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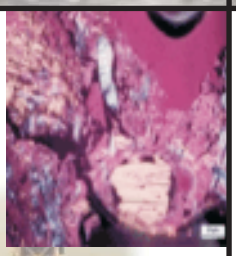

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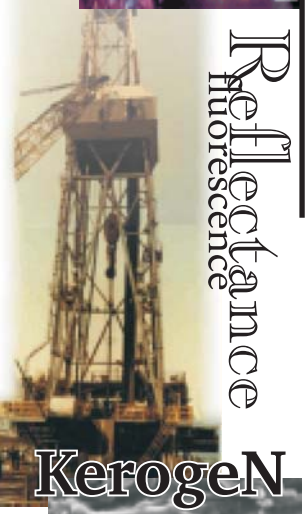

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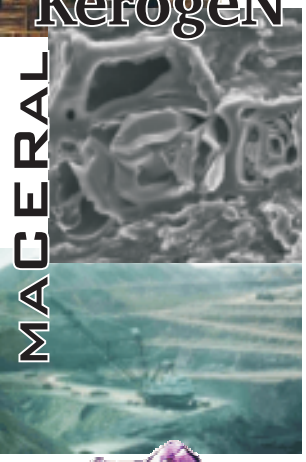

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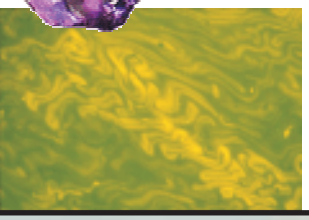

Marie Charmichael Stopes

Oct 15, 1880 - Oct 2, 1958

50Years

ICCP Nomenclature Committee meeting in Paris in 1957 showing from left to right, Parks, Noel, Mackowsky, Alpern, Stopes, Stach, ?, Chandra and Fenton. *Photo: Harold Smith*

inside this issue

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From the Editor

This year is the 50th anniversary of the death of Marie Carmichael Stopes. Her work is embedded deeply in the ICCP, with many aspects of our basic nomenclature systems imbued with her name - the Stopes - Heerlen System.

To mark this anniversary, some aspects of her work are being reproduced in this volume. Of particular scientific interest is "On the Petrology of Banded Bituminous Coal. *Fuel*, 1935" and "On the Four Visible Ingredients in Banded Bituminous Coal: Studies in the Composition of Coal, No 1. *Proc. Roy Soc. Lond. B*, 1919" (reproduced in this volume with kind permission of the Royal Society).

However, Marie Stopes also made many contributions to a variety of arts and sciences. According to Eaton and Warnick (1977), Stopes produced in excess of 66 Scienific contributions, 122 items in the area of Health and Social Welfare (many in the field of contraception and birth control) and 42 publications in the field of Literature and Travel (including under the pseudonyms of Eric Fay and Marie Carmichael). Many of these works have been translated into multiple languages. Additionally, there are no fewer than 18 books about her life and contributions to science, the arts and society. Sadly, one wonders if even this copious, multi-disciplinary output would be sufficient to access grants from some funding agenies!

In 1914, Stopes wrote *"Years ago I mapped out a life for myself which I hoped to live, for it seemed an ideal one. I planned to spend twenty years on scientific research, then twenty years on philosophy, and then twenty years in the direct service of humanity, meanwhile writing one poem in which to embody a lifetime's experience of the Universe, and when the poem was finished ... to die!"*

Her words from the past ring true in today's very busy world: "Sleep, the primitive and profound pleasure of all mankind, is enjoyed in retrospect and in prospect, but never in duration" (Stopes, 1956).

cheers and happy reading

Peter (ICCP Ed.)

Eaton, P. and Warnick, M. (1977) Marie Stopes. A checklist of her writings. Croom Helm Ltd, London. 59pp.

Stopes, M. (1914)Man, Other Poems and a Preface. William Heineman, London. 76pp.

Stopes, M (1956) Sleep. Chatto & Windus, London. 154pp.

Front cover drawing of Marie Stopes from: *Stopes, M. C. and Prieto, G. (illustrator) (1949) We Burn. Delamore Press, Alex. Moring Ltd., London. 100pp.*

From the President

Dear colleagues,

The enormous economic importance of coal, and the scientific challenges involved in understanding its evolution, composition and in optimizing its utilization have attracted many brilliant scientists to the field. In the twentieth century these included such diverse characters as Marie Stopes. She was interested in coal as a fossilised plant material and developed the classification, which still forms the base of our present classification.

Peter already highlighted the very diverse character of Marie Stopes. To my opinion, one of her striking characteristic was the way she always 'told it as it is'. Science is meant to be impartial, but it appeared that many of Stopes' palaeobotanical colleagues tried to improve their fossils by tweaking photographs or drawing extra details on specimens. Stopes took a clear and outspoken stance against this widespread but dubious practice, declaring it simple fakery. Even more significantly, she was careful to separate observation from interpretation, which is the essence of good scientific method.

