

Well, I was born there in 1930. The population was then about 30,000 and the mines were going strong. My mother's father was killed in the main mine about 1910. He'd been downgraded because although he was a foreman he had supported the men in a strike. After he was killed, my grandmother was given a few company shares, and that was all. My mother was a piano teacher and organist at the local Catholic cathedral. My father came to Broken Hill from Sydney, though he was originally from the Victorian goldfields area. They were married in the late 1920s. So I grew up in Broken Hill. At that stage, some of the streets were unpaved, but most of the city was. It was a fascinating place; they were just planting trees to make a 'green belt' round the town. But we had some terrific sandstorms. One I particularly remember occurred in about 1935. My sister got 'sandy blight' and was blinded for several weeks. But it was a good life. Times were hard during the depression and my father, who taught mathematics at the technical college, worked hard. Among his pupils was Maurie Mawby, a fine mineralogist and later Managing Director of the Zinc Corporation. I remember there was a museum at the college, but sadly it's now no longer in existence.

* Dr Branagan is a former President of INHIGEO. He organised the Commission's meeting in Sydney, Australia in 1994.

Was it a rough town?

Well, there were elements both ways; and there were some cultural aspects—a philharmonic choir and a men's choir, and famous actors and musicians often visited. The churches all had good music, but many men were missing having been killed in World War I.

Was it an isolated existence? It's a very long way from anywhere.

Well it was, but a connection was made by train from Sydney, 700 miles east, in 1927. The main connection by train (and in general) was with Adelaide, not Sydney. There were in fact two separate railway stations. The Silverton Tramway station clock (for the South Australian line) was set according to Adelaide time, whereas the post office, connected by a telephone line to Sydney, was on Sydney time!

You mentioned your mother's musical interest and I know you have such interests too, which may be a surprise to some INHIGEO members who think of you as a geologist and historian of geology. Did your musical interests begin in Broken Hill?

Not really. We had an old gramophone with only about six records; and I heard my mother play Beethoven, Grieg and Chopin. My father played a bit too, by ear. But while music was encouraged I didn't really become involved in Broken Hill. We left Broken Hill when I was only seven, and moved to Sydney to give us children better educational opportunities. We first lived in the suburb of Randwick by the military reserve, mostly bare sand-dunes, not far from the sea. I went to the convent school, and then to the Marist Brothers' school. I was there for a year (with boxing!). Then my brother got a scholarship to Riverview College [a long-established Jesuit boys' secondary school in Sydney (ed.)] so we moved across town to Lane Cove [a Sydney suburb near the 'inner harbour' (ed.)]. The school had only about three hundred boys, mostly boarders, and I followed my brother with a scholarship, perhaps because he was doing so well. We were both 'day-boys', walking or cycling from home, about two miles. They were enjoyable days, with athletics, and I began singing. But the teachers were not impressed that I wanted to attend an eisteddfod rather than doing Latin. Ironically, the school is now noted for its extensive music education program.

What about the science teaching?

It varied. We had a competent chemistry teacher (a layman), but he was not a good disciplinarian. I had a wonderful mathematics teacher, 'Tex' Crowley. The physics was good with Father Burke-Gaffney, and through him we had contact with the seismological observatory that existed in the school. He was the first person to recognize the underground nuclear test at Bikini Atoll from the seismic records, and the Americans were annoyed when he published on this.

I believe that the Riverview observatory was part of the world-wide network of Jesuit observatories. Is that right?

Yes. Father O'Connell, who moved on to the Vatican observatory in Rome in 1950, Burke-Gaffney, and more recently Father Laurie Drake was there, who's now working in Bolivia.

At the time there was really only one university in Sydney where you could move on to.

Yes, there was only Sydney University.

Did you opt for geology then?

Yes, I got interested through a friend, and started reading some of his geology books. Science students at that time had to do mathematics, physics, and chemistry in first-year, and an add-on subject. I took geology as my fourth subject. Only a few of us took it intending to continue through to graduation. I had the offer of a forestry scholarship, but my father didn't object when I said I wanted to do geology, and I got a primary school teacher scholarship. There weren't many secondary scholarships available at that time, with the huge return of soldiers from the War, who got preference. The university expanded enormously, so that the first-year geology class had about a hundred and twenty students, and about sixty went through to third year, which placed enormous pressure on the department.

Which teachers do you remember there?

Well, they were all memorable. Professor Leo Cotton offered fascinating first-year lectures. He would go over time into the lunch hour, and no one moved. He was a superb lecturer. I particularly remember his lectures on Wegener and his ideas on moving continents, which he supported. I think he picked that up from his predecessor, Edgeworth David. The department was still pretty much in the 'David mode', even though he'd died back in 1934; but people were still living and talking about Edgeworth David. Part of the reason was that W.R. Browne had finally finished the rewriting of David's *Geology of the Commonwealth of Australia*. Browne had taken that over after the Government bought the manuscript from the David family in 1935, thinking it was nearly finished. But WW II interrupted its completion. Browne's work developed the understanding of Australia's stratigraphy. His lectures were just superb. He was the intellectual giant of the staff. For example, his work on batholiths was important on the world scale. Then we had Germaine Joplin, who worshipped the ground that Browne walked on. She was a great petrographer, an excellent lecturer with many interesting ideas, though because of the way things were in those days she was only ranked as a demonstrator or something. Another female teacher was Florence Quadling, a crystallographer. She was not a great lecturer but was extremely good as a laboratory teacher. George Osborne was an eccentric but brilliant fellow. He had spent a year or two at Cambridge in the 1930s after completing his doctorate, but got recalled from leave as there was a shortage of funds in Sydney. He introduced us to a lot of the concepts of modern structural geology and tectonics. He was great in the field.

So you had a pretty well-rounded course at Sydney University?

Yes, though there was rather a lot of rote learning in palaeontology.

There has to be, doesn't there?

Well, to some degree, but the trouble was that the person we had, Ida Brown, had had to convert to palaeontology from petrology, when the previous lecturer died suddenly. She was a splendid mapper, and in due course produced some high-quality palaeontological research. But she seemed to assume that we knew more biology than we knew, or at least more than I knew. It wasn't till I started to give first-year lectures ten or fifteen years later that I began to get the hang of what the functions of certain fossil parts actually were!

So you did a four-year course?

Yes, I did three years and then the honours year.

What were you honourable about?

Well, coal in fact. But I should go back a bit to mention John Dulhunty. He was a superb lab teacher, but I did not realise at first that he was a coal and kerosene shale researcher of world calibre. Quite a number of Australian geologists at that time didn't always publish in overseas journals and so their work, particularly in the War period, wasn't sufficiently recognized. But John's work on coal formation and coal petrology was of world standard, and the British government sent him to Germany at the end of the war to report on the brown coal industry there (just as Edgeworth David was sent at the end of WW I). I got to know John a lot better later, as he was still on the staff when I joined it.

A big change came when Cotton retired in the middle of my third year and a new broom came in from outside. Charles Marshall from England, who'd been working in the States, was a coal man. He energetically attacked the administration and got funding for new positions; so we became introduced more to geophysics and sedimentology and micropalaeontology. Frank Rickwood, a pioneer of oil search in New Guinea, Leo Koch, a German geochemist, and Emile den Tax, a Dutch structural petrologist [now an Honorary Senior Member of INHIGEO] and Hal Thirlaway, geophysicist were part of the huge change that hit us. I went off to do some work at Broken Hill for a short time, where I got my first real field research experience with Bill Patterson, Haddon King, and Tim O'Driscoll at the Zinc Corporation (probably because of my father's connection with Mawby). Then I came back to do the honours year, having passed a supplementary applied mathematics exam. There was an interesting group of twelve students, all but four being ex-servicemen. I wanted to do a major project in petrology, but was taken by George Osborne on a short trip to Newcastle [the mining town to the north of Sydney] for a supposedly 'small project'. Marshall, being interested in getting into Australian coal research, then pushed me into a thesis on the coal measures. Anyway, I got to like it and enjoyed living in Salvation Army accommodation, riding a bike around, and avoiding the fleas at night. I learnt a lot!

But then, as I understand, you suddenly pulled up sticks and went to London to try and become an opera singer! Is that right? Or was there a time gap?

No, there was a time gap. I'd got into music at the University and we had a big choir, and a good one. The choirmaster, George Faunce Allman, was a great inspiration to a whole generation at the University with music. At the first rehearsal, I was sitting next to a large geology student who said "I'm Fred Douth. I'm an atheist". I replied: "I'm Dave Branagan and I'm a Catholic". We've been great friends ever since! So, I got into quite a lot of things. There were quite a few of us singers in geology, and we drove the non-singers mad in the petrology practicals, all singing Bach fugues to the sound of "Shut up!". Then having missed the initial meeting, I found I'd been 'elected' to direct a local church choir. The parish priest, Father William O'Flynn, a man of great culture, and knowledgeable of tonic solfa, thought that all members of the choir could learn their parts while walking to the station or whatever, and it was all supposed to come together on the Sunday. Of course it didn't. But he had a marvellous collection of polyphonic music, and we learnt plainsong, Palestrina masses, motets, and so on. I found a good accompanist. There were some wonderful voices in the young group, and we 'got there'. There were a number of marriages out of that group that have all lasted. So I started taking singing lessons during my fourth year of University with Hector Fleming and went into eisteddfods, along with intervarsity athletics and table tennis. I also discovered girls.

So it was a pretty busy honours year!

Well, perhaps that was why I didn't do as well as I should have done. But the day after my last examination I went for an interview and was offered a job with the Geological Survey of New South Wales and I grabbed it! I worked there for three wonderful years, in various parts of the State. I got back into coal with Ted Rayner, a wonderful field geologist. We worked on the Western Coal Field [below the western side of the Blue Mountains, to the west of Sydney], and down on the coastal field south of Sydney, and had a great range of experience with other fine geologists on dam sites, back to Broken Hill working on radioactive materials (I had to take a book with me to find out what it was about!), and so on. I kept on with my singing and had some success in eisteddfods. I missed out on a job in Antarctica by one, but got offered a post looking for copper in Central Australia, where I worked for a year and had a great time, taking over the local church choir at Cloncurry. I played rugby league and cricket for the town, but, lacking experience, I wasn't much good at managing the older men in the field camps.

Then I decided to go overseas in 1955 to try and make a career in music. In London, I met an old friend from Queensland University who was studying the piano. He and I had a friend called Gillian (now my wife) who'd come from Australia and another musician (a rather dreamy composer), and the four of us had a great trip through Europe in an ancient pre-war vehicle, visiting music festivals at Beyreuth, Munich, and so on. But money was getting tight, so I taught for a year at Chiswick Grammar School; and then I got a post at Old Street in London's East End, which was a very different experience. Then I got a job in London with the aerial photography company, Huntings, and studied courses in music, art, architecture, and so on.

And generally becoming a polymath and a Renaissance man!

Something like that! Gillian and I decided to get married and we did so at the Brompton Oratory, with Henry Washington's choir singing and Ralph Downes at the organ. We had our honeymoon hitch-hiking in Italy and France—things you couldn't do these days. Then I did a bit of opera, but my real musical interest was in early music and there wasn't much of that on a professional level in the 1950s. It was clear we'd soon be starving in a garret, so we started back to Australia via the States, driving across the continent, the last part in an old car that we abandoned on the wharf. Here in Australia, I got a job with Commonwealth Industrial Gases. There wasn't much geology going at that time except in the bush, but by then we had our first baby. I got back into church music and we started singing in St Mary's Cathedral. I kept that group going for about thirty years and we did some good things, travelling outside Sydney and doing some broadcasts.

I wasn't greatly enjoying the job though. A lot of it was sales work, which wasn't my cup of tea, and I made enquiries from Charlie Marshall back at the University to see if there was anything in the offing, and someone had decided not to take up a position in coal geology that he'd been offered and very luckily I got the position, which was the beginning of my career proper. I'd published a few papers, including a co-authored item on the classification of sedimentary rocks.

This was presented at an ANZAAS congress and to our surprise it caused a lot of interest and discussion. Afterwards, we came to think it was the only paper at the conference that everyone could understand!

Yes, you can always have a good discussion as to where to make the 'cut-off' between one grain size and another, which is a different kettle of fish from the problems of classification in igneous or metamorphic petrology!

Quite right! Anyway, I got back into my coal work and enrolled in a PhD, using my old material on the Western Coal Field for my MSc. The doctorate was on the coal seams in the Newcastle field, so I was back in my old ground, and one of the things that happened there (about 1959) was that I found a lot of old maps and papers in the local library—records from the 1840s–50s, and I found myself unrolling maps that hadn't been looked at for a hundred years or more. It was a real treasure trove.

So this was the beginning of your interest in the history of geology?

Well, I'd had a bit of an interest before. I'd given a paper on the mine disasters at Lithgow in the Western Coal Field; but yes, it was really the beginning for me. And quite a lot of that old stuff was brought into the thesis, not just as part of a literature review, but as part of my arguments about the nature of the field.

So, turning the conversation again a bit, what subjects did you teach at the university?

Well, I got a lectureship teaching first-year geology, which suited me as I was always keen to get up a whole lot of things that I knew nothing about. There was the whole spectrum of geology to cover; but later I got involved in engineering geology and taught this to geology and civil engineering students, and became involved in problems in remote sensing. And I was always deeply involved in the students' field mapping exercises.

But today you spend more time working on the history of Australian geology than anyone else in the country, I think. Did that interest come from our mutual friend Tom Vallance [the first Australian INHIGEO Member, now deceased, who taught petrology at Sydney University]?

Almost certainly from Tom, though as I said I had the interest from the coal work. But Tom's interest introduced me to new aspects, and then when I went on leave I met Victor and Joan Eyles through him, and again was introduced to a whole range of fascinating aspects about people and ideas. Tom and I did a number of collaborative papers. I was asked fairly early on to look at the history of the Royal Society of New South Wales, which had its centenary coming up, and so I did some work on that; and then Tom and I got together in the late sixties in a book on the general history of science in Australia. Sadly, Tom died from cancer in 1993, and we dedicated the INHIGEO meeting in Sydney the following year to his memory. I put his immense card index on Australian geologists, miners and surveyors, which was something he'd worked away on for years onto a computer program. He did a vast amount of work, and I was always sad that he didn't publish earlier on some of the things he'd really finished. He was a stickler for getting everything completely right. His Presidential address to the Linnean Society of New South Wales in 1975 is still the classic statement on the history of geology in Australia.

I was lucky too that I got one of the Currie Fellowships from the State Library one year, which enabled me to do some work on the work of the early surveyor of the Australian coastline, Phillip Parker King, and his science (largely the geological aspects). I'd joined the Geological Society of London, and met the archivist John Thackray, who became a good friend and was a wonderful help for my research in London.

And what do you feel about the way studies in the history of geology have been going in the last few years? And how would you like it to run in the future?

That's a hard one, but I should go back to talk first about INHIGEO. I was introduced to it by Tom, who had attended the first meeting, run by the Russian Vladimir Tikhomirov, now deceased. I became one of the 'Associates'. It was a very hierarchical system in those days. I was lucky to be able to get to a couple of meetings, in particular the 1972 meeting in Montreal, (and the Lyell meeting in 1975), and I was able to see something about the organization of international congresses. Then we had the meeting in Sydney in 1976. At Montreal it was an eye-opener to see the politics of the business. It was extremely political and absolutely bizarre—quite astounding to see the attempts at one-upmanship between the Americans led by the late George White and the Russians led by Tikhomirov. As usual, most of the Russians arrived penniless, and then at the conferences they sat in the front row and talked and didn't listen!

A year or two later, at the Lyell meeting in London, there were moves for the new elections as to who was to be President and Secretary-General (who had most of the 'power' except when Tikhomirov was President). George White argued that the S-G should be elected first (though there was no special precedent for this) and he got in and nominated Douglas Bassett (UK), but Doug wasn't well enough to take it on. Eventually, Hooykaas from Holland was elected President and Martin Guntau became Secretary-General (which didn't please the Americans, though he did a terrific job over the years). Politics was very much in the foreground in those days.

I got into trouble because Hooykaas was annoyed by comments made by Leonard Wilson in the abstract to his paper at the Lyell meeting. I happened to be chairing the session. Actually during his oral presentation Wilson didn't talk about the controversial matter that was in his abstract but it was there in black-and-white. Hooykaas demanded equal time and was astounded when I, a mere colonial, told him that I was running the meeting and he couldn't speak at length on that matter. Afterwards, we talked about it amicably and it was agreed that what I'd done was right. Politics again. I could also tell you much more about the 1976 meeting in Sydney, but not here.

So could we go back to my question about the direction of studies in history of geology?

Well, one of the features of that particular period was that Tikhomirov seemed to be keen for us to write a definitive history of geology, and it was very hard to get across to him that this simply couldn't be done.

I think that kind of project was quite characteristic of the communist period, with the idea of producing an 'official' history of science, or whatever.

Yes. That was what he wanted and was part of the problem on which we couldn't agree. And there were others who wanted to write on different aspects of the history of geology. The IUGS also seemed to regard INHIGEO as a kind of body that could or should be writing a history of mineralogy in general, or whatever, but related to the various IUGS sections. This was essentially impossible as the various members of INHIGEO, had, and still do have, individual research

interests in the vast canvas of the history of geology. However earlier periods are gradually being better understood, I believe, thanks to the research of the past fifty years or so.

I don't really have a proper answer to these questions about the direction of studies in history of geology, as I've always tended to be an individualist and part of the problem as I've seen it is that there's so much emphasis put on European and North American (US) achievements in geology that this has been something of a distortion. I've tried to counteract that. But that's partly my own bias. There's no doubt that the major beginnings of geology were in Europe and many later major developments were in North America. But even by the middle of the nineteenth century a great deal of work was being done in other places. One of the problems, even with INHIGEO, is that we don't really know enough about the non-English language aspects of the history of geology.

Well, there's quite a lot done in China and Japan, but when we get to India, Africa, the Muslim countries of the Middle East, and so on, it's like a terra incognita.

I agree. We know little about those areas. In a sense one can do one's best work done by following individuals, but to me I see the problems of people trying to get in with fashions—changes in attitudes about 'metropolitan and periphery', etc. But we don't know enough about work in the nineteenth century in Africa, India, and so on. People like Oldham in India or du Toit in South Africa haven't been written up properly. So general theories may be premature. However, there is work going on at the 'margins'. Someone is writing on J.W. Gregory for example, and such people deserve biographies (and biographies are now coming back into fashion somewhat). The big problem of the history of geology is that there are so many specialized subfields that some type of team writing is needed. But that's hard to achieve in the history of science. *Yes, these days everyone is busy, and it's very difficult to co-ordinate the work of teams of writers, unless the work is funded as a special project.*

But even then, the problems of interpretation and opinion in the history of ideas are immense. If we look at the current controversies in Australia about the history of the Aborigines we can see how very difficult it is to get a unified objective view, and we have analogous problems even in science. I have myself always been a writer of what I'd call 'factual' history of geology, and sometimes when I've submitted papers I've been asked to add more interpretation. But maybe that should be left to the reader: I shouldn't be 'forcing' my interpretations. I'm not sure that I'm good enough at making interpretations, but I'm doing more of it now as I think I've more grasp and experience. But it's always seemed to me that so many historians of science 'pontificate' on their ideas, without looking properly at the factual aspects of the interrelations between people or the science itself. It seems to me that we must keep doing that kind of basic work before we attempt large syntheses.

In fact, this has come up in a piece of work I'm trying to do at the moment saying what happened in geology between 1900 and 1960. I've argued there that specialties developed so much that people weren't able to look at the 'big problems', and perhaps weren't particularly interested in them. But the information from the specialties was essential to enable the emergence of 'big-picture' theories or ideas. And the other aspect of that period was the technology—the huge improvement in equipment that enabled people to make more precise and accurate measurements. We've certainly gone from a qualitative geology to much greater quantification.

I quite agree with you about that. I don't think anyone has done much about writing a general history of the instruments used in geology (or certainly not in the first half of the twentieth century).

Yes, and it's so important. Without the instruments we certainly wouldn't have the information we now have. And if you look at the history that some people have written they haven't understood how the data have actually been generated.

We were talking about Huntings and aerial photography a little while ago. Where's a book or papers on the history of that kind of work, so far as geology has been concerned?

There is a little written, but not much (for instance a brief history of the mineral exploration by the Western mining Company in Australia). And the advances since 1960 is a field that's still wide open for historical investigation. Doubtless interest will grow. But the big problem is that few universities are prepared to support research of this kind.

It doesn't fit the usual pattern of historical work that receives institutional funding.

That's right. I remember applying with a colleague a few years ago to do some work on Edgeworth David. It went to the Science faculty and then to Arts, and got nowhere. It didn't fit any niche.

Yes, it would have fallen between two stools. But perhaps we could conclude by your saying something about Edgeworth David, as I know that you've kept going on that project and I understand it's now nearly finished.

Well, I've no doubt that David was the greatest of Australian geologists. He wasn't someone who made any major or fundamental discoveries, and he wasn't a theoretician, but he grasped the essentials of the research being done and he applied it to so many areas. David's major contribution was, in a way, in the building up of the Australian National Research Council, as much as his work in geology per se.

But perhaps before we go on we'd better say who Edgeworth David actually was. Many readers won't have heard of him, other than what you told us at the beginning.

Well, his major contribution was his study of the late Palaeozoic glaciation in Australia. He was an Oxford graduate and had a short spell at the Royal School of Mines and did fieldwork in Wales. His first papers were published just before he came to Australia in 1882, on glaciation in South Wales. He came to Australia to join the Geological Survey of New South Wales, having visited the tin mines in Cornwall before leaving Britain. When he got here, he first studied the tin deposits in northern NSW and later on the coalfields in the Hunter Valley north of Sydney. He was a wonderful mapper. He became Professor of Geology at Sydney University in 1891 and a few years later led the second expedition to the atoll of Funafuti in the Pacific, to try to drill it to confirm Darwin's theory of atoll formation. That really put David on the world geological map, and he got an FRS in 1900 for this work. In the course of this investigation he learned how to raise funds for science, and how to deal with politicians and businessmen. He went to Mexico, to the International Congress, travelling via India to look at evidences of Palaeozoic glaciation there, and examined the damage of the 1906 San Francisco earthquake. At the congress he met many of the major American and Canadian geologists and maintained friendships with them over the years. In 1908, he joined the Shackleton expedition to Antarctica and he and Mawson and McKay got to the region of the

South Magnetic Pole, which is still regarded as one of the great Antarctic journeys. In 1915, he formed the Australian 'Tunnelers Battalion' and went to France, working on the geology of northern France, and was involved in the huge explosions set off beneath German forces. From 1920 he was involved back in Australia in collecting material for writing his *Geology of Australia*, and his geological map of the Continent and the accompanying *Explanatory Notes* (1932). He went back to England to try to finish the project, but kept getting diverted, dramatically so in 1928, when he thought he'd found arthropods in Precambrian rocks in South Australia. Moreover, he was building up the Australian Research Council, which was essentially the forerunner of the Australian Academy of Science. He became the spokesman for science in Australia, over the years getting government funding for the second Scott expedition, for the Mawson expeditions, and the Japanese Shirase expedition. His life was really full.

So he was 'Mr Big' in Australian science in those years?

He was, until he died in 1934.

And fortunately your biography of him is now just about finished?

Yes. There was a fine earlier one by his daughter, published in 1937, but it left a lot more to be said. So I've now largely finished, with some checking to be done: 500 pages of text are run off so far; 200 pages of footnotes; and 400–500 figures to get sorted out.

We're most grateful to you, David, for giving us a foretaste of that major book. It will surely be very important.

Well, I'll be glad to see it finished and to get onto other shorter and perhaps easier things.

Sydney, 7 January, 2003

FORTHCOMING MEETINGS and CONFERENCES

The Kaliningrad Museum of the World Ocean is inviting papers for the VIIth International Congress on the History of Oceanography, September 8–14, 2003. The website is www.vitiaz.ru and the email is postmaster@vitiaz.koenig.su

Scientific Instrument Symposium

The 22nd Scientific Instrument Symposium of the International Union of History and Philosophy of Science will be held at the Mariners' Museum, Newport News, Virginia, USA, from 30 September to 4 October, 2003. Sessions will include 'Scientific Instruments in Iconography' and 'Conservation Problems with Materials on Modern Instruments' and there will be visits to Colonial Williamsburg and the National Museum of American History. For further information, visit www.mariner.org/sic2003, or phone 757 596 2222.

Australian Mining History Association Conference, Broken Hill, Australia

2–6 July 2003

For further information on the conference, contact: AMHA President, Peter Bell, Tel. 61-8-8373 1900, pbell@adelaide.on.net; or Greg Drew, Tel. 08-84633270, drew.greg@saugov.sa.gov.au

For registration information, contact Mel Davies, 61-8-93802939, e.mail: mdavies@ecel.uwa.edu.au

The meeting has a list of 26 speakers. Most, but not all, the papers deal with the history of gold mining.

28th INHIGEO Symposium on the Theme of 'Geological Travellers', Dublin, 14–18 July, 2003

INHIGEO will hold its 28th Symposium at the Department of Geology, Trinity College, Dublin, on the general theme of 'Geological Travellers'. The organiser is Dr Patrick Wyse Jackson (<wysjcknp@tcd.ie>). The registration fee is 380€ (100€ for accompanying members). Accommodation is available at 50 or 58€ per night, or at more expensive hotels. For full details visit: www.tcd.ie/Geology/MAIN-PAGE/inhigeo.htm. The meeting will be followed by a round the island of Ireland field excursion (500€). But we are informed that places for this are now all taken. For all up-to-date information, please contact Dr Wyse Jackson,

Tethys Symposium, Budapest, August, 2003

The sixth International Tethys Symposium ('Shallow Tethys 6') will be held in Budapest in 22–26 August this year, with excursions before, during, and after the meeting. The convener is INHIGEO Member Dr Miklos Kazmer (kazmer@ludens.elte.hu). The whole of the last day (26th) will be devoted to 'Tethys–History of Geology Colloquium'.

VIIth International Congress on the History of Oceanography, Kaliningrad, 8–14 September, 2003

The Congress will hold sessions on marine ecology, the contributions of navies to ocean research, oceanographical research, marine law, etc. For further information, contact Museum of the World Ocean, Russian Federation, 2360056, Kaliningrad, Naberezhnaya Petra Velikogo 1 (<<http://www.vitiaz.ru>>).

Geology in Vilnius University: The 200th Anniversary, 8–9 October, 2003, Vilnius, Lithuania

A conference will be held under auspices of the INHIGEO and Lithuanian National Commission for UNESCO

The Conference is being organised by Vilnius University to commemorate the 200th anniversary of the Mineralogy Department, established in 1803. During the two hundred years of the Department's history, many scientists of worldwide reputation worked and taught at the Department. The Department's first period (1803–1832) when Professors Stanislaw Bonifac Jundzill, Roman Symonowicz, Felix Drzewinski, Ignatius Horodecki, Eduard Eichwald, and Ignatius Jakowicki worked at the University was particularly interesting. Abraham Gottlob Werner, Leopold von Buch, Alexander von Humboldt and Alexander Brongniart were in touch with Vilnius natural historians at that time. Later on, in the period 1832–1920, Roderick Impey Murchison, Constantin Grewingk, Anton Giedroyc (Giedraitis), and Alexander Tornquist, etc., made geological surveys in the Eastern Baltic area. From 1920 to 1939 the Stefan Batory University in Vilnius and the Vytautas le Grand University in Kaunas had geology, mineralogy, and geophysics (in Vilnius) departments. Professors Juozas Dalinkevicius, Mykolas Kaveckis, Jozef

Lukasiewicz, Bronislaw Halicki, *etc.*, lectured and conducted geological investigations in the area. From 1940 (1945) to the present over 800 professional geologists and hydrogeologists have graduated from Vilnius University. About one hundred geologists (*sensu lato*) have DSc degrees, and there are over twenty are professors.

For further information, contact Professor Algimantas Grigelis (grigelis@geologin.lt); or 13 Sevcenkos Street, Vilnius 2600, Lithuania. Tel 370 5 210 47 15; Fax 370 5 21 36 408.

The 17th Australian Geological Convention, Hobart, Tasmania, 8–13 February, 2004

The Dynamic Earth: Past, Present and Future

This meeting will serve as a tribute to Professor S. Warren Carey, who died in March, 2002, who is remembered for his early advocacy of continental drift, and then of expanding earth theory. The programme will with topics in southern hemisphere tectonics environmental geology, mineral exploration, maritime law, *etc.* For further information, contact Professor Pat Quilty (P.Quilty@utas.edu.au) or visit <http://www.17thage.gsa.org.au/>.

INHIGEO Meeting, Florence, 20–28 August, 2004

The 32nd International Geological Congress

This large congress has an INHIGEO-organised section (T16) on the History of Geosciences, the two themes being 'The Origin of Modern Geology' and 'Institutions, Museums, and Scientific Societies in the History of Geosciences'. For general information, contact Ms Chiara Manetti, Dipartimento di Scienze della Terra, Via La Pira, 4–50121 Firenze, Italy. Tel./Fax: 39 055 2382146 Email: casaitalia@geo.unifi.it. Or visit: www.32igc.org.

Registration fees (provisional):

	Until 31 March 2004	Until 30 June 2004	After 30 June 2004
Members	430€	480€	530€
Accompanying	250€	275€	300€
Members			

For information on the INHIGEO programme, and offers of papers on the above themes, please contact Professor Nicoletta Morello (nicoletta.morello@lettere.unige.it) or Dr Ezio Vaccari (ezio.vaccari@unisubria.it). Following the Congress, they will be organising a week-long excursion, visiting museums and other institutions of interest to historians of geology, as well as some 'classic' geological localities, beginning the journey in Florence and terminating in Venice.

International Commission on the History of Meteorology, Conference, Polling Monastery, Weilheim, Germany, 5–9 July, 2004.

'From Beaufort to Bjerkenes and Beyond: Critical Perspectives on Observing, Analyzing and Predicting Weather and Climate'

For information, contact INHIGEO Member Dr Cornelia Lueddecke (C.Lueddecke@lrz.uni-muenchen.de).

INHIGEO Meeting, Prague, July 2005

This meeting, with an organizing committee headed by Jan Kozak (Prague) will have the history of geophysics as its main focus. (INHIGEO has never held a meeting specifically dedicated to this theme.) However, attention will also be given to the history of mining in Bohemia and to the stratigraphy of the region. For those with botanical interests, there will be the opportunity to visit the Mendel garden and museum in Brno. Needless to say, Prague is a 'must' for tourists.

The provisional programme is:

Registration and gathering of participants in Prague: Wednesday, 9 July 9, morning

Opening, Lectures in Prague: 9 July, noon and afternoon

Lectures in Prague: 10–11 July

Sightseeing Prague/visit to the Geophysical Institute: 12 & 13 July

Final lectures in Prague or in Brno: Monday 14 July, Symposium close

Excursions: Tuesday 15 July–Thursday 17 July

An additional day (18 July) is presently held in reserve in case of the enlargement of the symposium and/or the excursions.

INHIGEO Meeting, Beijing, 2005

The International Union of History and Philosophy of Science–Division of History of Science (to which INHIGEO is affiliated) will hold its XXIInd International Congress on the History of Science in Beijing in 2005. The Chinese Members of the Commission will be organising a session on the History of Geosciences in Asia, which will be under the leadership of Professor Yusheng Zhai of the Chinese University of Geosciences (Beijing). Further information will be given in the next two Newsletters. The overall Congress theme is: 'Globalisation and Diversity: Diffusion of Science and Technology Throughout History'. For further information, contact: Institute for the History of Natural Science, Chinese Academy of Sciences, 137 Chao Nei Avenue, 100010 Beijing, China (<2005bj@ihns.ac.cn> or <<http://2005bj.ihna.ac.cn/>>).

BOOK REVIEWS

Freiberg and INHIGEO's Werner Celebration Now Published

Helmuth Albrecht and Roland Ladwig (eds), *Abraham Gottlob Werner and the Foundation of the Geosciences. Selected Papers of the International Werner Symposium. Freiberg. September 19 to 24, 1999*, Freiburger Forschungshefte D 207 (Montan- und Technikgeschichte), xlvii + 396 pp., illus., tables, (German and English), Freiberg University of Mining and Technology, Freiberg (Sachsen), 2002.

[Sales: Akademische Buchhandlung, Merbachstrasse, PF 1445, D-09599 Freiberg, Germany; Tel.: 49-(0)3731-221 98, Fax: 49-(0)3731-226 44; 19.50 Euros, pb.]

On the occasion of the 250th birthday of Abraham Gottlob Werner (1749–1817) in 1999, an international symposium on the history of science, with a pleasantly large resonance, was held in Freiberg (Saxony). It was organised by the Freiberg University of Mining and Technology in conjunction with the International Commission on the History of Geological Sciences (INHIGEO) on the topic 'Abraham Gottlob Werner and his Times'. It was supported by a large number of other geoscience institutions and companies of the Federal Republics of Germany and Poland. About 250 scientists and guests from all over the world joined this 24th International INHIGEO Symposium, with five plenary lectures and 95 papers given in ten sections.

The symposium's preparation and organization lay in the hands of Dr Peter Schmidt, who died totally unexpectedly a couple of months before the event took place. Thanks, however, to Professor Dr Helmuth Albrecht and Dr Roland Ladwig at Freiberg, who took over responsibility for the event, the conference was organised successfully and a volume with 49 contributions was submitted for publication, yielding the book here under review.

The conference volume introduces the contents of the symposium in its essential fields and contains a notable quantity of new information. Many well-known interrelations were enriched by new aspects, and, above all, new findings in fields of Werner research were presented, which had previously hardly been worked upon.

In the plenary sessions, Alexander Ospovat (USA), the Nestor of Werner researchers, argued that Werner's scientific achievements should be lauded. However, he did not speak of him as *the* founder of geology but as *one* of the co-founders of this science. Helmuth Albrecht elucidated Werner's importance for the Mining Academy Freiberg, emphasising the novelty of his reforms for student education, which so helped to establish his success as a university teacher and attracted academic youth. Dieter Wolf spoke about Werner's Freiberg mineralogical school (in the sense of an 'invisible college'). Actually, a considerable number of his students subsequently became university professors and contributed greatly to the development of this discipline.

Presentations of Werner's achievements in the various fields of learning constituted the core of the symposium. Historical research seems to have lost interest in the Neptunism–Plutonism dispute or the character of basalt. Contributions resulting from the achievements of Werner and still relevant to the present were of higher importance though. For example, the contribution of Andreas Massanek shows the value of the Werner's mineral descriptions for the modern *Catalogue of Type Minerals Specimens* (CTMS), edited by the International Mineralogical Association. Axel Friebe and Manuel Lapp describe developments, dating from Werner's geological mapping in the Saxon *Erzgebirge* (ore mountains). Hans-Eckard Offhaus analyses Werner's geognosy as a structured 'genetic' model, which represented the Earth as a global system. Christian Schubert examines the approaches of Werner's geological modelling with reference to problems of mineral deposits. He concludes that Werner's *New Theory of the Formation of Veins* (1791) may be considered the beginning of a development leading to the present-day discipline of economic geology. In terms of the history of ideas, Gottfried Hofbauer's discusses the geological recognition of reality, comparing Werner and G.Ch. Fuchs from methodological points of views. Bernhard Fritscher places Werner's mineralogy—in connection with the culture of Jena—in the context of 'German Science', a politically determined aspect, occurring within the process of the formation of the German nation.

Further new aspects are introduced in some contributions based on manuscript studies based on Werner's extensive hand-written unpublished writings. They include Norman Fuchsloch about Werner and the change from nature to environment, in which—going beyond mining—he analyses and represents the relations between and nature. A solid comparison between Werner and F.W.H. Trebra, in relation to their contributions to mining, is presented by Horst Gerhard. On the one hand, he shows that Werner systematised knowledge of mining and taught it successfully. On the other, though, Werner showed hardly any new results in terms of research, as he lacked practical experience, compared with Trebra. For the first time, several authors such as Rainer Sennewald, Heinz-Joachim Spies, Dieter Janke analyse Werner's work on ferrous metallurgical engineering and ferrous metallurgy, praising the related lectures. Obviously Werner, whose family had been associated with ironworks over generations, had better contact with these technologies than mining. According to Heinz-Joachim Spies 'Werner's contribution to the development of ferrous metallurgy' consisted in 'replacing empirical craft by a system of scientific principles as a base for the education of ferrous metallurgists'. Similarly, Dieter Slaby and Roland Ladwig examine Werner's ambitions with regard to the economic aspects of mining and his related lectures, illustrating a wide spectrum of scientific research.

A considerable part of the volume deals with Werner's scientific influence, from various points of view. Already in his lifetime many students from Germany and abroad were attracted by his ideas and teaching to study at Freiberg. On this topic, there are two contributions of particular interest: Guenter Hoppe writing about Leopold von Buch's relation to Werner; and Dietrich von Buch about the character of his ancestor, dedicated to one of the best-known students of the *Bergakademie* Freiberg. For the first time probably in a German publication, Manuel S. Pinto gives attention to the Brazilian Manuel Ferreira da Camara who studied under Werner in 1792–1794. Not only did he publish a wide range of works on geology, mining, and metallurgy but also he worked as a mine manager in his homeland Minas Gerais, where he was in charge of gold mining.

There are also other personalities representing and disseminating Werner's ideas in his lifetime who receive similar appreciative attention. This refers to the contributions of Benjamin Silliman (Sr) from the USA by Robert H. Silliman; to Silvestre Pinheiro Ferreira from Portugal by Antonio A. Soares; and to Ferenc Benk (who translated Werner's *External Characters of Minerals* (1774) into Hungarian (1784)) by Miklós Kázmér. Helpful surveys are provided through the contributions on the distribution and effects of Werner's views in various countries, notably the studies by Ezio Vaccari for Italy, Antoni Kleczkowski for Poland, Eugenij E. Milanovsky for Russia, and Gerhard Lehrberger and Guenter Grundmann for Bavaria. They all show the forms and ways in which Werner's ideas were spread around the world.

There are other interesting contributions dealing with Werner's thoughts and interests. Karl-Hermann Kandler strives to situate Werner's religious views in the context of intellectual history. He claims to have found traces of natural theology in Werner and emphasises his religious and confessional tolerance. Stefan Büttner's philosophically oriented contribution is similarly of special interest. He presents and discusses the reconstruction of Werner's system in G.W.F. Hegel's natural philosophy. In addition, there are contributions that consider some of Werner's numerous interests outside the geoscientific field in the narrower sense. Angela Kiessling exemplifies the character of his linguistic studies and Christel Grau provides insights into the history of Werner's coin collection, paying special attention to his 4,117 Roman imperial coins.

The theme for the symposium was 'Abraham Gottlob Werner and his Time', in accordance with which a number of contributions present accomplishments and personalities that enriched geoscientific knowledge around 1800, though they were not directly related to Werner. Kenneth Taylor analyses the framework of geological thinking at the end of the eighteenth century, with special consideration of descriptive and theoretical norms. It is noticeable that for the francophone area theories of the Earth largely corresponded to descriptive generalisations, in the form of what Taylor calls 'dispositional regularities'. Emile de Tex describes the contribution of Dutch scholars to volcanology at that time and Lamberto Laureti draws an analogous picture of Italian geologists' positions with regard to Plutonism and Neptunism. Stefan Emeis reminds us of the almost forgotten meteorologist and geologist J.-A. Deluc, and Peter L. Siems of T.A. Peithner's lectures on geology and mining in Prague, both of which were active in Werner's lifetime. Eugen and Ilse Seibold discuss the influence of James Hutton's uniformitarian ideas on Karl Ernst Adolf von Hoff, by which route they arrive at one of the most widely discussed fundamental problems of geology in the nineteenth century.

Mineralogy and geology were fashionable sciences in Werner's day, attracted considerable attention in society, and played a significant role in intellectual life. This was also true for literature and thus offered the opportunity for Michaela Haberkorn to bridge the gap between the natural sciences and fiction by discussing the role of geology after the discovery of 'deep time' (a new temporal dimension for the Earth!) in fiction around 1800.

Summarising, it can be said that the present volume is of considerable significance for the history of geosciences and beyond, i.e. for cultural history around 1800. Naturally, and with so large a number of contributions, it cannot be expected that every statement will be accepted by everybody without objection. However, the wide range of subjects is stimulating and the new findings will enrich our knowledge about the time known as the dawn of mineralogy and geology. Hence, the volume should be looked upon as an important contribution to the historiography of geosciences. It was actively supported by numerous members of the International Commission on the History of Geological Sciences (INHIGEO) from several countries.

Martin Guntau, Rostock

INHIGEO in Rio de Janeiro

David R. Oldroyd (ed.), *The Earth Inside and Out: Some Major Contributions to Geology in the Twentieth Century*, Geological Society, London, Special Publication No. 192, 2002.

No sooner has the last century of the second millennium ended than historians of geology are manoeuvring to capture the dazzle of its multi-coloured story. What have been the pre-eminent advances, the new band-wagons that upset old apple-carts, the more gradual bringings into focus, and the blind alleys? What is geology about today that it only partly possessed or had no inkling of at the beginning of the twentieth century? This was the broad theme ambitiously addressed in August 2000 at a symposium on 'Major Contributions to Geology in the Twentieth Century', held at the International Geological Congress in Rio de Janeiro and organised by INHIGEO.

It is a fact of life that the more recent the period examined by the historian of science, exponentially the greater is the volume of material to be delved into. One can escape by joining company with the contemporary researcher, and view down ever-narrowing avenues. That geologists can try to have it both ways is evident from the broad sweep of the volume under review, with the inevitable consequence that each of its fourteen articles stands alone, unlinked to its neighbours. While the editor's introductory chapter manfully attempts to forge a unity to the proceedings, the impression remains that this is a book of pieces rather than a story, a collage rather than a history.

Editor Oldroyd muses on 'writing about twentieth-century geology', leading to the thought that historians of science might be engaged in a 'metascientific' activity. Psychological and philosophical determinants additional to purely scientific enquiry dispose the historian to examining the entire coral reef and its structure, not merely the tips containing the living animals. It is a reef on which shipwrecks can occur. The historian can choose between Kuhn's and Şengör's theories of the progression of science, the one proposing conceptual discontinuities in a single stream of research, the other maintaining two co-existing but fundamentally differing ways of looking at nature regularities or else proceeding from local irregularities contrasts, not altogether accurately, as Aristotelian versus atomist (Pythagorean) approaches. In education, the evolution of late twentieth-century geology is reflected in a changing emphasis from clearly defined, strictly scientific subdisciplines to broader, more diffusely bounded subdisciplines that interface with immediate human and environmental interests. Oldroyd ends by summarising each of the ensuing essays, unintentionally perhaps revealing a common theme that to understand twentieth-century geology one cannot avoid reaching back to the nineteenth century. Development is as much the *môt juste* as is discovery for much of twentieth-century geology.

Yet one of the triumphs of the twentieth century was the begetting of space exploration. In opening their perspective to the solar system, twentieth-century geologists obtained surprising insights into the planet under their feet. Ursula Marvin (USA) provides a lucid summary of the various types and likely origins of meteorites, and then considers the unique relationship of Moon and Earth, their respective orbital and rotational dynamics so out of kilter. Pen-portraits of three key personalities who laid the groundwork for selenological studies lead up to a summary of the geological and geochemical results of the *Apollo* Program, including a useful table of lunar stratigraphy updated to 2001. Marvin highlights how planetary exploration has impacted on public awareness of the host vehicle, a small jewel on which, unbidden, mankind finds itself in uncertain purpose and destiny. She ends with a word of advice to today's researchers, after citing two major 'impact' discoveries that were greeted with averted minds by the scientific community: G.K. Gilbert on the nature and origin of the cratered lunar surface, and G. Penfield and A.

Camargo on the Chicxulub structure in Yucatán. Her tart query: 'Does one, [even] these days, have to belong to an 'in' group to gain an audience?'

Next we come to twentieth-century mathematical geology, where Richard Howarth (UK), in common with most of his fellow-authors, draws on the vigorous youth of his subject. Hand-drawn isoline maps, point symbol maps, graphs, line graphs, scatter plots, bar charts and pie diagrams were all twentieth-century tools founded on nineteenth-century inventiveness. The use of graphics in geology was pioneered by Auguste Michel-Lévy (1844–1911), while multivariate statistical methods and mathematical modelling, in which William Krumbein was a key player in the twentieth century, developed from nineteenth century applications of statistics to geology. But it was the foundation of the International Association of Mathematical Geology in 1968 that kick-started enormous advances in the fields of time-series analysis, lithostratigraphic correlation techniques, geostatistics, modelling, and image-processing techniques.

Norman Bowen, whose 'shadow looms over twentieth century igneous petrology', is again assessed by Davis Young (USA). As is well known, Bowen devoted a lifetime's work to the thesis, founded on strategic laboratory experiments at high pressures and temperatures, that the diversity of igneous rocks owes essentially to a single process, namely the separation of mineral crystals from cooling magma in the process of fractionation crystallisation. Young considers that 'Bowen's theory . . . gained attention because of its inherent scientific merits and because it was promoted by a scientist of rare intellectual vigour, determination and literary skill . . . Because of its breath-taking sweep, igneous petrologists could not ignore the theory.' Yet Clarence Fenner contended that there was a difference between not ignoring and not being seduced by. Bowen was fortunate to be working with the right people at the right time. The then-director of the Geophysical Laboratory at the Carnegie Institute, Arthur Day, sought, fostered and tended Bowen's experimental work, which happened to commence just when new high-temperature and high-pressure technology was coming on stream in 1912. Bowen, 'a quiet, retiring person not distracted by mapping, writing textbooks, thinking about classification, or learning much about tectonics or metamorphism', was free from the onerous duties of the responsible university academic. While the final decades of the twentieth century elevated other magmatic processes to importance in producing diversity among igneous rocks, fractional crystallisation is as vigorous as ever in chambers both silicate and cerebral.