Since the death of Marie Stopes, coal research has faced number of ups and downs. In the late 70's and 80's when many mines closed in Europe a number of outstanding petrologists have left the field of coal research. For ICCP this had and still has a significant impact, since the majority of one (or maybe even two) generations of organic petrologists are not working in this field any more and their knowledge and experience is threatening to disappear.

In this situation, it is very fortunate that ICCP has always maintained the 'Archives', where a wealth of knowledge has been stored which we can utilize. The Chair of Commission II, Angeles Gomez Borrego has already started to inventory and evaluate some of the data from previous ICCP work. The results, as presented at the last year's meeting, are remarkable. The publication of this exercise does not only honour the work of previous generations, but also assures that we will not invent the wheal for the second time.

Of course it is very important that we generate new ideas for ICCP working groups; nevertheless, sometimes it might be useful to look back to get a good impulse for future work.

If you have comments or requests do not hesitate to contact me at mailto:Petra.david@tno.nl

With kind regards

Petra David

From the Treasurer

After many frustrating delays with the bank, credit card facilities are once again available for payment on ICCP invoices, including membership dues and accreditation program fees. We can only accept

VISA and MASTERCARD

Costs will be converted to Canadian dollars on the day of the transaction at the exchange rate published on Google. If you have any queries about this, please feel free to contact me directly.

Jen Pearson
ICCP Honorary Treasurer
mailto:jen@coalpetrography.com

We Burn

Marie Carmichael Stopes

We speak of fire
When oxygen leaps swift
In fierce embrace to carbon,
Then the lift
Of heat flicks red-hot tongues
So fierce they heavenward aspire.
Eyes that perceive the smoke,
The glow, the cinder,
Of swift embrace divalent,
Yet are blind
When the same force plays on a lower scale
Whose ranges lend to man his lissom life
His power, his love, and all his leaping strife.

Man burns !
In every fibre and revolving cell
The seeing eye can tell
Man burns to live,
Man burning lives ---
No, not in hell, but here
On the sweet-girdled earth.
His burning is so cool
That like a fool
He feels it not himself
Nor knows the flame he is,
Nor feels the ember in his breath.

Blindly he turns to death
For fiery torments,
Though he burns in life.

His very breath
A cascade of those swift divalent loves
Hot fire creates.
He reinstates
His soul's vitality with pulsing warmth
From the slow furnace of his vibrant cells.
A gazing child, eyes sun-lit asks
“Does any live in God's great bonfire there ?”
Arrogant wise-heads shake their gloomy ‘No’s’
“Impossible! For ’tis all fire,” they say.
The child pretends great dragons there once fell
And, breathing fire, in that great heat, still dwell.
With incandescent breath upon Earth’s plains
Had silicon, not carbon, made your chains
It might be true
Of you.

Cool Truth proclaims
Life lives by burning.
Tuned to our slow-scaled speed in ceaseless fire we dwell
Breathing a smoke so cool
We in the plangent rhythm of life's heart
Know not the pain of burning, but apart
Live, love, serenely in each rose-flecked cell.
(1939)

Stopes, Marie Carmichael and Prieto, Gregorio (illustrator) (1949) We Burn. Delamore Press, Alex. Moring Ltd., London. 100pp.

Know Your Coal (Petrologist) #31

Yes, we do burn.... but what and where? Answer page 23.

International Conference on Coal and Organic Petrology
ICCP - TSOP
September 21-27, 2008, Oviedo, Spain

http://www.incar.csic.es/iccp_tsop

Organized by: Instituto Nacional del Carbón (INCAR-CSIC)

The Joint Meeting ICCP-TSOP (The International Committee for Coal and Organic Petrology - The Society for Organic Petrology) will be held in Oviedo (Spain) in September 21-27, 2008. The conference venue is:

Prince Philip Auditorium
Plaza de la Gesta 33007 Oviedo
http://www.palaciocongresos-oviedo.com

Call for Abstracts

Key Conference Themes:

★ Advances in Organic Petrology and Organic Geochemistry.
★ Applied Organic Petrology to Coal utilization and coal by-products.
★ Organic Petrology in the context of Clean Coal Technologies
★ Organic Petrology and Environment

Submit Abstracts for Technical Oral and Poster Presentations **by April 15, 2008** to:

Dr. Isabel Suárez-Ruiz
Instituto Nacional del Carbón (INCAR)
Francisco Pintado Fe, 26
33011 - Oviedo. SPAIN
mailto:isruiz@incar.csic.es

Send all abstracts via email, stating preference of Session, Poster, Oral, or either Oral/poster.

Abstracts must be 250-300 words maximum, sent as Microsoft Word or text files; no figures and no special formatting required

Oral Presentation: Each presentation will be 25 minutes long (20 minute talk with 5 minute question period)

Complete paper must be submitted by December 1st, 2008

Information for Presenters

Oral Presentations:
Presentations are limited to 25 minutes per talk. Breakdown: 20 minute presentation with 5 minute question period.

Presentations must be created on powerpoint (or a program that is compatible with powerpoint). Please bring presentations on a memory USB key or on CD.

Poster Presentations:
Poster maximum size:
Height: 150 cm
Width: 95 cm

Registration dead-line: April 15, 2008.

Registration forms can be found on the website (Word document and pdf file) as well as in this newsletter. Information on how to formalize your registration and submit your contributions and many other details about the Joint Meeting can be found at the
This Website can be also reached via ICCP and TSOP Web pages.

Transport Information

Oviedo is 40 km from the Asturias Airport. After arrival at the Asturias Airport, Oviedo may be reached by:

- Bus. Outside the Airport building on the right hand there is a Bus with the label "Oviedo". The rate is: ~ 6 €
- Taxi. Just outside the Airport building there is a line of taxis white colour. The rate is: ~50 €

More information at can be found via links on the website http://www.incar.csic.es/iccp_tsop

Field Trip

Date: Saturday, September, 27.

Asturian Coastal sections of Jurassic age will be visited. These rocks include black shale petroleum source rocks and dinosaurs tracks. The outcrops will be complimented by a visit to the Jurassic Museum. More information at can be found via links on the website
http://www.incar.csic.es/iccp_tsop

Accommodation

A series of hotels from 2 to 5 stars are recommended. These hotels are located in Oviedo downtown close to the Conference venue, that may be reached by walking. Delegates must make their own reservations. Details are given below.

Important and detailed information about hotel reservations, rates and dead-lines follow. Dead lines to make hotel reservations are very close and delegates are reminded to make bookings as soon as possible.

Website

The website is regularly being up-dated therefore, it is recommended to check it frequently.

http://www.incar.csic.es/iccp_tsop

The website contains the most up to date information on technical programmes, field trips, accommodation, registration forms and all aspects pertaining to the meeting.

For further details or inquiries contact:

Isabel Suárez-Ruiz
mailto:isruiz@incar.csic.es

Slot coke ovens at INCAR which were decommissioned in 2000. Photo: P. Crosdale

The Asturias mountains. Photo P. Crosdale

International Conference on Coal and Organic Petrology
ICCP-TSOP Joint Meeting
Oviedo, Spain. September 21-27, 2008
Registration Form

Name:
Affiliation:
Address:

Country:
Telephone:
Fax:
E-mail:

Registration (payable in cash upon registration).
If paying by cash please note that only **EURO** will be accepted
Personal cheques or credit cards are **NOT** accepted.

Meetings & Conference:

	PRICE	QUANTITY	SUB-TOTAL
Delegate Members:	160 Euro		
Non-members:	200 Euro		
Students:	60 Euro		
Meeting Guests:	85 Euro		
	TOTAL:		

Conference Dinner:

PRICE	QUANTITY	TOTAL
50 Euro		

Vegetarian dish requested: yes/no (please circle): No vegetarian dishes requested

Post Meeting Field Trip:
Cost includes lunch. Dinner is not provided.