Metamorphic geology is granted two excellent essays, both of which refreshingly escape from anglophone monosound. And in both, the vitality of nineteenth-century and even eighteenth-century roots again come irresistibly to the fore. Writing from the Netherlands, Jacques Touret and Timo Nijland expose the French contribution to the foundation of metamorphic geology, where the names of Gabriel Daubrée, Achille Delesse, and Joseph Durocher are prominent. The transfer of Strasbourg into Prussia after the 1870 war, and the establishment there of a university, provided a chair for Harry Rosenbusch from which he launched the science of descriptive petrography. France may have lost a university, but it was the ubiquitous Michel-Lévy who proposed feldspar composition as a basis for rock classification. Regional metamorphic zoning, recognised by Ami Boué in the 1810s, was clearly demonstrated by George Barrow in the final decade of the nineteenth century, though his results were passed over until the 1920s. In the early twentieth century, the chemistry of metamorphic rocks and minerals was intensively researched in Scandinavia and Germany, notably by Brøgger, Vogt, Goldschmidt, Eskola, Grubenmann, Niggli, and Wegmann. Sederholm, in his studies of granite–gneiss relationships, coined such now-familiar terms as migmatite, magmatite, anatexis, deuterite, myrmekite, palingenesis, pygmatic, and many others. Complementary to Bowen's igneous researches, Victor Goldschmidt and Friedrich Becke gave huge impetus to the understanding of metamorphism in applying chemical thermodynamics and the phase-rule to mineral systems. Yet *plus ça change*, Touret and Nijland conclude: 'it is remarkable to see how some basic problems, notably the contest between fire (magma) and water (fluid), have remained at the core of research, [and] a number of opposing viewpoints in the current debate in metamorphic petrology would still appeal to them [Werner and Hutton]!'

Bernhard Fritscher (Germany), opening with Goethe, sheds further light on the turn-of-the-century contribution by Continental geologists and geochemists to metamorphic studies. It was fundamental insights from the 'Kaiser's petrographers' into the progressive effects of metamorphism that inspired Goldschmidt's experimental work and application of the phase-rule. Here was another man acutely sensitive to the matter of priority, on one occasion remarking that if one of his critics 'had seen more he would have said less', a timeless caution to each and every earth scientist. The frequently neglected influence of cultural context, in this case on the history of metamorphic studies, is exemplified in the contrasting 'British and the Continental styles', as personified in the approaches of Alfred Harker as compared with Pentti Eskola or Goldschmidt. The planning of the renowned Geophysical Laboratory of the Carnegie Institute in Washington D.C. by George Becker was based on his experience at the *Physikalisch-Technische Reichsanstalt*, Berlin, which it happens was also where director Day received his early training. The authors conclude that the exclusion of German science during the decade following World War I had a profound influence on the direction of metamorphic studies.

Biography returns with a further portrait of Arthur Holmes by Cherry Lewis (UK). Quotes from his private letters provide new insight into the development of his ideas. There are tantalising hints of the indirect but not necessarily unimportant influence a spouse can have on her husband's science. In Holmes's case, did his wife assist or divert? Can love, or its absence, better foster the work of the scientist (and artist)? What caused Holmes once to write: 'I felt somehow what a meaningless tragedy the whole Universe appeared to be'? Lewis discourses under the four themes of radioactivity and (1) the Age of the Earth, (2) Continental Drift, (3) Convection Currents, and (4) the Unifying Theory. The story begins in 1911, even before it had been proven that lead was the final decay product of uranium, when Holmes obtained the first U–Pb date for a mineral. In 1915, now making allowance for the new discovery of isotopes, he determined the oldest sampled minerals to have formed at least 1,500 Ma ago, a magnitude that met with disbelief not only from 'Thompsonite' physicists but also geologists. As William Sollas, ensconced in Dublin, remarked: 'The age of the Earth was thus increased from a mere score of millions to a thousand millions and more, and the geologist who had before been bankrupt in time, now finds himself suddenly transformed into a capitalist with more millions in the bank than he knows how to dispose of! A succession of books by Holmes on radioactive dating and earth history came off the press in 1913, 1920, 1921 and 1927. Small wonder that Reginald Daly acclaimed Holmes as 'one of the few English geologists with ideas on the grand scale'.

Alfred Wegener's fervent advocacy of continental drift had a profound influence on Holmes (The absence of a biographical article on Wegener is a profound lacuna in the volume under review). In the late 1920s, Holmes's thoughts on drift

were propelled by the realisation that heat from radioactive decay of potassium was sufficient to drive lateral convection currents within a hot, glassy sub-crust. Here at last was a mechanism for ocean-basin widening and large-scale lateral movements of continents. Yet, in incorporating Bell's convective drag theory, Holmes's ideas were too radical to gain acceptance from the contemporary geological community. As his partner, Doris Reynolds, remarked: 'Geology is always like this, very slow moving. When a new geological discovery or suggestion is made it is quite quick if it is noticed in twenty years, and may take fifty to a hundred or more. Then dogmas form obstructions.'

Obstructions to the countenancing of continental drift were nowhere more evident than in the Soviet Union. Yet Victor Khain and Anatoly Ryabukhin (Russia) show that in that isolated culture hostile to nonconformity, a background of diversity survived at least for a while. In the 1920s and early '30s, geologists such as Aleksey Borissyak and Boris Lichkov applied Wegener's ideas with enthusiasm. But by the late 1930s immobility set in, and the authoritative figure of Nikolay Shatsky in the '40s was emphasising an incompatibility between geosynclinal structure and any lateral movement of continents. Vladimir Belousov famously took over the baton through the 1950s and '60s, but now mobilist currents were again stirring below the surface. Khain and Ryabukhin address the influence of the new plate theory on Russian geology of the 1970s and '80s, and the web of tensions, polemics and changes of direction that perhaps inhibited the birth of major new ideas from Russian geologists during this time.

An undivided and slightly offbeat essay from Australia on plate tectonics and terranes by Homer Le Grand ('Geologist forms of evidence sustain and close geological controversies') gradually focuses on the speedy acceptance, pockets of 'refusniks' notwithstanding, of the dramatic new hypothesis in the late 1960s-early '70s. Despite the immediate and elegant success of simple plate geometry in extending ocean-floor tectonics to the fringes of continent, it was Tapponier and Molnar's application (not mentioned by Le Grand) of slip-line field theory to the India-Asia collision that in the late 1970s pushed the application of plate tectonics into continental interiors. Le Grand's personal diary of the history of recognition of suspect terranes is enlivened from numerous tapings of comments from some of the main protagonists. Thus John Dewey: 'The value of models is not that they give us solutions but give us an idea of how to proceed'; and Warren Hamilton's conceit on Alaska: 'the garbage dump of the Pacific'. Le Grand tends to focus on the extremes in debate rather than the quietly industrious 'middle' which held most field geologists: the 'guys who have worked an awful lot, sweated blood, witnessed deaths, been threatened themselves to extract this information . . . take a certain amount of umbrage at some dandy [plate tectonician] coming in and spending a summer reinterpreting all the rocks' (Howell).

Marie Tharp and co-worker Bruce Heezen didn't take on plate theory. Yet their inspired design and compilation of a widely publicised set of oblique-perspective physiographic maps of Earth's ocean floors played a major rôle in convincing geologists of the validity of plate theory. Indeed, Cathy Barton (USA) shows how some symbol-emphasis on the maps changed 'drastically' during the establishment of the new paradigm. The maps were published at just the right time to provide vital templates for the identification and testing of transform faults and plate boundaries. Heezen and Tharp's maps were outstanding works of art as well as of data representation. Barton quotes A.I. Miller: 'Many scientific disciplines, not least geology, frequently proceed from the use of visual thinking and aesthetic considerations rather than deductively through logic or inductively from empirical data.' Tharp worked under harsh disadvantages of gender and lack of tenure. Yet it is to her that we owe the recognition of rift-valley continuity along the crest of the mid-Atlantic Ridge, and her insight in extrapolating it along the majority of Earth's mid-ocean ridges on the basis of an association with extensional earthquakes.

Terrestrial magnetic studies, born of von Humboldt and Gauss, had little time for geology into the early twentieth century. Gregory Good (USA) shows that it was only by the middle of the century, driven by cultural and economic-industrial factors, that geomagnetism blossomed and branched into geodynamo theory, palaeomagnetism, induction in the crust, and atmospheric and auroral electromagnetism. Four landmark books encapsulate these developments: Chapman & Bartels' (1940) *Geomagnetism* (an English neologism taken from the century-old German *Erdmagnetismus*), Nagata's (1953) *Rock Magnetism*, Blackett's (1956) *Lectures on Rock Magnetism*, and Irving's (1964) *Paleomagnetism*. Good has some pertinent words for the historian: 'Irving isolated scientific acts from their historical contexts and saw them in the light of their own concerns. This selective approach to history [leads one easily into] tracing out a 'family tree' when looking backward from a strong preoccupation, such as one's current research. It is common to forget or gloss over the confusion, or the dead-end project, or the one simply left behind.' 'Major developments in science sometimes induce a sort of amnesia, which we must constantly fight against if we are to write histories faithful to the contexts of their times.'

Overdistillation mars the ambitious 'Sedimentology: from single grains to recent and past environments' by Eugen and Ilse Seibold (Germany). To hold the sweep of twentieth-century sedimentary geology within six pages is to lose too much. Sedimentology, initially a specialised science (1918-1945), rapidly diversified into studies of sedimentary processes, facies, palaeoenvironmental reconstruction, and diagenetic processes (1945-1968). Major symbiotic impetus followed from advances in engineering technology in the oil industry, while deep-sea drilling and continuous reflection seismic profiling opened up an ocean of new ideas in interpreting offshore stratigraphy (1968-2000). But there is more to the tree of knowledge than the trunk distantly pictured here.

In a characteristically pungent essay, Hugh Torrens (UK) examines the ways and uses of stratigraphy, in particular the dangers of correlation' and unthinking claims to time-equivalence. His hero is Sidney Buckmann, who in the late nineteenth century conclusively demonstrated lithologic diachronism. Torrens briefly and entertainingly reviews the potential precision of both biostratigraphical and non-biostratigraphical methods of correlation. Event stratigraphy and its offshoot, sequence stratigraphy, come in for a measure of well-earned skepticism. Stratigraphic interpretation of the K-T boundary event is shown to need more care than is often or even generally given to it. Thus anomalous concentrations of iridium can accumulate from normal rates of cosmic input when the environment is one of little or no sedimentation, and negligible erosion. So it can become that 'one man's anomaly [is] another's normality'! Stratigraphers still need and are needed to investigate the incompleteness of stratigraphic sequences. As Buckmann put it nearly a century ago, 'additions to fauna decrease the imperfection of the zoological, but increase that of any local geological record: the gaps caused by destruction stand revealed more plainly.' Or more colloquially: The harder the stratigrapher looks at rocks, the less complete their record of the passage of time becomes.

The late Bill Sarjeant (Canada) in his own inimitable style provides a panoramic review, at once scholarly and entertaining, of the twentieth-century science of palynology. As an extra bonus, the essay is uniquely illustrated with portraits and photographs of its practitioners, many now deceased but captured by the author's camera in the 1960s. The tremendous surge of interest in palynological studies and applications during the later decades of the twentieth century is attested to in Sarjeant's huge bibliography. On the other hand, the actual contributions of palynology to related areas of geology are left relatively unexplored.

The volume closes with an exploration of the 'sociology' of British geology by Simon Knell (UK), which shows the sensitive relationships between associations of geologists and their political and commercial weight-pullers. The conservative ideology which dominated late twentieth-century England was contemptuous of state funding for ivory-tower research. Correct thinking held that 'where industry would benefit, industry would pay'. The same applied to environmental conservation, whose protagonists bent quickly and painfully to pragmatic accommodation. Reflecting on all this, Knell concludes that science benefits its own cause according to public accountability, especially through making allies in the mass media. Conflicts of interest between the community of geologists and commercial interests are illustrated in summary case-histories of site conservation, and of destruction. By the late twentieth century, geologists were being forced to forego their traditional image: 'Where once the hammer had been [their] essential tool, in the new conservation-aware science it had become an 'offensive weapon''. The Geologists' Association felt compelled to drop the hammers from its century-old badge! With the new millennium, however, localised threats from commercial hammerers have been overtaken by mass-destruction under the bulldozers of so-called developers. The struggle for survival continues: what remains must be preserved, both unique exposures and collections in museums. Knell is succinct: 'History is critical to nationhood. Collections, as entities which cross time, are not simply products of that history, they also symbolize it. They contribute to identity . . . The confrontations and manoeuvrings of scientists and their political masters have resulted, in the early twenty-first century, in a position where the latter can claim socially relevant success and yet the former retain ownership of the world'. Ah, but is that true or wishful thinking?

Some essays in this impressive if disparate collection betray a faint unease at the prospect for geology in the twenty-first century. The unparalleled exponential growth in technical ingenuity and knowledge in almost all its subdisciplines during the latter half of the twentieth century cannot continue indefinitely without fracture and possible failure of the unity of the science. Where new subdisciplines bud and grow, are old ones dying out? Is extinction to be individual or en masse? One vital factor in determining the future of geology's ongoing evolution is the manner in which its practitioners communicate. Electronic journals are already with us, article titles and authors' names becoming replaced by digital codes. With the ocean of truth threatening to drown us under floods of data, salvation lies in successful filtering processes that bring all the researcher seeks, and not one whit more, to the unblinking screen. Despite which, this reviewer is still keeping his ancient boots and field notebook at the ready.

Paul Mohr, Galway

The INHIGEO Meeting in Lisbon and Aveiro: 24 June–1 July, 2001

Manuel Serrano Pinto (ed.), *Proceedings of the 26th Symposium of the International Commission on the History of Geological Sciences 'INHIGEO Meeting: Portugal 2001, Geological Resources and History'; Aveiro and Lisbon, Portugal, 24th June–1st July, 2001*, Centro de História e Filosofia da Ciência e da Técnica & Universidade de Aveiro, Aveiro, Portugal, 2003,

The Symposium took as its two principal themes 'Mineral Resources and History' and 'From Stones to Dinosaurs and other Megafauna'. This generated a very wide range of papers, as described below.

The *Proceedings* begin with the article, 'Stones, Monuments and History' by Luís Aires-Barros, in which, following an overview of the importance of stone in human history, the author concentrates on three major examples of Portuguese architecture: the Cathedral of Lisbon and the old cathedral of Coimbra, both built in the twelfth century; and the Monastery of Batalha built in the early fifteenth century, in particular its Founder's Chapel. The article addresses various issues pertaining to the conservation of these monuments: the origin and geological characterisation of their building stones; the decay and damages these monuments have suffered throughout time, and the history of the interventions made in different periods; the techniques used in the assessment of various kinds of 'stone pathologies'; restoration criteria and the options taken regarding their conservation, from a scientific and technical point of view. The article ends with an overview of the available non-destructive tests used in monuments stone conservation, such as ultrasonic methods, colour analysis, image analysis, endoscopic analysis, GPR (ground penetrating radar), and thermography. Despite the absence of bibliographic references, the article is specially interesting and relevant in the Portuguese context, given the neglect still affecting various Portuguese monuments and cultural heritage. It is a fine example in which science, technology, and history converge in the best interests of culture.

Octavio Puche Riart in his paper '*Histoire des mines dans la Péninsule Ibérique*' provides an overview of the history of mines in the Iberian Peninsula, from Antiquity to the nineteenth century, covering the Metals Age, Greek and Roman colonisation, the Middle Ages, and the modern period. The long time-span covered by the author does not allow for in-depth analysis of particular aspects of such an interesting theme. However, this limitation is counterbalanced by a kind of 'geography' of Portuguese and Spanish mines, interspersed with remarks on the major social and technical changes that marked mining history in this part of the world.

William A.S. Sarjeant produces an enjoyable account, titled 'Footprints before the Flood: Incidents in the Study of Fossil Vertebrate Tracks in Nineteenth-Century Britain'. He opens by arguing that the study of vertebrate footprints did not begin in the US, but in Britain, more specifically in Scotland when, in 1824, a five-foot slab of red sandstone was found by Carruthers of Dormont, in a quarry in Dumfries-shire. As a good Christian, Carruthers gave it to the Reverend Henry Duncan, who, intrigued by it, sought the expert advice of William Buckland. Buckland made experiments with tortoises and a young crocodile to see whether or not he could produce similar tracks. He repeated the experiments for fellow scientists and concluded that a tortoise had been the track maker. Sarjeant argues that this was probably one of the earliest palaeoichnological experiments. Richard Owen solved the taxonomic complications involving this finding by placing

Duncan's fossil into a new taxon, *Testudo duncani*, belonging to a still extant genus of tortoises; but the author argues that even today specialists debate whether or not it is appropriate to assign footprints, essentially sedimentary structures, to taxa based on living animals. Sarjeant also shows that footprints have stimulated interest and exercised great fascination to this day. He provides his own first-hand rediscovery of the only slab of Permian footprints ever found in the English Midlands on a back wall of the building of Nottingham Regional College of Technology in 1965, which was originally discovered by Francis Holmes back in 1897. Such an experience had a profound personal impact on the author's career, who felt compelled to change intermittently his own track by subsequently devoting himself to palaeoichnology.

Both Filomena Amador and Teresa Salomé Mota address questions involving Portuguese textbooks in the teaching of geology, though in different contexts. Textbooks have recently been the object of renewed interest by historians of science who are looking at them not just as instruments of normal science (in the Kuhnian sense) and vehicles for the transmission of uncontroversial knowledge. It has been increasingly recognised that the authors of textbook are much more than neutral or passive actors, and that they play a creative role in the development of a scientific discipline.

In the first case, Filomena Amador in her article 'An Analysis of Portuguese Textbooks Used in Secondary Education, Between 1836 and 1936, Centred on the Study of Dinosaurs' begins by contextualising textbooks within the major teaching reforms of Portuguese liberalism, in particular, the emphasis put on science by political leaders in the syllabuses of the nationwide network of *lycées* created in 1836. During this period, geology was taught in the framework of a discipline 'Natural History of the Three Kingdoms of Nature Applied to the Arts'. The author analyses the subsequent reforms launched by major Portuguese policy makers, from the nineteenth century until the 1930s, and their impact on secondary and higher education. She presents a typology of books and provides an overview of the way these textbooks addressed the study of dinosaurs. It is unfortunate that Dr Amador's bibliography at the end of the paper lists only three books, and she does not use notes as appropriate to history of science articles. These would better document her paper and provide useful references to the reader.

In her paper, 'The Teaching of Geology through Textbooks during the *Estado Novo*: Dealing with Stones in some Old Fashioned Way', Teresa Salomé Mota focuses on geology textbooks for secondary education during the Salazar dictatorship (1947–1974). She begins by briefly raising historiographical questions relevant to the topic. Next she describes the structure of Portuguese secondary education in the period under consideration, followed by considerations about Portugal after World War II: the authoritarian nature of the State, the major changes in Portuguese society, and the instrumental role of the teaching system in this context. Ms Mota concludes that during the *Estado Novo* geology teaching in secondary education was guided by a descriptive orientation within the tradition of Natural History, and neglected the historical and causal dimensions of the subject. Teaching practices were anachronistic, but in tune with the ideology and intentions of the regime. As to the contents of textbooks, the emphasis on mineralogy and crystallography is striking.

Dr Amador presents a more philosophical oriented paper titled 'Abductive Reasoning and the Representation of Megafauna in the History of Geology', in which she addresses discussions around ichnofossils in the nineteenth century from the perspective of 'abductive reasoning'. This kind of reasoning is characterised by the development of a set of explanatory hypotheses (given *X*, what explanation(s), *Y*, could account for *X*?) that are then evaluated, allowing the introduction of new concepts, thereby playing an important role in geological thinking, as the author correctly argues. Palaeontology is one of the areas of earth science in which abductive reasoning is more systematically used and has led to new and interesting insights, according to the author.

In his concise and well argued paper titled 'André Schneider: Pioneering Mobilistic Ideas about the Iberian Segment of the Variscan Orogen', A.A. Soares de Andrade presents an alternative to Lotze's Hercynotype, the Alpinotype scheme put forward in 1947 by the intriguing and almost forgotten German-born geologist André Schneider. According to Soares de Andrade, the reasons why Schneider's challenging analysis of Variscan Iberia went almost unnoticed and is currently largely ignored by the scientific community are threefold: the advanced nature of Schneider's mobilistic views, and the fixist intellectual environment of the 1940s; the fact that Schneider's paper was written in Portuguese; and the restricted circulation of the periodical where his interpretations were expounded, *Técnica*, a journal published by students of Lisbon Technical University. Soares de Andrade concludes that Schneider's scheme for the Iberian Variscides, especially its nappe structure, represented a pioneering view, which was (re)discovered in the 1960s. Schneider was involved in tugsten exploration in northern Portugal during World War II, but the contours of his coming to and departure from Portugal remain obscure. We may hope that Soares de Andrade will be able to unveil the mysteries surrounding this elusive character, surely a case that would delight Raymond Chandler's Philip Marlowe.

Miguel Telles Antunes, presents two articles, 'The Earliest Illustration of Dinosaur Footprints'; and a paper, co-authored with Philippe Taquet, entitled '*Le Roi Dom Pedro V, Alcide d'Orbigny et la Paléontologie: un exemple de rapports scientifiques entre la France et le Portugal*'. In the first article, the author takes up archaeological, historical, and palaeontological data and correlates them with the practice of religious cults. He claims that the tile panel of the Pedra da Mua chapel, located at Cape Espichel, is seemingly the first representation of dinosaur footprints ever produced in Portugal or anywhere else. These footprints were first recognised by Telles Antunes in 1971–1976 as having being due to late Jurassic sauropod dinosaurs. In the second article co-authored with Philippe Taquet, the authors tell us about the interests in the natural sciences of one the most learned Portuguese monarchs, Pedro V. In this chronological narrative, covering almost seven decades, the authors give an account of Pedro V's travels in Europe, in particular the relationships between Portugal and France, and of the contacts the Portuguese King established with naturalists such as Alcide d'Orbigny and Roderick Murchinson. Pedro V's visit to the Natural History Museum in London, his luncheon with Queen Victoria, and the fossil collection he was offered at the Natural Museum of Paris, were high points of the King's journeys abroad and portray the scientific interests cultivated by the European aristocracy during this period.

Although scattered in different parts of the *Proceedings*, the following four papers present common features and for this reason I shall deal with them as a group. They were written by history of science Portuguese post-graduate students, and all rely primarily on sources kept at the Historical Archive of the Institute of Geology and Mining, Lisbon, many of

which are now being brought to light. This archive, although well preserved, is not catalogued, unfortunately a situation that is not unusual in Portugal.

Renato Ribeiro focuses on the 'Growing Interest in Mining in Portugal by the End of the Eighteenth Century' and analyses the measures taken to promote mining in continental Portugal, and their limited outcome. In the context of the late eighteenth-century economic policy aimed at reducing imports, this trend culminated in 1802 with the creation of the General Administration of Mines and Metals of the Kingdom (*Intendência Geral de Minas*), a state-led response to the needs of Portuguese industry, the majority of which were state-controlled.

With her article 'Bringing Rocks into State Bureaucracy: the Portuguese Geological Survey' Vanda Leitão addresses the circumstances that led to the creation in 1848 of the Geological Survey, in the context of the Royal Academy of Sciences of Lisbon, and its suspension in 1855. She then analyses a document produced the following year by Isidoro Emilio Baptista, a graduate of the Paris *École des Mines* and professor at the Lisbon Polytechnic. It contained a set of proposals meant to improve Portuguese mining and was to provide the basis for the creation, in 1857, of a second Geological Survey, under the aegis of the Ministry of Public Works, Trade and Industry, an emblematic power structure of Portuguese liberalism.

Luís Teixeira Pinto presents a well-argued paper entitled 'Paul Choffat's (1849–1919) early Contributions to Portuguese Geology'. The Swiss-born Choffat worked for the Portuguese Geological Survey under contract and became one of its leading geologists. The author analyses Choffat's early researches and his network of contacts overseas. Teixeira Pinto argues that Choffat's coming to Portugal was part of a deliberate strategy designed by Carlos Ribeiro, first Director of the Survey, and his successor Nery Delgado to develop and internationalise Portuguese geology as practised in the context of this institution.

Finally, Maria das Dores Areias addresses geology in the context of nineteenth-century imperialism in a paper titled 'Rocks'n Roll: The Contributions to African Geology of Portuguese Travellers Malheiro and Andrade'. She begins with considerations of science and imperialism in the nineteenth century and in particular the ambivalent situation of Portugal, a peripheral country in the European context, but a centre in relation to its African colonies. She then analyses the contributions to African geology of two men of different political profiles and professional careers, Malheiro and Andrade. They both sent geological data and maps to Choffat, which were analysed by the Swiss-born geologist. In this way Choffat carved a place for the geology of Angola and Mozambique in the European scientific scene.

In her paper 'The Contributions of the Moscow University Natural History Museum to the History of Geology in Russia in the Nineteenth Century' Zoya Bessudnova tells the fascinating history of the Natural History Museum of Moscow University. She traces its origins back to eighteenth-century collections and donations. The German Johann Gotthelf Friedrich Fischer von Waldheim, a former student of Werner, played a major role in the organisation and cataloguing of the collections, as well as in introducing palaeontology to Russia. The research associated with this Museum was continued by Fischer's remarkable successors and it became an important centre in the emergence of new geological disciplines and the training of geologists in nineteenth-century Russia.

The Australian geohistorian David Branagan presents two papers: '2001 Rocks—an Australian Memorial to Federation'; and 'Rock and Stone on Canvas—Real or Imagined or Geology and Painting: Fifteenth-Century Beginnings'. In the first brief article the author recalls the role geologists had in the celebration of the Australian Commonwealth's first Centenary. In planning this celebration, the historian Gavin Souter had the idea that a permanent monument to mark the occasion could be built with rocks coming from all the states composing the Australian Federation. The symbolic role of the rocks was manifold, and would remind people that the Australian continent is more than 2,000 millennia old. As the centenary was celebrated on 1 January 2001, 2001 rocks were brought to Sydney from all over the Commonwealth. Geological Surveys were among the various institutions, private and official, that sent the rocks, with which the sculptor Hayden Wilson built the monument commemorating the Centenary event.

In his second article, Branagan focuses on the interesting relationships between geology and painting, addressing some of the artistic problems facing the landscape artist. Perspective is certainly one, which explains why landscape painting developed only around the mid-1400s, when perspective was understood in both theory and in practice. However, the author adds other reasons, philosophical and sociological—namely the relation between man and God, and the human values associated with nature. After listing some of the most renowned painters, ranging from Van Eyck to Leonardo, and the particularities of their depictions of landscape, Branagan addresses what he calls 'lesser works'. He concludes with an analysis of the geological features that may be recognised in fifteenth- and early sixteenth-century landscape painting, and points to the challenging question of correctly identifying the landscape locations portrayed by artists.

In his article 'Between Dinosaurs and Turtles: José Royo Gómez (1895–1961) and the Study of Fossil Vertebrates in Contemporary Spain', Jesus I. Catalá begins by situating the consolidation of geology and palaeontology in the context of Spanish natural history and considers the role of major institutional developments and events in this process. He identifies two centres in particular that contributed to the development of geology and palaeontology in Spain: one linked to the National Museum in Madrid, led by Eduardo Hernández-Pacheco; the other in Barcelona, first at the Geological Museum, and afterwards at the Diocesan Seminary. They are usually known as the 'Madrilenian geological school' and the 'Catalan school of geology' respectively, but the author questions this dual perspective. He then focuses on the contributions of Royo, during the dictatorship of Primo de Rivera and the Second Republic. A former pupil of Hernández-Pacheco in Madrid, and a Republican, his allegiances led to his exile in Colombia, following the Spanish Civil War. Despite his tribulations, Royo produced novel interpretations of the fossil record and of Iberian stratigraphy and tectonics. His contributions converted him into an essential reference for the study of the Iberian continental Tertiary and the palaeontology of Mesozoic vertebrates, in particular the dinosaurs of the Valencian Wealden, a topic he developed in the 1920s.

Barry Cooper from Adelaide presents a study on 'The Use of Stone in South Australia'. As early as 1840 buildings, ranging from churches and theatres to warehouses in South Australia, were built of stone so that by 1880 about sixty per cent of dwellings were constructed of stone. The author argues that despite the fact that South Australia has only had a short history and is a very small producer of building stone on the world scale, the use of stone in this region can be

used as a case study in the world context. Cooper focuses on the particular case of Adelaide, a testimony to the building stones locally available and economically exploitable. He covers the use of loose stone like river pebbles, hard nodular limestone or calcrete, which made up half the buildings in Adelaide, and the locally called 'bluestone', bedded shale, which replaced calcrete when it became scarce. Cooper also tells the story of the use of South Australian sandstone, limestone, marble, granite, and slate in buildings, as well as of the stones imported to the region, such as marbles, granites, and limestone, including travertine.

In a creative article, 'Life, Work and Historical Reception of Alchemist and Mining Engineer Martine de Bertereau († c. 1643)', Martina Kölbl-Ebert gives a kind of 'cubist' portrait of an elusive character, Martine de Bertereau, Baroness of Beausoleil. Charged with practising the occult arts, the Beausoleils (Martine, her husband, and their children) had apparently a tragic end but seemingly a fascinating 'afterlife'. With almost no primary sources available—other than two letters by the Abbé de Saint-Cyran, Bertereau's fellow prisoner at Vincennes, and the Baroness's own writings on mining—Kölbl-Ebert has set out to investigate the many shades and colours in which her character's portrait has been painted over the last two hundred years: from a famous adventuress and wizard to an 'eminently rational, empirical and modern individual', and a prophet of the industrial age. As a woman in a male business, in the twentieth century Martine de Bertereau eventually reached the status of a feminist heroine. After providing a short biography and trying to reach Madame de Beausoleil's personality, Kölbl-Ebert focuses on her writings and geological work. She ends with Bertereau's posthumous 'life' in the narratives of historians, librarians, encyclopaedists, and journalists, thereby providing an example of how history can be forged, to some extent by its own characters, and how each historical period selects its heroes and demons, in accordance with dominant ideologies. I am sure Madame Beausoleil's life has all the ingredients for a movie plot or a novel, and one cannot avoid thinking of how the late Marguerite Yourcenar might have written it.

In 'Size and Hypertely: Simpson's Exemplars for the Evolutionary Synthesis' Léo F. Laporte focuses on the work of the American palaeontologist George Gaylord Simpson, a major participant in the 'modern evolutionary synthesis'. Laporte argues that in all Simpson's works the claim that micro-evolutionary processes of the geneticists and ecologists were necessary and sufficient to explain the macro-evolutionary record of fossils is a recurrent theme. One of the examples presented by Simpson was the phenomenon of phyletic size increase and associated hypertely—that is, the claim that size increase leads to maladaptive structures and ultimately to extinction. Laporte argues that in spite of acknowledging the reality of phyletic size increase Simpson denied that it demonstrated internally-directed 'orthogenesis'. In addition, Simpson resorted to examples of cases of supposed hypertely to deny the two other presumed inherent evolutionary mechanisms: of 'momentum' and 'inertia'. Laporte then analyses Simpson's arguments in the context of this fundamental discussion and concludes that on the one hand Simpson had to demonstrate that the evolutionary mechanisms put forward by contemporary genetics and ecology provided a theoretical framework for interpreting the actual historical patterns of evolution presented by palaeontologists; and on the other he had to demonstrate that the prevailing counter-interpretations of palaeontologists were ill-founded or even wrong. Laporte claims that in designing his arguments Simpson's use of phyletic size increase and hypertrophy, particularly in vertebrates, was critical.

Goulven Laurent offers a paper titled '*Cuvier et Élie de Beaumont*', in which he claims that the received view, according to which Beaumont was a follower of Cuvier in his defence of catastrophism and fixism and was opposed to evolution, needs to be revised. Laurent argues that Beaumont was a symbol of the opposition to evolution rather than a true opponent and that he distanced himself from Cuvier's most ardent followers. Following an overview of Beaumont's career and his theories of a contracting earth and the antiquity of Man, Laurent contends that one needs to read Beaumont's *oeuvres* chronologically in order to realise how much he drifted away from Cuvier's views, especially following the death of his *maître*, in 1832. By the 1830s, Laurent argues, it is clear that Cuvier's catastrophism was already obsolete in France, and Beaumont could easily dismiss universal catastrophes to advocate, rather, catastrophes of limited effects. Regarding species, though Beaumont did not subscribe to the principle of transformation of species he did believe in the continuity of life, and consequently admitted the existence of intermediary forms of life, which nevertheless were still unknown. Laurent shows that Beaumont's position was perceived as contrary to Cuvier's by his contemporaries and that Darwin argued that even geologists such as Beaumont had discarded the notion that the inhabitants of the globe had been destroyed by a series of periodic cataclysms. Laurent claims that Beaumont assumed an intermediate position between dogmatic catastrophism and anti-catastrophism. He further argues that the 1850s marked the maturity of Beaumont's conciliating view regarding the history of earth. However, while he never came to accept evolution and natural selection, this is not, Laurent argues, enough to rank him among Cuvier's faithful advocates. Finally, the author draws attention to the fact that ideas such as Beaumont's are close to present views on the earth's history.

Ursula B. Marvin presents a paper entitled 'The Meteorites Fall at Évora Monte, Portugal, 1796' in which she addresses the case of the fall of a meteorite whose occurrence is accepted as real on the basis of written descriptions, despite the absence of the meteorite or of any fragment of it. Dr Marvin gives an account of the importance of this meteorite's fall in the general acceptance of meteorites as natural phenomena. She then gives an overview of the characteristics of meteorite fall phenomena as they are understood today so that the reader can understand the attitudes towards these phenomena in the late eighteenth century. Marvin proceeds with a discussion of the importance of meteorites in geology, especially their impact on the knowledge of rock types on other planets, and concludes with an overview of meteorites that have fallen on Portuguese territory.

In his paper 'Origin, Development and Present Day State of Ideas on the Great Extinctions, their Causes and Relations with the Earth's Geological Evolution', Evgenii Milanowsky begins by expounding the views of Russian palaeontologists and geologists, in particular, the couple Marie Pavlova and Alexei Pavlov in the 1920s, and more recently of A.S. Alexeev in 1998. Pavlova analysed different views on the factors influencing mass extinctions of living organisms. Her husband took into consideration various epochs of animal development and of mega-extinction. As Milanowsky argues, Pavlov drew attention to the connections between epochs of extinction and epochs of orogenesis, of diastrophism phenomena and phases of volcanic activity. The author points to the fact that Pavlov's views are still influential in Moscow University where he formed the well-known 'Pavlov school'. Meanwhile, in the last two decades progress has been made in

the study of taxonomic diversity during the Phanerozoic and also in the study of extinction phenomena beginning at the end of Late Phanerozoic. Lately, so Milanowsky argues, Alexeev claimed that each great cycle of changes in taxonomic diversity of biota occurring between two sequential epochs of mass extinction generally begins with a relatively short period followed by a considerably longer one of fast increase of taxonomic diversity; then a period of preservation of the high level of taxonomic diversity ensues. The cycle ends with a relatively short period of biotic crisis, when the diversity of taxonomic biota decreases, leading to the great or greatest extinction. Milanowsky proceeds to the analysis of the possible causes of great extinctions and of two different groups of hypotheses, mainly derived from the consideration of external and internal terrestrial factors. He personally believes that cosmic phenomena control to some extent the development of many terrestrial geological and biological processes, namely the mass extinction of biota and their periodicity.

David Oldroyd offers a very different approach from Milanowsky's article, which was centred on a cyclic model for biota extinction, in which human action played no role. In his paper 'The Extinction of the Australian Megafauna', Oldroyd deals with an ongoing controversy between two opposing views on the causes underlying the extinction of megafauna in Australia. He begins with considerations on the relationship between population growth and economic development by invoking the views of the Romanian-born economist Nicholas Georgescu-Roegen (1971), who put forward the idea that the Earth as a whole is a kind of heat engine, in which the Sun is the heat source and outer space the heat sink. The Sun and plants provide us with ordered matter, and Georgescu-Roegen makes the analogy between ordered matter and a 'dowry' (e.g. oil or coal), which is only available to us once. Consequently, humanity is currently running the risk of spending its dowry, by over-exploiting resources such as oil and water, among others. According to Oldroyd, conciliation between economic growth and an ecological steady-state system seems almost impossible to achieve, a belief that has led him to a pessimistic neo-Malthusian position. Looking retrospectively, he raises the question whether or not humans have always behaved as they do today, when they had at their disposal a large new resource that seemed inexhaustible at first. This question entails another, which raises the possibility of humans having been responsible for the extinction of the world's megafauna. Oldroyd then reviews ideas about megafauna extinctions advocated by the Australian zoologist and palaeontologist Tim Flannery (overkill theory) and by the American Paul Martin (*Blitzkrieg* theory), who both emphasise human predation as the cause of megafauna extinction, as opposed to climatic changes. The author proceeds with a history of early research of Australian megafauna in the nineteenth century, and with the discussions of the topic in the twentieth century, in particular the interpretations surrounding the research carried out by various teams at the Cuddie Spring Site on the Western Plains of New South Wales, since the 1990s. In particular, Oldroyd addresses the role of different dating techniques in fuelling the debate between two major contenders, Tim Flannery and David Horton, who opposes the overkill model, as far as Australia is concerned, and advocates climatic change as the main cause of the demise of the megafauna. The debate has been complicated by the intrusion of ideological questions and political beliefs. These beliefs are associated on the one hand with Flannery's Neo-Malthusian perspective; and on the other, with Horton's endorsement of the 'Aboriginal Cause', which by portraying the aborigines as people living in harmony with nature refuses the idea of their being the cause (or one of the causes) underlying megafauna extinction in Australia. So far, as Oldroyd argues, Flannery's theory has got the upper hand but there is much contradictory evidence. In his concluding remarks Oldroyd confides that at when beginning the paper he accepted Flannery's outlook, but by the end he was closer to Horton's as far as Australian megafauna is concerned. However, he is not completely sure and argues that perhaps they are both right and maybe both human and climatic changes were responsible for the extinctions.

In her paper 'Geology: A Balancing Act?', Sally Newcomb addresses the question of the use of weighing balances in the history of geology and the impact of the information they gave, especially at a time when the balance was instrumental in chemistry. In her introduction, Newcomb claims that in order to understand the part that weight relations played in general, and particularly in geology, one has to review three kinds of evidence. The first comes from the history of geology, and shows that chemical procedures and methods of chemistry were applied to solve geological questions. The second comes from the history of technology, particularly metallurgy and assaying. The third kind of evidence is provided by literature about instruments. Despite the many cross-overs, the author contrasts the interest of chemists when using balances and those of geologists in the eighteenth century. For those working with terrestrial materials their goal was measurements of specific gravities and, or, chemical analyses of minerals in order to identify and characterise them. Newcomb shows that the need to standardise balances and weights was recognised from mid-eighteenth century onwards. She contends that balances and weight relations had a major use in the determination of mineral composition, and in the analysis of mineral waters, and overall they contributed to the emergence of geology as the science we know today.

Manuel Serrano Pinto's paper 'Memoir Written in 1796 by Manoel Ferreira da Camara about Mining in Transylvania' analyses Camara's article and its consequences for mining in Brazil in the first half of the nineteenth century. The author begins with a short biography of Camara, a Brazilian-born who completed a degree in natural philosophy and in law at the University of Coimbra. With a grant from the Portuguese Government he went in 1790 first to France to study chemistry, mining, and mineralogy and in 1892 to Freiberg. From 1794 to 1798 he visited mines in Central and Eastern Europe, Scandinavia, and Britain. Following his return to Portugal he held various administrative positions pertaining to mining. In 1799 he settled in Brazil, and worked in Bahia and Minas Gerais. When Brazil became independent in 1822 he began a career as a politician. He is considered to be the first Brazilian mining engineer. Serrano Pinto proceeds with the analysis of the manuscript and concludes that its interest derives from the fact that it is an independent source of information on mining in Transylvania in the eighteenth century and should be taken into account in studies on the history of the natural sciences in that part of Europe. In addition, the author argues that many of Camara's ideas expressed in this memoir took expression in the Portuguese mining legislation issued between 1803 and 1808, and that Camara also tried to apply them in Brazil.

Liliana Póvoas and César Lopes offer the paper '*Dinosaures au Muséum National d'Histoire Naturelle (Lisbonne). Histoire d'un Processus de Communication*', in which they explore the idea that the Lisbon Natural History Museum has been a privileged place for the communication of science to the public. The authors begin by analysing various dinosaur exhibitions organised by the Museum and are drawn to the conclusion that science has to reach increasingly wider audiences.

They argue that dinosaurs provide a good starting point to acquaint people with geology, because extinct animals are generally appealing to the public and find a good reception in the media. Dinosaur exhibitions, workshops and contests which the Museum has promoted have shown that these kinds of event link the Museum to the local community, especially schools. However, such events are still received with suspicion by some sectors of the Portuguese scientific community. This article makes Portuguese readers especially reflect on the role and potential of popularisation in the realm of the earth sciences.

The article 'The Tunguska-Catastrophe and Events in the High Atmosphere on June 30, 1908' by Wilfried Schröder advocates the idea that the phenomena reported to have been seen on 30 June, 1908—auroras, noctilucent clouds and increased nightglow—might not have been observed after all, or were not associated with the Tunguska catastrophe, caused by the impact of a meteorite. Schröder goes through various geophysical and astronomical reports that support his view, in particular, that the alleged aurora could not have been observed and that is impossible to establish a connection between the effective duration of the other phenomena and the Tunguska meteorite. To this day, the Tunguska catastrophe is surrounded by mystery and continues to excite the curiosity of the scientific community.

Joahannes Seidl's paper '*Quelques documents inédits concernant le début des géosciences à l'université de Vienne. La tentative d'Eduard Suess (1831–1914) d'obtenir l'autorisation d'enseigner la paléontologie dans la Faculté des Lettres (1857)*' addresses Eduard Suess's attempt at teaching palaeontology at the Humanities Faculty of the University of Vienna. Seidl begins with biographic considerations of Suess, whose life he states is well documented, especially after 1862 when Suess became professor of palaeontology at the University of Vienna. Seidl argues that prior to this period Suess's biography still presents some unresolved questions and sets out to clarify the period around 1857, when Suess tried to obtain permission to teach palaeontology. Based on hitherto unknown manuscripts at the Administration Archives and National Archives of Vienna, the author explains that on 28 March, 1857, Suess wrote a letter to the Humanities Faculty of the University of Vienna in which he asked permission to teach palaeontology; but he failed. Three weeks later Suess addressed the Minister of Culture with a similar letter but he added a *curriculum vitae* and a document in which he explained the contents of the course he would teach in the event of being given the professorship. The *c.v.* offers new information. Suess had collaborated with Thomas Davidson, who in 1853 had published the first volume of *British Fossil Brachiopoda*. Suess corresponded with him and was intending to publish a German translation of Davidson's work. With his course, Suess intended to show his students the essential role of fossils in stratigraphic research, and he emphasised that he would use the collections of the *Hofmineralienkabinett*. As Seidl shows, this was perhaps the decisive argument in the Minister's decision to recommend Suess's appointment to the first chair of palaeontology in a German-speaking country.

David Spalding writes a paper entitled 'Friendly Rivalry or Bitter Feelings? The Canadian Dinosaur Rush', in which he analyses two competing expeditions undertaken around 1912–1915 along the Red Deer River in Alberta, Canada. They were respectively led by two American-born collectors: Barnum Brown, curator at the American Museum of Natural History, New York, and Charles Sternberg, working for the Geological Survey of Canada. Spalding's purpose is to reassess the account of Edwin Colbert in his pioneer history of dinosaur collecting, *Men and Dinosaurs* (1968), in which Colbert commented that the Canadian 'Dinosaur Rush' was marked by amicable rivalry and that the two groups worked in friendly competition. Spalding remarks that this chapter of the Canadian Dinosaur Rush is far from being well understood, in particular the development, transfer, and appropriation by specialists working locally of the field technique in which large fossils are encased in a jacket plaster of Paris before their removal from the field. Spalding argues that while the broad picture of the competition between Brown and Sternberg parties is clear the contours of the opposition raised against Brown's activities need further analysis. The author also claims that while the two parties were not in open rivalry they expressed their bitter feelings to each other and the parent institutions. Spalding ends by remarking that research on this topic is still being carried out in order to fully assess the history of the Canadian Dinosaur Rush, inasmuch as this episode involved several of the world's most important palaeontological institutions. In addition, the site where it occurred was established as the first world heritage site, and it is arguably one of the richest in the world.

The paper 'Quarrying and Geology in early Eighteenth-century Italy: The Lithological Column of Gregorio Piccoli (1793)', authored by Ezio Vaccari and Ettore Curi, addresses the scientific literature produced by a forgotten, poorly documented and supposedly minor eighteenth-century Italian figure, Gregorio Piccoli (1680–1755), whose activities developed in a provincial context. Piccoli was born in Erbezzo, a village in the pre-Alps near Verona. He was ordained priest but also became a land surveyor and a cartographer. In the course of these activities he was led to study palaeontology and geology, which culminated with a publication in 1739. The authors argue that among Piccoli's various interesting considerations was the lithological column presented at the end of his text, together with a topographical map of a wide area of northeastern Italy, in which he indicated the locations of different kinds of fossils. With his lithological column, Piccoli intended to show the series of regular horizontal strata as observed by him in various quarries of the Verona region. Vaccari and Curi contend that this columnar visual representation was unusual but not unique in early eighteenth-century Italian geology and preceded by twenty years the '*coupes générales*' of Lavoisier published in Guettard and Monnet's *Atlas et description minéralogique de la France*. According to the authors, Piccoli's columnar representation was probably taken from the drawing practice of the quarrymen or inspired by a visit to a flagstone quarry in the Lessini Mountains. Vaccari and Curi also argue that visitors to the site of some ancient quarries in these mountains may easily identify Piccoli's geological column. Despite the small circulation of Piccoli's 1739 book, the authors claim that the value of his lithological column is significant for the history of Italian geology.