PRICE	QUANTITY	TOTAL
60 Euro		

NOTE: Individuals are responsible for arranging accommodation

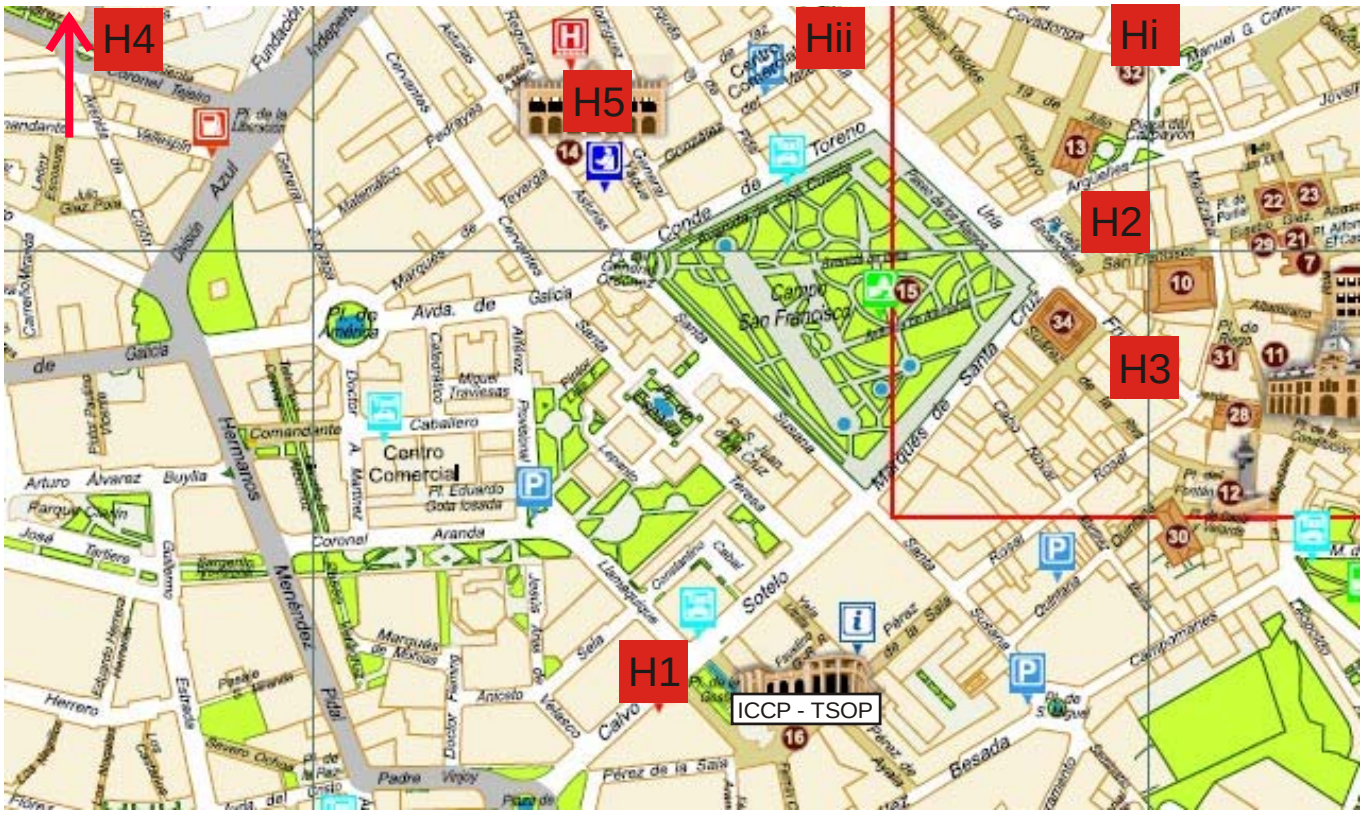
Fax Form to:
Begoña Ruiz Bobes FAX: +34985297662
Or Email digital scanned copy to mailto:begorb@incar.csic.es
mailto:isruiz@incar.csic.es

INTERNATIONAL CONFERENCE ON COAL AND ORGANIC PETROLOGY
ICCP-TSOP **September 21-27, 2008** **Oviedo. Spain**
Organized by: Instituto Nacional del Carbón (INCAR-CSIC)

MEETING SCHEDULE

Time	Sunday September 21	Monday September 22	Tuesday September 23	Wednesday September 24	Thursday September 25	Friday September 26	Saturday September 27
8:30 - 9:00		*Registration*	*Registration*		***ICCP Pl. Session***		
9:00 - 9:30							
9:30 - 10:00	**Council Meeting**	**Welcome & ICCP General Assembly**	**ICCP Commission Meeting**	**ICCP Commission Meeting**	**Joint Scientific Session ICCP-TSOP**	**TSOP**	**Field trip**
10:00 - 10:30							
10:30 - 11:00	**ICCP**					**Technical Session**	**Asturian Jurassic and Museum Visit**
11:00 - 11:30					**TSOP Technical Session**		
11:30 - 12:00							
12:30 - 13:00							
13:30 - 14:00					**Business Luncheon and Meet the TSOP Council Event**		
14:00 - 14:30	*Lunch break*	*Lunch break*	*Lunch break*	*Lunch break*		*Lunch break*	
14.30 - 15:00							
15:00 - 15:30							
15:30 - 16:00	**Council Meeting ICCP**	**ICCP Commission Meeting**	**ICCP Commission Meeting**	**ICCP Commission Meeting Plenary Session**		**TSOP Technical Session**	
16:00 - 16:30					**TSOP Technical Session**		
16:30 - 17:00							
17:00 - 17:30						**Poster Session**	
17:30 - 18:00							
18:00 - 18:30	**Registration & Ice-Breaker Party**						
18:30 - 19:00							
19:00 - 19:30							
19:30 - 20:00			**Council Meeting ICCP**	**Council Meeting TSOP**			
20:00 - 20:30							
20:30 - 21:00						**Evening Conference Dinner**	
21:00 - 21:30							
21:30 - 22:00							
22:00 - 22:30							
22:30 - 23:00							
23:00 - 23:30							
23:30 - 24:00							

Hotel Information



Oviedo downtown: Conference Venue, and Hotel location according to the number in the list

A series of hotels at special rates (see below) for the Joint Meeting are recommended. These hotels are located in Oviedo downtown close to the Conference venue, that may be reached by walking.