Frederik van Veen from the Netherlands presents an article titled 'Ideas about Salt-Tectonics in Europe and the USA in the Early Twentieth Century' in which he confronts various salt-dome theories co-existing in Europe and the US. The author focuses on the discussions surrounding this topic at the end of the nineteenth and beginning of the twentieth century. The association between oil fields and salt domes on the American continent in the late nineteenth century led American scientists to think about the origin of salt deposits and to propose a multitude of theories. As the author argues, some of these theories were speculative because there was little knowledge about salt structures. In the early twentieth century, a lively discussion arose in the US about the origin of salt domes, ranging from theories advocating expansive

recrystallisation forces to volcanic activity. In Europe, knowledge of the origin of salt deposits relied primarily on the long history of salt mining. Notably the concept of 'diapir' was introduced in the early twentieth century and during the first decades the discussion about the origin of salt domes was limited to orogenic and isostatic mechanisms. Van Veen claims that the visit of the Dutchman Willem Waterschoot van der Gracht to the US in the early twentieth century was of major importance in making the European ideas known to American geologists.

Ana Carneiro, Lisbon

History of Geological Research in Austria and Neighbouring Countries from the Perspective of the 150th Year of the Federal Institute of Geology, Vienna

Christina Bachl-Hofmann, Tilfried Cernajsek, Thomas Hofmann & Albert Seidl, *Die Geologische Bundesanstalt in Wien: 150 Jahre Geologie im Dienste Österreichs (1849–1999)*, Böhlau Verlag, Vienna, 1999.

Harald Lobitzer & Pavol Grecula (eds), 'Geologie ohne Grenzen: Festschrift 150 Jahre Geologische Bundesanstalt, *Abhandlungen Geologische Bundesanstalt, Wien*, 1999, 56 (1).

Both these books describe the history of the Imperial/Federal Institute of Geology, Vienna, and the geological exploration of Austria and the former states of the Austro-Hungarian monarchy (now Austria's neighbouring states) in great detail. They show the reader a wealth of facts and correlations about the geological mapping and the search for mineral raw materials in these states. In addition, there are a variety of biographies of geologists, mining engineers, and politicians who were involved in the research and participated in the implementation of important resolutions for the development and organization of the geological survey in Austria.

The Imperial Institute of Geology had the task of researching the geology of the Austrian empire and publishing its findings in publicly available maps. Additionally, a geological and mineralogical museum, and a chemical laboratory (also to be used for metallurgical investigations), were established. All discoveries were to be published and an archive established. The Institute's first Director was Wilhelm Karl von Haidinger.

The 538-page commemorative book, *Die Geologische Bundesanstalt in Wien*, contains—in addition to introductory remarks about present geological developments—the following chapters: a 'History', with sections about the Institute's development and pre-history since its establishment in 1849; the period until the end of World War I, with the results of researches in Bosnia/Herzegovina, Italy, Croatia, Poland and Galicia, Slovakia, Bohemia, Moravia, and Austro-Silesia and Hungary; the activities of the Federal Institute during the first Austrian Republic (1918–1938); the period of affiliation with the Third Reich (1938–1945); the period of reconstruction (1945–1973); and the period of re-organization (1973–1998). There follows the chapter 'Duties and Activities', with a detailed and well-illustrated presentation of the modern geological survey, its duties, programmes, and organization (pp. 183–341). The chapter 'National and International' is also interesting, with its overview of Austria's international activities and the honours and medals that have been awarded over the years. The chapter 'Accommodation and Environs' provides an account of the construction of the Rasumofsky Palace, a biography of the building's owner Prince Andreas Rasumovsky, and a record of prominent visitors to the Institute. 'Light and Sentimental Retrospective' provides something to smile about, giving examples, in historical context, of artistic, politico-critical and satirical productions of the Institute's workers. They are mostly about the continuation of the Imperial Institute of Geology or the Federal Institute of Geology, especially when the State was in dire straits. In the chapter 'Outlook', the present and future roles of the Federal Institute are highlighted. Its activities are presently focused on editing geological and thematic maps; the exploration of mineral deposits and minerals for industry; on hydrogeological problems; geophysical topography; geological engineering; environmental geology; and information and documentation. The Institute presently has a staff of about 120.

The exceptionally well produced commemorative book has an Appendix that provides a chronological table of events, a list of directors, the leading staff and scientific personnel since the organization's inception, a compilation of the legal framework for the work of the Imperial and Federal Institute, a list of the maps produced by the Austrian Geological Survey, examples of geological maps of historical importance, and an extensive bibliography.

The second commemorative book was published to celebrate the 150th year of the Federal Institute of Geology, Vienna, being Volume 56 (1) of the Institute's *Abhandlungen*. Edited by Harald Lobitzer and Pavol Grecula, and entitled *Geology without Borders*, it has 460 pages and 28 copiously illustrated and interesting contributions. Here, the objective has been to demonstrate the close connections that Austrian geologists and mineralogists have had with colleagues in neighbouring states. Von Haidinger himself came from Bohemia; the distinguished early geologist Mark Vinzenz Lipold came from Slovenia, and the Institute's third Director Dionys Stur hailed from Slovakia, where he is regarded as the founder of Slovakian geology. This close association with neighbouring geological research continues to this day, without regard to political boundaries, in many forms of interdisciplinary co-operation.

Part A of the volume is headed 'Contributions to the History of Geology: the Imperial/Federal Institute of Geology and Neighbouring States'. Seven contributions describe the historical relationships between geologists from Switzerland, Bavaria, Bohemia, Slovakia, and Italy. Part B contains contributions to the history of geology: biographical information and special material about the geological exploration of Bosnia and Herzegovina, the Tyrol, *Vorarlberg*, Hungary, and Bohemia, and also the role that the Institute of Geology played in the appointment of lecturers in the geosciences to the chairs at Graz.

Part C, entitled 'Crystalline and Palaeozoic [Rocks] in Austria', has contributions about the *Zweiglimmer Granit* of the south Bohemian plutons; the petrology, geochemistry and *Weissmetrik* of marble from the Lower Tauern; ideas concerning the Silurian nautiloids of the Karnische Alps; bivalves of the Karnische Alps; the stratigraphy, geochemistry and conditions of deposition of the graptolite slates of the Karnische Alps; and the high-pressure metamorphosed basalts from Bad Ischl in the Salzkammergut.

The concluding Part D, entitled 'Miscellaneous', compares the 'Magura' nappe with the *Flysch* of the eastern Alps; provides an archaeological inventory of earlier settlements between the Raab and Mur Rivers (Austria, Slovenia, and Hungary); gives an account of the Miocene volcanite of the Steirisch Basin; heavy metals in the Inn Valley; geo-electric co-operation between Austria and Hungary; the Upper Chalk of the Trans-Danube highlands (Hungary); and lastly the Middle Eocene microfauna of Tierra del Fuego (Argentina: which is geographically disconnected from the other topics in the volume). The

volume also contains a great variety of often historical photographs, fossil images, geological maps and sections, and an extensive bibliography.

I should like to thank the publishers and editors for the extensive and detailed work that these commemorative volumes provide. It is to be hoped that these valuable geohistorical books will both reach a wide audience among specialist colleagues.

Peter Krüger, Berlin

Theoretical Notions from Russia

Igor A. Rezanov, *Evolution of the Concepts of the Earth's Crust*, Nauka, Moscow, 2002 (in Russian).

Dr Rezanov's monograph is devoted to the evolution of the ideas about the Earth's crust—the principal object of geoscience. The author reviews three crustal models that arose consecutively, prior to the invention of seismic surveys: one based on the idea of a primitive crust produced by a cooling Earth; one based on the principle of contraction and differentiation into rigid cratons and deformable orogens; and a model based on the principle of isostasy, with crustal blocks differing in density or thickness. The difference in crustal structure between continents and oceans was postulated by Alfred Wegener in 1912 on the basis of isostasy, and in 1914 Reginald Daly proposed a two-layer structure of the continental crust (granite-gneisses resting upon a basaltic layer). The discovery of a seismic discontinuity, interpreted as the base of the crust by Andriy Mohorovičić in 1901, and the discovery of a discontinuity inside the crust by W. Conrad, enabled Harold Jeffreys in 1926 to introduce the notions of the granitic and basaltic layers into the seismic model of the crust. His model, however, differed essentially from that proposed by Daly. The latter believed that the consolidated crust rested upon molten basalt, whereas Jeffreys insisted, with reference to seismic data, that the whole Earth was solid down to the core. The modern seismic models of the continental crust appeared in the 1940–1950s. The Russian geophysicists Grigory Gamburtsev and Yuri Godin, who adjusted and applied refraction seismic surveys to the study of crustal structure, played the leading part in the solution of this problem concerning continental crust. The Lamont–Doherty Earth Observatory of Columbia University in the US, headed by Maurice Ewing, played the leading part in the studies of oceanic crustal structure.

The author himself strongly favours the three-layer model of the continental crust, with a waveguide in the middle, proposed by Irina Kosminkaya and Ninel Pavlenkova in 1986.

Rezanov recognizes two approaches to interpreting the origin and early evolution of the Earth's crust: the cosmic approach, according to which the early history of the Earth is deduced by analogy with the Moon and the other planets; and the historical–geologic approach, based on constituent rock formation conditions. He arrives at the following conclusions on the early Earth's evolution (p. 196):

1. We should refrain from trying to find the solution to this major geological problem by analogy with the histories of other planets such as the Moon, the Mars, the Venus, and the disintegrated Olbers' planet. This is a vicious circle; within which we lose the possibility of deducing individual features of our planet's early history.
2. It is wrong to speak about a gap in the Earth's geologic record, which prevents us from having knowledge of the events on our planet that took place during the initial 500–800 Ma of its history. It is merely that we are still unable to understand the initial pages of this record, as is evident from the recent publication of the discovery of granites in Australia dated 4.4 Ga.
3. A radical difference between the early histories of the Earth and the Moon has been established: the crust of the former has undergone high-pressure metamorphism (granulite facies) that is absent on the latter.
4. The high-pressure metamorphism of the primitive crust was caused by the pressure of 8 ± 2 kbar exerted by the primary hydrogenous atmosphere, which dissipated at about 4.0 Ga.
5. The granite-gneiss ('granitic') layer of the continental crust with a thickness of about 10 km was formed as a result of two processes: the eruption of basalts and their granulite metamorphism during the initial 500–600 Ma of the Earth's history; and granitization of the granulites, which continues up to the present. The lower crust (the 'basaltic' seismic layer) is composed of mantle serpentinites, depleted as a result of basalt separation at the beginning of the Earth's evolution.

The author proposes an original explanation for the low thickness of the oceanic crust. Rezanov sets out the history of the plate-tectonic hypothesis and proposes an alternative concept of 'oceanization'—the inception of oceans as a result of the transformation of the thick continental crust into thin oceanic crust. In the last two chapters of the monograph, he sets out his own understanding of the origin, structure, and evolution of the crust and discusses its chemical model.

Rezanov criticises the plate-tectonic concept and insists that deep oceanic basins arose from pre-existing continents as a result of the dehydration of a thick serpentinite layer at the base of the continental crust. Violent basaltic magmatism in the Mesozoic heated the crust and induced the deserpentinization of its basal layer. The crust sank down isostatically, and the incipient oceanic basins were filled with the expelled water.

The principal scientific attraction of the monograph is the critical analysis of the available geological and geophysical data on the Earth's crust, from which the author has built up the original concept of crustal structure and evolution set forth in the book.

Georgi Khomizuri, Vernadsky Geological Museum, Moscow

A Millerian Aperitif

Lester Horley (ed.), *Hugh Miller in Context: Geologist and Naturalist—Writer and Folklorist. A Collection of Papers Presented at Two Conferences: The Cromarty Years (2000) and The Edinburgh Years (2001)*, The Cromarty Arts Trust in association with The National Trust for Scotland and National Museums of Scotland, place of publication not stated, 2002.*

Elsewhere in this issue (p. 13), the INHIGEO Member and palaeontologist Michael Taylor (Edinburgh, UK) has given a detailed account of a conference held at Cromarty (northeast Scotland) in 2002 to mark the 200th anniversary of the birth of the celebrated Scottish amateur geologist, writer, journalist, and controversialist (in the domain of Scottish ecclesiastical politics): Hugh Miller (1802–1856). The Proceedings of this meeting will be published in due course, but so important is Miller thought to be in Scotland that there were ‘preliminary’ day conferences in the two years preceding the bicentenary of his birth. And it is the proceedings of these two meetings that are presented in this volume edited by Lester Borley, formerly Director of the National Trust of Scotland.

Miller was assuredly a significant figure in the history of Scottish geology, and he is celebrated for his popular geological writings, chiefly on Scottish geology, and particularly on the fossil fish of the Old Red Sandstone, his work on which was immortalized in his book *The Old Red Sandstone* (1841). (As an undergraduate in the 1950s I was particularly enjoined to read this book, and also the biography of Miller’s friend and collector Robert Dick—the ‘baker of Thurso’. Many years later, I actually did as I was told. Far from finding the work a joy to read, I found it a little tedious, but doubtless that would reflect on me, not Miller. By contrast, our lecturer thought that Miller was the *only* geologist who was a significant writer in his own right. Maybe he was correct?)

That Miller should be causing such waves of celebratory enthusiasm two centuries after his death (by suicide) must say something about his importance (or perhaps the rising Scottish sentiment towards the end of the second millennium?). I am a great Scotophile, in regard to all aspects, except Scotland’s weather and its gang warfare football matches. So I cannot but applaud the effort put into examining Miller. In a sense, there is hagiography at work, by virtue of the sheer intensity of attention that he has been accorded these last few years; but the effort in the book here under consideration is to present a rounded picture of the man, his life and times, his social context, and his great range achievements.

Miller had a remarkable career. Born into a middlish-class family (son of a sea captain), in the small fishing town of Cromarty near Inverness, he was a rebel at school and initially decided to become a labourer (a stonemason) rather than a middlish-class person. But while his first avocation took him towards amateur geology, he eventually gravitated back to the ‘middle’. He became first a bank clerk and writer, married a lovely middle-class woman, became involved in Evangelical Church politics, and was invited to Edinburgh to become the first editor of the Evangelical newspaper *The Witness*. In this capacity, he worked frenetically to get out the paper twice a week, and was necessarily *au fait* with a vast array of issues. But he continued to maintain his interest in geology until the end of his life, and made geological excursions each year, which he described to his readers on his return to Edinburgh. And these accounts were subsequently developed into his best-selling books (the success of which was due in no small measure to the efforts of his wife Lydia—herself a writer—to bring out new editions of Miller’s works after his tragic death, and materials that were not readily available at that time).

In geology itself, Miller made his name by his collection and reconstruction of Old Red Sandstone fish, which were washed up in nodules on the shores near Cromarty in the winter storms. He developed a good sense of how the parts fitted together, and he imagined how they all seemed to evidence (divine) design by a mechanically astute Creator. He also made sensible suggestions as to how the anatomical structures indicated the fishes’ mode of life and their conditions of existence. Starting off as a geological autodidact, Miller began to consort with naturalists of the Cromarty region, and later corresponded with leading figures like Roderick Murchison and Louis Agassiz. His specimens were found most useful by the latter, and Miller’s collections contributed significantly to Agassiz’s monograph on the fishes of the Old Red Sandstone.

While Miller was, by the standards of his day, an ecclesiastical rebel (though he thought of himself as safeguarding the heritage of the Scottish Reformers), by the standards of our day his religious thought was quite conservative in that he tried to find a satisfactory reconciliation of the creation myth of Genesis and the results of his palaeontological and stratigraphic researches, proposing that for each of the main stratigraphic subdivision the larger forms came first, followed by smaller fry. So, there were, so to speak, successive creations and degenerations. By this theory, he sought to oppose the proto-evolutionary ideas of his countryman Robert Chambers, the anonymous author of *Vestiges of the Natural History of Creation* (1844).

The articles in Borley’s collection are aimed at saying something about Miller’s geological work for the two phases of his career (in Cromarty and Edinburgh), and rather more about the literary, cultural and social context of these two areas. As to geology itself, Charles Waterston—the doyen of geohistorians in Edinburgh and formerly Keeper of Geology at what is now the National Museums of Scotland, where many of Miller’s specimens are housed to this day—helpfully explains how Miller at first (1838) conflated the types *Coccosteus* and *Pterichthys* [now *Pterichthyodes*] and then later (1840) described them as two distinct forms. Moreover, Waterston explains how it was after Miller’s death that Murchison proposed a tripartite subdivision of the Old Red Sandstone, with the Cromarty beds belonging to the middle unit. But Miller had thought these beds belonged to the lower part of the Devonian System. So his arguments against ‘progressive development’ were stratigraphically in error (though that error should not be held against Miller of course), as well as being philosophically or theologically ‘peculiar’ (as it seems to me). Indeed, I see Miller’s work as a caution against trying to ‘shoe-horn’ stratigraphy and theology into the same box (not that many people other than Creationists want to do that today). It may be, though, that the concept of ‘stratigraphic degeneration’ could have meshed with his Calvinist beliefs. Miller would not have thought his views ‘peculiar’.

Among the papers (which cannot all be discussed here) I should particularly like to mention the autobiographical piece by Stan Wood, an Edinburgh fossil collector, who does ‘work for profit’. That is, he is a commercial collector. There are

* Copies can be obtained directly from Dr Borley (4 Belford Place, Edinburgh EH4 3DH; lesterborley@waitrose.com) or from the shop of the National Museums of Scotland, Chambers St, Edinburgh, price £7.50 + £0.75 for postage and packing.

opposing views in Britain as to the extent to which commercial collecting should be 'allowed' (as discussed by INHIGEO Member Simon Knell in a paper in my INHIGEO volume, *The Earth Inside and Out* [2002]). Whatever the rights and wrongs of this, Wood has had a truly remarkable career in collecting—finding many rare and important specimens, notably in Scotland, and he is highly esteemed by professional palaeontologists. His finds include new Lower Carboniferous fish, rare amphibia, fossil sharks, a new lobe-finned fish, a new genus of 'horse-shoe crab', hitherto unknown Lower Carboniferous reptiles, centipedes, scorpions, eurypterids, and I know not what besides. Wood is evidently a genius collector. It is extraordinary that one man could find so much that had been passed over by all the university, museum, and Survey geologists for so long in a country that has received far more geological attention than most. Evidently, the spirit of Hugh Miller the amateur collector lived on in the Scotland of the late twentieth century. I have never met Stan Wood, but I can well imagine that someone will be writing a book about him on the occasion of the bicentenary of his birth. Of course, if he were so good as to set down his deeper thoughts now, and say how they relate to his social and philosophical milieu, that would be no bad thing. It would save earnest scholars in the future from having to try to work it out from fading historical records. Or would it? Can the historian know more and better, with the advantage of perspective or hindsight?

This thought aside, we have here an interesting little collection (112 pages for thirteen papers). I'm sure it will be seen to have been an excellent foretaste for the bigger book that will follow the meetings and exhibitions held in 2002.

David Oldroyd, Sydney

On the Birth of Modern Volcanology

Borelli, Giovanni Alfonso, *Storia e meteorologia dell'eruzione dell'Etna del 1669*. Translation from the Latin by Nicoletta Morello, Biblioteca della Scienza Italiana, Vol. XXX, Giunti Gruppo Editoriale, Firenze, 2001.

This book consists of an extensive introduction, which begins with an analysis of the major points of Borelli's presentation, followed by a short biography, a discussion of the translation problems raised by the absence of an adequate volcanological terminology in seventeenth-century Latin, and a general bibliography. The major portion of the volume consists of the original Latin and its Italian translation set *in juxta*, namely in facing pages, an extremely valuable and welcome form of presentation for scholarly purposes, which has become a rarity these days.

On 11 March, 1669, after fifteen years of quiescence, Etna became active in one of the most violent eruptions recorded in history. A swarm of earthquakes preceded the opening of a major fissure, 18 km long, on the SE slope of the volcano, from which a torrent of lava of enormous size flowed in the direction Catania destroying and burying everything along its path. An attempt to deviate the flow artificially failed. On 25 March, the summital crater collapsed, accompanied by a large cloud of volcanic ashes and after four months the volcanic activity ceased.

The magnitude of the event had a widespread effect on the scientific community at large and on the local naturalists meeting in the major academies of Messina and Palermo to analyse all the factual observations and examine the samples collected by the first climbings of the volcano after the eruption. Among these naturalists was Borelli (1608–1679) whose life spans almost the entire seventeenth century. He was a naturalist who led a tumultuous life, which did not seem to have interfered too much with his enormous capacities in a variety of fields such as mathematics, epidemiology, animal physiology, astronomy, physics, and geology. He was a forerunner of the revolutionary modern science that replaced the Aristotelian approach with rigorous observation, experimentation, instrumentation, usage of mathematics, logical reasoning, and independence from preconceived metaphysical systems. Borelli seemed to have had earlier plans to study the volcanism of Etna but the 1669 eruption combined with flattering requests of Henry Oldenburg, the Royal Society of London, and the Cardinal Leopold de' Medici precipitated his investigation. In a few months, he wrote what was supposed to be a descriptive account of the 1669 Etna eruption but which in fact became an extensive investigation of the volcanic process and a fundamental contribution to the birth of modern volcanology.

Ironically, Borelli did not witness the huge lava flow in motion, being at the time in Messina working on pendular movement, but his many friends among local naturalists provided him with a wealth of observations and results of experiments which were described in their numerous pamphlets and leaflets published during the eruption. He himself had visited Etna during earlier eruptions between 1634 and 1638 and in May 1670, after the eruption and just before publishing his book. This was a critical visit to observe the effects of the eruption, attempt to reconstruct the process, and verify the validity of the various data he had been given by his friends.

Borelli's book is divided into two parts. The first one (Chapters I–VIII) is the *storia* part of the title which consists of the orographic study of Etna, followed by the complete written account of the eruptive history of the volcano, including the eruption of 1669. These data are the necessary introduction to the *meteorologia* part (Chapters IX–XX), which concerns the natural history of the eruption, its effects and mechanisms. Borelli's apparently unusual use of the term *meteorologia* stressed the fact that the eruption belonged mainly to the group of phenomena called 'meteors', occurring in the atmosphere. Therefore, he extended the significance of the term to all the observable seismic and volcanic facts in the field, the data from experiments, the quantitative evaluation of the huge lava flow, the assumed mechanism of the eruption and other general speculations. Thus, he covered in the absence of an appropriate terminology, the entire field known today as volcanology.

We can only review here a few of the numerous original aspects of Borelli's contribution. His description, still used today, of the well-known vegetation or climatic zones which characterize the huge cone from bottom to top is related to hydrological, optical, physical, and physiological problems debated during the seventeenth century and which belonged to his wide expertise.

Borelli's discussion of the eruptive history of Etna begins by stressing the inadequacy of the earlier records based on speculations rather than field observations, and by the fact that the latter generally did not pertain to observed eruptions. Therefore, he attempted to establish the repeated and characteristic behavior of the volcano: namely an initial phase building the summital cone, followed by its collapse and the start of huge lateral eruptions from radial fissures on the slopes fed by hundreds of parasitic cones. Then, he applied a perfect methodology to his reconstruction of the 1669 eruption from precursor processes to climax and terminal events; from subaerial to surficial and to depth conditions; and from observations to hypothetical

interpretations. He was fully aware that gaseous materials rising as clouds and columns of 'smoke' implied different processes and different origins than fluid materials, among which the huge lava flows were the most interesting.

For Borelli, a lava flow is a self-sufficient closed system, the final product of heat which brought to fusion its minerals. The process is comparable to the flow of a river and the laws of hydrodynamics can be used for its explanation with certain reservations because the movement consists of advances and standstills, which he attributed to two main interfering factors: first, variations of the physical state of the lava by cooling in contact with the atmosphere, and second, friction through contact with the substratum or by incorporation of foreign materials.

The loss of heat was considered the only factor responsible for the liquefaction of the lava into an 'impure vitreous melt', not comparable to the one visible in the ovens of glass manufacturers because of the addition of foreign materials. Furthermore, Borelli did not have even a crude quantitative understanding of the mineral components of the lava and of the foreign materials which play a fundamental role in the viscosity of lava.

Borelli was naturally highly interested in the quantitative determination of the total mass of fluid lava erupted by Etna in 1669, which he calculated as the volumetric mass of solid lava. The purpose was to establish the relationship between the volcano before and after the eruption and the volume of the lava emitted to demonstrate that it originated from the mountain itself. Indeed, his calculations showed that the volume of the spectacular lava flow was only a minute fraction of the entire volume of Etna. Consequently, the volcano did not contain deep caves but consisted of an internal solid and compact core (comparable to a bone structure), completely surrounded by a thin crust, fragile and porous with internal conduits. The lava was generated in melting chambers located just below the summital crater and flowed along the flanks of the volcano just beneath the crust inside or within a curved and fissured 'siphon' by a mechanism which led to the collapse of the summital cone.

The final speculations pertain to the causes of the internal heat attributed to 'seeds of fire', which occur in concentrations of oily, sulphurous, bituminous and nitreous substances, where they change to fire and flames in the presence of air and water. Under these conditions, the explosive eruption is comparable to the effervescent reaction of water poured on quicklime.

As elegantly stated in Morello's introduction, the work of Borelli should not be considered as a treatise on volcanology: it is the natural history of an individual volcano approached in an almost modern fashion as the behavioural model of a single physical object through a rigorous scientific methodology. As a real forerunner, Borelli paved the way for the future consideration of volcanology on a planetary scale.

It is to be regretted that the translation is essentially devoid of explanatory footnotes or endnotes which, written in collaboration with a modern volcanologist, would have enhanced Borelli's pioneer scientific contribution, which was a century ahead of his time. Other disappointing aspects of the book are: the absence of a subject matter index, the rudimentary name index, and a page of two plates with no captions or sources at all. Morello herself stresses that Borelli's work is a fundamental scientific achievement. However her presentation did not succeed in fully documenting the past and present scientific implications of the work.

Albert V. Carozzi, Raleigh, North Carolina

Alcide d'Orbigny: The Multidisciplinary Scientist and Traveller

Taquet, Philippe (ed.), *Un voyageur naturaliste: Alcide d'Orbigny. Du nouveau monde . . . au passé du monde*. Muséum National d'Histoire Naturelle, Editions Nathan, Paris, 2002.

This handsome little volume with its spectacular display of colour illustrations is in fact the catalogue of the exhibition at the Muséum celebrating the bicentennial of the birth of Alcide d'Orbigny (1802–1857). Under the editorship of Taquet, twenty-three articles written by numerous contributors present a complete demonstration of the extraordinary scientific contribution of d'Orbigny.

The first part of d'Orbigny's career consisted of his famous trip to South America (1826–1834) sponsored by the Muséum and during which he studied all aspects of this yet poorly-known continent, between Patagonia and the southern reaches of the Amazonian jungle, sending back to his sponsors an incredible wealth of documents, artifacts, and collections of natural history. He can be seen in full activity as cartographer, prospector, ichthyologist, malacologist, mammologist, herpetologist, ornithologist, botanist, geologist, palaeontologist, anthropologist, archaeologist, ethnologist. The list of his successful fields of exploration is endless.

Upon d'Orbigny's return to Paris, the second phase of his career began. It consisted in the final writing of his notes, the preparation of illustrations and the description of his collections. This task took fourteen years and was completed, with the help of numerous coworkers, by the publication of his *Voyage dans l'Amérique méridionale* in ten volumes (1834–1847), one of the monuments of early nineteenth-century science. D'Orbigny's interest then turned to systematic palaeontology, of which rare collections existed in France at the time. In a few years, by means of numerous fieldtrips, he collected more than 100,000 specimens and described them under the title of *Paléontologie française: Description zoologique et géologique de tous les animaux mollusques et rayonnés fossiles de France* in eight volumes (1840–1856) with the aim of establishing correlations of sedimentary formations on the basis of the detailed inventory of their faunas. He had planned a more grandiose work entitled *Prodrome de paléontologie stratigraphique universelle des animaux mollusques et rayonnés*, of which only the first three volumes appeared (1850–1852). It was an inventory of 40,000 species of fossil invertebrates, among which he selected 18,000 species classified according to twenty-seven geological stages. A formal presentation of his work was given in *Cours élémentaire de paléontologie et de géologie stratigraphiques*, in three volumes (1849–1852). In this combination of palaeontology and stratigraphy, d'Orbigny defined several of the geological stages universally used today, such as: Sinemurian, Toarcian, Bajocian, Bathonian, Callovian, Oxfordian, Portlandian, and Turonian.

In the midst of these monumental works, d'Orbigny did not forget the major scientific interest of his early years: the Foraminifera, whose shapes recalled miniature ammonites and led them to be classified erroneously in the group of cephalopod mollusks. Through painstaking microscopic studies, he demonstrated that they belonged to a particular group, differing from the other cephalopods (as understood at the time), by the absence of a siphon and the existence of one or several openings located within the wall and separating two successive chambers which he called 'forams'. Thus was born the Order of Foraminifera,

which he classified in his memoir *Tableau méthodique de la classe des Céphalopodes* (1826). This memoir attracted the attention of the professors at the *Muséum* who decided to sponsor his trip to South America. At the same time, d'Orbigny had created the new science of micropalaeontology, which later became of critical economic importance when applied to oil exploration.

The death of d'Orbigny in 1857 was preceded by very unpleasant times, during which the professors of the *Muséum*, who had barely recovered from the tyranny of the deceased Cuvier, unjustly vented their accumulated jealousy on d'Orbigny, who was also a catastrophist. Finally, in 1853, the President of the Republic took control of this unsavoury situation by appointing him professor of palaeontology at the *Muséum*. However, rivalries did not cease entirely, and d'Orbigny never became a member of the *Institut de France*, despite no less than seven attempts at presenting his candidacy.

Albert V. Carozzi, Raleigh, North Carolina

Saussurian Style

De Saussure, Horace-Bénédict, *Voyages dans les Alpes Augmentés de Voyages en Valais, au Mont Cervin et autour du Mont Rose: Avant-propos par Albert V. Carozzi*, Éditions Slatkine, Geneva, 2002.

De Saussure has been the object of intense attention by Albert Carozzi and his wife Marguerite during the last few years, with numerous publications emerging as a result. In this latest contribution we have a reprint (not in facsimile) of the volume entitled *Voyages dans les Alpes: Partie Pittoresque des Ouvrages de H.-B. de Saussure Seconde Édition augmentée des Voyages en Valais, au Mont Cervin et autour du Mont-Rose*, Paris & Geneva, Joël Cherbuliez, 1852.

The original complete edition of De Saussure's *Voyages* (1787) had eight volumes, and made rather tedious reading if taken in full. So it is unsurprising that the important work was republished in shortened versions in the nineteenth century and again in the twentieth century. It is one of these versions that is reproduced here, making readily available one of the classics of Alpine literature by one of the grand masters of early geology. But the focus of the selection is on De Saussure as a writer of charm, clarity, and simplicity rather than on his geology *per se*. De Saussure 'embedded' his science in a literary matrix which was highlighted in the edition of 1852, for which the editor stripped out the science, leaving an essentially literary work.

Professor Carozzi offers this reprint as a prolegomenon to the full edition of the *Voyages*, which is to be issued in 2003. In his introduction, he refers to De Saussure's geological theory, with its foregrounding of the idea of horizontal earth movements responsible for the Alps' upward movement under compression, making him one of the *grands précurseurs* of modern structural geology. (INHIGEO Members had the opportunity to view some of the exposures that underpinned de Saussure's ideas during our excursion to Switzerland in 1998.) Carozzi also refers to De Saussure's 'picturesque', 'pastoral', 'wild', and 'sublime' geological writings.

Reference is made to some myths that have grown up around De Saussure. His was not, says Carozzi, the first party to climb Mont Blanc (actually it was the third), nor was he the founder of Alpinism. He chose routes that gave him access to geological information, rather than climbs for climbs' sake. Much of his work was done at lower altitudes, but he was glad to observe close up vertical strata in the upper parts of Mont Blanc.

Readers will welcome this publication of a selection of De Saussure's writings and will look forward to being able to ask their libraries to acquire the *Voyages* complete, even if, one must suppose, the cost will exceed what most humble historians of earth science can afford as a private purchase.

David Oldroyd, Sydney

The History of Sedimentology: A Japanese View

OKADA, Hakuyu, *Sedimentology: A Way to the New Discipline of Earth Sciences*, Kokon Shoin Co., Tokyo, 2002 (in Japanese). As submarine geology developed after World War II, a great deal of new information on sedimentological features was accumulated and a new interdisciplinary field of sedimentology established an important position for itself in Earth sciences through the study of sediments and sedimentary rocks.

In order to encourage and promote the study of sedimentology in Japan, the 'Sedimentological Society of Japan' was founded in 1971. It published *The Encyclopaedia of Sedimentology* (Asakura Shoten Co., Tokyo, 470 pp.) in 1998 under the leadership of Professor Hakuyu OKADA as chief editor, with the collaboration of 180 scientists.

Professor OKADA began his career in sedimentology at the newly established Sedimentological Research Laboratory, Reading University, UK, in 1964. At that period, he visited many institutions and laboratories, not only in Britain but also in other European countries, and discussed sedimentological problems with numerous sedimentologists. On the basis of these experiences and his subsequent career in teaching and research in sedimentology, OKADA has written a book focusing on the historical development of sedimentology, describing the achievements of scientists who have contributed to the establishment of this science. Its main components are: I. Introduction; II. Pre-sedimentology (11); III. The development of the observation of strata (10); IV. The development of sedimentary petrology (4); V. The development of lithology (4); VI. The establishment of sedimentology (5); VII. Sedimentology and the study of the ocean floor (2); VIII. The sedimentology of Japan (4); and IX. Sedimentology for the 21st century.

Chapter I defines sedimentology, explains the objects of sedimentological studies, and outlines the research methodologies that are necessary background for Chapters II–VII that follow. These chapters provide a history of the establishment of sedimentology and introduce the sedimentologists and their key research references at the several stages in the development of sedimentology. The forty portraits (see the numbers in parentheses above) in themselves a useful history of science.

Chapter VII provides a valuable reminder that research on ocean-floor sediments was critical in the rapid development of sedimentology, not least the special role of the *Glomar Challenger*. Examples include the recognition of Walther's Law for oceanic sediments, the spectacular discovery of the desiccation of the Mediterranean Sea, and clarification of the behaviour of currents at the abyssal bottom.

Chapter VIII focuses on the history and development of Japanese sedimentological research. It provides an interesting footnote that the word 'sedimentology' was first used in Japan by Tsugio YAGI as early as 1929, prior to the Swedish geologist Hakon Wadell's proposal of the word in 1932. The period after 1950 is divided into approximately ten-year intervals and the

important achievements for each decade are summarized by research topic and according to the principal researchers. These summaries, together with the cited references in the index, offer effective guidance in selecting research topics for students and researchers who wish to embark on a career in sedimentology.

Finally, Chapter IX discusses new directions for sedimentology in the 21st century, which include the integration of sedimentology and stratigraphy, planetary sedimentology, and the urgent necessity of establishing the field of environmental sedimentology, dealing with the analysis and restoration of natural environments, and social sedimentology, which deals with the analysis of and countermeasures to environmental changes arising from human activities. The first topic emphasizes the important role of sedimentology in the elucidation of Earth history and reconstructing past environments. Here the author introduces the concept of 'experimental stratigraphy, proposed by Paola *et al.* (2001). The second and third topics will also become an important subject of study not only to sedimentology but also to the whole of geoscience.

The references at the end of the book give a key to the abbreviation of foreign journals, followed by a twenty-four page list of cited references, offering a valuable access to the primary literature on sedimentology.

This unique book is written from an historical perspective of the science of sedimentology, and will quickly become an important benchmark reference for geology students and researchers. For this reason, it is to be hoped that an English translation will be published in the not too distant future, making the book accessible to a wider audience, as it rightly deserves.

Masae OMORI, Tokyo

Trouble with the Moines

Richard J. Howarth and Bernard E. Leake, *The Life of Frank Coles Phillips (1902–1982) and the Structural Geology of the Moine Petrofabric Controversy*, The Geological Society, London, Memoir No. 23, 2002.

I have recently returned to work at the University of Bristol, having completed my first degree there some twenty years ago. Last week we opened a new building in the Earth Sciences Department, which includes some state-of-the-art teaching laboratories. As the Press flashed their cameras and took pictures of all the new equipment, we were asked if it would be possible to photograph some students 'using' the labs. Four undergraduates were duly rounded up, but because the labs are not actually in use yet, the students scrabbled in their bags looking for something to be seen 'doing' while they posed for the cameras. One young lad produced a stereonet—you remember, that circular net pasted onto a piece of card—and proceeded to look as if he knew what to do with it while the photographers did their thing. I mentioned to this lad afterwards that I was writing a review of a book about the man who wrote the famous textbook on how to use the stereonet in structural geology. 'Ah yes', he said, 'Frank Coles Phillips. He used to teach here, didn't he?'. I was both dumbstruck and delighted to find a student who knew something about the history of his subject. Certainly, no one had ever mentioned Phillips when I was a student at Bristol, and I had been taught by people who knew him (Bob Savage, Ian Ford, and Reg Bradshaw, for example). Perhaps, twenty years ago, not enough time had elapsed for us to appreciate his contribution.

The 'Life' of Frank Coles Phillips (1902–1982) is, however, something of a misnomer as a title, for in this Memoir, published by the Geological Society of London, we actually learn rather little about Phillips's life, for this is mostly about his work. But perhaps there wasn't much to say. Whilst at school Phillips subscribed to *Junior Mechanics and Model Engineer*, which somehow tells us, even before we read it, that he would be a creature of habit in later years. Indeed, although acknowledged as a clear and precise lecturer and an excellent supervisor of practicals, we learn that everything in his teaching was done to a set pattern; that he preferred not to become involved in the geological interpretations of contentious areas; and that he would not even visit research students in the field, believing that they should come to him if they had a problem. Despite this, we are told (several times) that Phillips was, first and foremost, a superb teacher. But although both authors knew Phillips, and one was even taught by him (RJH), I got absolutely no feel for *why* this man was considered such a good teacher, or how he managed to 'inspire' his students, since he comes across as extremely dull. Perhaps a bit more about the 'man' might have made him sound more interesting.

Phillips graduated from Cambridge in 1924, where he had developed an interest in petrology under the tutelage of Alfred Harker. The following year he began his PhD on the petrology of the igneous rocks of the Shetland Islands, an area which Harker considered would 'repay investigation by a petrologist'. It was during this period that Phillips honed his skills as a petrologist and the department bought a *universal stage*—a microscope that facilitates the measurement of the orientation of the optical axes of individual grains lying in any three-dimensional position. Phillips soon learnt how to use it and by the 1930s had become an expert in obtaining the measurements necessary to identify minerals.

Given this interest in microscope work and the nature of the rocks in his PhD area—a highly complicated series of ancient metamorphosed sediments and intrusives, now recognised as an ophiolite complex that has been tilted on its side and emplaced on top of metasediments—it is hardly surprising that Phillips became interested in petrofabrics. In 1936, he commenced a project to study the microfabric of some Moine Schists and associated rocks. Within a year he had completed some 20,000 separate measurements and analysed them using stereographic techniques. But this pioneering study, based on quantitative techniques first developed by the Austrian geologist Bruno Sander (1884–1979) in 1930, became somewhat controversial as geologists became less and less convinced that Sander's 'rules' had any relevance to the deformation of real rocks. Despite this, Phillips' petrofabric studies undoubtedly furthered an understanding about crystal deformation and recrystallisation during metamorphism, and helped unravel the complex structure of the Moine rocks.

Following publication, in 1946, of his first highly successful textbook, *An Introduction to Crystallography*, Phillips left Cambridge for the George Herdman Chair of Geology at Liverpool in 1947. Unfortunately, the culture shock resulting from the move, coupled with the loss of years of work due to a fire in the department, resulted in a nervous breakdown and retreat back to Cambridge. But a year later he was offered a lectureship in Bristol where he remained until he retired in 1967. It was here, in 1954, that he wrote his other famous textbook *The Use of Stereographic Projections in Structural Geology*—an invaluable tool, even today (I still have my copy somewhere), for teachers and students alike.

In retirement, Phillips translated Sander's original book on petrofabrics, a task made particularly difficult, despite being fluent in German, due to Sander's convoluted style and use of local dialectal terms. Unfortunately, this was little read or referred to, since Sander's methods had by then (1970) been superseded.

Although in an awkwardly large format, with a paper cover that will probably rapidly deteriorate, this Memoir will be of great value to those interested in the development of techniques that facilitated a better understanding of structural geology during the first half of the twentieth century. The detailed exposition on petrofabric research and the evolution of the stereonet will undoubtedly fascinate some. But perhaps it will be of greater interest to a substantial number of field-based geologists who grew up with, and subsequently followed, the unravelling of the deformational history of the Moine and Dalradian rocks of Scotland—a story that is almost as complex as the rocks themselves and which, even now, is still not fully understood. The detailed description of the controversy will be of great value to future historians, looking back when we have the answers.

Cherry Lewis, Bristol

A Plea for an 'Open Geoscience'

A.M. Celâl Şengör, *Is the Present the Key to the Past or is the Past the Key to the Present? James Hutton and Adam Smith versus Abraham Gottlob Werner and Karl Marx in Interpreting History*, Geological Society of America, Special Paper No. 355, Boulder (Colorado), 2001.

Professor Şengör's book is inspired by Karl Popper's concept of an 'open society' and his model of the growth of scientific knowledge by the formulation and falsification of hypotheses. Thus, the main purpose of the book is to show that:

what made Hutton's success greater than that of Werner was not so much the particular theories each formulated and promoted, but the way they viewed their own theories. In other words, the epistemological background of Hutton that encouraged the search for falsifications in all theories advanced, including his own, proved more conducive to framing and solving problems than the verificationist stand of Werner (pp. 35–36).

This means, however, that whether one likes the book or not will depend, not least, on the position that one holds towards Popper's philosophy. Let me say, then, that I like Şengör's spirited ideas. And this is due in part to the fact that his text reminds me of lively discussions during my student days on the so-called 'positivism controversy', or the controversy between Popper and the Frankfurt School of Theodor W. Adorno, Jürgen Habermas, and others, on precisely the problem Şengör that discusses, namely the role of history in natural and human evolution and on the 'true method' and 'true mission' of science.

However, these recollections are not the only reason why I like this book. For geologists, Şengör's 'special paper' sights directly at the heart of the methodology of geology: 'Is the present the key to the past or is the past the key to the present?' This is undoubtedly one of the essential (methodological) questions of the earth sciences, where it is usually discussed under the heads of 'uniformitarianism' or 'actualism'. However, this question—as Şengör makes us see—is not only a geological one. Rather, it relates to all disciplines concerned with possible (causal) interrelations between the present and the past; and, last but not least, it relates to the struggle about the 'true form' of human society.

Şengör has undertaken to construct two different historical lines with regard to the 'handling' of possible (causal) interrelations between the present and the past: an 'actualistic' and a 'non-actualistic' one; or, since we have here Scottish and German authors, two 'national styles'. The first is represented by James Hutton in geology (Vulcanism or Plutonism) and Adam Smith in sociology; the second by Abraham Gottlob Werner's Neptunist geology and Karl Marx's social theory respectively. Şengör writes: '[w]hereas Smith and Hutton interpreted history in terms of the present, Werner and Marx interpreted the present on the basis of history' (p. 1). With regard to Popper's model, the first 'couple' represents the formulation of hypotheses, open to falsification, while Werner (and Marx) represent (for Şengör) the 'closed society'. The 'denial of being engaged in hypothesizing did not allow Werner the possibility of testing and changing his earlier erected theoretical edifice' (p. 26; cf. also p. 30).

Given the immense range of issues in Şengör's book, I shall confine myself to just a few matters (in particular those where the 'German style' is concerned). The most troublesome aspect (for most readers) will surely be Şengör's comparison of Werner and Marx. The association of Hutton with his personal friend Smith, on the other hand, is quite evident, although one should be cautious about seeing Smith as Hutton's immediate 'teacher'. Rather, their common method seems to have been due to a common cultural background, as Şengör rightly states. However, I think, one should be cautious about giving too much emphasis to the philosophy of David Hume (cf. pp. 8 and 21). Rather, I suggest, French philosophy of the mid-18th century, in particular Étienne Bonnot de Condillac's *Traité des systèmes* (1749), should be taken into account when asking for the origins of the philosophy of science of both Smith and Hutton. Be this as it may, Şengör is not alone in suggesting the importance of Smith, and not the first to discuss the matter in relation to the philosophy of Hume (cf. pp. 8 and 21) (see my 'Volcanoes and the 'Wealth of Nations': Relations between the Emerging Sciences of Political Economy and Geology in 18th Century Scotland', in: N. Morello (ed.), *Volcanoes and History*, Brigati, Genoa, 1998).

The relation of Werner and Marx is, as Şengör states, much less evident, since the two never met. (Marx was born in 1818, the year after Werner's death.) Thus, here we are leaving the field of the historian and entering the domain of cultural philosophy. To be sure, I do not think the comparison is misleading or arbitrary. Şengör explicitly states that it would be futile to try 'to force Werner into a materialist mould' (p. 27). Rather, he emphasises the common cultural background, which (by comparison with the Scottish one) would be less fertile for the growth of a culture of critical discussion. Şengör rightly draws attention to the role of pietism, and in particular pietistic education, with its 'rationalistic and individualistic tendencies', i.e. its stress on 'learning and preaching with the aim of education as opposed to disputation' (p. 26).