Please, ***PAY ATTENTION to the dead lines*** to make reservations. The dead lines are variable depending on the selected hotel.

Very Important: Hotels from # 1 to # 5: delegates must make their own reservations via Email or FAX always indicating this reference: Petrologia Organica. 2008-INCAR.

Please, do not use the hotel WEB sites for reservations because then you will not be identified as delegates for this Congress. Hotel Web sites are only for information.

Note: special rates have been negotiated for some hotels and these have been emailed to all ICCP members on March 14. Special rates range from 108 Euro to 64 Euro + 7% Tax. Breakfast is included in all cases. If you did not receive this email or require further information, please contact the organisers

For the other hotels, delegates must take their own reservation via phone, webpage or Email.

H1 -Ayre Hotel Ramiro I (4 stars)
Calvo Sotelo, 13. Oviedo
Phone: +34985232850 / +34902303555
Information: http://www.ayrehoteles.com/
Rates per night: see delegate information
Breakfast included.

60 available rooms. ***Dead line: 1st May, 2008***
ICCP-TSOP Reservations:
mailto:comercial.ramiro@ayrehoteles.com
FAX: +34985236329
Reference: Petrologia Organica. 2008-INCAR. (Attention Maria Cordero)

H2- Hotel NH Principado (3 stars)
San Francisco, 6. Oviedo.
Phone: +34985217792
Information: http://www.nh-hotels.com/
Rates per night: see delegate information
Breakfast included.

15 available rooms. ***Dead Line: 15th August, 2008***
ICCP-TSOP Reservations:
mailto:nhprincipado@nh-hotels.com
(Attention: Maria Espiniella)
Reference: Petrologia Organica. 2008-INCAR.

H3- Hotel Fruela (3 stars)
Fruela, 3. Oviedo
Phone: +34985208120
Information: http://www.hotelfruela.com
Rates per night: see delegate information
Breakfast included.

15 available rooms. ***Dead Line: 15th August, 2008***
ICCP-TSOP Reservations:
mailto:info@hotelfruela.com
(Attention: Mayte Alvarez)
Reference: Petrologia Organica. 2008-INCAR.

H4- Ayre Hotel Alfonso II (4 stars)
Ramiro I, 30. Oviedo.
Phone: +34985277660
Information: http://www.ayrehoteles.com
Rates per night: see delegate information
Breakfast included.

5 available rooms. ***Dead Line: 15th April, 2008***
ICCP-TSOP Reservations:
mailto:comercial.ramiro@ayrehoteles.com
(Attention: Maria Cordero)
Reference: Petrologia Organica. 2008-INCAR.

H5- Hotel Occidental de La Reconquista (5 stars)
Gil de Jaz, 16. Oviedo.
Phone: +34985241100
Website: http://www.hoteldelareconquista.com/
Rates per night:
Single room: 140.50 Euro + 7 % Tax
Breakfast included.
Double room: 179.00 Euro + 7% Tax.
Breakfast included.

ICCP-TSOP Reservations:
FAX: +34985 24 60 11
mailto:comercial@hoteldelareconquista.com
(Attention: Ana Maria Martinez Llera)
Reference: Petrologia Organica. 2008-INCAR.

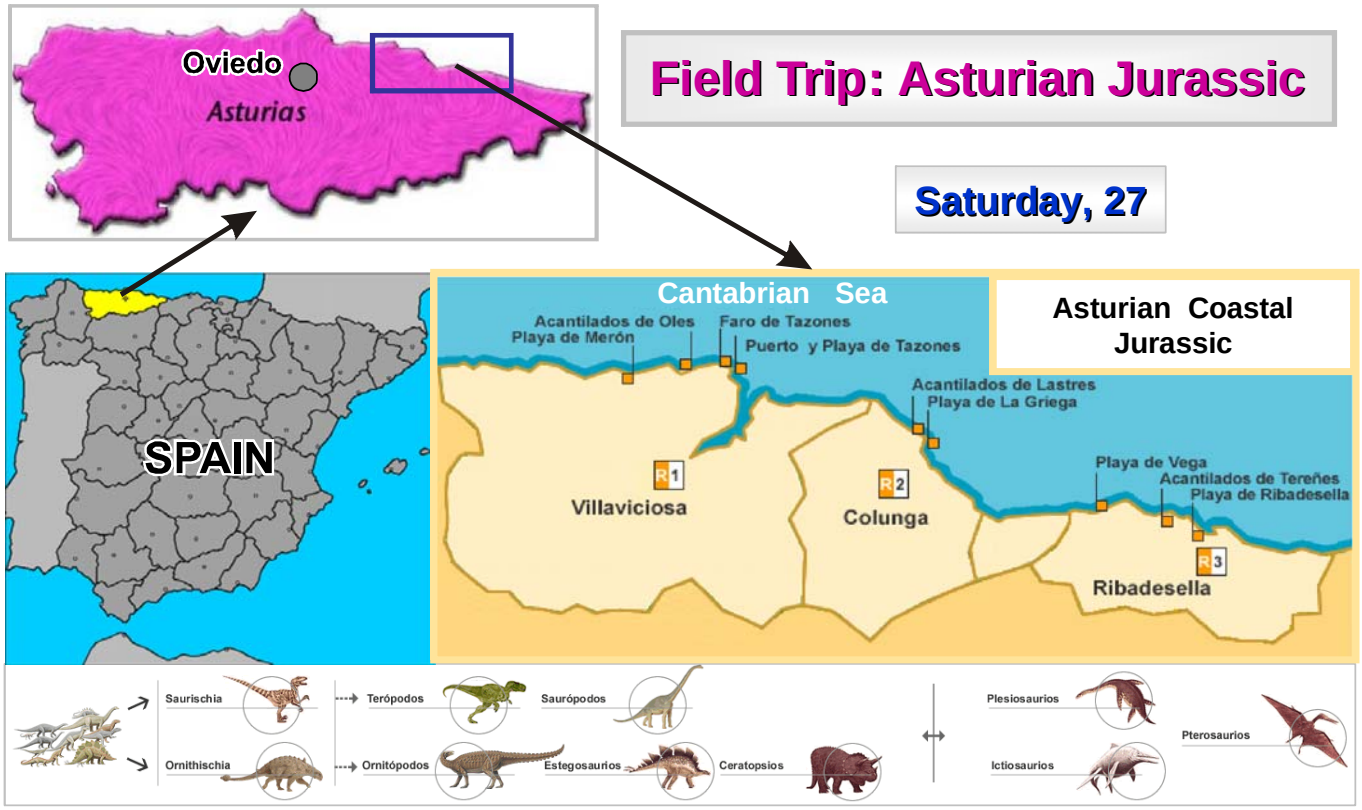
Other Hotels

Hi- Hotel Santa Clara (2 stars)
Santa Clara, 1. Oviedo
Phone: +34985222727
Website: http://www.hscoviedo.com/
Rates per night: 50.00 – 85.00 Euro + 7% taxes

Hii- Hostal Romero (2 stars)
Uria 36-38, 2º. Oviedo.
Phone: +34985227591
Website: http://www.hostalromero.net/
Rates per night: 36.00 Euro - 54.00Euro + 7% taxes
mailto:hostalromero@telecable.es

Accommodation inquiries:
Begoña Ruiz Bobes
mailto:begorb@incar.csic.es
Jose Ramón Montes Sánchez
mailto:joseramon@incar.csic.es

Exchange rates:
1 Euro = 1.55680 US Dollar (14/March/2008)




The streets of Oviedo. Photo P. Crosdale


The Prince Philip Auditorium - site of the meeting


Oviedo - 15th century cathedral Photo P. Crosdale

Call for Participation in the ICCP Accreditation Programs (Round 2008-2009)

The International Committee for Coal and Organic Petrology (ICCP) is pleased to invite you to participate in the next Accreditation round. At present the ICCP has three Accreditation Programs:

Single Coal Accreditation Program (SCAP) for both maceral group and vitrinite random reflectance analyses. In this program the ability of an analyst to identify and quantify the maceral groups and to identify and measure the vitrinite reflectance of a coal sample according to ISO standards is tested. Organizer: Kimon Christanis (mailto:christan@upatras.gr)

Dispersed Organic Matter Vitrinite Reflectance Accreditation Program (DOMVR). In this program the ability of an analyst to identify and measure the reflectance of vitrinite occurring as dispersed vitrinite in rocks such as carbonaceous shales or hydrocarbon source rocks is tested. Organizer: Alan Cook (mailto:alanccook@ozemail.com.au)

Coal Blends Accreditation Program (CBAP). In this program the ability of an analyst to identify the number of coals in a blend and their petrographic characteristics such as vitrinite reflectance and maceral group composition according to ISO standards is tested. Organic petrology is the only technique able to yield information of the individual component coals within a coal blend. Organizer: Isabel Suárez-Ruiz (mailto:isruiz@incar.csic.es)

The ICCP offers discounts for those participating in more than one accreditation program and has established a procedure to facilitate payments in which a single invoice will be produced. This requires that you contact the organizers of the programs before the **end of April** in order expedite the procedures. In addition the timing of the exercises has been spaced to reasonably distribute the analytical load of the participants along the year. The expected timing is summarized in Table 1.