These pietist tendencies remained influential through nineteenth century, particularly in Biedermeier pedagogy. Nevertheless, one should be cautious about putting Marx in the same intellectual milieu as Werner (cf. p. 29). Here, I particularly miss the political dimension. The intellectual milieu that dominated German science and philosophy around 1800 suffered some serious breaks in the early nineteenth century as a result of political developments (in particular, the Prussian restoration following the Congress of Vienna). The 'romantic dreams' of a universal science and the evolution of mankind to a higher stage of self-consciousness—in political terms, to a United German Empire—were still alive, but their function declined more and more to a rhetorical one. So I find that the intellectual discontinuities in German culture are glossed over in Şengör's treatment.

But here, we are straying a little too far from Şengör's book. I should also be pointing to the notion of experience in Werner and Marx, i.e. to that kind of empiricism that leads to 'intolerant dogmatism' (back cover). Şengör means a kind of experience that is strongly related to the 'concrete world', i.e. to the world we see and experience everyday. Here, theory and experience are inseparably mingled, such that theory becomes confirmed repeatedly in everyday life. Since Şengör opens his book with a quotation from Goethe, we may add a second one to illustrate this notion of experience: with regard to the Copernican system, Goethe pointed out that its problem was that it daily *contradicted* sensuous experience, i.e. our everyday perception.

It is in this sense that Şengör construes Marxist dialectic to be neither formal logic nor yet an empirical theory but 'a logical theory, supposedly based on the concrete (i.e., empirically perceptible) society' (p. 29). Similarly, Werner's Neptunistic theory might be called a logical theory, supposedly based on the concrete (i.e., empirically perceptible) earth (see my 'Die Verwissenschaftlichung der Geologie: Zur Bedeutung phänomenologischer und konstruktiver Erfahrungsbegriffe im Vulkanismusstreit', *Sudhoffs Archiv*, 1990; and Gottfried Hofbauer, 'Die sinnliche Naturgeschichte des Abraham Gottlob Werner: An der Grenze zwischen Empirismus und romantischer Naturphilosophie', *Zeitschrift für geologische Wissenschaften*, 1993). With regard to this common notion of experience, I called Werner's theory a 'phenomenological notion of experience', as opposed to a 'constructive' one, as in the case of Hutton. Here, I fully agree with Şengör. This, I think, is the point where Werner and Marx met. And, in this sense, Şengör's book may be recommended to all readers interested in the social history of science. I hope that we will have more such inspiring works.

Bernhard Fritscher, Munich

[This review first appeared in *Metascience* (2002, 11, 415–418), and is reproduced here by permission of the editor Nicolas Rasmussen.]

NOTES AND QUERIES

Congratulations to James Secord

INHIGEO is pleased to congratulate UK Member James Secord on his promotion to a personal chair in the Department of History and Philosophy of Science at Cambridge University and the award of a Leverhulme Major Research Fellowship for three years.

International Union of History and Philosophy of Science: Division of History of Science

You may be interested in the new web site of the Division of History of Science of the International Union of History and Philosophy of Science. You can find it at: <http://ppp.unipiv.it/dhs>. The site includes information about the Division, a selection of Internet links, news and a Database of Historians of Science. It is possible to register himself in the Database by filling in a form (available on the web), specifying Institution, mailing address and fields of interest.

Fabio Bevilacqua, Assistant Secretary, DHS

Second-hand Geological Books

Good 'search engines' for those interested in the history of the geosciences are: <http://www.bookfinder.com> and <http://www.addall.com>. Try also www.aquila-nhb.com, especially for German-language books.

William Smith on Web: Update

Cecil Schneer has written (September, 2002):

Smith's map is now available on our web site in the form of a single page index map in 15 blocks bounded by the fold lines of the original. Clicking on any part of the map brings up the underlying block sized to print out on a single page. All 15 pages with margins trimmed, tile together to form a 27 x 40 color reproduction of the original. I am still working on tuning the blocks for precision and color, but the result is I think quite presentable. And I am working on the accompanying text to clarify some of the details and to illustrate (with contemporaneous maps) the Smith map's place in the history of geology.

William Smith Publications: Correction

Cecil Schneer (USA) has written to say that there was a mistake in the web-site address given on p. 84 of INHIGEO Newsletter No. 34, regarding William Smith's 'Strata Identified by Organized Fossils'. Cecil says:

To access the Smith work, start at the Earth Sciences Department of the University of New Hampshire web site (<http://www.unh.edu/esci>). Click on <Related ESCI Links>. Select <'Strata' Smith on the Web> for the Smith work.

Explanatory notes to the Map and the map itself are now in the 'Table . . . Explanation' section, but will be separately listed under 'Contents' in the next few days. Larger-scale images of all fifteen separate sheets comprising the original map will be added as readied. The direct URL to 'Strata' Smith on the Web is: <http://www.unh.edu/esci/wmsmith.html>

OR

From <Related ESCI Links> select <History of Geology on the International Scene> for the INHIGEO material.

[We regret that the information previously supplied was not up to date. In the view of this Newsletter, the site is excellent. With a colour printer, you can get yourself a free copy of Smith's publications. Ed.]

John Phillips's Biography of William Smith

Memoirs of William Smith, LL.D. Author of the Map of the Strata of England and Wales by his Nephew, John Phillips FRS, FGS
A reproduction of John Phillips' *Memoirs of William Smith* is being offered by the Bath Royal Literary and Scientific Institution as a limited edition. It will be reproduced from an original copy presented by the author, John Phillips, to the Institution. Only 500 copies were originally published in 1844 and they are now extremely rare.

Three important additions to the *Memoirs* by the leading authority on Smith, Hugh Torrens, Emeritus Professor of Keele University, include:

An introduction and general overview of the life of the 'Father of English Geology'
His William Smith lecture, given to the Geological Society of London in 2000
Full indexing of the contents to create a valuable reference tool.

The *Memoirs* outline Smith's working life as a civil engineer, geologist, land and mineral surveyor, and cartographer. It is an extraordinary story that evolved through many phases of his career, to the time when he could at last create and publish the first geological map of Britain. But it took many years and many hard battles with the Geological Establishment before his skills and ideas were vindicated and he finally achieved acclaim and endorsement as the 'Father of English Geology'.

The book will be a hardback, under the BRLSI imprint, of about 200 pages and printed on 90gsm cream paper. It will be cased in Wibalin material over 2.3 mm boards, gold blocked on spine and front, with head & tail bands, plus a ribbon marker.

For further information, please contact exxbrlsi@bath.ac.uk OR Angela Reichardt, William Smith Book, BRLSI, 16-18 Queen Square, Bath, BA1 2HN, U.K.

J. Waterschoot van der Gracht

David Branagan (Australia: dbranaga@mail.usyd.edu.au) wishes to know whether this Dutch geologist worked in Patagonia and on the Antarctic Peninsula about 1900. If so, with which expedition was he involved? Information would be gratefully received.

Darwin Publications

Full (paginated) copies of much material relating to Darwin, including for example his paper on the Parallel Roads of Glen Roy, may be found at: <http://pages.britishlibrary.net/charles.darwin/>.

History of Geology in the United States

Read all about it at: <http://gsahist.org/>.

A New Plaque Commemorating Charles Darwin on the Royal Museum, Edinburgh, Scotland

Under a joint initiative by the University of Edinburgh and the National Museums of Scotland, a new plaque has been mounted on the south side of the Royal Museum building, on the site of Charles Darwin's student lodgings, to commemorate his time as a medical student in Edinburgh. It was unveiled by Sarah Boyack, Member of the Scottish Parliament, on 22 November 2002.

The sixteen-year-old Darwin came to Edinburgh to study medicine in 1825. Though he stayed for less than eighteen months, and did not complete his studies at the University, his time in Edinburgh was not without influence on his future development.

The city's streets and squares contain many public monuments to former famous residents, but hitherto none to Darwin. Thanks to an initiative by three Edinburgh-linked Professors (Roger Short, Aubrey Manning and Seth Grant), the bronze plaque was erected at the site where Darwin lodged with his brother Erasmus. It incorporates a cast head of Darwin by Vincent Butler of the Edinburgh College of Art, and is located on the Lothian Street façade of the Royal Museum, which has replaced the earlier house where he lodged.

On the afternoon of the 22nd, a public seminar was held in the Royal Museum Lecture Theatre, chaired by Aubrey Manning, with contributions from Dr Martin Eastwood of The University of Edinburgh, on the Medical School in the early nineteenth century; from Dr James Moore of the Open University, Darwin's co-biographer, on Darwin's time in Edinburgh; and, from Professor Richard Dawkins, Charles Simonyi Professor of the Public Understanding of Science at The University of Oxford, who reviewed Darwin and his achievements from a 2002 perspective.

Commenting on the event, the University's Principal, Professor Timothy O'Shea, said: 'We are immensely proud to count Charles Darwin in the ranks of our Edinburgh alumni. His intellect and innovative thinking have influenced the world and continue to inspire new generations of scientists at The University of Edinburgh to follow in his footsteps and challenge the scientific establishment with new ideas.' Mary Bryden, Head of Public Affairs at the National Museums of Scotland, added: 'We are delighted to unite with the University of Edinburgh to ensure that Darwin's brief but productive time in Edinburgh is not forgotten. Visitors of all ages can now say that they are walking in the footsteps of one of the world's most famous scientists.'

The Press Office, National Museums of Scotland, per Michael Taylor, Edinburgh

The Werner Symposium (1999) Proceedings

Professor Helmuth Albrecht (halbrech@vwl.tu-freiberg.de) has written from Freiberg:

I should like to inform you that we have published the Werner conference papers in June 2002. All authors will get their free copies. The book is available under the title *Abraham Gottlob Werner and the Foundation of Geological Sciences. Selected Papers of the International Werner-Symposium in Freiberg 19th to 24th September 1999*, Freiberg 2002. You can order the book under ISBN 3-86012-176-6 at the 'Akademische Buchhandlung Freiberg, Fax: 0049-3731-22644. [See also the review of this book by Professor Martin Guntau, p. 41.]

Sincerely yours, Helmuth Albrecht

Newsletter of the International Union of Soil Science

Professor Dan Yaalon (Israel Member from the Hebrew University, Jerusalem) reports that this *Newsletter* may be found on the web at www.iuss.org/CHP.pdf. It contains a considerable number of interesting items pertaining to the history of soil science.

G.G. Simpson Website

American Member Léo Laporte reports that he has established a website providing information about the distinguished palaeontologist, George Gaylord Simpson:

<http://people.ucsc.edu/~laporte/simpson/Index.html>.

The Earth and Environment Forum

The Earth and Environment Forum, an interest group of the History of Science Society, has launched its new website: <http://www.cicq.uqtr.ca:591/EEF.htm>. The website contains a directory of environmental historians of science and historians interested in environmental sciences, including, among others, ecology, oceanography, agricultural sciences, geology, conservation biology, earth sciences. You are invited to get your name on the membership list via the Membership Request link at the site.

The British Society for the History of Science

The British Society for the History of Science has a newly redesigned and expanded website at <http://www.bsos.org.uk/>.

A Grand New Lamarck Website: Jean Baptiste Lamarck (1744–1829)

Présentation du premier site Web entièrement consacré à un savant français. Ouvrages en texte intégral, documents, biographies, bibliographies. Base de données sur les 973 auditeurs des cours de Lamarck au Muséum.

Considéré comme l'un des plus grands savants français du XIXe siècle, Lamarck est le fondateur de la théorie de transformation des espèces. Pourtant, ses œuvres ne font l'objet d'aucune édition moderne d'envergure et sont parfois difficilement consultables dans les bibliothèques. Ceux-la même qui célèbrent Lamarck ne l'ont que rarement lu, étudié, évalué dans son influence sur la pensée biologique européenne des XIXe et XXe siècles.

Le site www.lamarck.net offre aujourd'hui la possibilité de consulter en texte intégral les ouvrages de Lamarck: plus de 6500 pages représentant la totalité du corpus théorique du naturaliste. Ainsi, il est possible d'effectuer en un instant des recherches dans les textes, d'étudier le vocabulaire conceptuel ou de vérifier des hypothèses d'interprétation.

Une nouveauté supplémentaire est fournie par la possibilité de consulter une base de données sur les élèves ayant signé le registre des cours de Lamarck au Muséum national d'histoire naturelle entre 1795 et 1823. Sur un total de 973 inscrits, on a recensé 767 Français, venus de l'ensemble des départements français, et 186 étrangers provenant d'une vingtaine de pays différents, y compris de contrées lointaines comme les Etats Unis, le Brésil, la Russie. Dans l'état actuel des recherches, 533 personnages sur 973 ont déjà pu être identifiés. Nous invitons les chercheurs français, européens et américains à nous aider dans cette enquête sur les auditeurs des cours du Muséum. Il s'agit donc d'un site qui associe la communauté scientifique internationale dans un projet ouvert et potentiellement capable de bouleverser les idées et les mythes reçus sur l'histoire de la pensée évolutionniste.

La présentation du site Lamarck, qui propose encore plusieurs autres rubriques, donnera en même temps l'occasion de faire le point sur les ressources disponibles en histoire des sciences sur Internet, ainsi que sur l'avancement du projet Hist-Sciences, un grand portail consacré à l'histoire des sciences et des techniques en langue française: auteurs et institutions, corpus de documents, études et bibliographies, parcours pédagogiques et sections grand public. Ce projet novateur voit le concours du Centre National de la Recherche Scientifique, de la Cité des Sciences et de l'Industrie, de l'Ecole des Hautes Etudes en Sciences Sociales, de l'Ecole Normale Supérieure. Des premières réalisations et des projets en cours seront aussi annoncés.

Contact: Pietro Corsi, Centre A. Koyré–E.H.E.S.S.–M.N.H.N. Pcorsi@univ-paris1.fr

[The site has both French and English text (Ed.).]

Two German Publications on the History of Aeronomy, Geophysics, ...

1. *Ertel Memorial Volume, on the Occasion of his 100 Birthday in 2004*

For the Ertel memorial book (*Gedenkschrift*, editor Wilfried Schröder) papers are kindly requested in the fields of Ertel's work: theoretical meteorology, weather forecasting, geophysical hydrodynamics, Ertel's Potential Vorticity Theorem, physical hydrography, oceanography, theoretical geomorphology, volcanology and history of meteorology and geophysics. Papers should be 10–14 pages in length, with black-white figures only. The deadline for submission is 31 October, 2003. Interested persons are invited to send their proposals, by letter, to Dr. Wilfried Schröder, Geophysical Commission, Hechelstrasse 8, D-28777 Bremen, Germany.

2. *Historical Development of Noctilucent Cloud Research and the Concept of Aeronomy*

A book is being published by Wilfried Schröder on aspects of the work of Otto Jesse (1838–1901) on noctilucent clouds and physics of the upper atmosphere. It contains: data collected before the Krakatoa eruption and the question of whether noctilucent clouds were observed before that event in 1883; the Berlin Atmospheric Programme up to 1897; original letters of Otto Jesse and reproduction of the first photographs of 1887. The appendix gives selected papers by Otto Jesse on twilight phenomena and noctilucent clouds, 1884–1896. For contact, please write to Dr Wilfried Schröder, Geophysical Commission, Hechelstrasse 8, D-28777 Bremen, Germany. The illustrated book has 150 pages and costs US\$15.

Iceland Spar

Japanese Member Toshihiro YAMADA has written:

Recently, I have had contact with an Icelandic researcher, who has surveyed the history of studies on Iceland spar and of the locality of the crystal. He, Leo Kristjánsson, published a paper on the topic in the *Journal of Geoscience Education* (2002, 50, pp. 419–427). He has sent me his original Icelandic booklet of 2001. This, it seems to me, is an important contribution to the history of geoscience. The work is: Leo Kristjánsson, *Iceland Spar and its Effects on the Natural Sciences: Notes and References*, Mimeographed Report RH-07, Reykjavik: Science Institute, University of Iceland, 2001, 126 pp.+36 pp. (40 figures) (in Icelandic with English summary); and a published version: 'Iceland Spar: The Unique Story of the Crystals from Helgustadir, Joekull, 2001, No. 50, pp. 95–108 (in Icelandic with English summary). For further information, please contact Dr Kristjánsson: <leo@raunvis.hi.is>.

The Edinburgh Geological Society

This active society publishes *The Edinburgh Geologist*, which contains numerous interesting historical articles. Visit www.edinburghgeolsoc.org/ to sample them.

PUBLICATIONS RECEIVED

- Albrecht, Helmuth & Ladwig, Roland (eds), *Abraham Gottlob Werner and the Foundation of the Geological Sciences: Selected Papers of the International Werner Symposium in Freiberg 19th to 24th September 1999*, Technische Universität Bergakademie Freiberg, Freiberg, 2002.
- Boletín de la Comisión de Historia de la Geología de España* (all issues for 2002).
- Borley, Lester (ed.), *Hugh Miller in Context: Geologist and Naturalist; Writer and Folklorist*, The Cromarty Arts Trust/The National Trust for Scotland/National Museums of Scotland, 2002.
- Branagan, David, 'Australian Stratigraphy and Paleontology: The Nineteenth-Century French Contribution', *Compte rendus de l'Académie des Sciences, Palevol*, 2002, 1, 657–662.
- Chambers, Paul, *Bones of Contention: The Archaeopteryx Scandals*, John Murray, London, 2002.
- Colloque International Alcide d'Orbigny: sa vie et son oeuvre histoire de stratigraphie de d'Orbigny à nos jours 1 Juillet–7 Juillet 2002, Abstracts*.
- Commission on the History, Philosophy, and Sociology of Soil Science/International Union of Soil Science/Council on the History, Philosophy, and Sociology of Soil Science, Soil Science Society of America, *Newsletter* No. 9, October, 2001.
- Corfield, Richard, *Architects of Eternity: The New Science of Fossils*, Review, London, 2002.
- Curtis, Garniss, Swisher, Carl & Lewin, Roger, *Java Man: How Geologists Changed the History of Human Evolution*, Abacus, London, 2002.
- De Saussure, Horace-Bénédict, *Voyages dans les Alpes augmentées des voyages en Valais, au Mont Cervin et autour du Mont Rose. Avant-propos par Albert V. Carozzi*, Editions Slatkine, Geneva, 2002 (from the 2nd edn, published by Joël Cherbuliez, Geneva, 1852).
- Ford, Trevor D., 'John Whitehurst (1713–1788): Philosopher, Geologist, Horologist and Engineer', *Geology Today*, 2002, 18, 66–73.
- Gaudant, Jean, 'Louis Agassiz (1807–1873), fondateur de la paléoichthyologie', *Revue d'histoire des Sciences*, 1980, 33, 151–162.
- Gaudant, Jean, 'La querelle des trois abbés (1793–1795): le débat entre Domenico Testa, Alberto Fortis et Giovanni Serafino Volta sur la signification des poisons pétrifiés di Monte Bolca (Italie)', *Miscellanea paleontologica: Studi e ricerche sui Giacimenti Terziari di Bolca*, 1999, 8, 159–206.
- Gaudant, Jean, 'Le manuscrit du cours de paléontologie professé par Alcide d'Orbigny en 1854 et 1855 au Muséum national d'histoire naturelle', *Compte rendus de l'Académie des Sciences, Palevol*, 2002, 1, 365–382.
- Gaudant, Jean & Bouillet, Geneviève, 'La genèse et l'interprétation des 'fossiles' dans le science classique: de la Renaissance aux Lumières', *Bulletin de la Société Géologique de France*, 2000, 171, 587–601.
- Geological Society of Australia, *Newsletter of the Earth Sciences History Group*, 2002.
- Grigelis, Algimantas et al., *Lietuvos Stratigrafinis Vadovas Lithuanian Stratigraphic Guide*, Geological Survey of Lithuania, Vilnius, 2000 (in Lithuanian and English).
- Grigelis, Algimantas (ed.), *Ignotus Domeika 1802–1889: Gyvenimas, Darbai ir Indėlis į Mokslą/Ignacy Domeyko 1802–1889: His Life, Works and Contribution to Science*, Vilnius University, Lithuanian Academy of Science/Institute of Geology and Geography/Institute of Lithuanian History, Vilnius, 2002 (in Lithuanian and English).
- History of Science Society, *2002 Guide to the History of Science*, History of Science Society, Washington; University of Chicago Press, Chicago, 2002.
- Howarth, Richard J. and Leake, Bernard E., *The Life of Frank Coles Phillips (1902–1982) and the Structural Geology of the Moine Petrofabric Controversy*, The Geological Society, London, Memoir No. 23, 2002.
- International Council for Science (ICSU), *ICSU Year Book*, Paris, 2002.
- International Union of Geological Sciences, *IUGS 2002: Annual Report of the International Union of Geological Sciences for 2001*.
- International Union of the History and Philosophy of Science: Division of History of Science, Scientific Instrument Commission, *Newsletter* No. 23, 2002.
- Japanese Association for the History of Geological Sciences, *JAHIGEO Kaiho* No. 18, 2002 (in Japanese).
- Kelber, K.-P. & Okrusch, M., 'Athanasius Kircher retrospektiv: Pendelschläge geowissenschaftlicher Erkenntnis'. In: Beinlich, H., Vollrath, H.-J. & Wittstadt, K. (eds), *Spurensuche: Wege zu Athanasius Kircher*, J.H. Roll, Dettelbach, 2002, 137–162.
- Laurent, Goulven, 'Pour une histoire des sciences à part entière', in: J. Rosmorduc (ed.), *Histoire de sciences et des techniques: Actes et rapports pour l'éducation*, CRDP de Bretagne, Rennes, 1997, pp. 9–37.
- Laurent, Goulven, 'Alcide d'Orbigny entre Cuvier et Lamarck', *Compte rendus de l'Académie des Sciences, Palevol*, 2002, 1, 347–358.
- Legré-Zaidline, Françoise, *Voyage en Alcide à la découverte d'Alcide d'Orbigny (1802–1857)*, Société Nouvelle des Editions Boubée, Paris, 1977.
- Morello, Nicoletta, *Giovanni Alfonso Borelli: Storia e meteorologia dell'eruzione dell'Etna del 1669*, Giunti Gruppo, Florence, 2001.
- Newcomb, Sally, 'Laboratory Evidence of Silica Solution Supporting Wernerian Theory', *Ambix*, 1986, 33, 88–93.
- , 'Contributions of British Experimentalists to the Discipline of Geology: 1780–1820', *Proceedings of the American Philosophical Society*, 1990, m/34, 161–225.
- Okada, Hakuyu, *Sedimentology: A Way to the New Discipline of Earth Sciences*, The Koken Shoin Co., Ltd, Tokyo, 2002 (in Japanese, with chapter headings and summary in English).
- Okrusch, Martin & Leiber, Klaus-Peter, 'Erkenntnisse–Phantasien–Visionen. Athanasius Kirchers geologisches Weltbild im Lichte heutiger Anschauungen', in: Beinlich, H., Daxelmüller, C. & Wittstadt, H.-J. (eds), *Magie des Wissens. Athanasius Kircher 1602–1680: Universalgelehrter–Sammler–Visionär*, J.H. Röhl, Dettelbach, 2002, pp. 131–160.

- Oldroyd, David R. (ed.), *The Earth Inside and Out: Some Major Contributions to Geology in the Twentieth Century*, The Geological Society, Special Publication No. 192, London, 2002.
- Pekov, Igor V., *Minerals First Discovered on the Territory of the Former Soviet Union*, Ocean Pictures, Moscow, 1998.
- Schroeder, Wilfried (ed.), *Alte und neue Probleme der Physik und Geophysik (Physics and Geophysics)*, Arbeitskreis Geschichte der Geophysik und Kosmischen Physik, Science Edition, Bremen and Potsdam, 2003.
- Şengör, A.M. Celâl, 'On Sir Charles Lyell's Alleged Distortion of Abraham Gottlob Werner in *Principles of Geology* and its Implications for the Nature of the Scientific Enterprise', *The Journal of Geology*, 2002, 110, 355–368.
- , 'Is the 'Symplegades' Myth the Record of a Tsunami that Entered the Bosphorus? Simple Empirical Roots of Complex Mythological Concepts', in R. Aslan et al. (eds), *Festschrift für Manfred Korfmann: Mauerschau Sonderdruck*, Verlag Bernhard Albert Greiner, Remshalden-Grünbach, 2002, 1005–1028.
- Slušinskaite, Marytė (ed.), *Ignotas Domeika: Lietuva, Prancūzija, Čilė/Ignacy Domeyko: For Lithuania, France, Chile/Ignacy Domeyko: Lituanie, France, Chili, 1802–1889*, Vilnius University/The Institute of Lithuanian History/The National Museum of Lithuania, Vilnius, 2002 (in Lithuanian, English, and French).
- Smith, Alan (ed.), *The Rock Men: Pioneers of Lakeland Geology*, The Cumberland Geological Society, Keswick, 2001.
- Taquet, Philippe, *Dinosaur Impressions: Postcards from a Paleontologist*, Cambridge University Press, Cambridge, 1998.
- (ed.), *Alcide d'Orbigny: du nouveau monde au passé du monde*, Nathan, Paris, 2002.
- The Victorian Naturalist* [published by The Field Naturalists Club of Victoria (Australia)], 'McCoy Special Issues', 2001, 118, Numbers 5 & 6. (The two issues contain a valuable and important set of papers on the work of the Irish/Australian palaeontologist Frederick McCoy. They include articles by INHIGEO Members Thomas Darragh and Neil Archbold.)
- Trewin, N. (ed.), *The Geology of Scotland*, 4th edn, The Geological Society, London, 2002.
- Trümpy, Rudolph, 'Trying to Understand Alpine Sediments—Before 1950', *Earth Science Reviews*, 2003, 61, 19–42.

COUNTRY REPORTS

Australia

David Branagan has completed his biography of the distinguished Australian geologist Sir T.W. Edgeworth David (1858–1934), Antarctic explorer, World War I geologist, compiler of the geological map of Australia (1931), and professor at Sydney University—among many other accomplishments. This involved some research checking in England and Wales, where David presented a lecture on David in Swansea. He also wrote four entries for the *Australian Dictionary of Biography* (Volume 16, 1940–1980) on the geologist H.G. Raggatt (1900–1968), the metallurgists T.A. Read (1886–1972) and G.K. Williams (1896–1974), and the mining dredge engineer G.H. Watson (1894–1963). Articles were also written for the *Dictionary's Supplement* on the clergyman–scientist the Reverend Joseph Campbell (1856–1933) and the mariner Joseph Thompson (ca 1784–1839). The experiences of Denys Bell (1917–2000) as the first Commonwealth Geologist at Alice Springs in Central Australia (Northern Territory) were edited for publication in the *Newsletter* No. 32 (December 2002) of the Earth Sciences History Group of the Geological Society of Australia. The two papers that David presented at the INHIGEO Portugal conference were published in March 2003 ('Rocks on Canvas: Real or Imagined? Geology and Art in the 15th Century' and '2001 Rocks: A Memorial to the Centenary of the Australian Federation'). Attending the COFRHIGEO/INHIGEO meeting in Paris in July, David also presented a paper on the contributions of French scientists to Australian stratigraphy and palaeontology in the nineteenth century (published in *Palevol*, 2002, 1, 657–662) and enjoyed the stimulating and fruitful field excursion to southeast France. He has reviewed *The Victorian Field Naturalist: McCoy Special Issues*; R. MacLeod (ed.), *Nature and Empire: Science and the Colonial Enterprise*; T.G. Vallance, D.T. Moore, and E.W. Groves, *Nature's Investigator: The Diary of Robert Brown in Australia, 1801–1805*; and D.R. Oldroyd (ed.), *The Earth Inside and Out: Some Major Contributions to Geology in the Twentieth Century*. Also he wrote an obituary of Konrad Heinrich Moelle (1933–2002) for *The Australian Geologist*.

David Oldroyd attended the COFRHIGEO/INHIGEO meeting in Paris and the associated field excursion. During another European journey, he also visited INHIGEO Members Jan Kozak and Josef Haubelt in Prague, to make preliminary arrangements for the INHIGEO meeting in that city in 2005. He went with them to Kutná Hora, where he met fellow cellist and INHIGEO Member Jan Urban, who conducted the visitors round his ancient mining town, where they saw the mining exhibition which Jan was partly responsible for preparing. There was also the opportunity there to visit one of the world's few surviving alchemical laboratories. During the excursion, visits were also made to sites associated with Joachim Barrande and to limestone caves. Next day, Dr Haubelt provided a detailed guided historical walk through 'pre-flood' Prague.

Additionally, David spent three weeks in Russia, visiting the major mineralogical museums in Moscow and St Petersburg, and attending a mineralogical conference in the old capital's university, where he presented a paper on the history of the sapphire industry in Australia. In Moscow, he had the pleasure of meeting, on their home ground, the Russian INHIGEO Members at the Vernadsky Museum, and was royally entertained there. Communication was good with the aid of a dictionary. He was particularly privileged to be shown round Moscow State University by Professor Efgenji Milanovsky and given a personal guided tour of the Tretyakov gallery of classical Russian art; also to visit him with Mrs Milanovsky in their *dacha* in the woods on the outskirts of Moscow. A somewhat terrifying week-long car journey with Russian friends took him to St Petersburg, through the traditional Russian countryside, in which the beauty of the old Pushkin estate was particularly memorable. So too, in Moscow, was the glorious singing in one of the churches in the Kremlin.

During 2002, David published a study of the character and philosophy of the great pioneer geologist Adam Sedgwick, in P. Harman (ed.), *Cambridge Minds*. His edited volume *The Earth Inside and Out: Some Major Contributions to Geology in the Twentieth Century* was published by the Geological Society as Special Publication No. 192, and contained his introductory chapter on 'Writing about Twentieth-Century Geology'. His paper co-authored with Beryl Hamilton entitled 'Themes in the History of Scottish Geology' appeared in N. Trewin (ed.), *The Geology of Scotland* (The Geological Society). And his *magnum opus*, *Earth Water, Ice and Fire: Two Hundred Years of Geological Research in the English Lake District* (Geological Society Memoir No. 25) was completed and should have appeared in September, but owing to unwonted (and unwanted) delays did not appear until May, 2003, albeit with a 2002 imprint. A paper on 'Why Study the History of Geology?' was published in

Comunicações do Instituto Geológico e Mineiro, Lisboa, and much (nine articles plus editorial work) was done in the way of historical contributions to Elsevier's forthcoming *Encyclopedia of Geology*. Reviews were published of D. Dean (ed.), *James Hutton in the Field and in the Study: Being an Augmented Reprinting of Volume III of Hutton's Theory of the Earth (I, II, 1795)*; C. Roman, *Continental Drift: Colliding Continents, Converging Cultures*; C.L.E. Lewis and S.J. Knell (eds), *The Age of the Earth: From 4004 BC to AD 2002*; and H.S. Torrens, *The Practice of British Geology: 1750–1850*. And a combined essay review ('Science in the Airport Lounge: Reflections on Some Popular Books in the History of Palaeontology') provided a critique of: R. Fortey, *Trilobite: Eyewitness to Evolution*; S. Fiffer, *Tyrannosaurus Sue: The Extraordinary Saga of the Largest, Most Fought Over T. Rex Ever Found*; G. Curtis, C.C. Swisher, and R. Lewin, *Java Man: How Two Geologists' Dramatic Discoveries Changed our Understanding of the Evolutionary Path to Modern Humans*; R. Corfield, *Architects of Eternity: The New Science of Fossils*; C. McGowan, *The Dragon Seekers: The Discovery of Dinosaurs during the Prelude to Darwin/How an Extraordinary Circle of Fossilists Discovered the Dinosaurs and Paved the Way for Darwin*; and P. Chambers, *Bones of Contention: The Archaeopteryx Scandals*, appeared in *Metascience*. In collaboration with INHIGEO Member YANG Jing-Yi, a paper was written on the work of the Chinese coral specialist MA Ting Ying, and his geotectonic theory; and has recently appeared in the 'Classic Papers' Series for *Episodes*. Editorial work has continued on the contributions received for this series.

Barry Cooper reports that he has helped Ross Ramsey to develop a formal proposal for a Geological Hall of Fame at the South Australian Museum, an idea that was originally suggested by David Branagan about ten years ago.

Tom Darragh continues to research the production of the quarter-sheet geological maps of the Geological Survey of Victoria with a view to an eventual publication. A lecture on this topic was given to the Victorian Branch of the Geological Society of Australia in May 2002. A paper was also published on the history of the base map used for the 1887 geological map of Continental Australia, and a paper on Frederick McCoy's Irish years.

Publications:

Darragh, T.A., 'Ferdinand Hochstetter's Notes of a Visit to Australia and a Tour of the Victorian Goldfields in 1859', *Historical Records of Australian Science*, 2001, 13, 383–437.

_____, Frederick McCoy: the Irish Years. *Victorian Naturalist*, 2002, 118, 160–164.

_____, 'This Beautiful Work of Art': Skene and Slight's *Continental Australia*, *The La Trobe Journal*, 2002, 68, 31–38. *Tasmania*

Carol Bacon continues her interest in the history of Tasmanian geology and is working on a *Dictionary of Tasmanian Mining* and chapters for a *Companion to Tasmanian History*.

A small group of people in Tasmania interested in the history of geology have had some input into the planning for the programme of the 17th Australian Geological Congress, to be held in Hobart, Tasmania, from 8 to 13 February, 2004. As a result, a session will be devoted to the topic 'Contributions made by 'visiting' geologists in south-eastern Australia in the 19th Century'. One could mention, for example, Charles Darwin, Joseph Jukes, A.R.C. Selwyn and many others. Dr Max Banks and Mr Robert Major have been asked to co-ordinate the session. Four excursions with some, to much, history of geology content are also planned.

1. Before the conference (on 8 February), Carol Bacon and David Leaman will lead an excursion to the Tasman Peninsula to, among other things, visit the Tessellated Pavement, hear the history of views (from those of R. M'Cormick of the Ross Expedition of 1842 onwards) on this interesting site and consider its origin, and to visit the site of the convict coal mine at Saltwater River.

2. On the same day, delegates will have the opportunity to follow Charles Darwin to the Pinnacle of Mount Wellington, with Dr Max Banks.

3. During the conference a ferry will cruise down and then up the Derwent River, provide lunch and a commentary on the passing geology and history of study thereof from Dr Max Banks, Dr David Leaman and Dr Michael Roach.

4. After the conference (on 14 February) Dr David Leaman will lead a party to follow the footsteps of Charles Darwin down the eastern shore of the Derwent River and make a short diversion to examine an outcrop noted by Joseph Jukes.

On a somewhat different note, Professor Patrick Quilty and Dr Max Banks have just completed a biography of the late Professor Samuel Warren Carey for publication by the Australian Academy of Science in the *Historical Records of Australian Science* series. It was a fascinating, and challenging, task.

David Oldfloyd, Sydney

Belarus

The Commission on Studies of the Quaternary of the Academy of Sciences of the USSR turned seventy-five in 2002. The Republic of Belarus (The Geological Sciences Institute, Belarussian Academy of Sciences), which has been an associated member of INQUA, participated in this event. A short article on the of the Belarussian Academy of Sciences academician, A.V. Matveyev, appeared in the journal *Lithosphere* (Vol. 17, No. 2, 2002).

The 200th anniversary of Ignat Domeyko—native of Belarus, famous geologist, explorer in Chile, and worldwide-known scientist, who made a great contribution to science, education and culture—was celebrated during 12–14 September. More than two hundred people participated (among them Domeyko's descendants, and guests from Chile, Poland, Lithuania, Norway, and Russia). Financial assistance was provided by The Council of Ministers, the UNESCO National Commission in Belarus, and the Praesidium of Belarussian Academy of Sciences.

The National Organizing Committee consisted of representatives of the Government of the Republic of Belarus, the Ministry of Foreign Affairs, the UNESCO National Commission in Belarus, the Ministry of Internal Affairs, the Ministry of Culture, the Ministry of Education, and the Ministry of Information. Academician R. Garetski represented the geological society. The Institute of Geology of the Belarussian Academy of Sciences headed the preparations and running of the celebrations.

On 12 September, celebrations took part in Domeyko's native places in the Grodno region—in the villages of Krupovo and Zapole not far from the town of Lida, the villages of Medvedka and Mir near Koreliche, and the town of Novogrudek. In Krupovo, near the school where a museum was founded, a memorial sign (stone with the portrait of

Domeyko by sculpture P. Grusha) was erected. In Zapole, they erected an obelisk in honour of the famous scientist (who had been sent there under police surveillance after his arrest in Vilno for revolutionary activities in 1823). In Mir, on the ground of St Nicholas Church, they erected a memorial sign made by P. Grusha). In Medvedka, where Domeyko was born, near the school which also has a museum, a bronze bust of Domeyko (made by I. Golubiev) was solemnly inaugurated. Unfortunately, the manor where Domeyko was born did not survive the 1941–1945 War; but the scientists' descendants, travelling from different parts of the world, knelt and kissed the remnants of the manor's foundations and poured there earth brought with them from their home countries. They also took away with them handfuls of Belarusian earth.

The traditional VI Korelichy Readings devoted to Domeyko's anniversary took place in Mir. (organised by the Educational Centre named after F. Skorina).

On 13 September, an International Scientific Conference, 'Contemporary Problems in the Geology of Belarus, Lithuania, and Poland', was held in Mińsk. The Organizing Committee was headed by the Director of the Geologic Institute of the Belarussian Academy of Sciences, Corresponding Member of the Belarussian Academy of Sciences A. Mahnach, who also presented the keynote address: 'Problems and Targets of Geology: From Domeyko to Today'. The conference materials were published in Belarussian and English.

On 14 September, a large meeting devoted to the jubilee was held in Mińsk. The President of the Belarussian Academy of Sciences Mr M. Miasnikovich read the salutatory address from President of the Republic Belarus, A. Lukashenko. The audience was warmly greeted by the Chairman of the Council of the Republic of the National Assembly of Belarus, Mr A. Voytovich and the Head of the UNESCO National Commission in Belarus, Mr. V. Schastny. An exhibition of Domeyko's works and publications about him was opened in the National Library of the Republic of Belarus. Memorable coins and envelopes were issued and a booklet *Domeyko's Small Motherland* (in Belarussian and English) were published, as well as the book by Domeyko *My Travels*, translated into Belarussian for the first time. There were numerous publications about the events in the periodical press.

Publications, devoted to 200th anniversary of Ignat Domeyko:

In journals

- Anoshka, Y., 'Ignat Domeyko: The 200th Anniversary', *Lithosphere*, 16, No. 1, 2002 (in Belarussian)
 Machnach, T., 'Ignat Domeyko in the Belarussian Press: Bibliography', *Lithosphere*, 16, No. 1, 2002 (in Belarussian)
 Ermolenko, V., 'Ignat Domeyko (1802–1889)', *Geography*, No. 4, 2002 (in Belarussian)
 Ermolenko, V., 'The Life and Activities of Ignat Domeyko', *Krynitsa*, Nos 9–10, 2002 (in Belarussian)
 Ermolenko, V., 'From the Neman to the Terra del Fuégo', *Neman*, Nos 4–5, 2003 (in Russian)

In newspapers

- Asmalowski, A., 'Ignat Domeyko is 200', *Narodnaya Vola*, 25 May, 2002 (in Belarussian)
 Borovaya, G., 'Ignat Domeyko—A National Hero of Chile', *Nasha Svoboda*, 11 February, 2002 (in Belarussian)
 'The 200th Anniversary of Ignat Domeyko', *Golas Radzimy*, 3 April, 2002 (in Belarussian)
 'In Commemoration of Ignat Domeyko', *Respublika*, 29 March, 2002 (in Belarussian)
 Ermolenko, V., 'National Hero of Chile: A Belarussian', *Znamya Yunosti*, 30 August, 2002 (in Russian)
 Zelenkova, A., 'Great Enlightener', *Beloruskoye Vremya*, 29 March 2002 (in Belarussian)
 Latushko, P., 'Concerning the 200th Anniversary of Ignat Domeyko', *Niva*, 31 March 2002 (in Belarussian)
 Latushko, P., 'National Hero Ignat Domeyko's March on the Planet', *Culture*, 23 April, 2002 (in Belarussian)
 Mahnach, T., 'Ignat Domeyko: Citizen of the World', *Contacts and Dialogues*, Nos 5–6, 2002 (in Belarussian)
 Sharayeva, G., 'Philomath from Belarus' *Belaruskaya Delovaya Gazeta*, 12 April, 2002 (in Russian)
 'UNESCO speaks about Domeyko', *Vedy*, 25 May, 2002 (in Russian)

The journal *Lithosphere*, 2002, No. 2, published five articles by V. Ermolenko (in Russian), devoted to famous geologists, natives of Belarus:

- 'Tolvinskiy Konstantin Zinovievich (1877–1961): The 125th Anniversary of the Birth of the Explorer of the Geology of Indonesia and Oil Discoverer in Western Ukraine'
 'Niedvietskiy Anton Petrovich (1902–1986): The 100th Anniversary of the Birth of Academician of the Academy of Sciences of Tadzhikistan, Explorer of the Polymetallic Deposits in the Pamirs'
 'Fedorovich Boris Alexandrovich (1902–1981): The 100th Anniversary of the Birth of the Explorer of the Geology and Deserts of Central Asia'
 Dominikovskiy Viktor Nikolajevich (1902–1986): The 100th Anniversary of Birth of the Petrographer, and Explorer of Phosphate Deposits'
 'Vossoyevich Nikolay Bronislavovich (1902–1981): Outstanding Explorer of Oil and Gas Fields, Corresponding Member of the Academy of Sciences of the USSR'.

Valeri Ermolenko, Mińsk

Bolivia

In April 2002, a new *Historical Dictionary of Bolivia (HDB)* was published by the Historical Studies Group, under the leadership of the well-known historian Josep M. Barna-das. More than 300 researchers or foreign contributors from different countries (Argentina, Austria, Belgium, Bolivia, Brazil, Canada, Chile, Ecuador, Finland, France, Germany, Great Britain, Holland, Israel, Italy, Norway, Paraguay, Perú, Poland, Spain, Switzerland, and the United States of America) collaborated in this magnificent book. The work comprises two volumes with more than 2,400 pages. It has more than 3,800 articles with information on: anthropology, archaeology, architecture, biography, diplomacy, economy, history, journalism, law, linguistics, painting, politics, religion, sculpture, and society. I contributed articles on: 'Amalgamation', 'Antonio Olier', 'Metallurgy (Republic)', 'Pedro Fernández de Velasco' and 'The Academy of Theoretical and Practical Metallurgy'. The *HDB* costs \$110. (For orders and further information, contact: GEH, P.O. Box 2546, Cochabamba, Bolivia, or abas@mara.scr.entelnet.bo).

In the French publication *La Houille Blanche* (an international journal on water) (No. 4/5, 2002, pp. 165–170), Alain Gioda, the archivist Ana Forenza and I published: 'Les ruptures de barrages dans le monde: un nouveau bilan de Potosí (1626,

Bolivia' ('Dam collapses in the world: a new assessment of the Potosí disaster [1626, Bolivia]'). The following abstract of the contents gives an idea of what it is about.

The Potosí (San Ildefonso) dam collapse on 15 March, 1626 was one of the major hydraulic disasters in the world with 4,000 human lives lost, following Jansen (1980) and Schnitter (1994). However, these authors consulted only a paper by Rudolph, an engineer in the 1930s who rebuilt and restored the Spanish dams (1573–1621) in Potosí. Rudolph's paper (1936) had been written using just the Arzans draft (1711) about the silver mining capital of the 16th–17th centuries (the Central Andes, Bolivia previously Perú). With more archival and biographic references, we propose a new estimation of the dam disaster with 2,000 casualties or a little bit more. A catastrophic pollution by mercury (Hg) happened immediately after dam burst, because tons of the toxic chemical element (which was indispensable to silver amalgamation) were flooded into the Potosí canal. Following our estimation, 19 t of mercury were likely swept into the Pilcomayo tributaries (Rio de la Plata basin). The mercury pollution was very high (48 mg/l Hg), having in mind the dam storage capacity (400,000 m³) and that all the water was spilled in about two hours.

Another contribution that I published in December in the city of Sucre-Bolivia in the 2002 *Yearbook of the Archive and National Library of Bolivia* (pp. 289–312) has a provocative title: 'Truths about Potosí'. This essay presents the different versions of the discovery of the legendary 'Rich Mountain of Potosí', one of the greatest silver beds in the world, which has been exploited continuously since 1544 up to the present time. In continuation of studies of the establishment of the town (at the beginning a simple settlement or mining site, that some years later became the Imperial Villa), the case of the Chuquisaca site is studied in order to understand the process of foundation.

The Spanish colonial presence in the desolate Andean altitude of the silver mines, gave place to a settlement and later an odd town, placed in an inhospitable spot, but which, due to the silver riches, resulted in a very fast growth (from 75 inhabitants in 1545 to about 120,000 in 1569, with an increase to 160,000 towards the middle of the 17th century). Subsequently, it began to be depopulated as a consequence of a drop in the value of minerals, the insufficient supply of mercury, the occurrence of severe plagues, and long and devastating droughts and famines. Thus by the end of the colonial period and at the beginning of the Republic, only 8,000 parishioners were registered.

The town's growth generated a need for organization and unification of the urban space: concerning the movement of persons; the location and distribution of services (taps, fountains, drainage channels, sewers, fluvial washing places); and particularly the location of epidemic focal points and the supervision of sanitary establishments.

On 31 October, 2002, the Society for Bolivian History attended the opening of the new building that houses the Archive and National Library of Bolivia, in the city of Sucre—a wonderful structure that occupies 7,679 square metres. It consists of a block for the National Library and a service area assigned to the National Archive. Among other outbuildings, it has an auditorium, an exhibition hall, a reading room, classrooms, a room for researchers, a café, rooms for computers microfilms, and restoration or conservation room. This structure will be able to house 6,797 linear metres of documents of different colonial institutions of Charcas, and nearly 120,000 books, thousands of leaflets, journals and 2,000 titles of national newspapers. The preserved archival material represents 40% of the total documentation. Regrettably the rest was irretrievably lost and it is now unavailable for researchers.

Carlos Serrano, Potosí

Canada

William Sarjeant (1935–2002)

The few workers on the History of Earth Science in Canada have been sadly diminished by the unexpected death of Bill Sarjeant, Professor at the University of Saskatchewan, in July 2002. An obituary appears elsewhere in this *Newsletter*.

Sarjeant's extensive library in the History of Earth Sciences is being added to the University of Alberta library in Edmonton, where it forms the core of a special collection in the history of science in the Cameron Library.

Sarjeant is perhaps best known to INHIGEO members for his ten volume bibliography of Geologists and the History of Geology, a reference work of international scope. Enough material had been gathered for a further supplement at the time of his death, and as his literary executor I hope that other scholars and organizations in this field will be interested in collaborating to continue the work in some way.

Early Dinosaur Discoveries

Among the projects Sarjeant was unable to address was a revision of his paper on Early Dinosaur Discoveries in *The Complete Dinosaur* (Farlow & Brett-Surman 1997), for a new edition that is in preparation. I have been working on this, and note much interesting new information that has been published by Sarjeant and others since the first edition.

In the pre-scientific area has been Adrienne Mayor's documentation (Mayor 2000) of many fossil vertebrate finds by the ancient Egyptians, Greeks and other early Mediterranean civilizations. One of her interpretations synthesizes new fossil knowledge, classical authors, archaeological finds and myth to suggest that the legendary griffon may be based on real dinosaur fossils from the Gobi Desert. Other folk/pre-scientific interpretations of dinosaur bones have also been documented from locations as far apart as Laos and Morocco, and of tracks from Cameroon, Portugal (the splendid site visited during the Lisbon INHIGEO conference), and the western United States.

The early nineteenth century classic period of dinosaur discovery in the UK is illuminated in particular by the new biography of Mantell (Dean, 1999), and book-length surveys of the period by British (Cadbury, 2001) and Canadian (McGowan, 2001) authors. Of many pertinent papers, perhaps the most intriguing is on the Mantell collection in the Museum of New Zealand Te Papa Tongarewa (Yaldwyn *et al.*, 1997).

Notable new information or interpretation includes the uncovering of numerous new 18th and early 19th century dinosaur bone finds in the UK; a letter in which Lyell urged Mantell to strive to become the first British expert on fossil vertebrates (before this position was later achieved by Owen); that Mantell's Iguanodon tooth taken to Cuvier in Paris by Lyell has survived in New Zealand; and that Buckland may have regarded most of Mantell's collection (including Iguanodon bones) as belonging to his *Megalosaurus*.

Summer in Dawson, Yukon Territory

Thanks to the generosity of Canadian writer Pierre Berton and the Berton House Committee, I was able to spend the summer of 2002 as co writer-in-residence (with my wife Andrea) in Dawson, Yukon Territory. Now a little town of 2000 people, Dawson housed some 30,000 residents a century ago, when it was created at the height of the Klondike Gold Rush. Many buildings from that era are still standing, and significant examples are preserved by Parks Canada, and are popular stops along the Klondike tourist trail.

Berton's father had gone to the Yukon as a gold miner, and later was mine recorder. His mother wrote her autobiography, one of the most entertaining of the accounts of early Dawson (Berton, L.B., 1954). Pierre Berton himself has written the definitive popular book on the gold rush (Berton, P., 1972), and his Klondike library is now housed in Berton House. This (along with the Dawson museum and Yukon collection in the local public library) gave me the chance to read or sample many rare works on the gold rush that are not readily available elsewhere.

Dawson itself is named after eminent Canadian geologist George Mercer Dawson (1849–1901), whose pioneer Yukon explorations for the Geological Survey of Canada in 1887 provided geological support for the mining boom that followed. Recent biographies (Chalmers, 2000, Winslow-Spragge, 1993) cover his short but remarkable life. A republished book (Wright, 1992) outlines the pre-gold rush history of the Yukon, with extensive treatment of the geological survey. Early books by the surveyors themselves are also recently republished (Dawson, 1987; Ogilvie, n.d.).

Another of Canada's eminent geologists, Joseph Burr Tyrrell (1858–1957), first went to Yukon with the Survey, then left the government to become a mining engineer at the height of the Klondike rush. I was able to locate the log house which Tyrrell built in Dawson, and then moved to a different site after a conflict with the Gold Commissioner. Indeed, since it was up for sale while I was there, I could have bought it if I had so wished (and had the money). I began research on Tyrrell's work in the area, and (with the support of third generation miner and local historian John Gould) was able to correct an error in the dating of pictures in his wife Edith Tyrrell's book about the gold rush (Tyrrell, M.E., 1938). Two biographies of Tyrrell (Inglis, 1978, Loudon, 1930) have been published, together with a study of his survey years (Martyn, 1933), but there is no up to date account of his long (99 years) and remarkable life.

Dawson is well known for gold, but it is not so widely realized that it is also an important centre for studies of ice age mammals. The Third International Mammoth congress is taking place there in May 2003 (website <http://www.yukonmuseums.ca/mammoth/>).

Tendaguru Revisited

Gerhard Maier has been a technician at the Provincial Museum of Alberta and Tyrrell Museum of Paleontology, and is now an oil patch worker based in Calgary. He has been fascinated by the African dinosaur site of Tendaguru for many years. Initially studied by German scientists, it produced a wealth of Morrison age dinosaurs, most famously Brachiosaurus, for long the largest known dinosaur, which has survived the troubled history of Berlin. The territory became British after World War I, when it was studied by a succession of British workers; John Parkinson, Frederick Migeod, and English-Canadian William Cutler (assisted by a very young Louis Leakey).

Fluent in both English and German, Maier has travelled to Berlin and Tanzania in pursuit of his obsession. His book on the history of the site—the first book on it in English since John Parkinson's 1930 volume—is *African Dinosaurs Unearthed: The Tendaguru Expeditions*. It is being published by Indiana University Press in May 2003. Its hardcover price is \$C 78.95.

References: Early Dinosaurs

- Cadbury, Deborah, *The Dinosaur Hunters: A Story of Scientific Rivalry and the Discovery of the Prehistoric World*, Fourth Estate, London, 2001.
- Dean, Dennis R., Gideon Mantell and the Discovery of Dinosaurs, Cambridge University Press, Cambridge, 1999.
- Farlow, James O. & M.K. Brett-Surman (eds), *The Complete Dinosaur*, Indiana University Press, Bloomington & Indianapolis, 1997.
- Mayor, Adrienne, *The First Fossil Hunters. Paleontology in Greek and Roman Times*, Princeton University Press, Princeton, 2000.
- McGowan, Chris, *The Dragon Seekers. How an Extraordinary Circle of Fossilists Discovered the Dinosaurs and Paved the Way for Darwin*, Perseus Publishing, Cambridge (Mass), 2001.
- Yaldwyn, John C. Garry J. Tee & Alan P. Mason. The Status of Gideon Mantell's 'first' Iguanodon tooth in the Museum of New Zealand Te Papa Tongarewa, *Archives of Natural History*, 1997, 24, 397–421.
- Dawson and Gold Rush*
- Berton, Laura Beatrice, *I Married the Klondike*, McClelland & Stewart, [Toronto], 1954.
- Berton, P. Klondike, *The Last Great Gold Rush*, McClelland & Stewart, Toronto, 1972.
- Chalmers, William, *George Mercer Dawson. Geologist, Scientist, Explorer*, XYZ Publishing, Lantzville (British Columbia), 2000.
- Dawson, George M., *Report on an Exploration in the Yukon district, N.W.T. and adjacent northern portion of British Columbia, 1887. Reprinted from Geological and Natural History Survey of Canada, Annual Report (New Series) Volume III, Part 1, 1887–88*. Yukon Historical and Museums Association, Whitehorse, Yukon, 1987 (first published 1889).
- Inglis, Alex, *Northern Vagabond: The Life and Career of J. B. Tyrrell—The Man who Conquered the Canadian North*, McClelland & Stewart, Toronto, 1978.
- Loudon, W.J., *A Canadian Geologist*, Macmillan, Toronto, 1930.
- Martyn, Katharine, *J.B. Tyrrell: Explorer and Adventurer: The Geological Survey Years 1881–1898*, University of Toronto Library, Toronto, 1993.
- Ogilvie, William, *Early Days on the Yukon, and the Story of its Goldfields*, Bell & Cockburn, Toronto. Reprinted Wolf Creek Books, Inc., Whitehorse, Yukon, n.d. (1913).
- Tyrrell, M.E., *I Was There; a Book of Reminiscences*, Ryerson, Toronto, 1938.

- Winslow-Spragge, Lois (ed Bradley Lockner), *No Ordinary Man: George Mercer Dawson*, Natural Heritage/Natural History Inc., Toronto, 1993.
- Wright, Allen A., *Prelude to Bonanza: The Discovery and Exploration of the Yukon*, Studio North Ltd, Whitehorse, Yukon, 1992 (first published 1976).
- East African Dinosaurs*
- Parkinson, John, *The Dinosaur in East Africa*, H, F & G. Witherby, London, 1930.

David Spalding, Pender Island, Canada

Czech Republic (Brno)

Two books dealing with the history of natural sciences were published in 2002: Josef Staněk, *Mineralogy in Moravia and Silesia in the Years 1720 to 1970*; and Rudolf Musil, *Sloup-Šošůvka Caves in the Moravian Karst*.

The mineralogical monograph gives a synopsis of all professionals and amateurs from the oldest written sources to recent times. Considering that there have only been two hundred years of this research, the number of workers is surprisingly high (257), a fact arising from the enormous mineral wealth of this country. The publication provides information about all those who have worked in this area and gives an account of the results obtained. The text is divided by period as follows:

1. The beginning of mineralogy, the time of establishing of science societies and museums (1770–1820).
2. The period between 1820 and the end of the nineteenth century/beginning of the twentieth century.
3. Mineralogy in Moravia and Silesia in former Czechoslovakia (1918–1939).
4. The period of the Second World War 1939–1945.
5. Mineralogy in Moravia and Silesia in the years 1945–1970.

The 65-page work, edited by Rudolf Musil, appeared in the series *Folia Historica*, published by the Faculty of Science, Masaryk University (No. 71).

Sloup-Šošůvka Caves in the Moravian Karst refers to all the research in this karstic area. It is a typical karst region with numerous caves and other karstic phenomena, and has numerous palaeontological and archaeological remains. It was one of the first karstic research areas in Central Europe.

The publication reports in detail the history of research, from various branches of science. The text utilises the oldest reports and information and written records from archival sources. The first historical information dates from the year 1350, but reports become relatively abundant only from the sixteenth century. Professional research began in the seventeenth century. This karstic area was a place where speleologists, vertebrate palaeontologists, and archaeologists of the former Austro-Hungarian Monarchy gained knowledge through field investigation. The publication has 178 pages and numerous illustrations.

In 1–5 September, in conjunction with colleagues from Slovakia, we organized the 5th Workshop of the IGCP/UNESCO Project No. 442: 'Raw Materials of the Neolithic/Aeneolithic Polished Stone Artefacts: Their Migration Paths in Europe'. Lectures and poster sessions took place during the first two days in Bratislava (Slovakia). The subsequent three-day excursion was arranged in Moravia. It was possible to show our most important archaeological sites connected with the processing, distribution, or mining of stone raw materials in prehistoric times.

The first locality—Pohansko near the town of Břeclav, situated at the confluence of the Morava and Dyje rivers—was an important Slavonic settlement and hill-fort from the sixth century through to the first half of the tenth century AD. We discussed the provenience of raw materials for stone building materials, millstones and stone whorls. The next stop was one of the most popular Paleolithic sites in Central Europe—Dolní Věstonice—with its famous female figurine made of baked clay some 26,000 years ago (Eastern Gravettian Culture). The collection of lithic chipped artefacts from Dolní Věstonice has hundreds of thousands of pieces. The Paleolithic hunters used raw materials imported from a long distance (erratic flints from sediments of continental glaciation, radiolarites from the Alpine–Carpathian area, flints of the Kraków–Częstochowa Jurassic in southern Poland, and occasionally obsidian from southeast Slovakia).

Next day we visited Jurassic limestones with cherts on the Stránská Skála hill in Brno. The cherts were extracted in the Aeneolithic by people of the Funnel–Beaker Culture. A few years ago, archaeologists found a large workshop from that period, with limestone blocks and chert artefacts transported here some 200–500 metres from rocky outcrops. We could not miss the exhibition hall, Anthropos, in Brno, which shows the origin and evolution of Mankind and the beginnings of human culture by means of material documents.

The fifth stop was an active quarry in greenschists at Želešice, south of Brno. Greenschists and fine-grained amphibolites were favoured raw materials for prehistoric polished implements in Central Europe. The Želešice greenschists were used for making polished artefacts, especially in the period of the Lengyel Culture. Unusual prehistoric mining of cherts was discovered in the Krumlovský Les [Krumlovský Forest] Upland. We also visited recent archaeological excavations of mining pits, dug in soft Tertiary gravels, probably of Bronze Age. The last stop of our excursion was to the famous Býčí Skála cave in the Moravian Karst, which was one of the most important places of sacrifice in Hallstatt Europe.

Rudolf Musil and Antonín Přichystal, Brno

France

In 2002, French historians of geology enjoyed celebrating the bicentenary of the birth of the father of modern stratigraphy, the famous Alcide d'Orbigny (1802–1857), who began his scientific life studying foraminifers, and classifying them in a fundamental way, even though he was only twenty-four years old. D'Orbigny also worked for seven years for the French National Museum of Natural History as an extremely competent naturalist and traveller in South America, as demonstrated by his impressive eleven-volume *Voyage en Amérique méridionale* (1835–1847).

In July, Professor Philippe Taquet and the French National Museum of Natural History organized a successful international symposium under the patronage of the International Commission on the History of Geological Sciences (INHIGEO). The Proceedings of this symposium were promptly published by the French Academy of Sciences in the first volume (Issues Nos 6 and 7) of *Comptes Rendus Palevol* (a rather bizarre hybrid name given to one of the former series of the

famous *Comptes Rendus de l'Académie des Sciences*). Naturally, many members of the French Committee on the History of Geology (COFRHIGEO) attended this symposium, and six of them contributed to its proceedings.

Additionally, COFRHIGEO organized, as usual, three scientific sessions during the year. Nine lectures were delivered during these meetings. The corresponding written contributions were printed in the annual volume of its *Travaux* (3rd series, Vol. 16):

Michel Durand-Delga, 'Pierre-Bernard Palassou (1745–1830): pionnier de la géologie des Monts Pyrénées'.

Goulven Laurent, 'Jean-Guillaume Bruguière (1750–1798), et les débuts de la paléontologie des invertébrés'.

Dominique Frizon de Lamotte & Diego Buil, 'La question des relations entre failles et plis dans les zones externes des chaînes de montagnes. Ebauche d'une histoire des idées au cours du XX^e siècle'.

Isabelle Laboullais-Lesage, 'Les méthodes de la géographie physique selon Nicolas Desmarest'.

Silvia F. de Mendonça Figueiroa, 'Les rapports entre le Brésil et la France au XIX^e siècle dans le domaine des sciences géologiques'.

André Combaz, 'Les premières découvertes de pétrole au Sahara dans les années 1950'.

Jean-Jacques Chauvel & Jean. Plaine, 'Géologie et archéologie bretonnes: le président de Robien (1698–1756), un précurseur au temps des Lumières'.

Georges Pichard, 'Pons-Joseph Bernard (1748–1816): un naturaliste provençal du siècle des Lumières'.

René Medioni, 'Du Service de la Carte géologique de la France au Service géologique national: causes et conséquences de la fusion de 1968'.

Jean Gaudant, who is in charge of editing the proceedings of the Dolomieu symposium, held in Paris in November, 2001, received the last manuscripts at the end of the year. The publication is scheduled for 2003, in the new collection *Mémoire de la science*, edited by the French Academy of Sciences.

Jean Gaudant, Paris

Germany

Meetings

The German group held its annual meeting on 5 September, 2002, in Würzburg during the 'Geo 2002', the regular annual symposium of the various German earth science societies. In the historical session on 'Geology in Germany, 1914–1945', chaired by Martina Koelbl-Ebert and Bernhard Fritscher. Seven papers were presented; in addition to the papers of Lüdecke and Fritscher, mentioned below (see 'lectures'). These were: H.S. Torrens, 'Political constraints on a scientific career: the case of Sidney S. Buckman, 1860–1929'; W. Czegka, 'Zwischen Kontinentalverschiebung und Emigration—Wilhelm Salomon-Calvi, 1868–1941'; T. Kammel, 'Stand des Projekts "Leistung und Leben von Arthur Schoenflies: Rezeptionsgeschichte und Familie, ihre Herkunft und Schicksal"'; I. Rabien, 'Hans Jüngst, 1901–1944, und die Wehrgeologie im Zweiten Weltkrieg'; and, C. Rooff, 'Kriegsziel Dinosaurier-Skelette: Besatzungspolitik, Kulturgutabplanungen und die deutsche Paläontologie in Belgien im Ersten Weltkrieg'.

With regard to the political aspects and difficulties of this time of German history, and science, the section was preceded by a lively public discussion on the question 'why we should work on the history of geology during the time of national socialism'. A more detailed review (in German) of this discussion by Dr Koelbl-Ebert can be found in issue No. 10 of *Geowissenschaftliche Mitteilungen; Gmit* of the Deutsche Geologische Gesellschaft, December 2002, 81–82.

A second historical section at the Würzburg symposium on 'The Ups and Downs of Ideas and Concepts—or Successes and Failures in Geodynamics: From Past to Future' was chaired by W. R. Jacoby. Papers were presented by W. Jacoby, S. Horn & B. Kreher-Hartmann, J. Strehlau, D. Bernoulli *et al.*, N. Oreskes, M.T. Greene, M. Kölbl-Ebert, G. Hofbauer, and M. Dorn.

The History of Meteorology group of the German Meteorological Society held a meeting on 'International Meteorological Cooperation and Projects' at Leipzig (26–27.9.2002), chaired by Dr Lüdecke. And the German Commission for the History of Geophysics and Cosmical Physics held a session in May 2002, chaired by Hans-Jürgen Treder, where problems in geophysical and relativistic hydrodynamics were discussed.

Publications

Albrecht, H., and Ladwig R., *Abraham Gottlob Werner and the Foundation of the Geological Sciences: Selected Papers of the International Werner Symposium in Freiberg 19th to 24th September 1999, Freiburger Forschungshäfte D 207, Montan- und Technikgeschichte*, Technische Universität Bergakademie Freiberg, 2002.

Brunner, K. & C. Lüdecke, 'Kartographische Ergebnisse der ersten Deutschen Südpolar-Expedition 1901–1903', *Kartographische Nachrichten*, 2002, 52, 143–148.

Fritscher, B., 'Hegel und die Geologie um 1800', in: O. Breidbach & D. von Engelhardt (eds), *Hegel und die Lebenswissenschaften* (Ernst-Haeckel-Haus-Studien: Monographien zur Geschichte der Biowissenschaften und Medizin, 5), Berlin 2002, 55–74.

_____, 'Metamorphism and Thermodynamics: The Formative Years', in: D. Oldroyd (ed.), *The Earth Inside and Out: Some major Contributions to Geology in the Twentieth Century*, The Geological Society of London, Special Publication, 192, London, 2002, 143–165.

_____, 'Chronologie der Geowissenschaften' (von Christi Geburt-1840, 1871–1900), in: *Chronologie der Naturwissenschaften: Der Weg der Mathematik und der Naturwissenschaften von den Anfängen in das 21. Jahrhundert*, Frankfurt am Main 2002.

_____, 'Nobis, H. M., Mittelalterlich-scholastische Wurzeln der Mineralogie Georgius Agricolae. Ein Beitrag zur Geistesgeschichte der Geowissenschaften der frühen Neuzeit', in: M. Folkerts, S. Kirschner & A. Kühne (eds), *Pratum floridum: Festschrift für Brigitte Hoppe, Algorismus*, H. 38, Augsburg 2002, 325–357.

_____, 'Alfred Wegener's "The Origin of Continents, 1912"', *Episodes*, 2002, 25, 100–106.

_____, 'Erdwissenschaft und "Deutsche Bewegung": Bemerkungen zur Rezeption der Wernerschen Mineralogie in Jena', in: *Abraham Gottlob Werner and the foundation of the geological sciences*. H. Albrecht and R. Ladwig (eds), *Selected*

- Papers of the International Werner Symposium in Freiberg 19th to 24th September 1999*, (Freiberger Forschungshefte, D 207) Freiberg 2002, 45–52.
- _____, 'Vom Donner der Erde zur Sternschnuppe', *Spektrum der Wissenschaft Spezial: Forschung und Technik im Mittelalter*, Special Issue No. 2, 2002, 44–47.
- _____, 'Erdgeschichte zwischen Natur und Politik: Lorenz Okens 'Zeugungsgeschichte' der Erde', in: D. von Engelhardt and J. Nolte (eds), *Von Freiheit und Verantwortung in der Forschung: Zum 150. Todestag von Lorenz Oken (1779–1851)* (Schriftenreihe zur Geschichte der Versammlungen Deutscher Naturforscher und Ärzte, 9) Stuttgart, 2002, 110–129.
- _____, & Seibold, E., Die Geowissenschaften im zwanzigsten Jahrhundert und die Leopoldina, in: 350 Jahre Leopoldina: Anspruch und Wirklichkeit. Festschrift der Deutschen Akademie der Naturforscher Leopoldina, 1652–2002, ed. By B. Parthier and D. von Engelhardt. Halle (Saale) 2002, 587–608.
- Guntau, M., 'Geological and Mineralogical Knowledge and the Field of Mining before the Industrial Revolution', in: G. Laurent (ed.), *Proceedings of the XXth International Congress of History of Science (Liège, 20–26 July 1997)*, Vol. X, *Earth Sciences, Geography and Cartography*, Brepols Publisher n.v., Turnhout, Belgium, 2002, 19–24.
- _____, 'Zu einigen Aspekten der Geologie in der Zeit des Nationalsozialismus in Deutschland (1933–1945)', *Geohistorische Blätter*, 2002, 5, 125–150.
- _____, 'Zu den Prinzipien der Klassifikation natürlicher Objekte in den Vorstellungen von Abraham Gottlob Werner', in: H. Albrecht & R. Ladwig (eds), *Abraham Gottlob Werner und die Begründung der Geowissenschaften* (Freiberger Forschungshefte D 207), Technische Universität Bergakademie Freiberg 2002, 79–87.
- _____, 'Geowissenschaften (except Geographie) 1901–1950', in: K.-H. Schlote (ed.), *Chronologie der Naturwissenschaften. Der Weg der Mathematik und der Naturwissenschaften von den Anfängen in das 21. Jahrhundert*, Verlag Harri Deutsch, Frankfurt am Maine, 2002, 617–795.
- _____, Review of: Milanovskij, Evgenij Evgenjevic, *Alfred Wegener 1880–1930*, Nauka, Moscow, 2000. In: *Internationale Zeitschrift für Geschichte und Ethik der Naturwissenschaften, Technik und Medizin (NTM)*, 10 (n.s.), 2002, 198.
- Hofbauer, G., 'Die Diskussion um die Entstehung der Süddeutschen Schichtstufenlandschaft: Eine historisch-methodologische Skizze mit einem Modell zur fluviatil gesteuerten Schichtstufen-Morphogenese', *Natur und Mensch Jubiläumsausgabe 200 Jahre NHG*, 2001, 85–108.
- _____, 'Aktualismus und die Prinzipien erdgeschichtlicher Forschung', in: *Zeitschrift der Deutschen Geologischen Gesellschaft*, 2001, 152, 109–127.
- _____, 'Geognosie: Von Füchsels reflektierter Spekulation zu Werners voreingenommener Wahrnehmung', *Freiberger Forschungshefte*, 2002, D 207, 111–123.
- _____, 'Historisch-methodologische Aspekte der Kontroverse um das Süddeutsche Schichtstufenland', *Nachrichtenblatt zur Geschichte der Geowissenschaften*, 2002, 12, 14–15.
- Kelber, K.-P. & Okrusch, M., 'Athanasius Kircher retrospektiv: Pendelschläge geowissenschaftlicher Erkenntnis', in: Beinlich, H., Vollrath, H.-J. & Wittstadt, K. (eds), *Spurensuche: Wege zu Athanasius Kircher*, Dettelbach, J.H. Röhl, 137–162.
- Kölbl-Ebert, M., 'Augenzeugin der Gebirgsbildung? Das chilenische Erdbeben von 1822 als wissenschaftshistorischer Kriminalfall', *Geohistorische Blätter*, Berlin 5, 2002, No. 1, 73–97.
- _____, 'Crocodile-Lady: The Stratigraphical Work of Barbara Marchioness of Hastings (1810–1858)', in: Venec-Peyre, M.T. & Taquet, Ph., *Alcide d'Orbigny: sa vie et son oeuvre. La stratigraphie de d'Orbigny à nos jours*, Paris, 1–4 juillet 2002, Abstracts.
- _____, 'Bei Ihrer Mitteilung über den Schriftwechsel mit Herrn Prof. Quiring habe ich von Herzen gelacht'—neue Quellen zum Scheitern der Impakthypothese für Nördlinger Ries und Steinheimer Becken vor 1960', *Schriftenreihe der Deutschen Geologischen Gesellschaft*, 2002, 21, 195f.
- _____, 'British Geology in the Early 19th Century: A Conglomerate with a Female Matrix', *Earth Sciences History*, 2002, 21, 3–25.
- Lüdecke, C., Eine Ausstellung anlässlich der Hundertjahrfeier der ersten deutschen Südpolarexpedition (1901–03), *Nachrichtenblatt für die Geschichte der Geowissenschaften*, 2002, No. 12, 27–30.
- _____, 'SWEDARC 2000: Wissenschaftshistorische Feldarbeiten zur Geschichte der Polarforschung in Spitzbergen (Sommer 2000)', *Nachrichtenblatt für die Geschichte der Geowissenschaften*, 2002, No. 12, 127–133.
- _____, German Marine Weather Stations of World War II at Spitzbergen, *International Council of Monuments and Sites, 13th General Assembly, Scientific Symposium, Madrid, Spain 1–5 December 2002*, 39–41.
- _____, Meteorologische Messungen im 18. Jahrhundert, in: E. Donnert (ed.), *Europa in der Frühen Neuzeit. Festschrift Günther Mühlpfordt*, Böhlau Verlag, Köln, Vol. 6: *Mittel-Nord- und Osteuropa*, 951–953.
- _____, 'Wechselbeziehungen zwischen Geologie und Meteorologie am Beispiel von Horace-Bénédict Saussure (1740–1799)', in: H. Albrecht and R. Ladwig (eds), *Abraham Gottlob Werner und die Begründung der Geowissenschaften. Ausgewählte Vorträge des Internationalen Werner-Symposiums vom 19. bis 24. September 1999*, (Freiberger Forschungshefte, D 207 *Montan und Technikgeschichte*), Technische Universität Bergakademie Freiberg, 2002, 198–209.
- _____, 'Kostenvoranschlag für die Reparatur eines Ozonlochs', in: Nele Ströbel (ed.), *Reparaturen der Welt*, Herbert Utz Verlag, München, 153–157.
- _____, 'Ein genußreiches Zusammenleben und arbeiten': Friedrich Ratzels Zeit in München (1875–1886), *Berichte zur Wissenschaftsgeschichte*, 25 January, 2002, 25–39.
- _____, 'Carl Ritters Lehrtätigkeit an der Allgemeinen Kriegsschule in Berlin (1820–1853)', *Verlag für Wissenschafts- und Regionalgeschichte*, Michael Engel, Berlin, 97.
- _____, 'Geopolitik ist wohl das Endziel' Hintergründe zu Karl Haushofers persönlicher Nachkriegsgeschichte 1918', in: B. Niebuhr (ed.), *Schriftenreihe der Deutschen Geologischen Gesellschaft, Geo* 2002, 1.–5. Oktober 2002, Würzburg, 21, 229–230.

- _____, 'Alfred Wegener Biographie', *Brockhaus Lexikon Naturwissenschaft und Technik*, F.A. Brockhaus AG, Mannheim, 3, 2002, 2158.
- _____, Approximately 50 bibliographies of meteorologists and about 50 entries on meteorology, *Lexikon der Geowissenschaften*, Spektrum Akademischer Verlag, Heidelberg 2000–2002.
- _____, Review of: Ch. Hammerl, W. Lenhardt, R. Steinacker & P. Steinhauser (eds), *Die Zentralanstalt für Meteorologie und Geodynamik 1851–2001: 150 Jahre Meteorologie und Geophysik in Österreich* (two CD-Roms), Leykam, Graz, INHIGEO Newsletter No. 34, 2002 for 2001, 38.
- _____, Review of: Walter Kertz, 1999, *Geschichte der Geophysik. Zur Geschichte der Wissenschaften. Eine Reihe der TU Braunschweig*, Vol. 3, Georg Olms Verlag, Hildesheim, 1999, INHIGEO Newsletter No. 34 for 2001, 2002 for 2001, 38–39.
- _____, Review of: *MeteoSchweiz*, 2000, *Alte meteorologische Instrumente*, Zürich, pp. 90 (to be acquired by MeteoSchweiz, Kräbühlstrasse 38, CH-8044 Zürich), in: *Mitteilungen der Meteorologischen Gesellschaft*, February 2002, 23–24.
- Schröder, W., *Solar Variability and Geomagnetism*, Science Edition, Bremen, 2002.
- _____, *Changes in the Natural Observations: The Aurora of March 1716*, Science Edition, Bremen, 2002.
- _____, *Life and Work of the Pioneer of Australian Culture*, Erhard Eylmann, Science Edition, Bremen, 2002.
- _____, *Noctilucent Clouds (History, Development, Observations)*, Science Edition, Bremen, 2002.
- Seibold, E. & Seibold, I., 'Alfred Bentz—Erdölgeologe in schwieriger Zeit, 1938–1947', *Geologische Rundschau*, 2002, 91, 1081–1093.
- _____ & _____, 'Sedimentology: From Single Grains to Recent and Past Environments: Some Trends in Sedimentology in the Twentieth Century', in: D. Oldroyd (ed.), *The Earth Inside and Out: Some major Contributions to Geology in the Twentieth Century*, The Geological Society of London, Special Publication No. 192, London, 2002, 241–250.
- Völkel, H., *Mineralogen und Geologen in Breslau. Geschichte der Geowissenschaften an der Universität Breslau von 1811 bis 1945*, Bode Verlag GmbH, Haltern, 2002.
- Wagenbreth, O.; Düntzsch, H.; Gieseler, A., *Die Geschichte der Dampfmaschine: Historische Entwicklung—Industriegeschichte—Technische Denkmale* (including a CD-Rom with dates and pictures of more than 30.000 steam engines), Münster, 20002.

Lectures

- Fritscher, B., 'Alcide d'Orbigny and the Germans: Outline of a Comparative Case Study of French and German Jurassic Stratigraphy in Mid-19th century', Paris, Musée d'histoire naturelle (Grande Galerie d'Evolution), Colloque International Alcide d'Orbigny, sa vie et son oeuvre, histoire de la stratigraphie de d'Orbigny à nos jours, 1.–7. Juli 2002 (3.7.2002).
- _____, 'Im Vorgarten der Natur': Hermann und Adolph Schlagintweit am Großglockner', Salzburg, Universität, Pangeo 2002: Gemeinsame Jahrestagung der österreichischen erdwissenschaftlichen Gesellschaften, 30.6.2002.
- _____, 'Deutsche Geologie': Ursprünge, Strukturen, Praxis', Würzburg, Geo 2002: Gemeinsame Jahrestagung der deutschen geowissenschaftlichen Gesellschaften, 1–5.10.2002 (5.10.2002).
- Guntau, M., 'Die Geowissenschaften um 1800', Gastvorlesung im Rahmen der Ringvorlesung 'Wissenschaft und Technik um 1800' des Instituts für Wissenschafts- und Technikgeschichte der Technischen Universität Bergakademie Freiberg (8.1.2002).
- Koefl-Ebert, M., 'George Bellas Greenough and 'Elevation'? Private Background of a Geological Debate', Meeting 'The Amateur in British Geology', History of Geology Group (HOGG) of the Geological Society of London, London, 14–15 March, 2002.
- _____, 'Vom Vulkan zum Meteoritenkrater? 100 Jahre Impakthypothese am Nördlinger Ries und Steinheimer Becken', München, Freundeskreis der Geologischen Staatssammlung (8.5.2002).
- _____, 'Über den Ursprung der Geologinnen durch soziale Auslese: ein deutsch-britischer Vergleich'. München, Soroptimist (Club München-Schwabing) (25.6.2002).
- Lüdecke, C., 'Über die militärische Ausbildung und das Japankommando des späteren Geopolitikers Karl Haushofer (1869–1946)', München, Institut für Geschichte der Naturwissenschaften (17.1.2002).
- _____, 'Universitas Antarctica—Über die erste deutsche Südpolarexpedition (1901–1903)', München, Geologisches Museum, Festvortrag anlässlich der Eröffnung der Ausstellung 'Universitas Antarctica—gestern und heute' (6.3.2002).
- _____, 'Karl Haushofer (1869–1946), seine militärische Laufbahn und Hinwendung zur Hochschule und Geopolitik', München, Institut für Geschichte der Naturwissenschaften (25.4.2002).
- _____, 'Geschichte der Umweltforschung am Beispiel der Polarforschung', Münster, Zentrum für Umweltforschung an der Universität (2.5.2002).
- _____, 'Das Prinzip der Freiheit—Interdisziplinäre Forschungen während der ersten deutschen Südpolarexpedition (1901–1903)', Berlin, Museum für Naturkunde, Gemeinsames Seminar (8.5.2002).
- _____, 'Universitas Antarctica. Erste deutsche Südpolarexpedition vor hundert Jahren', Würzburg, Sparkasse Mainfranken, Opening Address (17.9.2002).
- _____, 'Erforschung des Unbekannten—Internationale Kooperation in der Antarktis 1901–04', Leipzig, Tagung des Fachausschusses Geschichte der Meteorologie 'Internationale meteorologische Kooperationen und Projekte' (27.9.2002).
- _____, 'Geopolitik ist wohl das Endziel': Hintergründe zu Karl Haushofers persönlicher Nachkriegsgeschichte 1918', Würzburg, Geo 2002 (5.10.2002).
- _____, 'German Marine Weather Stations of World War II at Spitsbergen', Madrid, International Council of Monuments and Sites, 13th General Assembly, Scientific Symposium (3.12.2002).

Further activities

Cornelia Lüdecke, together with Ingrid Hoensch und Heinz Peter Brogiato (both Leipzig), organized an exhibition on the 100th anniversary of Erich von Drygalski's Antarctic expedition (1901–1903), entitled 'Universitas Antarctica', which was presented at

the 'Sparkasse Mainfranken' in Würzburg, from 17 September to 9 October, 2002. From 17 to 19 October, Dr Lüdecke participated in the 'Münchner Wissenschaftstage' (Munich Science days), presenting a poster on meteorological measurements ('Messen—erst am Boden, später hoch hinaus'). And, on 6 December she finished her 'Habilitation' at the University of Hamburg with a lecture on 'Selected Chapters from the History of Earth Sciences—Protagonists, Theses, Institutions'.

Bernhard Fritscher presented a lecture course on 'Earth Sciences in the Biedermeier Time' at the History Department of the University of Munich.

And, finally, in 2002, No. 12, of the *Nachrichtenblatt zur Geschichte der Geowissenschaften* (containing, among other things, the abstracts of the 2001 Munich meeting on the history of geology), edited for the German group by Oskar Burghardt, has been published. It can be obtained from Oskar Burghardt, Taubenstrasse 47, 47800 Krefeld-Bockum, Germany.

The help of the German members of INHIGEO in the compilation of this report is much appreciated.

Bernhard Fritscher, Munich & Martina Koelbl-Ebert, Eichstätt

Hungary

The Geohistorical Section of the Hungarian Geological Society held seven independent meetings (23 presentations) and six more (35 presentations) in co-operation with twelve other institutions.

Commemorations were read on: Ms Ilona Csepregy-Meznerics (1906–1977); Loránd Eötvös (1848–1919); Antal Koch (1843–1927); Ferenc Schafarik (1854–1927); Eligius Róbert Schmidt (1902–1973); József Szabó (1822–1894); Endre Szöts (1914–1984); Zsigmond Szentpétery (1880–1952); András Tasnádi-Kubacska (1902–1977); István Velty (1900?–1961?); Aladár Vendl (1886–1971); and István Vitális (1871–1947).

The lecture series on the Mining Museums in Hungary was continued:

'30 years of the Museum of Hungarian Aluminium Industry in the town of Székesfehérvár'.

Other lectures included:

L. Bognár, '50 years of the J. Szabó Technical School of Geology'.

G. Papp, 'Role of the Hungarian Museum of Natural History in the development of Mineralogy, Petrology and Geochemistry in Hungary'.

B. Csath, 'The Thermal Well in the Town of Szeged was Drilled 75 years Ago'.

B. Csath *et al.*, 'Hungarian Water Exploration in Mongolia Started 45 years Ago'.

I. Z. Nagy and T. Kecskeméti, 'Two Hundred Years of the Hungarian Museum of Natural History'.

A new INHIGEO member was elected from Hungary: Miklós Kázmér (Department of Palaeontology, L. Eötvös University, Budapest). With the death of G. Csiky in 2001, the number of Hungarian members is still nine.

Selected publications

Dudich, E. *et al.*, 'The Role of Geologist Members of the Hungarian Academy of Sciences [MTA] in the Development of Geology in Hungary', *MTA Közgyűlési Előadások [Lectures of the Annual Congress of the Hungarian Academy of Sciences]*, November, 2000, 549–558 (in Hungarian).

Galács, A. & Vörös, A., 'Palaeontological Research in Hungary and 175 Years of the Hungarian Academy of Science', *MTA Közgyűlési Előadások [= Lectures on the General Assembly]*, November, 2000, 619–627 (in Hungarian).

Marosi, S. (ed.), *L. Lóczy Senior: A Memorial Volume*, Geoscientific Research Centre of the Hungarian Academy of Sciences, Budapest (in Hungarian).

Nagy, B., 'Effect of the Members of the Hungarian Academy of Sciences on the development of Mineralogy, Petrology and Geochemistry in Hungary', *MTA Közgyűlési Előadások*, November, 2000, 619–627 (in Hungarian).

Papp, G., *History of the Minerals, Rocks and Fossil Resins in the Carpathian Region*, *Studia Naturalia* 14, Hungarian Museum of Natural History, Budapest, 2002.

Szakáll, S. *et al.*, *Minerals of the Carpathians*, Granite Publications Co., Prague, 2002.

Tóth, A. (ed.), *E. Vadász Commemorative Conference [held in 2000]*, Museum of the Hungarian Aluminium Industry, Székesfehérvár, 2002 (in Hungarian).

_____, 'Roots of Historical Geography', in: *Historical Geography of the Nyírség and Upper Tisza Area*, Gy. Bessenyei Academy, Nyíregyháza, 17–22 (in Hungarian).

Organisational information

On 17 February 2003, the Geohistorical Section of the Hungarian Geological Society elected new officials. E. Dudich, President since 1997, and J. Hála, Secretary since 1989, retired. Ms. Tereza Póka, member of INHIGEO since 1976, was elected President and P. Papp as Secretary. Professor Vilma Széky-Fux was elected life-long Honorary President of the Section.

The new contact address is: Péter Papp, Geological Institute of Hungary (MÁFI), H-1143 Budapest, Stefánia út 14, e-mail:

<papp.peter@mafi.hu>.

Endre Dudich, Budapest

Ireland

During the last year a number of items have been published by the Royal Irish Academy in Dublin that will be of interest to INHIGEO members. The first, *Irish Innovators in Science and Technology* is an updated and expanded version of two earlier books, and provides short one to two-page biographies of Irish scientists. A full list of the geologists and mineralogists covered in this volume is given below. The second publication is a pamphlet on the Reverend Samuel Haughton by David Spearman, which contains the text of the Annual Public lecture of the National Committee for the History and Philosophy of Science. Both publications are available from the Royal Irish Academy, 19 Dawson Street, Dublin 2, Ireland.

Gordon Herries Davies continues to work on his eagerly awaited history of the Geological Society of London.

Paul Mohr's book, *John Birmingham, Tuam and Ireland's New Star*, was recently published by the Millbrook Nova Press.

Patrick Wyse Jackson has been busy organising the forthcoming INHIGEO symposium on 'Geological Travellers'. At the time of going to press 58 delegates and their accompanying members have signed up for this event in July. He has also edited

three books in the last year. One of these, *Annals of Bryozoology*, contains a number of papers on the history of research on fossil and Recent bryozoans, some of which are authored by INHIGEO members. Of particular interest to historians of geology will be the papers on the fossil dealer and corset maker George Robert Vine [Buttler, Wyse Jackson & Sharpe], early studies in the Netherlands [Cadée], micropalaeontological collections in Austria [Kázmer & Vávra], the Cincinnati paleobryozoologists [Cuffey, Davis & Utgaard], the collaborative work of Canu and Bassler [Sanner], the life and work of A.E. Reuss [Vávra], the work of the female bryozoologist Eliza Jelly [Torrens & Winston] and W.D. Lang's studies of orthogenesis in Cretaceous bryozoans [Taylor]. This volume, published by the International Bryozoology Association, is available from Patrick Wyse Jackson.

Publications

- Mollan, R.C., Davis, W.J. & Finucane, B. (eds), *Irish Innovators in Science and Technology*, Royal Irish Academy, Dublin, 2002.
- Patrick Ganly, William Fitton, George Victor du Noyer [by Jean Archer]; John Tyndall [by David Attis]; Edward Hull [by Jim Bennett]; William Traill [by Martin Brown]; Robert Mallett [by Ron Cox]; Richard Griffith, Joseph Beete Jukes, Thomas Oldham [by Gordon Herries Davies]; Peter Woulfe [by William J. Davis]; William Willoughby Cole, the Earl of Enniskillen [by Kenneth James]; Frederick M'Coy [by Nigel Monaghan]; Thomas Molyneux [by J.B. Lyons]; John Joly [by Adrian Somerfield]; Samuel Haughton [by David Spearman]; Richard Kirwan [by Duncan Thorburn Burns]; William Thomson, Lord Kelvin [by Denis Weaire and David Attis], Reverend William Hamilton, Charles Lewis Giesecke, Henry Medlicott, Richard Dixon Oldham, and Frank Mitchell [by Patrick Wyse Jackson]
- Buttler, C.J., Wyse Jackson, P.N. & Sharpe, T., 'George Robert Vine (1825–1893): Stay Maker, Bryozoologist and Fossil Dealer', in: Wyse Jackson, P.N. & Spencer Jones, M.E. (eds), *Annals of Bryozoology: Aspects of the History of Research on Bryozoans*, International Bryozoology Association, Dublin, 2002, 1–29.
- Mohr, P., *John Birmingham, Tuam and Ireland's New Star*, Millbrook Nova Press, 2002.
- _____, Review of: C.L.E. Lewis & S.J. Knell (eds), *The Age of the Earth: From 4004 BC to AD 2002*, The Geological Society, London, 2001. In: *Episodes*, 2002, 25, 214–215.
- Monaghan, N.T., 'Irish palaeontological illustrations of the 19th century', in: Rushton, B.S., Hackney, P. & Tyrie, C.R. (eds), *Biological Collections and Diversity*, Linnean Society Occasional Publications, 2001, 3, 83–91.
- Murphy, T., 'The Seismology Observatories of Mungret and Rathfarnham', *Irish Journal of Earth Sciences*, 2002, 20, 1–32.
- Spearman, D., 'Samuel Haughton, Victorian Polymath', *Annual Public Lecture National Committee for the History and Philosophy of Science*, Royal Irish Academy, Dublin, 2002.
- Wyse Jackson, P.N., 'Kerry Diamonds: Facts and Folklore', *The Kerry Magazine*, 2001, 12, 23–25.
- _____, 'Classic Paper in the History of Geology: John Joly's Paper: 'Uranium and Geology' (1908)', *Episodes*, 2002, 25, 258–263.
- _____, 'Sir Richard Griffith's Catalogue of Mines and Mineral Occurrences in Ireland: Notes on Various Editions Published between 1853 and 1862', *Journal of the Mining Heritage Trust of Ireland*, 2002, 2, 9–14.
- _____ & Parkes, M.A., 'Charles Hepworth Holland: palaeontologist and biostratigrapher', in: Wyse Jackson, P.N., Parkes, M.A. & Wood, R. (eds), *Studies in Palaeozoic Palaeontology and Biostratigraphy in Honour of C.H. Holland*, Special Papers in Palaeontology, 2002, 67, 5–13.
- _____, Robinson, M. & Austin, W.E.N., 'Arthur Earland (1866–1958) and his Links with Ireland', *Journal of Micropalaeontology*, 2002, 21, 167–168.
- _____ & Spencer Jones, M.E. (eds), *Annals of Bryozoology: Aspects of the History of Research on Bryozoans*, International Bryozoology Association, Dublin 2002.
- _____ & _____, 'From Rondelet to Stockholm: Four Centuries of Bryozoological Research', in: Wyse Jackson, P.N. & Spencer Jones, M.E. (eds), *Annals of Bryozoology: Aspects of the History of Research on Bryozoans*, International Bryozoology Association, Dublin, 2002, 363–381.

Patrick Wyse Jackson, Dublin

Northeast Italy

The past year saw several activities in the field of history of geology in NE-Italy, diffused in various occasions throughout the area. The three administrative regions form what is generally called NE-Italy: Veneto (or the Venetian Region), Friuli-Venezia Giulia and Trentino-Alto Adige.