Different number of samples are to be analysed in the programs depending on your previous participation. Participants entering SCAP or DOMVR programs or having lapsed for a round will be required to analysed six samples, whereas continuation in the program requires the analysis of two samples. For CBAP beginners are expected to analyse two samples and continuation require the analysis of a single sample.

No participation of automatic systems will be allowed in this round.

The samples for the exercises will be distributed once the organizer has been informed by the treasurer about the reception of the corresponding fee. The fees for the next Accreditation Round are summarised in Table 2. In addition, for participation in two ICCP accreditation programs a

Table 1. *General Schedule Proposed for 2008-2009 ICCP Accreditation exercises*

	SCAP	DOMVR	CBAP
Feb 2008- May 2008	Announcement, call for participants and invoicing		
Apr 2008-June 2008	Sample Distribution and analysis		
July 2008-Sep 2008	Evaluation of results	Sample Distribution and analysis	
Oct 2008-Dec 2008	Certificates and Web	Evaluation of results	Sample Distribution and analysis
Jan 2009-Mar 2009		Certificates and Web	Evaluation of results
Apr 2009-June 2009			Certificates and Web
Certificates' Validity	1.1.2009 to 31.12.2010	1.1.2009 to 31.12.2010	1.07.2009 to 30.06.2011

10% discount will be applied in the two of them and for participation in the three accreditation programs a **20% discount** will be applied in the three of them.

Further details on the Accreditation programs and evaluation procedures can be found at the ICCP website (http://www.iccop.org) and can be also received by contacting the respective program organizers.

The ICCP accreditation programs have grown up and consolidated over the years and are now an efficient instrument for checking the ability and method of an analyst for petrographic analysis. If you are interested in joining the programs, please contact the corresponding organizers.

Angeles G. Borrego
Chair of the Accreditation Subcommittee

Table 2. *Fees for the current ICCP Accreditation Programs*

	SCAP		CBAP		DOMVR	
	Entry	Continu-ation	Entry	Continu-ation	Entry	Continu-ation
Non-Members, USD	$ 150.00	$ 100.00	$ 240.00	$ 200.00	$ 120.00	$ 80.00
Members, USD	$ 80.00	$ 50.00	$ 120.00	$ 100.00	$ 60.00	$ 40.00

Membership Matters

Please update your contact details for :

Dr Tim A. Moore
Vice-President Technical Services
Arrow Energy
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Brisbane, Qld. 4000
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Brisbane, Qld. 4001
Tel: +61 7 3105 3400
Fax. +61 31-5 3401
Mob. +61 449 036 640
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fax: +36 1 363 7256
mailto: vido@elgi.hu
http://www.elgi.hu

Mr. Barry R. Clark
mailto:barry.clark@au.bureauveritas.com

If applicable please update your contact details with the General Secretary.

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Prof. Dr Wang Jie

Prof. Wang Jie was born in Shanghai, China on Dec. 14, 1929 and died in Beijing of Parkinson's disease on Dec. 8, 2007 at the age of 78 years.

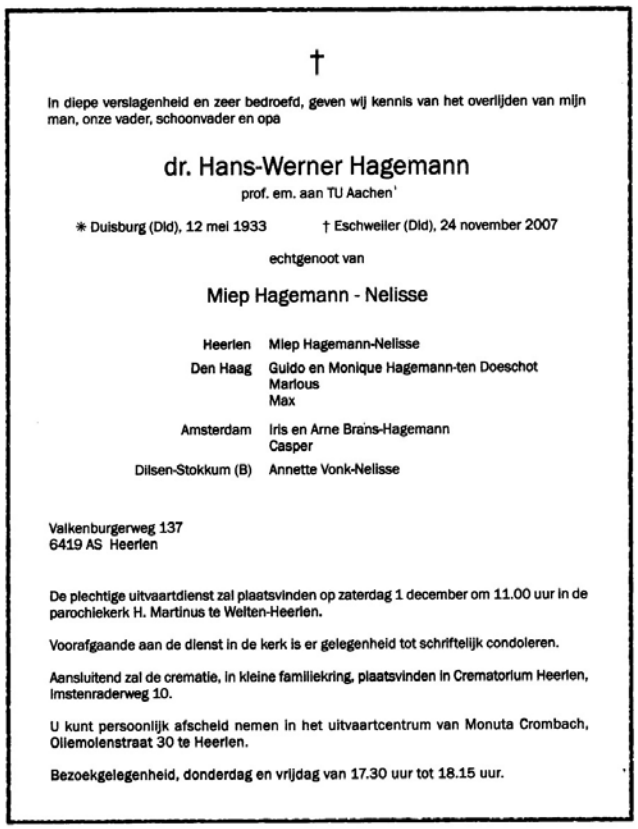
She graduated from the geological department of Tsinghua University in 1952. In those days Chinese graduate schools were ceased, so she was assigned to work at geological department of China University of Mining and Technology. Through more than 50 years outstanding work, She became a famous coal geological and coal petrological Professor in China. In addition,

she held a leading post of the geological department for several years.