In Venezia (Venice) Corrado Lazzari published a volume of 174 pages, with 62 text-figures and a good bibliographic list, entitled: *Le Scienze della Terra nel Veneto dalle origini ai giorni nostri (Earth Sciences in Veneto [or Venetian Region] from the Origin to the Present Day)*, with a subtitle: *8 secoli di studi, scoperte, progressi e legende (Eight centuries of Studies, Discoveries, Progress, and Legends)*. The text is addressed to a wide public, not only to specialists, and was printed on behalf of the *Società Veneziana di Scienze Naturali* (Venetian Society of Natural Sciences). The contents can be shortly reported as follows.

After a foreword with outlines of the geological observations in the classic Greco-Roman period and in the Middle Ages, the author points out the birth of geological interest in the Venetian Republic with mining activity and thermal water use in the eighteenth and nineteenth centuries. In 1222, the University of Padova (Padua) was founded, the second in Europe after Bologna, and scientific arguments were considered from the beginning as part of the philosophical debates. For instance, Albert of Hallstätt, the future Albertus Magnus (Albert the Great), who frequented Padova University from its foundation and entered the Dominican Order, affirmed that mountains are formed in connection with volcanic activity and are shaped by the erosive activity of water.

In the fifteenth and sixteenth centuries, the question of the origin of fossils was debated energetically in the cultural circles of the Venetian Republic. In 1540, Gerolamo Fracastoro, teacher of medicine at Padova University, affirmed correctly in a letter to a Veronese lawyer that fossils are remains of marine organisms, encased in the sediments when the sea formerly

extended to the areas where they are found. He denied that inner forces could give rise to rocks shaped in the forms of fossils, interpreted as sports of nature (*lusus naturae*).

The collection of minerals, fossils, unusual objects, and archaeological pieces started in the sixteenth and seventeenth centuries and museums were formed, initially as sites for the display of 'marvellous' objects (*Wunderkammer* of the German cultural area), and then with scientific intention. The first museum in the Venetian Republic was set up in Verona by Francesco Calzolari (Calceolari) in 1571. Meanwhile, the fossil fish-site of Bolca, not far from Verona, was discovered in 1554. It represented what was, up till then, the richest fossil fish-site of in the world; the fishes were found in an excellent state of preservation and some of them were very large. Over 250,000 samples of fossil fishes have been recovered to the present day and are housed in museums and collections all over the world.

The origin of mountains found a first explanation in 1740 by the abbot Anton Lazzaro Moro from San Vito al Tagliamento in his work: *De' corpi marini che si truovano su' monti* (*Concerning Marine Bodies Found on Mountains*). He maintained that not all mountains are of the same age. Those formed by rocks containing no fossils were uplifted before the appearance of life on Earth; those with fossiliferous rocks were formed after such an event, up to the present, as the archaeological remains included in some volcanic tuffs and the formation of a new island in the Santorini eruption in the Aegean, in 1707, proved. In the controversy about the Universal Deluge, Moro affirmed that it was a miracle that did not require an explanation in terms of normal physical laws.

In the same years Antonio Vallisneri Sr, a teacher at Padua University, explained the perennial cycle of water in 1714: *Lezione accademica sull'origine delle fontane* (*Academic Lecture on the Origin of Springs*), demonstrating that water does not rise from the earth's depths because of the internal fire, as sustained by analogy with the alembic, but falls from the clouds formed by evaporation from the sea because of the sun's heat. As to fossils, he denied that they were related to the Noachian Deluge.

The scientific collections in the museums were now used for scientific purposes. Giovambattista Gazola became owner of a part of the famous fossil site at Bolca in 1787 and set up a museum, with more than 1200 ichthyolites, classified according to the Linnaean rules proposed by the Swedish naturalist. The collection was donated, or sold to a very low price, to Napoleon Bonaparte when he invaded the Venetian Republic, which came to an end in 1797, after a millennium of glorious existence. Its territory was given to Austria, with important consequences for scientific life.

Two years before the end of the Republic, Giovanni Arduino, arguably the 'father of stratigraphy', died in Venice. In 1759, on the basis of observations of the stratigraphic sequence in various parts of the Venetian domain and abroad, he distinguished four orders (or eras) of Earth history: Primary, Secondary, Tertiary and Quaternary. These are still in use. He was born in Caprino Veronese and was appointed inspector of mines, of uncultivated areas, and then of agriculture.

In 1739, Gregorio Piccoli del Faggiol, a Veronese land-surveyor and cartographer, published the first known stratigraphic column known, dealing with the fossil bones of mammals. Thus terrestrial vertebrate palaeontology was born at that time. Girolamo Barettoni found a skull of what we now think is a Mesozoic crocodile in the Vicentinian. In 1814, Giovanni Battista Brocchi, from Bassano, published the first monograph on stratigraphic palaeontology in Veneto, *Conchologia fossile subapennina* (*Subapennine Fossil Conchology*). In the controversy between Neptunists and Vulcanists about the origin of crystalline rocks, he converted to Vulcanism from Neptunism after a visit to the Vesuvius. On Vulcanist side of the debate were Giovanni Arduino, Alberto Fortis, and Lodovico Pasini, all active geologists towards the end of the eighteenth century who recognized the existence of ancient volcanoes in Veneto and adjacent areas.

At Padua University, Tomaso Antonio Catullo, from Belluno, became a teacher of Natural History. He used fossils, especially ammonites, for what we would now call Mesozoic stratigraphy. At that time, Achille De Zigno was an active palaeontologist, who corrected some age attributions of Catullo. De Zigno, whose mother was Irish and lived in London for a period, was one of the few Italian palaeontologists of the period who could speak English.

In 1866, Veneto was joined to Italy and the new chair of geology was assigned in 1869 to Giovanni Omboni, from Milan. That of mineralogy went to Ruggero Panebianco from Messina in 1882. So the modern disciplines in the Earth sciences entered Padua University.

In 1909 Giorgio Dal Piaz, born in Feltre from a family of Trentinian origin, became professor of geology in Padua University. With him the development of geology in Veneto acquired a modern character. He proposed an advanced interpretation of the structure of Southern Alps and founded the *Memorie dell'Istituto Geologico della Regia Università di Padova* (*Memoirs of the Geological Institute of the Royal University of Padua*) in 1912. His former students and then colleagues were numerous and some of them reached important positions in the scientific world, among which was his son Giambattista Dal Piaz, who interpreted the structure of the Alpine Chain; Ramiro Fabiani, specialist of Paleogene stratigraphy; Silvio Vardabasso, who studied the Mesozoic magmatic activity in the Alps and in Sardinia; Carlo D'Ambrosi, karstologist and stratigrapher of Istria; and Piero Leonardi, who studied the Dolomites. Also remembered are Angelo Bianchi, mineralist and petrographer in Padua, who studied the plutonic rocks of the Alps; Michele Gortani, stratigrapher of the Palaeozoic of the Eastern Alps and Carnia in particular, and hydrogeologist. Among the people active in geology in a broad sense in more recent times are the micropalaeontologists Francesco Ferasin and Fabio Medizza, the paleoichthyologist Lorenzo Sorbini, and the geophysicist Armando Norinelli, and Ardito Desio, who studied the Himalayan Chain and died in 2001 at the age of 104.

The exposition by Corrado Lazzari ends with the above scientists; the living ones are excluded from the treatment, as it is usually done in this kind of works.

In the summer meeting of the *Società Paleontologica Italiana* (Italian Paleontological Society), held in Verona and in Bolca in June 2002, Margherita Frigo Sorbini and her collaborators described the history of research about the fossils of Bolca (in particular the fishes) carried out during the last thirty-five years by many Italian and foreign authors.

The fifth number of *Natura Vicentina* (*Vicentinan Nature*), a periodical edited by the city Museum of Natural History and Archaeology, was printed in Vicenza. It contains an exposition by Claudio Beschin about the history of researches regarding the Cenozoic Brachiuran Decapods. There are many fossiliferous sites around Vicenza with such Crustaceans and an international meeting was recently organized by the author in Montebelluna Maggiore, in an ancient villa, with specialists from

many countries attending. I was invited to present the new volume and expound the history of the research in geology and palaeontology in the Vicentinian over the last three centuries.

In a meeting promoted by the friends of the local museum in Montebelluna Maggiore, in December 2002, Paolo Mietto, a teacher at Padua University, outlined the development of the naturalistic tradition in Vicentinian from the Enlightenment to the present.

Fabio Marco Dalla Vecchia published in the periodical *Natura Nascosta (Hidden Nature)*, No. 24, 2002, edited by the *Museo Paleontologico Cittadino* (Paleontological Civic Museum) of Monfalcone, Gorizia Province, Friuli-Venezia Giulia Region, an article entitled *A caccia di fossili nel Far West* ('Fossil Hunting in the Far West'). He reported the history of the first discoveries of dinosaurs in the extended area of new occupation by USA at the western border of the Union in the middle and late 19th century. He referred in particular to the activity of Charles Sternberg, flanking the expeditions organized by Edward D. Cope, after the refusal of Sternberg's collaboration by Othniel C. Marsh.

The *Annali del Museo Civico (Annals of the Civic Museum)* of Rovereto, Trento Province, Trentino-Alto Adige region, No. 16, dated 2000 but actually published in 2002, contained two articles on archaeozoological and palaeoanthropological subjects. The authors reported the history and organization of the researches, in both cases spanning through some lustrums (periods of five years) near Chiusole (M. Capitanio and C. Corrain), or nearly a century near Mori (S. Bonardi, S. Marconi, A. Riedel, U. Tecchiat). Both places are situated not far from Rovereto.

From the above account, it is clear that reports it is becoming usual in scientific to begin with an historical introduction about the subject, making the history of science ever more popular in our country, especially in recent years.

Giuliano Piccoli, Padua

Japan

The Japanese Association for History of Geological Sciences (JAHIGEO) held ordinary and general meetings at Hokutopia, Tokyo, on 15 June and 23 December, and an evening meeting at the annual meeting of the Geological Society of Japan, at Niigata University on 16 September, 2002. The following presentations were made at the general meeting in June:

Masahiro Okubo, 'Short Notes on the *Principles of Geology* by Lyell'.

Masahiko Akiyama, 'Development of paleobiochemistry and organic geochemistry in Japan'.

Yoshikazu Hayama, 'Professor Gorai's pursuit of a new theory of magmatism'.

Masao Gorai was a leading petrologist, known for his proposal of twin method of plagioclase to distinguish between magma-type and metamorphic granites, and pioneering his studies of subsidiary elements and isotope petrology. He was one of the editors of *The Geologic Development of the Japanese Islands*, published in 1965. He died at the age of 86 on 4 February, 2002, and a Memorial party was held in his honour in Tokyo on January 25, 2003.

The following three lectures relating to Niigata Prefecture were presented at the evening meeting at Niigata University.

Kazuya Chihara, 'Review of the Compiled Geological Maps of Niigata Prefecture'.

Tadashi Hasegawa, 'History of Geological Education in Niigata Prefecture'.

Mitsuo Shimazu, 'Development of Metallic Mines and Mining Geology in the Tohoku District during the Meiji and Taisho Eras'.

The following three lectures were given at the general meeting in December.

Michiko Yajima, 'In Memory of the Notable American Palaeontologist Stephen Jay Gould'.

Yasumoto Suzuki, 'On the Geodetic Study of Crustal Movements in Japan in the 1920s and 1930s'.

Toshihiro Yamada, 'On Varen's *Geographia Generalis* and Steno'.

Seminars on the history of geosciences were held on three occasions under the leadership of the younger members of the Association on 16 March, 21 September, and 22 December. The following presentations were made.

Fumihiko Tochinnai, 'Methodological Aspects of Historical Controversies in the Japanese Geological Community after World War II' (in March, at Aoyama, Tokyo).

Boum-Soung Kim, 'The Study of Seismicity in Relation to Meteorological Phenomena in the Meiji and Taisho eras' (in September, at Aoyama, Tokyo).

Kwang-Nam Kim, 'On Lyman's Field Notes Preserved at the State University of Massachusetts at Amherst' (in December, at Hongo, Tokyo).

Benjamin Smith Lyman (1835–1920) was one of the geologists invited to Japan by the Japanese Government during the Meiji Era. He engaged in geological survey work in Hokkaido and discovered coal fields in that island. In addition, he is respected for his training of several gifted young geologists.

Yasumoto Suzuki, Tokyo & Kenzo Yagi, Sapporo

Lithuania

Professor Algimantas Grigelis, first elected a Member of INHIGEO in 1970, was re-elected at the Commission's Business Meeting held in Paris in July, 2002.

[N.B. When a limitation of eleven Members per country was established, following a determination made at the meeting in Dresden, several scholars from the former USSR lost their membership of the Commission. Since the re-emergence of several new countries, we are glad to see the renewal of membership from persons in Uzbekistan, Lithuania, and Belarus, and hope and trust that other persons from countries of the former Soviet Union will join the ranks of INHIGEO. Ed.]

Short articles

Short articles have been published devoted to following topics:

'History of stratigraphy in Lithuania', in: *International Symposium Alcide d'Orbigny 1802–1857. His Life and Work. Stratigraphy: From d'Orbigny until Today. Museum of National History*, 1–7 July 2002, Paris, Abstracts, 26.

'Ignatas Domeika—Pasaulio Piliotis; Ignacy Domeyko—Citizen of World', in: *Ignacy Domeyko 1802–1889. His Life, Works and Contribution to Science. Proceedings of the International Scientific-Conference, 10–12 September 2002, Vilnius, Lithuania*, Vilnius, 2002, pp. 9–13 (in Lithuanian and English).

'Ignacy Domeyko and Alcide d'Orbigny—men of the same age but different fate; Ignacio Domeyko y Alcide d'Orbigny—hombres de misma época pero distintas fortunas', in: Międzynarodowa Konferencja Naukowa: Ignacy Domeyko (1802–1889): mineralog, geolog, ojciec nauczania górnictwa w Chile, *Polskie Towarzystwo Mineralogiczne, Prace Specjalne, Zeszyt*, 2002, 21, Kraków, 15–36 (in English and Spanish).

Book review

Review of: Edmundas Lekevičius, *The Origin of Ecosystems by Means of Natural Selection*, Vilnius, 2002 (in Lithuanian).

Obituaries

Two publications devoted to the memory of Professor Lars-König Königsson, 1933–2001, Quaternary geologist (Uppsala University, Sweden):

'Profesorius Lars-König Königsson atminimui', *Geologijos Akiračiai*, 2001, No. 4, p. 56 (in Lithuanian).

'Lars-König Königssonas (1933–2001)', *Geologija*, 2002, 38, pp. 61–62 (in Lithuanian) [co-author, M. Kabailienė].

Conference reports

Four international conferences were attended during 2002:

International Symposium 'Alcide d'Orbigny 1802–1857. His life and work. Stratigraphy: From d'Orbigny until today', Museum of National History, 1–7 July 2002, Paris.

International Scientific Conference, 'Ignacy Domeyko 1802–1889: His Life, Works and Contribution to Science', Vilnius University and Lithuanian Academy of Sciences, 10–12 September 2002, Vilnius, Lithuania.

The Fifth Baltic Stratigraphical Conference on 'Basin Stratigraphy: Modern Methods and Problems'. Baltic Stratigraphic Association, 22–27 September, 2002 Vilnius, Lithuania.

Międzynarodowa Konferencja Naukowa: 'Ignacy Domeyko (1802–1889): mineralog, geolog, ojciec nauczania górnictwa w Chile'. Cracow Technical University AGH and Polskie Towarzystwo Mineralogiczne, 12 December 2002, Kraków, Poland.

Brief notices and miscellaneous matters

The Lithuanian Ignotas Domeika Society was established in Vilnius on 4 December, 2002, in association with the Lithuanian Academy of Sciences. Professor Grigelis was elected President. An announcement about the Society was published in the scientific newspaper *Mokslo Lietuva* on 19 December, 2002, page 17.

Report on own work

Editorial work

Grigelis compiled and edited *Ignotas Domeika 1802–1889. Gyvenimas, darbai ir indelis į mokslą; Ignacy Domeyko 1802–1889. His Life, Works and Contribution to Science, Proceedings of the International Scientific Conference, 10–12 September 2002, Vilnius, Lithuania*, Vilnius, 2002 (in Lithuanian and English).

With co-authors O. Kondratienė, J. Paškevičius, T. Jankauskas, J. Satkūnas, Grigelis has compiled *Lietuvos stratigrafijos vadovas; Lithuanian Stratigraphic Guide*, Geological Survey of Lithuania, Vilnius, 2002 (in Lithuanian and English). [This contains a valuable abridged version of the International Stratigraphic Guide, previously published in *Eptisodes*, 1999, 22, 255–271 (Ed.).]

Grigelis is editor and publisher of the *International Yearbook on Geology, Geomorphology and Palaeogeography of the Baltic Sea 'BALTICA'*. Volume 15 was published in 2002 by the Lithuanian Academy of Sciences and Institute of Geology, Vilnius, 2002 (in English).

Country reports

Several publications were published by A. Grigelis in the field of history of geology, devoted to:

Professor Jan Harff, as a new foreign member of the Lithuanian Academy of Sciences.

The 80th anniversary of the famous stratigrapher, Professor Alexandr Zhamoida (St Petersburg).

The 200th anniversary of the mineralogist, geologist, ethnographer, and educationist Ignacy Domeyko.

200 years anniversary of world-wide palaeontologist and stratigrapher Alcide Dessalines d'Orbigny.

Transcripts of interviews

Grigelis reported on the Ignacy Domeyko UNESCO year in Lithuania on the Jubilee session of the Lithuanian Academy of Sciences, 8 October, 2002. The occasion was hosted by the President of the Lithuanian Academy of Sciences, Academician B. Juodka.

Authorization of articles submitted to Proceedings of the Ignacy Domeyko International Scientific Conference was made by A. Grigelis in the Jagiellonian University and Academia Umiejetnosci, Cracow, and in the Muzeum Ziemi PAN, Warsaw, 10–14 June, 2002, hosted by INHIGEO members Professors W. Narębski and Z. Wojcik.

Other matters

Some other initiatives have been:

Vilnius, October 2003: 200th anniversary of geological sciences in Vilnius University. The Organizing Committee has requested of INHIGEO patronage for this Conference, and some financial assistance for the Conference edition.

Episodes 'Classic Papers': Professor A. Grigelis (Lithuanian Academy of Sciences and INHIGEO) has agreed to complete with Professor A. Paulo (Cracow Technical University-AGH) extracts from Ignacy Domeyko classic work 'A View of Chilean Cordilleras . . . ' published in Polish in 1878. A manuscript is in preparation.

INHIGEO in 2006? Vilnius could be considered of a possible place for the INHIGEO meeting in 2006, hosted by the Lithuanian Academy of Sciences.

Algimantas Grigelis, Vilnius

Grigelis

Malta

A new Museum at Ghar Dalam (S.E. Malta), organised by myself, was inaugurated on the 23rd of May, 2002, by the Minister for Education and Culture. Its aim is to inform visitors on the cave of Ghar Dalam and on the Pleistocene mammalian dwarf fauna that it contains. A section has been devoted to the people who carried out serious research on the above. In addition to the cave's stratigraphy sequence, information is provided also on the effects of the European Ice Age, the formation of Ghar Dalam, and evolutionary adaptations.

George Zammit Maempel, Hal Balzan, Malta

New Zealand

As in previous years, much of the research into the history of New Zealand geology is initiated by members of the Historical Studies Group of the Geological Society of New Zealand. Members currently engaged in research include Heather Nicholson, who is unravelling the development of stratigraphic nomenclature of the basement rocks, so critical to the understanding of New Zealand geology, with all its inherent controversies. Graham Bishop, after extensive research in New Zealand and Scotland, has now completed a first draft of a biography of the nineteenth-century geologist Alexander McKay. Simon Nathan, currently at the Stout Research Centre at Victoria University, is writing a biography of Harold Wellman, best remembered as the geologist who first recognised the 480-km dextral displacement on the Alpine Fault in the South Island of New Zealand. Perhaps one of the most exciting developments during the year was the discovery of Dr Ferdinand von Hochstetter's 5th Diary, which records much of his geological observations while in Nelson in 1859. Leonore Hoke is co-author of a soon to be published English translation of the diary. She is also researching the letters written by Hochstetter to his former assistant in New Zealand Julius von Haast, who went on to be Director of the Canterbury Museum in Christchurch. Alan Mason continues to delve into the contributions made by geologists such as E. de C. Clarke and J.A. Bartrum. Tony Hocken completed a history of the Geology Department of the University of Otago, which the Geological Society hopes to publish in 2003. As a sideline to his research of the West Nelson Gold Fields, Mike Johnston has been following the brief career of Edward Heydelbach Davis (1845–1871), who was the only geologist employed by the New Zealand Geological Survey to die on active service. To assist future research into the history of geology, the Geological Society continues to build up its Alan Mason Historical Studies Fund.

The group keeps in touch through an annual meeting as part of the Geological Society's conference and in particular by way of the bi-annual *Historical Studies Newsletter*, which is published under the auspices of its editor Alan Mason. *Newsletter* Nos 24 and 25, published in March and September 2002 respectively, contain a range of interesting and informative articles. Alan Mason had a lead paper describing the activities of James Hector in Canada as part of the Palliser Expedition of 1857–1860. Hector, who in 1865 became the inaugural Director of the New Zealand Geological Survey, was instrumental in the discovery of Kicking Horse Pass, which as the name suggests, nearly resulted in his death. Alan also has articles on the pioneer surveyor and artist Charles Heaphy as well as an account of the teaching of geology at the University of Sydney. His brother Brian similarly refers to geology at the University of Canterbury. Tony Hocken details Pat Marshall's resignation from the chair of geology at the University of Otago and John Weeber provides a facsimile of the oldest known drill-log for a water-well in New Zealand. A biography of the New Zealand geologist Alexander Finlayson and an account of the Swedish glaciologist Carl Caldenius's visit to New Zealand are provided by Bill Watters and Simon Nathan respectively.

A number of members of the group have achieved distinctions. Professor Douglas Coombs of Otago University was made a Companion of the New Zealand Order of Merit and Brian Mason received an Honorary Doctor of Science from his *alma mater*, the University of Canterbury. A former member, the late Robin Oliver is remembered by the University of Adelaide's Robin Oliver Memorial Prize.

Michael Johnston, Nelson

Poland

The main history of geology event in Poland for this year involved the celebrations of the 200th anniversary of birth of Ignacy Domeyko (1802–1889). This eminent geologist, mineralogist, and mining engineer was born in a Lithuanian province of the former Polish–Lithuanian Commonwealth, but became a political exile and lived in Chile in the years 1838–1889. He spent his youth in native Novogrodek region (now in Belorussia) and graduated from the Vilna University in 1822. As a participant in anti-Russian insurrection, Domeyko had to emigrate through Saxony to France, where he studied chemical and geosciences at the Sorbonne, the *Collège de France* and the *École des Mines* in the years 1832–1837. In 1838, invited by Chilean Government, Domeyko moved to Coquimbo (La Serena) where till 1846 he taught chemistry, mineralogy, and assaying in the local college. Following this, Domeyko was nominated Professor at the University of Santiago, being elected Rector four times in the years 1867–1883. Due to his exceptional merits in this field, the Chileans have named Domeyko the 'apostle' of science and education. In fact, he contributed significantly to the economic and civil progress of the young republic.

Domeyko published his important geoscientific results chiefly in the Paris journals of the *Académie des Sciences* and *Annales des Mines*, as well as in *Neues Jahrbuch für Mineralogie* and other international journals. Altogether he was the author of several hundred publications on mineralogy, geology, mining sciences, meteorology, volcanology, assaying, geochemistry, geophysics, and ethnography. Among them there were academic textbooks, continuously supplemented with appendices containing descriptions of newly discovered mineral compounds. One of them was named in 1845 domeykite. Moreover, a large Chilean mountain range was named Cordillera Domeyko in his honour and several Andean Jurassic fossils, examined by French palaeontologists, bear his name.

Thanks to the initiative of the former Polish ambassador in Chile and Professor Zdzisław J. Ryn of Jagellonian University, the year 2002 was announced as being devoted to Ignacy Domeyko. Consequently, this international institution organized a large exhibition in Paris, with advice from the authors of his most detailed biographies: Zbigniew Wojcik and Z.J. Ryn, who offered their historical materials to the organizers. The exhibition was highlighted with Domeyko's bust, which had been cast in the laboratory of Mining and Metallurgic University in Cracow.

In Poland, the scientific sessions and exhibitions commemorating the anniversary were organized by the National Library in Warsaw, Jagellonian University in Cracow, the Polish Academy of Arts and Sciences, the Mining and Metallurgic

University, and Warsaw University. During these conferences, apart from main lectures by Domeyko's biographers Ryn and Wojcik, his many-sided scientific and educational activities were represented by specialists in different branches of geosciences and in the study of archival materials. Andrzej Paulo (explorer of Andean geology) discussed Domeyko's achievements in general Andean and applied geology. Wojciech Narebski described his pioneer role in chemical mineralogy, discussing more than 200 analyses of minerals, rocks and waters. Ewa Koszowska, Andrzej Laptas and Anna Wolska described the valuable mineralogical collections presented by Domeyko to Jagellonian University and the Polish Academy of Arts and Sciences, partly checked using modern analytical methods. The same procedure was applied by Henryk Kucha, Andrzej Paulo and Adam Pieczka in examination of silver ores from Domeyko's Chilean collection. The results of studies of interesting archival materials, deposited in Cracow and Poznan, were presented by Teresa Stupnicka-Kepinska, Ewa Niedzialkowska, and Janusz Skoczylas.

The Polish organizers invited the participation of scientists representing all the countries related with Domeyko's life and his many-sided activities, *i.e.* Belorussia, Lithuania, France, and Chile. Moreover, Polish scientists were invited to take part in similar international conferences organized in these countries: in Paris, Santiago, Vilnius, Minsk, and Brest. The exchanges promoted significantly the studies on history of sciences in post-Soviet republics and stimulated the interest of Russian mineralogists from St Petersburg in Domeyko's role in the development of geosciences.

These conferences were accompanied by several important publications. A voluminous book entitled *Ignacy Domeyko: Citizen of the World*, was edited and largely written by Professor Ryn with support from Jagellonian University. It contains, among other data, a valuable detailed almanac of our hero's life and rich bibliography. The Mineralogical Society of Poland, in co-operation with the Mining and Metallurgic University, published the twenty-first volume of its *Special Papers* containing lectures presented at the International Scientific Conference: *Ignacy Domeyko (1802–1889)—Mineralogist, Geologist and Father of Mining Sciences in Chile*. The materials of the International Domeyko's Conference in Brest and Lida (4–7 October, 2002) were edited by T. Goniewicz's as *Foundation for Help to Polish Schools in the East*. Moreover, the National Library in Warsaw has published a catalogue of the Exhibition: *I Care for Chile but I Pine for Poland* with an article by Jadwiga Garbowska and Krzysztof Jakubowski. The Jagellonian Library in Cracow issued a booklet: *From Lithuania to Chile. Ignacy Domeyko 1802–1889*.

In the background of these jubilee celebrations, some other studies were continued in our country. Stanislaw Staszic's museum in Pila has edited *Staszic's Fascicule* No. 3, containing lectures concerning the outstanding geologist and statesman Domeyko by A.S. Kleczkowski, S. Czarniecki, J. Skoczylas, and Z. Wojcik.

The recently published fifth part of *Archival Materials on Geosciences in the Collections of the Museum of the Earth of the Polish Academy of Sciences* contains interesting documents of Polish geologists who were active in Russia: Hanna Czechczt, Leonard Jaczewski, and Boleslaw Rychlowski.

Dr Wojcik has published in the periodical *Analecta: Studies on the History of Science* a manuscript elaboration of Stefan Zbigniew Rozycki entitled '200 years of Geological Sciences in Warsaw'. Additionally, he has published a book *Geological and Mining Problems in 'Kielce journal' in the Years 1871–1909*, and delivered to the editor a voluminous monograph *Jozef Morozewicz and his Participation in the Organizing Committee of the Mining University in Cracow in the years 1912–1921*. The history of earlier attempts to found this University in the nineteenth century has been elaborated in detail in a paper by A.S. Kleczkowski, published in the *Yearbook of Scientific Library of the Polish Academy of Arts and Sciences* in Cracow.

The history of geological exhibitions in the Museum of the Earth of the Polish Academy of Sciences was described in detail by its Director, Krzysztof Jakubowski, on the occasion of the fiftieth anniversary of this Academy.

Stanislaw Czarniecki has published the history of geologic exploration of the Podgorze quarter of Cracow in a local periodical; and a paper on the contribution of inhabitants of Bochnia (the site of famous salt mine near Cracow) to the geology of Poland.

Based on his researches in the palaeontological collections in the Pierre-et-Marie Curie University in Paris, and documents collected by Dr Czarniecki in his Laboratory of the History of Polish Geology in Cracow, Radoslaw Tarkowski has presented the results of his studies on the contacts of and cooperation between Polish and French geologists in the mid-19th century in the French journal *Coptes Rendus de l'Académie des Sciences, Paris, Palevol* (Volume 1, 2002).

Zbigniew Wojcik, Warsaw & Wojciech Narebski, Cracow

Portugal

Some Information about the History of Geology in Portugal (2002)

There have been several developments about History of Geology in Portugal or in close relationship to this country. One of the major items was the Colloquium commemorating the second centenary of the birth of Alcide d'Orbigny, held July 1–5, 2002, at the *Muséum National d'Histoire Naturelle de Paris*. A communication was presented by Miguel Telles Antunes and Philippe Taquet, focusing on the relationships between Portugal and France and especially on those between Napoléon III and the Portuguese King Pedro V (to whom an excellent collection of fossils was presented by d'Orbigny). A fuller account was, following the Committee's request, published in a special volume of *Comptes Rendus de l'Académie des Sciences, Palevol*.

Another item was a consequence of our mission to Brazil in November, 2002. The rediscovery by us of Cretaceous fish-containing nodules from Ceará, Brazil, at the Museum of the Academy of Sciences of Lisbon was followed up. These nodules were almost certainly sent to Portugal in the eighteenth century, well before their presumed discovery in the nineteenth century. Contacts have been established with Professor Idalécio de Freitas and other researchers at Crato, Ceará, who have been studying the Cariri area, in order to try to obtain more data about the origin of these fossils.

Still another item consists in the divulgation of the palaeontological part of an interesting but poorly-known collection of fossils, minerals, rocks and archeological material from Portugal. This collection was offered to the National Museum of Rio de Janeiro by the Oporto University in 1935, following an initiative by Professor A. Mendes Corrêa who had the collaboration of J. Carrington da Costa. An abstract was submitted to the VIth *Congresso Nacional de Geologia* (to be

held at the New University of Lisbon, June 4–6, 2003), and a more complete account will be published in the *Bulletin of the National Museum*.

Miguel Telles Antunes

Miscellaneous

INHIGEO members Miguel Telles Antunes and Manuel S. Pinto attended the d'Orbigny Meeting in Paris in July, 2002.

INHIGEO member Ana Carneiro and assistants have continued to work in cataloguing and in the preservation of material of the geoarchives of the *Instituto Geológico e Mineiro* (formerly Geological Survey of Portugal).

Talks were delivered by INHIGEO members Ana Carneiro (*A geologia e o domínio do território: as Comissões Geológicas do século XIX*, in Évora, Portugal) and by Manuel S. Pinto (*Gaspar Frutuoso e o vulcanismo dos Açores*, in Ponta Delgada, Azores, Portugal and *Impacto ambiental da mineração no Brasil colonial* in Évora and in São Paulo, Brazil).

Contrary to what was expected, and due to technical problems, the Proceedings of the INHIGEO Meeting held in Portugal in 2001 were not published in 2002, but have recently appeared. Apologies are presented to all members by the editor, Manuel S. Pinto.

An international meeting on mining heritage was held in Portugal and Spain, INHIGEO Spanish Member Octavio Puche Riart being a member of the Organizing Committee.

Publications

- Amador, F. & Pinto, M.S., 'Two Portuguese students of the d'Orbigny fossil collection in Portugal', *International Symposium Alcide d'Orbigny (Paris, France), Abstracts*, 2002, 1.
- Amador, F., 'Gaspar Frutuoso, precursor da Geologia', *Boletim da Associação Portuguesa de Geólogos*, No. 22, January/April 2002.
- Andrade, A.A.S. (2002) 'The Mineralogy of Abraham Gottlob Werner (1749–1817) in Silvestre Pinheiro Ferreira's (1769–1846) 'Philosophical Lectures'', in: Helmuth Albrecht & Ronald Ladwig (eds), *Abraham Gottlob Werner and the Foundation of the Geological Sciences, Freiburger Forschungshefte, D 207 Montan- und Technikgeschichte*, Technische Universität Bergakademie Freiberg, Freiberg, 2002, 1–4.
- Antunes, M. Telles & Taquet, P., 'Le Roi Dom Pedro V, Alcide d'Orbigny et la Paléontologie—un exemple de rapports scientifiques entre la France et le Portugal', *International Symposium Alcide d'Orbigny (Paris, France), Abstracts*, Paris, 2002, 3.
- ____ & _____, 'Le Roi Dom Pedro V et le paléontologue Alcide d'Orbigny: un épisode des relations scientifiques entre le Portugal et la France', *Compte Rendus de l'Académie des Sciences, Paris, Palevol*, 2002, 1, 639–647.
- Carvalho, A.G., *Introdução ao estudo do magmatismo e das rochas magmáticas*, Âncora, Lisbon, 2002.
- Coutinho, R.S., 'Amazônia pura (Alexandre Rodrigues Ferreira)', *National Geographic Portugal*, January, 2002.
- ____, 'O colecionador da história (Carlos Ribeiro)', *National Geographic Portugal*, February, 2002.
- ____, 'O amigo americano (Abade Correia da Serra)', *National Geographic Portugal*, April, 2002.
- Nunes, A. F., 'Os metais preciosos na expansão portuguesa em África', *Sociedade de Geografia de Lisboa, Memórias*, 2002, 1, 1–103.
- Oldroyd, D.R., 'Why Study the History of Geology? And Why are Archives Important?', *Comunicações do Instituto Geológico e Mineiro, Lisbon*, 2002, 89, 5–18.
- Pinto, M.S., 'Werner, the Bergakademie and Manoel Ferreira da Camara', in: Helmuth Albrecht & Ronald Ladwig (eds), *Abraham Gottlob Werner and the Foundation of the Geological Sciences, Freiburger Forschungshefte, D 207 Montan- und Technikgeschichte*, Technische Universität Bergakademie Freiberg, Freiberg, 2002, 270–278.
- ____ & Rios, E., 'Some Environmental Effects of Gold and Diamond Mining in Colonial Brazil', *29th Symposium of the International Committee on the History of Technology ICOTECH (Granada, España), Abstracts*, 2002, 91–92.
- Silva, M.M. & Amador, F., 'Dos modelos históricos (História da Geologia) aos modelos dos alunos. Um estudo exploratório sobre os modelos mentais, respeitantes à origem, ao armazenamento e à circulação das águas subterrâneas, realizado com alunos do 12º ano do ensino secundário português', *Investigações em Ensino de Ciências*, 2002, 7, Lisbon.
- ____ & _____, 'Contribuciones de la Historia de la Geología para el plan de actividades didácticas en el ámbito de la hidrogeología', *Actas XII Simposio sobre Enseñanza de la Geología (Girona, España)*, 2002, 85–91.

Manuel S. Pinto, Aveiro

Russia

Professor Anatoly Ryabukhin has reported the following publications:

1. Khain, Victor E. & Ryabukhin, Anatoly G., 'Russian Geology and Plate Tectonics Revolution', in: Oldroyd, D.R. (ed.), *The Earth Inside and Out: Some Major Contributions to Geology in the Twentieth Century*, The Geological Society of London, Special Publication No. 192, London, 2002, pp. 185–198.
2. Ryabukhin, Anatoly G., 'Professor of Moscow State University: G.E. Shurovsky as an Historian of Science (for the 200th Anniversary of his Birth)', *Bulletin of the Moscow State University, Geology Series*, 2002, No. 5, pp. 54–58 (in Russian).
3. Ryabukhin, Anatoly & G. Bryantceva, G.V., *Geologists of Moscow University: Volume 2*, Moscow State University Press, Moscow, 2002 (in Russian).

Dr Andrei Lapo has written:

1. In March 2002 I went on a business trip to Paris to collect a stuff on V.I. Vernadsky's stays there and to conduct a video interview by Prof. R.L. Berg containing her recollections on V.I. Vernadsky (a report on this business trip was published, see below).
2. As chairman of the Organizing Committee of the V.I. Vernadsky St. Petersburg Interdisciplinary Seminar, I conducted its 8th and 9th meetings on March 12 and December 3 respectively, which were devoted to various aspects of Vernadsky's scientific heritage.
3. Publications:

- “Bottomless Book”: *The Biosphere* by V.I. Vernadsky in the Context of Modern Sciences’, *Science Studies*, 2001 (issued 2002), No. 4, pp. 163–170 (in Russian, with English abstract).
- ‘Vernadsky’s Works on Bio-inert Systems and Interactions’, in: V.V. Gavrilenko (ed.), *Bio-inert Interactions: Life and Rocks. Abstracts of the 1st International Symposium*, St. Petersburg, 2002, pp. 14–16 (in Russian).
- ‘Why to Paris? Report on the Results of a Business Trip with Indispensable Comments’, *Noosphere*, No. 14, pp. 32–39 (in English).
- ‘Why to Paris?’, *Noosphere*, No. 15, pp. 38–45 (in Russian).
- ‘Historical Review of Studies on the Inventorying of Geo-sites and Organization of their Protection, in: O.V. Petrov (ed.), *Geological Committee (VSEGEI) on the Development of the Geological Survey and Reinforcement of the Mineral Resource Base of Russia (1882–2002)*, St. Petersburg, VSEGEI Press, pp.335–338 (in Russian).

Professor Efgenji Milanovsky has written:

During 2002 I continued to work at my new book *Two Hundred Years of the Geological School of Moscow University (from Fischer von Waldheim up the Present)*, to be published for the Jubilee of Moscow University in January, 2005. Four chapters of this book devoted the life and scientific activity of the founders of geology (‘geognosy’) and palaeontology in our University in the 19th and beginning of 20th century (Professor Fischer, Professor G. Tschurovsky, V. Kovalevsky and Academician A. Pavlov) are already written and were partly published in 2002 or will be published in 2003 as separate papers in *Vestnik [= Herald] of Moscow University, Series 4, Geology*. In addition, several other papers devoted to the history of geology (nine altogether) were published in 2000 or will appear in 2003.

In July, 2002, I participated in the INHIGEO symposium in Paris dedicated to the 200th Anniversary of the birth of one of the founders of stratigraphy Alcide d’Orbigny, and presented a paper on ‘First Steps in the Development of Stratigraphy in Russia’.

Recently there appeared another highly positive review of my book *Alfred Wegener* (Nauka, Moscow, 2000), written by Professor Martin Guntau (Rostock) in *N. T. M. (International Journal for History and Ethics of Natural Sciences, Technology and Medicine*. Basel, Switzerland, 2002, 10, p. 198. Thus far, four reviews have appeared.

Publications in 2002:

‘G.I. Fischer von Waldheim and his Time (1804–1835) at Moscow University’, *Vestnik [Herald] of Moscow University, Series 4, Geology*, 2002, No. 4, pp. 87–96 (in Russian).

‘Losses of Science: Professor O.A. Mazarovich (1922–2002), *Moscow Naturalists Society Bulletin, Geology*, 2002, No.5 (in Russian).

‘The Role of the Freiberg Mining School and Scientific Ideas of A.G. Werner in the Development of Geology in Russia in the 18th and beginning of 19th Century’. In: A.G. Werner and foundation of geological sciences. Selected papers of the International Werner Symposium in Freiberg 19–24 september 1999. Freiberg Forschungshelpe, D-207. 2002. Edited by H. Albrecht & Roland Ladwig. Technical Universitat Bergakademie Freiberg, pp. 218–227.

‘First Steps in the Development of Stratigraphy in Russia’, *Abstracts of the International Symposium Alcide D’Orbigny. Stratigraphy from D’Orbigny until Today. Paris. July 1–4, 2002*, p. 38.

Dr Khomizuri has kindly provided the following more general information concerning recent Russian publications:

Amon, E.O., ‘For the 200th Anniversary of the First Evolutionary Theory: The Transformism of Jean-Baptiste Lamarck’, *Materials on Stratigraphy and Paleontology of the Urals*, No. 6, Ekaterinburg, 2001, 113–128 (in Russian).

Anon., *Yury Mikhajlovich Scheinmann: A Life Devoted to a Science*, 2 vols, Moscow, The Schmidt Institute of Physics of the Earth, Russian Academy of Science, 2001 (in Russian).

_____, *Memoirs of I.O. Brod and N.B. Vassoevich (the 100th Anniversary)*, GEOS, Moscow, 2002 (in Russian).

Arkhipova N.P. & Filatov V.V., *Naturalists in the Urals in the Twentieth Century*, Nauka, Ekaterinburg, 2001 (in Russian).

Baghenov, Yuri M., *A Brief History of Development of Mining Science and Mineral Sciences*, Moscow State University, Moscow, 2002 (in Russian).

Bessudnova, Zoya A., ‘Evolution of the Opinions of G. Fischer von Waldheim on the Systematization of Minerals According to the Catalogues (1806, 1811, 1824) of the Moscow University Natural History Museum’, St Petersburg State University, St Petersburg, 2002, 34–35 (in Russian with English summary).

_____, ‘Formation of a Collection of Meteorites and their Study at the Moscow University Natural History Museum (19th–20th Centuries)’, *Third All-Russia Readings in Memory of the Ilmen Mineralogist V.O. Polyakov*, GEOTUR, Miass, 2002, 13–18 (in Russian).

_____, ‘The Coral Collection of P.G. Demidov (1738–1821)—Its New Life’, *Materials of the International symposium on a History of Mineralogy and Mineralogical Museums, Gemmology, Crystallochemistry and Classification of Minerals (June 26–30)*, St Petersburg, 2000, pp. 18–19 (in Russian with English summary).

Chernova, Mariya G., *Unknown Pioneer of Mineral Resources of the Pechora Territory: G.A. Chernov*, Moscow, Scientific World, 2001 (in Russian).

Khomizuri, Georgi P., ‘A Word about Suess’, *Bulletin of Geosciences*, 2002, 20 (electronic version) (in Russian).

_____, *Geotectonic Ideas in Antiquity*, Nauka, Moscow, 2002 (in Russian with English summary).

Markova, E.V. & Voynovskaya, K.K., *Konstantin Genrihovich Voynovsky-Kruger 1894–1979*, Nauka, Moscow, 2001 (in Russian).

Mitta, Vassiliy V. & Starodubtseva, Irida A., ‘W.A. Stchirowsky and the Study of the Mesozoic in the Alatyr–Kurmysh Area Basin of the Middle Volga’, *Vernadsky Museum–Novitates*, 2000, No. 5, 3–15 (in Russian).

Nevesskaja, L.A. and Kurochkin, E.N., ‘A History and Condition of Researches in the Paleontological Institute of the Russian Academy of Science (for the 70th Anniversary of the Institute)’, *Paleontological Magazine*, 2000, 5, 3–15 (in Russian).

Saenko, Galina N., *Vladimir I. Vernadsky: Scientist and Thinker*, Nauka, Moscow, 2002 (in Russian).

Simakov, Kirill V., *Origin, Development and Perspectives of the Theory of Paleobiospheric Time*, North-East Science Press, Magadan, 2001.

- Sokolov, Boris A., 'Towards a History of the International Geological Congresses (1878–2000)', *Bulletin of Moscow State University*, Series 4, 2000, pp. 3–4 (in Russian).
- Soloviev, Yuri Ya., 'The Date of Death is Known Only to the Ministry of Internal Affairs': Dmitrii Ivanovich Mushketov, 1882–1938', *Issues in the History of Science and Technology*, No. 2, 2001, 75–92 (in Russian with English summary).
- , 'The Contributions of A. d'Orbigny and H.A. Trautschold to the Study of the Jurassic Stratigraphy and Cartographic Paleogeography in Russia', *Colloque international Alcide d'Orbigny 1 Juillet–7 Juillet 2002. Sa vie et son oeuvre histoire de la stratigraphie de d'Orbigny a nos jours. Abstracts*, Paris, 2002, 46.
- , Bessudnova, Zoya A. & Przhedetskaya, Ludmila T., *Native Active and Honorary Members of the Russian Academy of Sciences from the 18th to the 20th Centuries: Geology and Mining Sciences*, Scientific World, Moscow, 2000 (in Russian with English summary).
- Starodubtseva, Irada F., 'Nikolay Petrovich Vishnyakov—Naturalist and Collector', *Bulletin of the Moscow Society of Naturalists*, 2001, 76, 54–63 (in Russian).
- Trubetskoy, Kliment N., Krasnyansky, Georgi L., Kursky, A.N. & Panfilov, E.I., *Mining Legislation of Russia: Yesterday, Today, Tomorrow*, Academy of Mining Science Publishing House, Moscow, 2000 (in Russian).
- Zhegallo, Vladimir I., Kalandadze, Nikolay N., Bessudnova, Zoya A., Noskova, Nataliya G. & Tesakova, Ekaterina M., 'On Extinct Rhinoceroses of the Genus *Elamotherium* (Using the Specimens of the Vernadsky Geological Museum Collections)', *Vernadsky Museum—Novitates*, No. 9 (in Russian with English summary).
- Georgy Khomizuri, Moscow <mailto:hstgeo@sgm.ru>

Spain

2002 was the centenary of José Macpherson (Cádiz, 1839–La Granja, Segovia, 1902). Macpherson was a geologist linked to the Free Institution of Education (Institución Libre de Enseñanza, ILE), which was established in 1876 as a reaction against the official prohibition of the teaching evolution. He studied the province of Cádiz, was the main person in the introduction of microscopic petrology to Spain. He also studied Spanish tectonics and glaciation. There was a seminar in Segovia about Macpherson's scientific contributions and a field trip near La Granja, in the Central Range, to the sites that he studied. The ILE has published a special number about Macpherson (biota@arrakis.es, Dr José Luis Barrera).

2002 also saw the 2nd centenary of two Spanish mining engineer-geologists, trained in Freiberg (Germany): Rafael Amar de la Torre (1802–1874) and Felipe Bauzá (1802–1875). Amar de la Torre set up the first geological camp in 1838 and was the first to teach paleontology in Spain (from 1838). Bauzá, was the first President of the Spanish Commission for the Geological Survey (in 1864).

In Cartagena, an ancient city founded by Cartago as Cartago Nova in the third century BC, the Spanish Society for the Protection of Geological and Mining Heritage (SEDPGYM, <http://inicio.es/de/sedpgym/>) organised the 3rd International Congress of Geological and Mining Heritage. During the meeting, there was a field trip to the Mining Sierra, one of the world's most important mining districts for silver, lead, and zinc during the 19th century.

Publications

- Álvarez-Halcón, R.M. Y Arrébola, J.R., 'Los orígenes de la Malacología española', *Ingenium*, 2001, 7, 37–51.
- Aragónés, E., 'Descobrint el vulcanisme quaternari de la Garrotxa: de les observacions precientífiques als primers estudis geològics (s. XVI–XIX)', *Treballs Museu de Geologia de Barcelona*, 2001, 10, 77–125.
- Ayala-Carcedo, F.J., 'La Mitra y la Roca: intereses de Alfonso Carrillo, arzobispo de Toledo, en la Ribera del Ebro', *Boletín Geológico y Minero*, 2002, 113, 111–112.
- , 'La colaboración de Macpherson con la Comisión del Mapa Geológico', *Boletín de la Institución Libre de Enseñanza*, 2002, 45–46, 121–127.
- , 'Catástrofes Naturales, mitos, religiones e historia', in Ayala-Carcedo, F.J. & Olcina, J. (eds), *Riesgos Naturales*, Ariel, Barcelona, 2002, 103–124.
- Barrera, J.L., 'Biografía de José Macpherson y Hemas (1839–1902)', *Boletín de la Institución Libre de Enseñanza (Homenaje a José Macpherson)*, 2002, 45–46, 47–78.
- Blázquez Paniagua, F., 'La Teoría Sintética de la Evolución en España: primeros encuentros y desencuentros', *Llull, Sociedad Española de Historia de las Ciencias y de las Técnicas*, 2001, 24, 289–313.
- Delvene, G., 'Revisión histórica de las especies de bivalvos citadas en el Jurásico de la Cordillera Ibérica, España', *Revista Española de Paleontología. Sociedad Española de Paleontología*, 2002, 17, 199–210.
- Fernández-Cañadas, M. Review of: F.J. Ayala-Carcedo, *Historia de la Tecnología en España*, 2001. In: *Llull, Sociedad Española de Historia de las Ciencias y de las Técnicas*, 2001, 24, 512.
- García Cruz, C.M., *The History of the Canary Islands: A Chronology of Ideas and Related Concepts from Antiquity to 2000*, INHIGEO, Sydney, Australia, 2001.
- Gómez-Alba, J., 'El mamut y la colección petrológica de grandes bloques del Parque de la Ciudadela (Barcelona, España)', *Treballs Museu de Geologia de Barcelona*, 2001, 10, 5–76.
- Gomis, A., 'José Macpherson y la Sociedad Española de Historia Natural', *Boletín de la Institución Libre de Enseñanza (Homenaje a José Macpherson)*, 2002, 45–46, 109–120.
- López Andrés, S. & López-Azevedo, M.V., 'Recordando al Profesor D. José Luis Amorós Portolés, 1920–2001', *Boletín de la Real Sociedad Española de Historia Natural (Geología)*, 2002, 97, 139–158.
- Lozano, R.P. & Rábano, I., 'Las colecciones históricas de rocas de Barcelona del museo Geominero (IBME, Madrid: catalogación e interpretación histórica', *Boletín Geológico y Minero*, 2001, 112, 133–146.
- Martin Escorza, C., 'Aportaciones de Macpherson al avance del conocimiento tectónico', *Boletín de la Institución Libre de Enseñanza (Homenaje a José Macpherson)*, 2002, 45–46, 79–94.
- Ontañón, J.M., 'La labor de Macpherson en la Institución Libre de Enseñanza', *Boletín de la Institución Libre de Enseñanza (Homenaje a José Macpherson)*, 2002, 45–46, 147–156.

- Ordaz, J., Martín Escorza, C. & Alcalá, L., 'Meteoritos caídos en Asturias en el siglo XIX', *Boletín de Ciencias de la Naturaleza, Oviedo*, 1998–1999, 45, 21–34.
- _____, 'Referencias geológicas en el Estadismo de las Islas Filipinas, del P. Martínez de Zúñiga', *Geotemas*, 2000, 1, 63–65.
- Ordóñez, S., 'La geología española en la época de José Macpherson', *Boletín de la Institución Libre de Enseñanza (Homenaje a José Macpherson)*, 2002, 45–46, 29–46.
- Pascual, María José, 'Viajes científicos españoles: El megaterio: un gigante del pasado', *National Geographic España, edición especial, November 2002: El origen de la vida sobre la Tierra*, 216–224.
- Pelayo, F., 'El Orden Natural y los Gigantes: la 'Gigantología Spagnola Vendicata' (1760) de José Torrubia' *Archivo Teológico Granadino*, 2002, 65, 129–186.
- Perejón, A., 'El descubrimiento de los primeros arqueociatos en España', *Boletín de la Institución Libre de Enseñanza (Homenaje a José Macpherson)*, 2002, 45–46, 95–108.
- _____, 'Aproximación a la historia de la paleontología española', *Enseñanza de las Ciencias de la Tierra, Girona*, 2001, 9, 127–143.
- Puche Riart, O., 'Los hermanos Elhúyar, descubridores del Wolframio', *Fundetel*, February, 2001, 72–84.
- _____, 2002. La Comunidad de Madrid estudia declarar las Salinas de Espartinas Bien de Interés Cultural (BIC). *Boletín de la SEDPGYM*, 17, 5–6, ed. Spanish Society for the Protection of Geological and Mining Heritage.
- _____, 'La contribución de los ingenieros a la Arqueología Española', in: Quero Castro, S. & Pérez Navarro, A. (co-ordinators), *Historiografía de la Arqueología Española: Las Instituciones*, Museo de San Isidro, Ayto, Madrid, 2002, 13–45.
- _____ & Mazadiego Martínez, L.F., 'Patrimonio Minero-Metalúrgico de la Comunidad de Madrid', in: Mata Perelló, J.M. & González, J.R. (eds), *Libro de Actas del Primer Simposio sobre la Minería y Metalurgia Antigua en el Sudoeste Europeo* (Serós, Lérida, 5–7 May, 2000), 2, 2002, 443–460, ed. UPC-ILE-SEDPGYM.
- _____ & _____. 'Industrias cerámicas históricas de Madrid: Hornos continuos y sus chimeneas', in: Brandao, J.M. (ed.), *Actas do Congresso Internacional sobre Património Geológico e Mineiro* (Beja, 4–7, October, 2001), ed. FCT-IGM-SEDPGYM-Inst., Beja, Lisboa, 2002, 391–398.
- _____ & Fernández Gutiérrez Del Amo, L.J., 'Hornos cerámicos antiguos de la Comunidad de Madrid: Campo Real', in: Brandao, J.M. (ed.), *Actas do Congresso Internacional sobre Património Geológico e Mineiro* (Beja 4–7 October, 2001), ed. FCT-IGM-SEDPGYM-Inst. Beja. Lisboa, 2002, 399–408.
- _____ & _____. 'Fabricación histórica de ladrillos refractarios en Valdemorillo Madrid: Minas y fábricas de D. Ángel González', in: Brandao, J.M. (ed.), *Actas do Congresso Internacional sobre Património Geológico e Mineiro* (Beja, 4–7 October, 2001), ed. FCT-IGM-SEDPGYM-Inst., Beja, Lisboa, 409–416.
- _____ & Orche García, E., 'Apuntes sobre los intercambios culturales y comerciales, con relación especial a los minerales, entre España y Egipto, desde la Antigüedad hasta la Edad Media', in: Mata Perelló, J.M. & González, J.R. (eds) *Libro de Actas del Primer Simposio sobre la Minería y Metalurgia Antigua en el Sudoeste Europeo* (Serós, Lérida, 5–7 May, 2000), 2, 2002, 397–401, ed. UPC-ILE-SEDPGYM.
- Rábano, I., 'Colecciones históricas de fósiles de la provincial de Jaén en los fondos del Museo Geominero (IGME, Madrid)', *Temas Geológico-Mineros*, 2000, 31, 529–535.
- Schroeder, R., 'Homenaje al profesor Franz Lotze (1903–1971), en reconocimiento de sus méritos por la investigación geológica de España', *Boletín de la Real Sociedad Española de Historia Natural (Actas)*, 2002, 99, 35–46.
- Sequeiros, L., 'José de Acosta (1540–1600) y sus ideas sobre la Evolución biológica, cuatro siglos después', in: A. Blanch (ed.), *La Nueva Alianza de las Ciencias y la Filosofía. Conferencia en el homenaje a Acosta. XXVII Reunión ASINJA, Madrid, septiembre de 2000*, 2001, 27, 235–248.
- _____, 'El Aparato para la Historia Natural Española (1754) del franciscano granadino fray José Torrubia (1698–1761): aportaciones postridentinas a la Teología de la Naturaleza', *Archivo Teológico Granadino*, 2001, 64, 59–127.
- _____, 'De José de Acosta (1540–1600) a Athanasius Kircher (1601–1680): dos momentos en los albores de la biogeografía', in: *Los Fósiles y la Paleogeografía*, *Actas XVII Jornadas de Paleontología, Sociedad Española de Paleontología*, 2001, 5, 3–27.
- _____, 'Los fósiles 'hablan': Qué aporta la paleontología al conocimiento del planeta tierra?', in: J.A. Gámez & E. Liñan (eds), *La Era Paleozoica: Jornadas de Paleontología de Ricla*, 2001, Instituc. Fernando el Católico, 27–59.
- _____, 'Qué puede aportar la Historia de la Paleontología al profesorado de Ciencias de la Tierra?', *Enseñanza de las Ciencias de la Tierra*, 2001, 9, 100–109.
- _____, 'Paleontología', *Enciclopedia de España*, Barcelona, 2001, 16, 7578–8579.
- _____, 'El Geocosmos de Athanasius Kircher: una imagen organicista del mundo en las Ciencias de la Naturaleza del siglo XVII', *Llull, Sociedad Española de Historia de las Ciencias y las Técnicas*, 2001, 24, 755–807.
- _____, 'Popper y Kuhn: veinte años después. Reflexión didáctica en el centenario del nacimiento (1902) de Karl R. Popper', *Enseñanza de las Ciencias de la Tierra*, 2001, 9, 2–12.
- _____, 'Karl R. Popper (1902–1994): un siglo de 'búsqueda sin término' de la verdad', *Proyección*, 2002, 69, 33–59.
- _____, 'Nuestro personaje es: un lepero universal: Álvaro Alonso Barba', *Acmipa*, 2001, 46, 22.
- _____, 'José Macpherson en el contexto de la geología europea en la segunda mitad del siglo XIX. Libro Homenaje a Jose Macpherson. Boletín de la Institución Libre de Enseñanza, Madrid, Julio 2002, No. 1, 45–45, 15–28.
- _____, 'Otro centenario más: el bicentenario del nacimiento del gran naturalista Alcide D. d'Orbigny (1802–1857)', *Boletín de la Comisión de Historia de la Geología de España*, 2002, 18, 6–9.
- _____, 'El centenario del nacimiento de George Gaylord Simpson (1902–1984) y la paleontología a mediados del siglo XX', *Boletín de la Comisión de Historia de la Geología de España*, 2002, 18, 9–11.
- _____, 'Las cosmovisiones científicas o macroparadigmas: su impacto en la Enseñanza de las Ciencias de la Tierra', *Enseñanza de las Ciencias de la Tierra*, 2002, 10, 17–25.
- _____, *De la ira de los dioses a la Tectónica de Placas. Un enfoque histórico de las energías de la Tierra*, Curso UIMP, Santander, 2002.

- _____, 'La extinción de las especies biológicas: Construcción de un paradigma científico', *Discurso de Ingreso en la Academia de Ciencias de Zaragoza*. Nov. 2002. *Monografías de la Academia de Ciencias de Zaragoza*. Noviembre de 2002, No. 21.
- Sequeiros, L. (ed.), *Boletín de la Comisión de Historia de la Geología de España*, Sociedad Geológica de España, 2001, 17.
- _____, *Boletín de la Comisión de Historia de la Geología de España*. Sociedad Geológica de España, 2002, 18.
- _____, *Boletín de la Comisión de Historia de la Geología de España*, 2003, 19.
- Sequeiros, L. & Martín Escorza, C., 'El geólogo andaluz José Macpherson (1839–1902) y sus aportaciones a la enseñanza e investigación de Ciencias de la Tierra', *Enseñanza de las Ciencias de la Tierra*, AEPECT, 2001, 9, 214–221.
- Leandro Sequeiros, Granada & Francisco Ayala-Carcedo, Madrid

Sweden

Christer Nordlund informs us that he is currently working as a postdoc at Professor Tore Frangsmyr's Office for History of Science in Uppsala. He reports the following publications:

- Christer Nordlund, 'Arvet efter Högbom—några blad ur landhöjningens västerbottniska idéhistoria', *Västerbotten*, 2002, 2.
- _____, *Den upphöjda kusten: Reflektioner kring Höga Kustens karriär som landskap*, Arbetsrapporter från forskningsprogrammet Landskapet som arena no 5 (Umeå, 2002).
- _____, 'Landscape's Memory', in *The Politics of Place*, Bildmuseet, Umeå, 2002.
- _____, 'Landskapet som resurs för miljöhistorisk undervisning', in: Per Eliasson (ed.), *Miljön har en historia: Miljöhistoriska studier från Skandör till Kiruna*, Vetenskapsrådet, Stockholm, 2002.
- _____, 'Naturen och det nationella i det tidiga 1900-talets Sverigelitteratur', in: Ann-Katrin Hatje (ed.), *Sekelskiftets utmaningar: Essäer om välfärd, utbildning och nationell identitet vid sekelskiftet 1900*, Stockholm, 2002.

United Kingdom

A New Chair

Perhaps the most important announcement of the year with regard to the history of geology and science in Britain was that James Secord has been awarded a personal chair at Cambridge, in the Department of History and Philosophy of Science. Congratulations to Professor Secord on this outstanding achievement. Furthermore, Professor Secord's book *Victorian Sensation: The Extraordinary Publication, Reception and Secret Authorship of Vestiges of the Natural History of Creation* (University of Chicago Press, 2000) won the History of Science Society's Pfizer Prize for the best book in the history of science. In October, 2003, he will be taking up a Leverhulme Trust Major Research Award for three years, to write a book on science in the illustrated newspapers during the nineteenth century.

Hugh Miller's Bicentenary

The year has been dominated with the bicentenary of Hugh Miller and the events associated with it. Michael Taylor, the UK's most recent INHIGEO member, was lead curator on the team for the National Museums of Scotland (NMS) exhibition *Testimony of the Rocks: Hugh Miller 1802–1856* which took place from 9 March to 3 June, 2002, in collaboration with the National Galleries of Scotland and the National Library of Scotland. It has now gone the way of all temporary exhibitions, although some of it went towards the *Hugh Miller—Local Hero* exhibition by Groam House Museum and NMS at Rosemarkie (near Cromarty), and in Edinburgh a small complementary display of Miller's fossils has been retained (organised by Lyall Anderson) to show the interesting range of Miller's work.

Dr Taylor was also involved in various talks, field trips, and other events, notably the bicentenary conference in Cromarty. He reports on these more fully elsewhere in this issue (see pp. 13–18). His research on Miller has been focused on the immediate needs of our public services rather than on producing formal academic papers, though he has recently finalised the *Oxford Dictionary of National Biography* entry on Miller. Mrs Marian McKenzie Johnston, great-great-granddaughter of Hugh and Lydia Miller, has been collaborating with him on the neglected area of the domestic and family life of the Millers. Taylor and Simon Knell (UK Member, Leicester) are considering how and why Miller collected his fossils and what he did with them (*Conference Proceedings*, in press).

Unveiling

2002 was also the bicentenary of the births of the photographer David Octavius Hill and of Robert Chambers, author of *Vestiges of the Natural History of Creation*, in Peebles, some thirty km south of Edinburgh. There was an unveiling of a display panel to commemorate him and his brother William at the Tweeddale Museum, which is in the Chambers Institute, Peebles.

History of Geology Group

This year has seen a continuation of HOGG's (History of Geology Group) increasingly successful meetings, with some fifty people attending 'The History of Palaeobotany' meeting, held jointly with the Linnean Society. The fifteen papers presented at this meeting, plus several others on the topic, will be published in a Geological Society Special Publication in December, 2003.

The meeting on 'The Amateur in Geology', held jointly with the Geologists' Association (GA), also proved highly successful with about a hundred HOGG and GA members attending over the 2 days. The GA has agreed to publish a special volume of the papers, which will be available in the near future.

A geological tour in the neighbourhood of Bath which looked at 'The Industrial Basis of Stratigraphy' and celebrated the works of John Strachey (1671–1743) and William Smith (1769–1839), was 'sold out'. A fascinating detective story was revealed as we visited Sutton Court where Strachey lived and an estate at High Littleton where William Smith gained his first coal-mining experiences, amongst many other interesting sites. We were greatly entertained by the eloquence of the leaders, INHIGEO members Hugh Torrens and John Fuller, and were incredibly lucky to have gloriously warm weather.

Bath Royal Literary and Scientific Institute

New Trustee

Cherry Lewis was nominated by the West of England Geological Society to be a trustee of the Bath Royal Literary and Scientific Institute, which was founded in 1824. The Institute has one of the finest collections of ethnic artefacts, zoological and geological specimens, antiquarian books, curiosities, and archives in the west of England. Unfortunately, during the period before the

Institute's revival in 1991, the collections were neglected and allowed to fall into disrepair. The intention is now to make them available via the internet on which a 'virtual museum' is being created (<http://brlsi.bath.ac.uk>).

Memoirs of William Smith

A new venture by the Bath Royal Literary and Scientific Institute (BRLSI) is to reproduce a number of its rare or out of print books, thereby making them available to a wider audience. The first book in this series will be *Memoirs of William Smith, author of the Map of the strata of England and Wales*, published in 1844 by Smith's nephew and pupil, John Phillips. Only five hundred copies of the book were ever printed and by 1917 it was described by Thomas Sheppard as being 'exceedingly scarce'. An original presentation copy is held by BRLSI. The *Memoirs* concentrated on Smith's working life and, as Phillips admitted, 'purposely softened the darkest outlines of Mr Smith's private and personal fortunes'. To rectify this, Hugh Torrens has written an introduction to the volume, providing new insight into Smith and his life. In addition, the Geological Society of London has generously agreed to allow inclusion of Torrens' 'William Smith Lecture'. The whole has been newly indexed. In true Smithian tradition, subscribers were sought in advance to fund the project and the subscribers' names will be included in the book. It is now fully funded and nearing completion. The book will be launched at the BRLSI's premises in Bath on 7 June, 2003.

Adopt a Book Scheme

The BRLSI holds many books that, due to neglect in the past, have suffered from damp and insect damage. However, most of the books could be refurbished, their corners repaired, their endpapers replaced and new leather spines attached, if the money can be found to finance it. If you adopt a book, it will be restored by local bookbinders who specialise in antiquarian books. Your contribution will be recorded in the BRLSI's official register of the scheme, and your name will be inscribed on a specially designed bookplate. A selection of the geology books available for adoption follows below. Anyone wishing to adopt one of these books, make a tax free donation to the scheme, or requiring further information, can contact the BRLSI at 16-18 Queen Square, Bath, BA1 2HN, UK. Tel: +44 1225 318145; email exxbrlsi@bath.ac.uk.

Geology Books for Adoption

Cost of Repair

Agassiz, L.J.R., <i>Recherches sur les poissons fossiles</i> (1833-43). (Text volumes already restored)	3 vols of plates to be rebound. £87.55 per vol.
Basterot, B. de, <i>Mémoire géologique sur les environs de Bordeaux</i> (1875).	Repair £36.47
Bonney, T.G., <i>Cambridgeshire Geology: A Sketch for the use of Students</i> (1875).	Repair £36.47
Burmester, H., <i>The Organisation of Trilobites</i> (1846).	Repair £51.90
Crookall, R., <i>Fossil Plants of the Carboniferous rocks of Great Britain (Second Section), From Memoirs of the Geological Survey of Great Britain: Palaeontology, Vol. 4 pts 1 & 2</i> (1955, 1959).	£27 quoted for a box, but if this is complete we would probably have it bound.
Cuvier, G.L.C.F.D. de, <i>Récherches sur les ossements fossiles</i> (1821).	6 vols. to be rebaked, £44.67 each.
Cuvier, G.L.C.F.D. de, <i>Discours sur les revolutions de la surface du globe, et sur les changemens qu'elles ont produit dans la regne animal</i> (1826).	Repair £72.15.
Daubeny, C.G.B., a volume of tracts bound by Rev. Leonard Jenyns, including: 'A Description of Active and Extinct Volcanoes' (2nd supplement, 1858); 'On the Elevation Theory of Volcanoes' (from the <i>Edinburgh New Philosophical Journal</i> , 1860); 'Obituary Notice of Charles Giles Bridle Daubeny' (by John Phillips, read to the Ashmolean Society, 17 February, 1868)	Price on application
<i>Geological Society of London, Journal: a run from 1939 to 1949</i>	To be bound at £14.87 per vol.
Mawe, J., <i>A Treatise on Diamonds and Precious Stones, Including their History, Natural and Commercial</i> (1813)	Repair £47.50
Murchison, R.I., <i>The Silurian Region and Adjacent Counties of England and Wales geologically illustrated; from the Ordnance Survey Coloured in the field During the Years 1831-8.</i>	This map requires a new case, £22.
Nicol, J., <i>Manual of Mineralogy; or the Natural history of the Mineral Kingdom</i> (1849)	Repair £36.47
Witham, H.T.M., <i>Observations on Fossil Vegetables</i> (1831)	To be boxed £27

Future Meetings

3 December, 2003, HOGG meeting at the Natural History Museum

History of meteorites

Convenors: Joe McCall (McCall@freenetname.co.uk) & Peter Tandy (pt@nhm.ac.uk)

Draft Programme

Ursula Marvin, 'Piloting Through Reefs and Shoals: An Overview of the History of Meteoritics'

Vladimir Jankovic, 'Wonders, Marvels and Ominous Meteorites'

Matthieu Gounelle, 'History of the Paris Collection'

Sara Russell, 'History of the Natural History Museum Collection'

Guy Consolmagno, 'History of the Vatican Collection'

Richard Howarth, 'The Work of Daubrée (1814-1896) on Classification'

'Robert Hutchison?', 'Wold Cottage Fall 1795: The Prime Convincer in England'

Matthieu Gounelle, 'L'Aigle Fall 1803: The Prime Convincer in France'
 Joe McCall, 'Asteroidal Source versus Cometary: The Farmington Fall 1890 as the Lead-in Factor'
 Ted Nield, 'A Visit to Hobbs (1920 find) in the Twenty-first Century'
 Spare slot, 'Recognition of Meteorite Cratering: The Beginnings'
The History of Education in the Earth Sciences
 March, 2004, Convenor Stuart Baldwin: sbaldwin@fossilbooks.co.uk

Publications

- Ford, Trevor D., 'Geology of the Matlock Mines: A Review', *Mining History*, 2001, 14, 1–34.
- _____, 'John Whitehurst (1713–1788): Philosopher, Geologist, Horologist and Engineer', *Geology Today*, 2002, 18, 66–73.
- Howarth, R.J. (ed.), *Frank Coles Phillips. Vacation Course in Structural Petrology University of Adelaide, August 17–29, 1953. Course notes taken by Mervyn S. Paterson, transcribed and edited by Richard J. Howarth*. Supplementary Publication No. 18178, British Library Document Supply Centre, Boston Spa, 2002.
- _____, Fitting geomagnetic fields before the invention of least-squares: I. Henry Bond's predictions of the change in magnetic declination in London (1636 and 1668). *Annals of Science*, 2002, 59, 391–408.
- _____, INHIGEO Meeting, 'Geological Resources and History', 24 June–1 July 2001, Lisbon and Aveiro, Portugal [Conference Report], *INHIGEO Newsletter*, No. 34 (2002 for 2001), 9–12.
- _____, INHIGEO Meeting, 'Geological Resources and History', 24 June–1 July 2001, Lisbon and Aveiro, Portugal [Conference Report], *History of Geology Group Newsletter*, No. 15 (February 2002), 15–20.
- _____, 'From Graphical Display to Dynamic Model: Mathematical Geology in the Earth Sciences in the 19th and 20th Centuries', in: Oldroyd, D.R. (ed.), *The Earth Inside and Out: Some Major Contributions to Geology in the Twentieth Century*. Geological Society of London, London, Special Publications No. 192, 2002, 59–97.
- _____ & Leake, B.E., *The Life of Frank Coles Phillips (1902–1982) and the Structural Geology of the Moine Petrofabric Controversy*, The Geological Society, London, Memoir No. 23, 2002.
- Knell, S.J., 'Collecting, Conservation and Conservatism: Late Twentieth Century Developments in the Culture of British Geology', in: Oldroyd, D.R. (ed.), *The Earth Inside and Out: Some Major Contributions to Geology in the Twentieth Century*. Geological Society of London, London, Special Publication No. 192, 2002, 329–351.
- Le Voir, R. [& Howarth R.J.], Meeting Report. The Secret Life of Frederick Hatch. A Talk given by Richard J. Howarth (University College London) to the Geologists' Association on 7 June 2002, *Geologists' Association*, 2002, 1 (4), 6–7.
- Lewis, C.L.E., 'Arthur Holmes' Unifying Theory: From Radioactivity to Continental Drift', in: Oldroyd, D.R. (ed.), *The Earth Inside and Out: Some Major Contributions to Geology in the Twentieth Century*, Geological Society of London, London, Special Publication No. 192, 2002, 167–183.
- _____, (ed.), *Re:search: Bristol University's Research Review*, Vols 1 & 2, The University of Bristol, 2002.
- McKenzie Johnston, M.A. & Taylor, M.A. 2002, 'Lydia Miller and the Posthumous Reputation', in: Borley, L. (ed.), *Hugh Miller in Context. Geologist and Naturalist: Writer and Folklorist. A Collection of Papers Presented at Two Conferences The Cromarty Years (2000) and The Edinburgh Years (2001)*, Cromarty Arts Trust, Cromarty, and Others, place of publication not stated, 2002, 103–111.
- Oldroyd, D.R. & Hamilton, B.M., 'Themes in the Early History of Scottish Geology', in: Trewin, N.H. (ed.), *The Geology of Scotland Fourth Edition*, The Geological Society, London, 2002, 27–43.
- Taylor, M.A., 'Fellow Scots: John Muir and Hugh Miller', *John Muir Trust Journal and News*, 2002, 32, 12–17, 68–69 and www.jmt.org/news/2002/32/muirmiller.html.
- _____, 'Hugh Miller and his fossils – a bicentenary appreciation', *Edinburgh Geologist*, 2002, 38, 10–19 and www.edinburghgeolsoc.org/z_38_00.html.
- _____, 'Man of Vestiges—Robert Chambers 200 Years On', *Edinburgh Geologist*, 2002, 39, 32–35 and www.edinburghgeolsoc.org/z_39_00.html.
- _____, 'Taking Geology to the People—Hugh Miller 1802–1856', *Earth Heritage*, 2002, 18, 21–23.
- _____, Richards, E., Johns, A. & Secord, J. A., 'Vestigial Sensations' [essay reviews of J. A. Secord *Victorian Sensation* (2000) and author's response], *Metascience*, 2002, 11, 4–33.
- Torrens, H.S., Review of Wyse Jackson P.N. (ed.), *Science and Engineering in Ireland in 1798*, *Archives of Natural History*, 2002, 29, 120.
- _____, 'From d'Orbigny to the Devonian: Some Thoughts on the History of the Stratotype Concept', *Comptes Rendus de l'Académie des Sciences, Palevol*, 2002, 1, 335–345.
- _____, 'Justice Denied', *Geoscientist*, 2002, 12 (4), 14–15.
- _____, 'Some Personal Thoughts on Stratigraphic Precision in the 20th Century', in: Oldroyd, D.R. (ed.) 2002. *The Earth Inside and Out: Some Major Contributions to Geology in the Twentieth Century*, Geological Society of London, London, Special Publication No. 192, 2002, 251–272.
- _____, *The Practice of British Geology 1750–1850*, Variorum Collected Studies Series CS736, Ashgate Publishing Ltd, Aldershot.
- _____, (with Judy Winston), 'Eliza Catherine Jelly (28th September 1829–3rd November 1914): Pioneer Female Bryozoologist', in: P.N. Wyse Jackson & Mary E. Spencer Jones (eds), *Annals of Bryozoology*, International Bryozoological Association, Dublin, 2002, 299–325.

United States

Activities of the History of Geology Division of the GSA and the History of Earth Sciences Society

These two organizations co-sponsored a field excursion and two sessions at the October, 2002, meeting of the Geological Society of America in Denver. On the pre-meeting field trip titled, *Key Rocks and Seminal Thinkers: Classic Rocky Mountain Localities that Influenced Tectonic Thought*, led by A. M. Celâl Şengör and Tim Lawton, participants examined key outcrops between Salt

Lake City and Denver. On Sunday afternoon a special session, chaired by INHIGEO Member Celâl Şengör and Michele Aldrich addressed the *Contributions of American Geologists to Theoretical Tectonics on the Basis of Research Done West of the 100th W. Meridian in the Latter Half of the 19th Century*. The 100th meridian passes through the Dakotas, Nebraska, Kansas and West Texas. Beyond it lie the high plains, the Rocky Mountains, the Great Basin and the western Sierras and Coast Ranges. The session included nine papers on early investigations by individuals such as Alexander von Humboldt, Clarence King, G. K. Gilbert, and Clarence Dutton, and the extensive surveys led by F. V. Hayden and G. M. Wheeler. Dr Şengör, who chaired the Division, spoke on the influence of American geologists on the thinking of Eduard Suess in the latter half of the century.

A general session of thirteen talks, chaired by Robert Ginsburg and Roger Thomas, included topics that ranged widely over the history of geology from seventeenth-century drawings of rocks in Europe and China, through geology and paleontology in the writings of Mark Twain, to Walter Bucher's last field trip and conversion to the impact origin of Meteor Crater. Abstracts of both sessions are available at: <http://gsahist.org>

The two organizations held an evening reception for members, students and friends at which historic geological books and other objects were given out as door prizes. This was the second such reception and both have been so enjoyable that they are destined to become annual events.

At the luncheon and business meeting The History of Geology Award was presented to Dennis Dean, who holds a doctorate in English literature and had made a long career of archival research into the influences of geology and literature upon each other (see p. 26). After the presentation, Professor Şengör passed the gavel to Roger Thomas, the new Chair of the Division, who closed the meeting.

Communications from Members

Kennard B. Bork concluded a two-year term in January, 2003 as Past-President of the History of the Earth Sciences Society. One of his last acts as an officer of HESS was to work with the editor, Gregory Good, and a committee of colleagues to create a mechanism for publishing memorials in *Earth Sciences History*. Beginning with those who passed away in 2002, *éloges* for distinguished historians of geology will be published in *ESH*.

Bork, K. B. Review of Jean-Claude Pont and Jan Lacki (eds), 'Une Cordée Originale: Histoire des relations entre science et montagne'. In: *ISIS*, 2002, 93, 278–288.

_____. Review of: René Sigris (ed.), 'H.-B. De Saussure (1740–1799): Un regard sur la terre'. In: *ISIS*, 2002, 93, 705–706. [Note by Ursula Marvin: After many years of highly distinguished teaching and service at Denison University in Granville, Ohio, Ken plans to retire at the end of the present semester. We congratulate him for his many achievements and hope we may look forward to a stronger than ever emphasis by him on his studies of the history of geology.]

Robert H. Dott, Jr. reports that he was less active in history of geology research than in prior years. Nonetheless, for *The Outcrop*, his department's annual alumni newsletter at the University of Wisconsin, he wrote about a remarkable geological family dynasty. Walter K. Link graduated from Wisconsin in 1924, married a classmate who was a geologist, and commenced a petroleum industry career in the jungles of South America. The Links had three children, all of whom attended the University of Wisconsin and all of whom graduated in geology. In addition, Walter's older brother, Theodore, had preceded him into geology, and made a name for himself in Canada.

Dott's review of *The Ice Finders—How a Poet, a Professor, and a Politician Discovered the Ice Age*, by Edmund Blair Bolles (Counterpoint, Washington, D.C., 1999) was published in the *Journal of Geoscience Education* (2002, 50, 483–484). Dott remarks that although it is very readable, this little book is seriously flawed because the author presents Lyell as one of the three principals who finally won the day for the glacial theory. Lyell is the Politician, Agassiz the Professor, and Elisha Kent Kane the Poet in Bolles' title. Lyell certainly was politically adroit in handling his critics and competitors, but would anyone else characterize him as a Politician?

During the autumn semester, Dott was persuaded to come out of retirement to present the course, 'History of Geologic Thought', which he had first developed in 1965 and taught on an occasional basis thereafter. He found it to be a rewarding experience, but it proved to be a lot of work, so he was happy to retire once again. Dennis Dean, the 2002 recipient of the Geological Society of America's History of Geology Award, was a student in Dott's first offering of that course. So it was a great pleasure for Dott to be Dennis's citationist for that Award in October. Other activities tended to overshadow Dott's historical efforts. First, a co-authored article in *Geology* (February, 2002) about countless impressions of stranded Cambrian jelly fish in Wisconsin captured unexpected media attention. They postulated that episodic tropical storms washed the hapless creatures ashore. Finally, Dott and a co-author completed the manuscript for a *Roadside Geology for Wisconsin*, which we hope to see published late in 2003. They wove some snippets of history into this book.

Gregory A. Good edited the four issues of *Earth Sciences History* that appeared in 2002: Vol. 19, No. 2; Vol. 20, Nos. 1 and 2; and Vol. 21, No. 1. Altogether, these issues included fourteen articles and scores of book reviews. He attended the Geological Society of America meeting in Denver and the History of Science Society conference in Milwaukee. He did not present papers, but he attended all the historical sessions seeking submissions to *ESH*.

Good, Gregory A. 'From Terrestrial Magnetism to Geomagnetism: Disciplinary Transformation in the Twentieth Century'. In: *The Earth Inside and Out: Some Major Contributions to Geology in the Twentieth Century*. David R. Oldroyd (ed.), Geological Society (London) Special Publication No. 192, London, UK: 229–239.

_____. Review of Margaret Hindle Hazen and James Trefil (eds), *Good Seeing: A Century of Science at the Carnegie Institution of Washington*, Joseph Henry Press, Washington, DC. In: *ISIS*, 93, 467.

_____. Review of 'James Rodger Fleming, *Historical Essays on Meteorology, 1919–1995*'. In: *Earth Sciences History*, 19, 216–217. [NB: This issue just appeared in 2002.]

Léo F. Laporte completed a web site on George Gaylord Simpson in 2002 and uploaded it onto the Internet in February 2003. He gave the following two talks: 'Travel as a Predictor of Scientific Innovation: The Corroborating Case of George G. Simpson', Novara, Italy, May 2002; sponsored by the Novara Museo di Storia Naturale ed Etnografico Faraggiana Ferrandi and intended for publication by the California Academy of Sciences in 2003 for its 150th anniversary; and 'Looking back at the record: G.G. Simpson and paleomammalogy', Centennial symposium in honor of G.G. Simpson, Society of Vertebrate Paleontology, Norman,

Oklahoma, October 2002; intended for publication in subsequent symposium volume in 2003, by the Johns Hopkins University Press.

Laporte, Léo, Review of 'Mystery of Mysteries: Is Evolution a Social Construction?' by Michael Ruse, *Journal of Bioeconomics*, 2002, 3, 237–239. [Although dated '2001', the journal issue actually appeared in 2002; and yet, Laporte wrote the review in 2000!]

_____, 'Why learn about Darwin?'. In: A. Chesworth, S. Hill, K. Lipovsky, E. Snyder, & W. Chesworth (eds), *The Best Single Idea, Ever: Darwin Day Collection One*, Tangled Bank Press, Albuquerque, New Mexico, 2002, 97–99.

Ursula B. Marvin presented four invited talks on the past, present and possible future of women in science. She began with an overview of her own career in a session titled, 'Fracturing Glass Ceilings: Women in Science', at the February meeting of the American Association for the Advancement of Science in Boston. In March, she gave two talks in separate classes and one in a union session at a women's school in Memphis, Tennessee. In October she gave an invited lecture at the Boston Museum of Science on past and present ideas relating to life on other bodies within the solar system. She concluded that, outside of the Earth, intelligent life in the solar system is impossible; microbial life is possible but unproved. She supports the minority belief, published by Professor S. R. Taylor at Australian National University in Canberra that intelligent life is highly unlikely to occur anywhere else in the universe.

Marvin, Ursula B, 'Geology: from Earth to Planetary Science in the 20th Century', in: Oldroyd, D.R. (ed.), *The Earth Inside and Out: Some Major Contributions to Geology in the Twentieth Century*. Special Publications No. 192, The Geological Society, London., 2002, 17–57.

_____, Review of: *Plate Tectonics: an Insider's History of the Modern Theory of the Earth* edited by Naomi Oreskes with Homer Le Grand. In: *ISIS*, 2002, 93, 754–755

_____, 'Oral Histories in Meteoritics and Planetary Science: V. Brian Mason', *Meteoritics & Planetary Science* (Supplement), 2002, 37, B35–B45.

_____, 'Oral Histories in Meteoritics and Planetary Science: VI. Stuart Ross Taylor', *Meteoritics & Planetary Science* (Supplement), 2002, 37, B47–B56.

_____, 'Oral Histories in Meteoritics and Planetary Science: VII. Alastair G. W. Cameron', *Meteoritics & Planetary Science* (Supplement), 2002, 37, B57–B67.

_____, 'Oral Histories in Meteoritics and Planetary Science: VIII. Friedrich Begemann', *Meteoritics & Planetary Science* (Supplement), 2002, 37, B69–B77.

_____, 'Oral Histories in Meteoritics and Planetary Science: IX. Heinrich Wänke', *Meteoritics & Planetary Science* (Supplement), 2002, 37, B79–B88.

_____, and Mario Cosmo, 'Domenico Troili (1766): *The true cause of the fall of a stone in Albereto is a subterranean explosion that hurled the stone skyward*'. *Meteoritics & Planetary Science*, 2002, 37, 1857–1864.

Articles in *Meteoritics & Planetary Science* are available on line at: <http://meteoritics.org>

Clifford M. Nelson continued working toward the completion of the fourth volume (1939–1979) of the history of the US Geological Survey, and the introductory material for the facsimile reprint of USGS Bulletin 222, the facsimile reprint of the *Catalogue and Index of the Publications of the Hayden, King, Powell, and Wheeler Surveys* by Laurence F. Schmeckebier (1904).

Nelson, Clifford M., 'McKelvey, Vincent E. (6 April 1916–23 January 1987)', in: Betz, Paul & Carnes, M.C. (eds), *American National Biography Supplement 1*, New York, Oxford University Press, 2002, 398–400.

_____, 'Nolan, Thomas B. (21 May 1901–2 August 1992)', *Ibid.*, 451–453.

_____, 'Bradley, Wilmot Hyde (4 April 1899–12 April 1979)', *American National Biography On line*, October 2002.

_____, 'In Memoriam: Mary C. Rabbitt (1915–2002)', *Geotimes*, 2002, 47 (12), 3+2.

Naomi Oreskes reports that the book, *Plate Tectonics: An Insider's History of the Modern View of the Earth*, which she edited with Homer Le Grand (Australia), was named by *Library Journal* as one of the best science and technology books of 2002. It was released in paperback in February, 2002.

Cecil J. Schneer succeeded in placing downloadable images of the William Smith map on the web site of the Earth Sciences Department of the University of New Hampshire; cf. <http://www.unh.edu/esci/wmsmith.html>. He has revised and expanded the explanatory notes so that the site now includes full color facsimiles of Smith's 'Strata Identified', his 'Table of the Strata', two of Smith's county maps, and of, of course, the map itself. The explanatory notes to the map include enlarged images of the Legend (for comparison with other maps of the period) and Smith's cross-section from London to Snowdon. The Legend is included as a prototype of a Geological Column. Also included for comparison are the legends of Cuvier and Brongniart's maps of the Paris Basin of 1808 and 1822, as well as their comparative maps of the London and Paris basins (1822), William Maclure's key to his 1809 geological map of the United States (and the Maclure map itself), Leopold von Buch's mineralogical maps of Glatz (1797) and of Saxony (1802), and d'Omalius d'Halloy's map of 'France, the Pays Bas, and neighboring countries' (1813, published in 1822).

Cecil writes that he hopes colleagues with access to other maps of the period will put them on the web, or failing that, send him good color photographs to add to this collection. His next task is to rewrite the explanatory material completely in the light of the ideas he has developed in the course of working on these maps. He has delivered one seminar to the Department of Geology at the University of New Hampshire, and a layman's version to his fellow octogenarians of his retirement community. Next month he will speak to the Faculty Emeriti group at UNH. This will be essentially a slide show that ends up showing the inevitability of a theory of evolution.

Kenneth L. Taylor reports that in the spring of 2002 Oklahoma University appointed him to a four-year term as the C.B. Hudson/Torchmark Presidential Professor. In addition to his paper in the volume for the Freiberg meeting, 'Two Ways of Imagining the Earth at the Close of the 18th Century: Descriptive and Theoretical Traditions in Early Geology', he has published a textual study in the *Travaux du Comité Français d'Histoire de la Géologie (COFRHIGÉO)*, for 2001, Vol. 15 (published in 2002): 'Un commentaire anonyme inédit sur les observations et les idées de William Hamilton (1730–1803) relatives aux

phénomènes volcaniques de la région de Naples'. In addition, an essay he previously published in French, in the 1997 *Festschrift for François Ellenberger*, appeared in English in 2002: 'The Beginnings of a Geological Naturalist: Desmarest, the Printed Word, and Nature', *Earth Sciences History*, 2002, 20, 44–61.

Ursula B. Marvin, Cambridge, USA

Uzbekistan

- I. The most important event was the celebration on 10 September of the 90th anniversary of the birth of the Corresponding Member of Academy of Sciences of the USSR, and Academician of Academy of Sciences of Uzbekistan, Khabib Abdullaev (1912–1962), Uzbekistan's most famous geoscientist. A symposium was held (11–12 September) in the Khabib Abdullaev Institute of Geology and Geophysics of the Uzbekistan Academy of Sciences on 'Modern problems of metallogeny', and at the Abu Raykhon Beruni Tashkent State Technical University (13 September).
The following items were published:
 1. *Modern Problems of Metallogeny: Proceedings of the Scientific Conference in Honour of the 90th Anniversary of the Birth of Khabib Abdullaev*, Fan, Tashkent, 2002. This contains 86 reports highlighting the role of Khabib Abdullaev in the development of general, regional, and special metallogeny and the different branches of geology.
 Four papers were dedicated exclusively to his creative activity:
 1. Khusanov, S.T., Sultanchodgaev, A.S., and Akbarov, H.A., 'Khabib Abdullaev: Famous Scientist and Statesman'.
 2. Lordkipanidze, L.N., 'Academician Khabib Abdullaev and his Classical work in petrometallogeny'.
 3. Rakhmatullaev, Kh.R., 'Toward a History of the Development of Metallogeny in Central Asia'.
 4. Kirshin, A.V. and Khusanov, S.T., 'The Role of Academician Khabib Abdullaev in the Establishment of Petroleum and Petrogas Geoscience in Uzbekistan'.
- II. The article 'Academician Khabib Abdullaev—True Son of the Uzbek People (on the occasion of his 90th anniversary of his birth)' was published by I.Kh. Khamrabaev, L.N. Lordkipanidze, J.M. Mirkhodjiev and T.M. Voronich in *Geology and Mineral Resources*.
- III. Many newspaper articles and talks on radio and television were devoted to this event.
- IV. The saddest event was the death on 29 June of Academician Ibrahim Khamrabaev (1920–2002), the famous Uzbek geologist, specialist in the fields of petrology, metallogeny, and the crustal structure of Central Asia, who was for many years head of the Institute of Geology and Geophysics of the Academy of Sciences of Uzbekistan.
- V. A series of the publications was dedicated to anniversaries of geoscientists of Uzbekistan:
The 70th birthday of L.N. Lordkipanidze: geologist and historian of geology, May, 2002.
Khamrabaev Ibragim Khamrabaevich, April, 2002 (obituary).
Timofeeva Tatiana Sergeevna: mineralogist, geochemist, ore mines specialist, April, 2002 (obituary).
Lora Lordkipanidze, Tashkent

Yugoslavia

I'm writing for the last time from the country called 'Yugoslavia' from which only *reliquiae reliquiarum* remained at the end of the 20th Century. The new name of the country, Serbia and Montenegro, has already been decided.

During 2002, the main attention of our geologists was devoted to the XVIIth Congress of Carpatho-Balkan Geological Association, held in Bratislava, Slovakia. It was decided there that the XVIIIth Congress would be in 2006 in Belgrade. This was accepted with pleasure, since in 1993 we were prevented from organizing the XVth Congress of the CBGA in Belgrade because of international sanctions, although it was completely prepared.

In 2002, one meeting of Historical Section of the Serbian Geological Society where I gave the lecture about the noted Russian geologist, Nikolai Bronislavovich Vassoevich, who was of Serbian origin. The lecture was held on the occasion of the twentieth anniversary of his death.

The following papers were published in the history of science journal, *Phlogiston* (No. 12):

- A. Grubic, 'History of Mining in Serbia in the Works of Vasilije Simic', pp. 225–256.
V. Jovic, 'Answers of District Physicians to the Geological Questionnaire of the Society of Serbian Science in 1860', pp. 147–174.

Z. Atanackovic, 'On Dusan Jovanovic and his Book *Gold and Copper of Eastern Serbia*', pp. 269–275.

J. Jovanovic-Simic, 'The First Scientific Congress in the South-Eastern Europe', pp. 277–280.

In continuation of the efforts of Serbian Academy of Science and Arts, the eighth volume of *Lives and Work of Serbian Scientists* was published, including the following papers:

- A. Grubic, 'Aleksa M. Stanojevic', pp. 61–105.
V. Jovic, 'Svetolik P. Stevanovic', pp. 107–126.
A. Stojkovic, 'M. Prodanovic, and A. Grubic: Branislav Petronijevic', pp. 213–260.
J. Obradovic, 'Stojan Pavlovic', pp. 323–352.
D. Stefanovic, 'Dragutin Prosen', pp. 379–414.
N. Caric and D. Bugarski, 'Branislav Bukurov', pp. 415–454.

I cannot finish this report without mentioning that Nikola Pantic (1927–2002), Fellow of the Serbian Academy of Science and Arts, died on 21 November, 2002. He was a noted palaeobotanist, geologist, historian and philosopher of nature, and worked tirelessly for the preservation of the environment. His rich opus included papers about the history of our science.

Aleksandar Grubic, Belgrade

INHIGEO MEMBERS

Dr Luis Alberto Buatois, Residencia Universitaria Horco Molle, Casa Nro 4 Horco Molle, Tucuman, ARGENTINA
Tel: 54 381 425 3053 **Fax:** 54 381 425 3053 **EMAIL:** ichnolog@infovia.com.ar

Dr Maria Gabriela Mangano, Residencia Universitaria Horco Molle, Casa Nro 4 Horco Molle, Tucuman, ARGENTINA
Tel: 54 381 425 3053 **Fax:** 54 381 425 3053 **EMAIL:** ichnolog@infovia.com.ar

Dr Daniel G. Rubiolo, Secretaria de Minería de la Nación, Avenida Julio a Roca #651, 10 Piso, Buenos Aires, ARGENTINA
Tel: 54 1 349 3166 **Fax:** 54 1 349 3160 **EMAIL:** drubio@secind.mecon.gov.ar

Professor Edward G. Malkhassian, Yesnik Koghbatsi str. 4, App. 31, Yerevan, ARMENIA
Tel: 374 2 533 686 **Fax:** **EMAIL:** gmalkhas@acc.am

Dr Neil Archbold, School of Ecology and Environment, Rusden Campus Deakin University, 662 Blackburn Road, Clayton, Victoria 3168, AUSTRALIA
Tel: 61 3 9251 7607 **Fax:** 61 3 9251 7626 **EMAIL:** narchie@deakin.edu.au

Ms Carol Bacon, Mineral Resources Tasmania, PO Box 56, Rosny Park, Tasmania 7018, AUSTRALIA
Tel: 61 3 6233 8326 **Fax:** 61 3 6233 8338 **EMAIL:** cbacon@mrt.tas.gov.au

Dr Maxwell R. Banks, 38 View Street, Sandy Bay, Tasmania 7005, AUSTRALIA
Tel: 61 3 6223 1860 **Fax:** **EMAIL:** madmax@netspace.net.au

Dr David Branagan, 83 Mimimbah Road, Northbridge, Sydney, New South Wales 2063, AUSTRALIA
Tel: 61 2 9958 7127 **Fax:** 61 2 9692 0184 **EMAIL:** dbranaga@mail.usyd.edu.au

Dr Barry Cooper, 20 Royal Avenue, Burnside, South Australia 5066, AUSTRALIA
Tel: 61 8 8226 0462 **Fax:** 61 8 8226 0323 **EMAIL:** cooper.barry@saugov.sa.gov.au

Dr David W. P. Corbett, 41 Hawthorndene Drive, Glenalta, South Australia 5052, AUSTRALIA
Tel: 61 8 8278 1851 **Fax:** 61 8 8278 1851 **EMAIL:** dbcorbett@ozemail.com.au

Dr Thomas A. Darragh, Division of Natural History, Museum of Victoria, P.O. Box 666E, Melbourne, Victoria 3001, AUSTRALIA
Tel: 61 3 9270 5040 **Fax:** 61 3 9270 5043 **EMAIL:** tdarragh@mov.vic.gov.au

Professor Homer Le Grand, Faculty of Arts, Monash University, Clayton, Victoria 3118, AUSTRALIA
Tel: 61 3 9905 2797/2100 **Fax:** 61 3 9905 5110 **EMAIL:** Homer.Legrand@arts.monash.edu.au

Professor David R. Oldroyd, 28 Cassandra Avenue, St Ives, NSW 2075, AUSTRALIA
Tel: 61 2 9449 5559 **Fax:** 61 2 9402 7635 **EMAIL:** doldroyd@optushome.com.au

Dr Tillfried Cernajsek, Geologische Bundesanstalt F.A. Bibliothek und Verlag, Geodatenzentrale u. Wiss. Archiv, Postfach 127 Rasumofskygasse 23, A-1031, Wien, AUSTRIA
Tel: 43 1 7125 67465 **Fax:** 43 1 7125 6747490 **EMAIL:** tcernajsek@cc.geolba.ac.at

Dr Albert Schedl, Geologische Bundesanstalt, Rasumofskygasse 23, Postfach 127, A-1031 Wien, AUSTRIA
Tel: 43 1 7125 67428 **Fax:** 43 1 7125 67456 **EMAIL:** aschedl@cc.geolba.ac.at

Professor Aleksandrovich Ermolenko, Geographical Department, Belarussian State University, 4 Francysk Skorina Avenue, 220050 Minsk, BELARUS
Tel: 375 17 260 5312 **Fax:** 375 17 226 5940 **EMAIL:** vele@tut.by

Professor Eric Groessens, Rue Louis Marcellis 98, B-1970 Wezembeek-Oppem, BELGIUM
Tel: 32 2627 0402 **Fax:** 32 2647 7359 **EMAIL:** eric.groessens@sciencesnaturelles.be

Dr-Ing. Carlos Serrano, Casilla 115, Calle Millares 21, Potosí, BOLIVIA
Tel: 591 62 22498 **Fax:** **EMAIL:** none

Associate Professor José Carlos Barreto de Santana, Department of Exact Sciences, State University of Feira de Santana, Bahia State, BRAZIL

Tel: 55 75 622 0307 **Fax:** 55 75 224 8085 **EMAIL:** zecarlos@uefs.br

Associate Professor Silvia F. de M. Figueirôa, Instituto de Geociências, Universidade de Campinas C.P. 6152, 13083-970 Campinas, São Paulo, BRAZIL

Tel: 55 19 3788 4571/4568 **Fax:** 55 19 3289 1562 **EMAIL:** Figueroa@ige.unicamp.br

Dr Pedro Wagner Gonçalves, Dept. of Geosciences Applied to Education, Institute of Geosciences, State University of Campinas, P.O. Box 6152 13081-970 Campinas, São Paulo, BRAZIL

Tel: 55 19 3788 7352 **Fax:** 55 19 3289 1562 **EMAIL:** pedrog@ige.unicamp.br

Associate Professor Maria Margaret Lopes, Instituto de Geociências, UNICAMP, Caixa Postal 6152 13081-970 Campinas, São Paulo, BRAZIL

Tel: 55 19 3289 1097 **Fax:** 55 19 3289 1562 **EMAIL:** mmlopes@ige.unicamp.br

Mr David Spalding, 1105 Ogden Road, RR No. 1 Pender Island, British Columbia V0N 2M1, CANADA

Tel: 1 250 629 2047 **Fax:** 1 250 629 2047 **EMAIL:** david@davidspalding

Dr Jian-Zhao YTN, Suite 302, 2320 Franklin Street, Vancouver BC V5L 1S1, CANADA [CHINA Member]

Tel: 1 604 215 1632 **Fax:** 1 604 215 1632 **EMAIL:** jimyin7@yahoo.ca

Professor Gen Yuan WANG, Department of Industrial and Commercial Management, Panyu Polytechnic, Qingshan Lake, Shawan, Panyu District, Guangzhou, Guangdong Province, 511483, CHINA

Tel: 86 20 8488 9785 **Fax:** 86 20 8473 6785 **EMAIL:** none

Professor Hongzhen WANG, China University of Geosciences, Xueyuan Road 29, Beijing 100083, CHINA

Tel: 86 10 6231 3652 **Fax:** 86 10 6231 0897 **EMAIL:** wanghz@cugb.edu.cn

Professor Jing-yi YANG, Institute for the History of Natural Science, Academia Sinica, 137 Chao Nei Avenue, Beijing 10010, CHINA

Tel: 86 10 6288 3390 **Fax:** **EMAIL:** yang_jingyi@sina.com

Professor Guangrong YANG, Research Section on History of Geology, China University of Geosciences (Beijing), 29 Xueyuan Road, Beijing 100083, CHINA

Tel: **Fax:** 86 10 8232 6368 **EMAIL:** none

Professor Yusheng ZHAI, China University of Geosciences (Beijing), 29 Xueyuan Road, Beijing 100083, CHINA

Tel: 86 10 8232 2650 **Fax:** 86 10 9232 2005 **EMAIL:** yszhai@cugb.edu.cn

Associate Professor Jiuchen ZHANG, Institute for the History of Natural Science, Academia Sinica, 137 Chao Nei Avenue, Beijing 100010, CHINA

Tel: 86 10 8402 7627 **Fax:** 86 10 8402 7627 **EMAIL:** jhzbz@glc.cn.net

Professor Armando Espinosa-Baquero, Universidad del Quindío, Facultad de Ingeniería, Armenia, COLOMBIA

Tel: 6745 2708 **Fax:** 6746 2563 **EMAIL:** none

Sr. Guillermo E. Alvarado, Section of Seismology and Seismic Engineering, Costa Rica Institute of Electricity, P.O. Box 10032, 1000 San José, COSTA RICA

Tel: 506 220 6394 **Fax:** 506 220 8212 **EMAIL:** none

Dr Gerardo J. Soto, Apartado 360-2350, San Francisco de Dos Ríos, San José, COSTA RICA

Tel: 506-219-4051 **Fax:** **EMAIL:** katomirodriguez@yahoo.com

Dr Josef Haubelt, Svojsovická 10/2834, Sporilov II, CZ-14100 Praha 4, CZECH REPUBLIC

Tel: 420 2 7176 2531 **Fax:** **EMAIL:** alfacz@volny.cz

Dr Jan Kozák, Geophysical Institute, Czech Academy of Science, Bocni 11/1401, 14131 Prague 4, CZECH REPUBLIC

Tel: 420 2 6710 3018 **Fax:** 420 2 7276 1549 **EMAIL:** kozak@ig.cas.cz

Professor Rudolf Musil, Department of Geology and Palaeontology, Masaryk-University, Kotlářská Street 2, 611 37 Brno, CZECH REPUBLIC

Tel: 420 5 4112 9255

Fax: 420 5 4121 1214

EMAIL: Rudolf@sci.muni.cz

Professor Antonin Prichystal, Department of Geology and Palaeontology, Masaryk University, Kotlarska 2, CZ-611 37 Brno, CZECH REPUBLIC

Tel: 420 5 4112 9247

Fax: 420 5 4121 1214

EMAIL: prichy@sci.muni.cz

Dr Jan Urban, Masarykova 580, , 28401 Kutna Hora, CZECH REPUBLIC

Tel:

Fax:

EMAIL: none

Dr Miloš Zárbybnický, Za Chalupami 144, 150 00 Prague 5, CZECH REPUBLIC

Tel: 420 2 5791 1514

Fax: 420 2 5791 0031

EMAIL: hornicka.matice@post.cz

Professor Jens Morten Hansen, Danish Research Agency, Randersgade 60, DK 2100, Copenhagen, DENMARK

Tel: 45 3544 6340

Fax: 45 3544 6201

EMAIL: jmh@forsk.dk

Mr Tonu Pani, Institute of Geology, University of Tartu, Vanemuise 46, Tartu 51014, ESTONIA

Tel: 372 7 375 839

Fax:

EMAIL: tpani@ut.ee

Professor Geneviève Bouillet, Maison de Retraite, 8 rue Bethune-Charet, BP 601, 18016 Bourges Cedex, FRANCE

Tel:

Fax:

EMAIL: none

Professor Michel Durand-Delga, 8 Rue Charles-Lefebvre, F77210 Avon, FRANCE

Tel: 33 1 6422 5559

Fax: 33 1 6422 5559

EMAIL: r.bourrouilh@cibamar.u-bordeaux.fr

Dr Jean Gaudant, Sciences de la Terre, Université Paris 7, 2 Place Jussieu, Paris, Cedex 05, FRANCE

Tel: 33 1 4424 1133

Fax: 33 1 4427 8148

EMAIL: gaudant@ipgp.jussieu.fr

Dr Gaston Godard, UFR de Sciences de Terre, Université de Paris 7, 2 Place Jussieu, 75251 Paris Cedex 05, FRANCE

Tel: 33 1 4427 5191

Fax:

EMAIL: gg@ccr.jussieu.fr

Dr Gabriel Gohau, 2 av. Bernard Palissy, 92 210 Saint Cloud, FRANCE

Tel: 33 1 4602 0097

Fax: 33 1 4046 0295

EMAIL: none

M. Philippe Grandchamp, 5 rue du Coteau, 92370, Chaville, FRANCE

Tel: 33 1 4709 6465

Fax:

EMAIL: phgrandchamp@aol.com

Professor Goulven Laurent, 5 rue Jean-Paul Sartre, 29200 Brest, , FRANCE

Tel: 33 2 9805 4367

Fax: 33 2 9805 4367

EMAIL: goulvenn@aol.com

Professor Philippe Taquet, Laboratoire de Paleontologie, 8 rue Buffon, Paris, 75005, FRANCE

Tel: 33 1 4079 3039

Fax: 33 1 4079 3580

EMAIL: taquet@cimrs1.mnhn.fr

Dr Lydie Touret, Musée de Minéralogie, E.N.S.M.P., 60 bvd St Michel, 75006 Paris, FRANCE

Tel: 33 1 4051 9143

Fax: 33 1 4634 2596

EMAIL: touret@musee.ensmp.fr

Professor Dr Jacques Touret, Musée de Mineralogie, Ecole des Mines, 75006, Paris, FRANCE [NETHERLANDS Member]

Tel: 31 20 444 7270

Fax: 31 20 646 2457

EMAIL: jtouret@ensmp.fr

Professor Rudolf Daber, Humboldt-Universität, Naturkundemuseum, Invalidenstrasse 43, 10115 Berlin, GERMANY

Tel: 49 30 2093 8576

Fax: 49 30 2093 8561

EMAIL: none

Dr Bernhard Fritscher, Diteramszellerplatz 7, D-81371 München, GERMANY

Tel: 49 89 723 4081

Fax: 49 89 2180 3162

EMAIL: B.Fritscher@lrz.uni-muenchen.de

Professor Rodney Grapes, Institut für Mineralogie, Petrologies und Geochemie, Universität Freiburg, Albertstrasse 23h, 79104 Freiburg, GERMANY [NEW ZEALAND Member]

Tel: 49 761 203 6394/6407

Fax: 49 761 203 6394/6407

EMAIL: rodney.grapes@minpet.uni-freiburg.de

Professor Martin Guntau, Am Fasanenholz 14, D-18147, Rostock, GERMANY

Tel: 49 381 201 8810

Fax: 49 381 493 4604

EMAIL: guntau@debitel.net

Dr Gottfried Hofbauer, Geowissenschaftliche Dokumentation, Anzengruberweg 2, D 91056, Erlangen, GERMANY

Tel: 49 135 724 416

Fax: 49 135 729 917

EMAIL: geoldoku@gdgh.de

Dr Martina Koelbl-Ebert, Jura-Museum, Burgstrasse 19, D-85072 Eichstätt, GERMANY

Tel: 49 (0) 8421 2956

Fax: 49 (0) 8421 89609

EMAIL: Jura-MuseumVF@altmuehlet.de

Dr Peter Krueger, Bahnhofstrasse 27, D-13127, Berlin, GERMANY

Tel:

Fax:

EMAIL: Krueger@aol.com

Dr Cornelia Lüdecke, Valleystrasse 40, D-81371 München, GERMANY

Tel: 49 89 725 6725

Fax: 49 89 725 6725

EMAIL: C.Luedecke@lrz.uni-muenchen.de

Prof. Dr N.A. Rupke [NETHERLANDS Member], Institut fuer Wissenschaftsgeschichte, Goettingen University,

Humboldtallee 11, D-37073 Goettingen, GERMANY

Tel: 49 551 399 467

Fax: 49 551 399 748

EMAIL: nrupke@gwdg.de

Dr Wilfried Schröder, Geophysical Institute, Hechelstrasse 8, D-28777, Bremen-Roennebeck, GERMANY

Tel:

Fax: 49 421 603 037

EMAIL: none

Dr Irma Dobos, Margit krt 44, H-1027, Budapest, HUNGARY

Tel: 36 1 202 2741

Fax:

EMAIL: hidroig@mail.inext.hu

Dr Endre Dudich, Karolyi M.u. 14/B iv.5, H 1053 Budapest, HUNGARY

Tel: 36 1 251 0109

Fax: 36 1 251 0703

EMAIL: dudich@axelero.hu

Dr József Hála, Hungarian Geological Survey, Népstadion ut 14, Pf. 106, H 1442 Budapest XIV, HUNGARY

Tel:

Fax:

EMAIL: none

Dr Miklos Kazmer, Department of Palaeontology, Eotvos University, P.O. Box 120, H-1518 Budapest, HUNGARY

Tel: 36 1 381 0555

Fax: 36 1 381 2104

EMAIL: mkazmer@hotmail.com

Dr Gabor Papp, Department of Mineralogy and Petrology, Hungarian Natural History Museum, Pf. 137, H-1431 Budapest, HUNGARY

Tel:

Fax:

EMAIL: pappmin@ludens.elte.hu

Dr Terez Póka, Laboratory for Geochemical Research, Hungarian Academy of Science, Budaörsi ut 45, H-1112 Budapest, HUNGARY

Tel: 361 319 3119/1153

Fax: 361 319 3137

EMAIL: poka@sparc.core.hu

Dr Peter Rozsa, Department of Geology and Mineralogy, University of Debrecen, H-4010, Debrecen Pf 40, HUNGARY

Tel: 36 52 447 474 (ext. 2311)

Fax:

EMAIL: rozsap@tigris.klte.hu

Professor Istvan Viczian, Branylazkou u. 7. I.5, H-1026, Budapest, HUNGARY

Tel: 36 1 275 3263

Fax: 36 1 251 0703

EMAIL: viczian@mafi.hu

Professor Kottapalli S. Murty, 101 Sneh Chaya Apts, 28 Hindustan Colony Amaravti Road, Nagpur 440-010, INDIA

Tel: 91 712 557 984

Fax: 91 712 547 141

EMAIL: ankush99_99@yahoo.com

Professor Gordon L. Herries Davies, Ballinacloy House, Ballinacloy, Nenagh, County Tipperary, IRELAND

Tel: 353 673 2742

Fax: 353 673 2742

EMAIL: none

Professor Paul Mohr, Tanagharran, Corrandulla, County Galway, IRELAND

Tel: 353 91 789 819

Fax:

EMAIL: pmohr@indigo.ie

Dr Patrick N. Wyse Jackson, Geological Museum, Department of Geology, Trinity College, Dublin 2, IRELAND

Tel: 353 1 608 1477

Fax: 353 1 671 1199

EMAIL: wysjcknp@tcd.ie

Dr Dov Ginzburg, Geological Survey of Israel, 30 Malchei Yisrael St., 95 501 Jerusalem, ISRAEL
Tel: 972 2 14 251 **Fax:** 972 2 538 0668 **EMAIL:** none

Professor Dan Yaalon, Inst. of Earth Sciences, The Hebrew University, Jerusalem 91 904, ISRAEL
Tel: 972 2 570 4411 **Fax:** 972 2 566 2581 **EMAIL:** Yaalon@vms.huji.ac.il

Dr Stefano Marabini, Via S. Martino 1, 48018 Faenza (RA), ITALY
Tel: 39 054 628 067 **Fax:** 39 054 628 067 **EMAIL:** stemarabini@libero.it

Ms Imma Menditti, Via Torre 75, 80030 Scisciano, Napoli, ITALY
Tel: 39 338 278 3060 **Fax:** **EMAIL:** immamenditti@infinito.it

Professor Nicoletta Morello, Istituto di Storia Moderna e Contemp., University of Genoa, Via Balbi 6, 16126 Genova, ITALY
Tel: 39 010 353 8317 **Fax:** 39 010 209 9826 **EMAIL:** Nicoletta.Morello@lettere.unige.it

Professor Giuliano Piccoli, Riviera San Benedetto 27, I-35139, Padova, ITALY
Tel: 39 049 872 2055 **Fax:** **EMAIL:** giulianopiccoli@hotmail.com

Dr Claudia Principe, Area della Ricerca, CNR di Pisa San Cataldo, Via V. Alfieri 1, 56010 Ghezzano, ITALY
Tel: 39 050 315 2355/6 **Fax:** 39 050 315 2360 **EMAIL:** C.Principe@iggi.pi.cnr.it

Dr Ezio Vaccari,
 Dipartimento di Informatica e Comunicazione, Università dell'Insubria, Via Mazzini 5, 21100 Varese, ITALY
Tel: 39 0332 218 940 **Fax:** 39 0332 218 918 **EMAIL:** ezio.vaccari@unisubria.it

Professor Isao IMAI, 9-5-805 Sakana-cho, Morioka 020 0878, JAPAN
Tel: 81 196 25 8327 **Fax:** **EMAIL:** none

Professor Toshio KUTSUKAKE, Laboratory of Geological Sciences, College of General Education, Aichi University, Toyohashi 441, JAPAN
Tel: 81 532 47 4111 **Fax:** **EMAIL:** kutukake@vega.aichi-u.ac.jp

Professor Hakuyu OKADA, 4-8-36-601 Yoshizuka, Hakata-ku, Fukuoka 812-0041, JAPAN
Tel: 81 92 623 8161 **Fax:** **EMAIL:** hokada@bb.mbn.or.jp

Professor Masae OMORI, 3-32-5 Sakujii-di, Nerima-ku, 177-0045, Tokyo, JAPAN
Tel: 81 93 3996 2341 **Fax:** 81 93 3996 2341 **EMAIL:** user555nob@aol.com

Dr Daikichiro SHIMIZU, 48 Tanaka-nishihinokuchi, Sakyo-ku, Kyoto 606, JAPAN
Tel: 81 75 701 4652 **Fax:** 81 75 701 4699 **EMAIL:** None

Professor Kanenori SUWA, 1-1020 Umemori-zaka, Meito-ku, Nagoya 465-0065, JAPAN
Tel: 81 52 701 0457 **Fax:** 81 52 701 0457 **EMAIL:** Suwa@handy.n-fukushi.ac.jp

Professor Yasumoto SUZUKI, Geothermal Energy Research & Dev. Co. Ltd., Kyodo Building, 11-7, Kabuto-cho, Nihonbashi, Chuo-ku, Tokyo 103-0026, JAPAN
Tel: 81 3 3666 5822 **Fax:** 81 3 3666 5289 **EMAIL:** yasu-suzuki@vega.ocn.ne.jp

Professor Kenzo YAGI, 2-5-10 Moiwashita, Minami-ku, Sapporo 005-0040, JAPAN
Tel: 81 11 581 1473 **Fax:** 81 11 581 1473 **EMAIL:** none

Dr Michiko YAJIMA, Tokyo Seitoku Gakuen, 8-26-9 Toshima, Kita-ku, Tokyo 114-0003, JAPAN
Tel: 81 3 3812 7039 **Fax:** 81 3 3812 7039 **EMAIL:** PXI02070@nifty.ne.jp

Mr Toshihiro YAMADA, 4-4-2-908 Takasu, Mihama-ku, Chiba, 261-0004, JAPAN
Tel: 81 43 279 7094 **Fax:** 81 43 279 7094 **EMAIL:** tosmak-yamada@muf.biglobe.ne.jp

Professor Algimantas Grigelis, 13 Sevcenkos Street, 2699, Vilnius, LITHUANIA
Tel: Tel 370 5 210 47 15 **Fax:** 370 521 36 408 **EMAIL:** grigelis@geologin.lt

Dr George Zammit-Maempel, 148 Triq San Frangisk, Hal Balzan BZN 07, MALTA
Tel: 356 442 204 **Fax:** **EMAIL:** nibmike@maltanet.net

Dr Gabriele I. C. Schneider, Geological Survey of Namibia, PO Box 2168, Windhoek, NAMIBIA
Tel: 264 61 208 5205 **Fax:** 264 61 249 144 **EMAIL:** gabi@mme.gov.na

Dr Michael Johnston, 395 Trafalgar Street, Nelson, NEW ZEALAND
Tel: 64 3 546 7575 **Fax:** 64 3 546 7574 **EMAIL:** mike.johnston@extra.co.nz

Mr Alan Mason, 75-A Argyle St., Herne Bay, Auckland 1002, NEW ZEALAND
Tel: 64 9 378 6981 **Fax:** **EMAIL:** none

Professor J. B. Waterhouse, 25 Avon Street, Oamaru, NEW ZEALAND
Tel: **Fax:** **EMAIL:** loris@xtra.co.nz

Professor Geir Hestmark, University of Oslo, Department of Biology, Blindern Postboks 1066, N-0315 Oslo, NORWAY
Tel: 47 2 45 5050 **Fax:** 47 2 285 4664 **EMAIL:** geir.hestmark@bio.uio.no

Dr Stanislaw S. Czarniecki, Zespół Pracowni ZNG PAN, ul. Senacka 3, Krakow, POLAND
Tel: **Fax:** **EMAIL:** micku@poczta.onet.pl

Dr Jadwiga Garbowska, Museum of the Earth PAN, A. Na Skarpie 20/26, 00-488 Warszawa, POLAND
Tel: **Fax:** **EMAIL:** none

Professor Wojciech Narebski, Muzeum Ziemi PAN, ul. Zelechowskiego 4/30, 30-124 Krakow, POLAND
Tel: **Fax:** **EMAIL:** narebski@geos.ing.uj.edu.pl

Professor Janusz Skoczylas, Inst. of Geology, Uniwersytet im. Adama Mickiewicza, ul. Maków Polnych 16, 61-606 Poznan, POLAND
Tel: 48 61 8257 332 **Fax:** 48 61 8257 845 **EMAIL:** skocz@amu.edu.pl

Dr Zibigniew Wojcik, Chlodna 15/1022, 00391 Warszawa, POLAND
Tel: **Fax:** **EMAIL:** none

Professor Luis Aires-Barros, Laboratory of Mineralogy and Petrology, Instituto Superior Tecnico, Av. Rovisco Pais, 1049-001 Lisbon, PORTUGAL
Tel: 351 218 400 806 **Fax:** 351 218 400 806 **EMAIL:** airesbarros@popsrv.ist.utl.pt

Professor Dr João Luis Cardoso, Universidade Aberta, Palacio de Ceia, R. Escola Politecnica n. 147, 1200-1000 Lisboa, PORTUGAL
Tel: **Fax:** **EMAIL:** mta@mail.fct.unl.pt

Dr Ana Carneiro, SACS, Faculdade de Ciencias e Tecnologia, Universidade Nova de Lisboa, 2825-114 Monte de Caparica, PORTUGAL
Tel: 21 2948 533 **Fax:** 21 2948 551 **EMAIL:** amoc@netcabo.pt

Professor Antonio Augusto Soares de Andrade, Dept Geosciencias, Universidade de Aveiro, 3810-Aveiro, PORTUGAL
Tel: 351 34 370 747 **Fax:** 351 34 370 605 **EMAIL:** asandrade@geo.ua.pt

Dr Ana Cardoso De Matos, Centro de Estudos de Historia e Filosofia da Ciencia, Universidade de Evora, Apartado 94, Evora, PORTUGAL
Tel: **Fax:** **EMAIL:** anacmatos@mail.telepac.pt

Professor Martim Portugal e Vasconcelos Ferreira, Departamento de Ciências da Terra, Apartado 3014, Universidade de Coimbra, 3049 Coimbra, PORTUGAL
Tel: **Fax:** 351 239 825 144 **EMAIL:** none

Professor Manuel C. S. Pinto, Department of Geosciences, University of Aveiro, 3810 Aveiro, PORTUGAL
Tel: 351 2 34 370 744 **Fax:** 351 2 34 370 605 **EMAIL:** mpinto@geo.ua.pt

- Miguel C. F. Telles Antunes, Departamento de Ciências de Terra, Centro de Estudos Geologitas, Universidade Nova de Lisboa, P-2825 Monte de Caparica, PORTUGAL
Tel: 351212948537 **Fax:** 351212948556 **EMAIL:** mta@mail.fct.unl.pt
- Dr Kerim I. Djafarov, VNIIGAZ, Leninsky Raion, Moskovskaya oblast, 142717, RUSSIA
Tel: 7 095 355 9367 **Fax:** 7 095 355 9107 **EMAIL:** Babichev@nv.vniigaz.gazprom.ru
- Dr Georgy Khomizuri, Vernadsky State Geological Museum, Mokhovaya Street 11, Bd. 2, 103009, Moscow, RUSSIA
Tel: **Fax:** **EMAIL:** histgeo@sgm.ru
- Dr Andrei V. Lapo, All-Russian Geological Research Institute (VSEGEI), Sredny pr. 74, 199106, St Petersburg, RUSSIA
Tel: 812 328 91 65 **Fax:** 812 321 30 23 **EMAIL:** vsegei@vsgei.sp.ru
- Professor Efgenji E. Milanovsky, Department of Geology, Moscow State University, 119899 Moscow, RUSSIA
Tel: 7 095 939 2750 **Fax:** 7 095 932 8889 **EMAIL:** tvertat@newmail.ru
- Dr Igor Alexandrovich Resanov, Institute of the History of Natural Sciences and Technology, Russian Academy of Sciences, Staropansky Street 1/5, Moscow 103012, RUSSIA
Tel: 7 095 928 4173 **Fax:** 7 095 925 9911 **EMAIL:** postmaster@history.ihist.ru
- Professor Anatoly G. Ryabukhin, Faculty of Geology, Moscow State University, 119899 Moscow, RUSSIA
Tel: 7 95 939 2081 **Fax:** 7 95 954 5103 **EMAIL:** ryabukhin@dynamo.geol.msu.ru
- Dr Yu. Ya. Soloviev, Vernadsky State Geological Museum, Mokhovaya 11, Building 2, 103009 Moscow, RUSSIA
Tel: 7 95 203 4796 **Fax:** 7 95 203 4736 **EMAIL:** histgeo@sgm.ru
- Dr Fidan Taufikovna Yanshina, Zvenigorodskaja str. 11, Flat 1, MOSCOW 121993, RUSSIA
Tel: **Fax:** **EMAIL:** yanshin@df.ru
- Professor Nikolai Pavlovich Yushkin, Russian Academy of Science, 54 Pervomaiskaya St., 107610 Syktyvkar, Komi Republic, RUSSIA
Tel: 7 95 82 1242 0037 **Fax:** 7 95 82 1242 5346 **EMAIL:** yushkin@geo.komisc.ru
- Dr Johan C. Loock, University of the Orange Free State, Bloemfontein, SOUTH AFRICA
Tel: 27 51 401 2374 **Fax:** 27 51 447 8501 **EMAIL:** LoockJC@sci.uovs.ac.za
- Dr Luis Adaro, Marques de San Esteban 15, 33206-Gijón, Asturias, SPAIN
Tel: **Fax:** 34 985 358 3878 **EMAIL:** comercial@suministros-adaro.com
- Professor Francisco I. Ayala-Carcedo, Instituto Tecnológico GeoMinero de España, C/Rios Rosas 23, 28003 Madrid, SPAIN
Tel: 34 91 349 5966 **Fax:** 34 91 349 5834 **EMAIL:** f.ayala@igme.es
- Mr Candido Manuel Garcia Cruz, Urbanizacion Llombet 15, 38296 La Laguna, Tenerife, Canary Islands, SPAIN
Tel: **Fax:** **EMAIL:** cgarcru@gobiernodecanarias.org
- Dr Rodolfo Gozalo, Departamento de Geologia, Universitat de Valencia, c/o Dr Moliner 50, E-46100 Burjassot, SPAIN
Tel: 34 96 3864 398 **Fax:** 34 96 3864 372 **EMAIL:** Rodolfo.Gozalo@uv.es
- Dr Jorge Ordaz, Universidad de Oviedo, Jesus Arias de Velasco s/n, 33005, Oviedo, SPAIN
Tel: 34 98 5103 164 **Fax:** 34 98 5103 161 **EMAIL:** jordaz@asturias.geol.uniovi.es
- Dr Emilio Pedrinaci, Loma Verde no 11, 41120 Gelves, Sevilla, SPAIN
Tel: 34 95 560 0651 **Fax:** 34 95 560 0651 **EMAIL:** pedrinaci@telefonica.net
- Dr Francisco Pelayo, CSIC-Universidad de Valencia, Facultad de Medicina, Avda. Vicente Blasco Ibanez 15, 46010 Valencia, SPAIN
Tel: 96 386 4164 **Fax:** 96 386 4091 **EMAIL:** Francisco.Pelayo@uv.es

Professor Dr Octavio Puche Riart, San Telesforo 8, 28017 Madrid, SPAIN

Tel: 34 91 3366 951

Fax: 34 91 3366 977

EMAIL: opuche@dinge.upm.es

Professor Leandro Sequeiros, Apartado de Correos 2002, 28080 Granada, SPAIN

Tel: 34 57 295 369

Fax: 34 57 958 151 440

EMAIL: lsequeiros@probesi.org

Dr Christer Nordlund, Department of Historical Studies, History of Science and Ideas, University of Umea, S-90187 Umea, SWEDEN

Tel: 46 90 786 9733

Fax: 46 90 143 374

EMAIL: christer.nordlund@histstud.umu.se

Dr Bjorn Sundquist, Falkvagen 2, SE-75756 Uppsala, SWEDEN

Tel: 46 18 421 282

Fax: 46 18 420 684

EMAIL: bjorn.sundquist@swipnet.se

Professor Henri Masson, Institut de Géologie, BFSH2 Université de Lausanne, CH-1015 Lausanne, SWITZERLAND

Tel:

Fax: 41 21 692 4305

EMAIL: henri.masson@igp.unil.ch

Dr Nazario Pavoni, Sonnenbergstrasse 11, CH-8134, Adliswil, SWITZERLAND

Tel: 41 1 710 6689

Fax: 41 1 710 6689

EMAIL: dieter@seismo.ifg.ethz.ch

Dr Marc Weidmann, Sentier du Molard 3, CH-1085, Jongny, SWITZERLAND

Tel: 41 21 922 9675

Fax: 41 21 922 9675

EMAIL: weidmann-dutoit@bluewin.ch

Professor Emeritus Frederik R. van Veen, Dohbelmannduin 38, 2202 EA, Nordwijk, THE NETHERLANDS

Tel: 31 71 364 6696

Fax: 31 71 364 6707

EMAIL: fr.vanveen@wolmail.nl

Professor A. M. C. Sengör, I.T.U. Maden Fakultasi, Jeoloji Muhendisligi Bolumu, Ayazaga 80 626 Istanbul, TURKEY

Tel: 90 216 332 0856

Fax: 90 242 285 6210

EMAIL: Sengor@itu.edu.tr

Dr Trevor D. Ford, 21 Elizabeth Drive, Oadby, Leicester LE2 4RD, UNITED KINGDOM

Tel: 44 1116 271 5265

Fax:

EMAIL: none

Dr John Fuller, 2 Oak Tree Close, Rodmell Road, Tunbridge Wells, Kent TN2 5SS, UNITED KINGDOM

Tel:

Fax: 44 1989 253 4644

EMAIL: none

Dr Andrew Grout, Special Collections, Edinburgh University Library, George Square, Edinburgh EH8 9LI, UNITED KINGDOM

Tel: 44 131 651 1720

Fax:

EMAIL: andrew.grout@ed.ac.uk

Dr Beryl M. Hamilton, Orlig, Kirk Road, New Galloway, Dumfries and Galloway DG7 3RS, UNITED KINGDOM

Tel: 44 1644 420 200

Fax: 44 1644 420 200

EMAIL: berylhamilton@aol.com

Dr Hiroshi HIRAI, Wellcome Trust Centre for the History of Medicine, 24 Eversholt Street, London, NW1 1AD, UNITED KINGDOM

Tel: 44 20 7679 8152

Fax:

EMAIL: jzt07164@nifty.net.jp

Professor Richard Howarth, 49 Selwyn Avenue, Richmond, Surrey, TW9 2HB, UNITED KINGDOM

Tel: 44 20 8332 7835

Fax: 44 20 8332 7835

EMAIL: r.howarth@ucl.ac.uk

Dr Simon Knell, Department of Museum Studies, University of Leicester, 105 Princess Street, Leicester LE1 7LG, UNITED KINGDOM

Tel: 44 116 252 3963

Fax: 44 116 252 3960

EMAIL: sjk8@leicester.ac.uk

Dr Cherry Lewis, Public Relations Office, Senate House, Tyndall Ave, University of Bristol, Bristol BS2 1TH, UNITED KINGDOM

Tel: 44 117 928 8086

Fax:

EMAIL: cherry.lewis@bristol.ac.uk

Professor Martin J. S. Rudwick, Department of History and Philosophy of Science, University of Cambridge, Free School Lane, Cambridge CB2 3RH, UNITED KINGDOM

Tel: 44 1353 665 043

Fax: 44 1353 665 043

EMAIL: mjsr100@cus.cam.ac.uk

Professor James Secord, Department of History and Philosophy of Science, The University of Cambridge, Free School Lane, Cambridge CB2 3RH, UNITED KINGDOM
Tel: 44 1223 334 544 **Fax:** 44 1223 334 554 **EMAIL:** jas1010@cam.ac.uk

Dr Michael Taylor, Department of Geology and Zoology, National Museums of Scotland, Chambers Street, Edinburgh EH1 1JF, UNITED KINGDOM
Tel: 44 131 220 4819 **Fax:** 44 131 247 4113 **EMAIL:** m.taylor@nms.ac.uk

Professor Hugh S. Torrens, Department of Earth Sciences, Keele University, Staffordshire, ST5 5BG, UNITED KINGDOM
Tel: 44 1782 583 183 **Fax:** 44 1782 751 357 **EMAIL:** gga10@Keele.ac.uk

Professor Victor Richard Baker, Department of Hydrology and Water Resources, The University of Arizona, Tucson, Arizona 85721 0011, UNITED STATES
Tel: **Fax:** **EMAIL:** baker@hwr.arizona.edu

Professor Kennard B. Bork, Department of Geology and Geography, Denison University, Granville, OH 43023, UNITED STATES
Tel: 1 740 587 6486 **Fax:** 1 740 587 6417 **EMAIL:** bork@cc.denison.edu

Professor Albert V. Carozzi, 7530 Lead Mine Road, #304 Raleigh, North Carolina 27615-4897, UNITED STATES
Tel: 1 919 845 3451 **Fax:** **EMAIL:** acarozzi@nc.rr.com

Professor Robert H. Dott Jr, Department of Geology and Geophysics, Weeks Hall University of Wisconsin, 1215 West Dayton St., Madison, WI 53706, UNITED STATES
Tel: 1 608 262 8960 **Fax:** 1 608 262 0693 **EMAIL:** RDott@geology.wisc.edu

Dr Gregory Alan Good, Department of History, University of West Virginia, Morgantown, West Virginia 26506-6303, UNITED STATES
Tel: **Fax:** **EMAIL:** ggood@wvu.edu

Léo F. Laporte, 430 Nimitz Avenue, Redwood City, CA 94061 4226, UNITED STATES
Tel: 1 650 364 3386 **Fax:** **EMAIL:** laporte@cats.ucsc.edu

Dr Ursula B. Marvin, Harvard-Smithsonian Center for Astrophysics, 60 Garden Street, Cambridge, MA 02138, UNITED STATES
Tel: 1 617 495 7270 **Fax:** 1 617 495 7001 **EMAIL:** umarvin@cfa.harvard.edu

Dr Clifford M. Nelson, US Geological Survey, 950 National Center, VA 22611-9740, Reston VA 201-0001, UNITED STATES
Tel: 1 703 648 6080 **Fax:** 1 703 648 6373 **EMAIL:** cnelson@usgs.gov

Associate Professor Naomi Oreskes, Department of History, University of California at San Diego, La Jolla, CA 92093, UNITED STATES
Tel: 1 619 534 1996 **Fax:** 1 619 534 7283 **EMAIL:** noreskes@sbcglobal.net

Professor Cecil I. Schneer, River Road, Newfields, NH 03856-0181, UNITED STATES
Tel: 1 603 772 4597 **Fax:** 1 603 862 2649 **EMAIL:** cjs1@hopper.unh.edu

Professor Kenneth L. Taylor, Department of the History of Science, University of Oklahoma, Norman, OK 73019-0315, UNITED STATES
Tel: 1 405 325 5416 **Fax:** 1 405 325 2363 **EMAIL:** KTaylor@uo.edu

Dr Lora N. Lordkipanidze, The Kh. M. Academy of Sciences of the Republic of Uzbekistan, H. Khodzibaeva str., 700041, Tashkent, UZBEKISTAN
Tel: **Fax:** **EMAIL:** ingeo@ingeo.uz

Mr Rogelio Altez, Urb. La Lanada, Residencias De Mar, Torre 4, Apartamento 1-B, Caraballeda, Estado Vargas, VENEZUELA
Tel: 58 212 3129 934 **Fax:** 58 212 6052 466 **EMAIL:** ryaltez@cantv.net

Dr Anibal R. Martínez, PDVSA, Ave. E. Blohm, Chuao, Caracas, VENEZUELA

Tel: 58 2 908 2411 (ext. 3445) **Fax:** 58 2 908 3349

EMAIL: anibalmartinez@cantv.net

Dr José Antonio Rodríguez-Arteaga, Venezuelan Foundation for Seismological Research, Urbanización El Llantino,
Prolongación Calle Mara, Apartado Postal 76880, Caracas 1070-A, VENEZUELA

Tel: 58 212 257 9346

Fax: 58 212 257 9977

EMAIL: jrodriguez@funvisis.org.ve

Professor Franco A. Urbani, Universidad Central de Venezuela, Apartado 47028, Caracas 10411A, VENEZUELA

Tel: 58 2 693 0927

Fax: 58 2 693 0927

EMAIL: none

Professor Aleksandar Grubic, Rudarsko-Geoloski Fakultet, Džusina 7, 11001 Beograd, YUGOSLAVIA

Tel: 99 38 11 402 707

Fax: 99 38 11 631 137

EMAIL: none

Associate Professor Vidojko Jovic, Faculty of Mining and Geology, Džusina 7, 11000 Belgrade, YUGOSLAVIA

Tel: 381 11 3226 032

Fax: 381 11 182 363

EMAIL: none

HONORARY SENIOR MEMBERS

Professor Walter Kupsch, Canada

Professor Wolf von Engelhardt, Germany

Professor Rudolf Trümpy, Switzerland

Professor Emile den Tex, The Netherlands

Professor Gordon Craig, United Kingdom

Professor Alexander Ospovat, United States

[Professor William Sarjeant was made an Honorary Member at the Paris Meeting in 2002 but, sadly, he died shortly afterwards. (See p. 31.)]

It is requested that contributors to the *INHIGEO Newsletter* kindly use the following conventions for references.

For books:

Author(s) or editor(s), *Full Title and Subtitle [Capitalised and Italicised]*,
Publisher(s), Place(s) of publication, date.

Please place a colon between the title and the sub-title.

E.g.

Foster, Mike, *Strange Genius: The Life of Ferdinand Vandeveer Hayden*, Roberts
Rinehart Publishers, Niwor (Colorado) and Schull (West Cork), 1994.

For journal articles:

Author(s), 'Title [Capitalised]', *Journal Title [Not Abbreviated; Capitalised;
Italicised]*, date, *Volume number [italicised]*, page numbers.

E.g.

Rudwick, Martin, 'Cuvier and Brongniart, William Smith, and the Construction
of Geohistory', *Earth Sciences History*, 1996, 15, 25-36.

(Note that volume numbers only, not issue numbers, are needed.)

For chapters in books:

Author(s), 'Title [Capitalised]', in: Book editor(s), *Full Title and Subtitle
[Capitalised and Italicised]*, Publisher, Place, date, page numbers.

E.g.

Briggs, John C., 'Mass Extinctions: Fact or Fallacy?', in: William Glen (ed.), *The
Mass-Extinction Debates: How Science Works in a Crisis*, Stanford,
Stanford University Press, 1994, 230-236.

For book reviews:

Author of review. Review of: Author of Book, *Title of Book*, Publisher, Place of
publication, date. In: *Title of Journal*, date, *Volume number*, pages.

E.g.

Sarjeant, William A.S. Review of: Jerry MacDonald, *Earth's First Steps:
Tracking Life Before the Dinosaurs*, Johnson Books, Boulder (Colorado),
1994. In: *Earth Sciences History*, 1996, 15, 84-85.

Please use single inverted commas.

Please do NOT make ANY abbreviations; and do NOT capitalise the names of
persons (except in the case of Chinese or Japanese names, where capitalisation of
family names is helpful). In articles and reports, *etc.*, please supply 'given'
(*'Christian'*) names where possible, and (as a general guideline) use them in the
main body of a text for their FIRST mention ONLY. Thereafter, just give the
family name, without the given name(s) or initial(s).