Now, she parts Chinese and ICCP collogues forever, but a lot of her writings exist, such as the "Coal geology of China" (Co. author) and "The aspects of Chinese coals" (Co. author) by which people may know her wisdom.

Kuili Jin

Dr Hans Hagemann



†

In diepe verslagenheid en zeer bedroefd, geven wij kennis van het overlijden van mijn man, onze vader, schoonvader en opa

dr. Hans-Werner Hagemann

prof. em. aan TU Aachen

* Duisburg (Did), 12 mei 1933 † Eschweiler (Did), 24 november 2007

echtgenoot van

Miep Hagemann - Nelisse

Heerlen Miep Hagemann-Nelisse
Den Haag Guido en Monique Hagemann-ten Doeschot
Marlous
Max
Amsterdam Iris en Arne Brans-Hagemann
Casper
Dilsen-Stokkum (B) Annette Vonk-Nelisse

Valkenburgerweg 137
6419 AS Heerlen

De plechtige uitvaartdienst zal plaatsvinden op zaterdag 1 december om 11.00 uur in de parochiekerk H. Martinus te Welten-Heerlen.

Voorafgaande aan de dienst in de kerk is er gelegenheid tot schriftelijk condoleren.

Aansluitend zal de crematie, in kleine familiekring, plaatsvinden in Crematorium Heerlen, Imstenraderweg 10.

U kunt persoonlijk afscheid nemen in het uitvaartcentrum van Monuta Crombach, Oliemolenstraat 30 te Heerlen.

Bezoekgelegenheid, donderdag en vrijdag van 17.30 uur tot 18.15 uur.

Dr Hans Hagemann spent his whole scientific life at Aachen University, starting with a Diplom-Ingenieur in mining engineering. His doctoral thesis correlated the micropetrography of some seams of the Ruhr Basin with their spore content. In part this thesis was printed, with the complete reference being found in the 2nd edition of Stach's Textbook.

Later working on the petrography of lignites created a lithotype classification which forms the basis of the ICCP system. During the last years at Aachen he worked on microscopic particle analysis (shape and size) of crushed coal and organic components within dust etc. He had a strong preference was in the field of new methods in coal petrology and also published and worked in the field of fluorescence. His connection to the methods within coal petrology was the basis for his succession to Prof. Mackowsky in the leadership of the former Commission of Coal Petrographical Methods.

At the Lehrstuhl für Geologie, Geochemie und Lagerstätten des Erdöls und der Kohle he was initially Assistent and later Oberassistent (Senior Assistant). After his habilitation he became Professor. He was involved in the instruction of students and he was working under 4 different heads of the institute, another of his big achievements!

Monika Wolf

ICCP Awards and Calls for Nominations

ICCP offers a number of awards to recognise outstanding achievements in coal and organic petrology at various stages of career development. Awards available and a brief summary are given below. Full details on the nature of the award, its terms and conditions and how to apply can be found on the ICCP home page at http://www.iccop.org or by contacting the chair of the award committee (see inside front cover).

Organic Petrology Award

The Organic Petrology Award recognises outstanding contributions by coal and organic petrologists at an intermediate stage of their career. It is limited to applicants under 50 years of age. The award consists of a bronze medal and a
certificate. Awards are made from time to time but applications are called for every 2 years.

The award committee currently consists of the Thiessen Medal Committee as a transitional arrangement. Eventually, the award committee will consist of the five most recent recipients but to date only two awards have been made.

Nominations are now open for the 2008 award and close on June 30, 2008. For details of procedures and nominations, contact:

Dr R. M. Bustin
Chair, Organic Petrology Award Committee
Department of Earth and Ocean Sciences
The University of British Columbia
6339 Stores Road
Vancouver, B.C. V6T 2B4
Canada
mailto:mbustin@eos.ubc.ca

Thiessen Medal

This is the highest award offered by ICCP. It recognises a lifetime of achievement and outstanding contributions in the fields of coal and organic petrology. The award consists of a bronze medal. The award committee consists ofthe rive most recent medallists. Awards are made from time to time but applications are called for every 2 years. No nominations will be accepted in 2008.

Proceedings of the Royal Society of London, Series B Containing Papers of a Biological Character
Volume 90, July 1919, pages 470 - 486.

On the Four Visible Ingredients in Banded Bituminous Coal: Studies in the Composition of Coal, No.1.

By MARIE C. STOPES, D.Sc., Ph.D., Fellow and Lecturer in Palaeobotany
University College, London.
(Communicated by Sir George Beilby, F.R.S. Received August 22, 1918.)
[PLATES 11 AND 12.]

(reproduced with permission of The Royal Society, London)

Even after a century of investigation coal remains a complex mass of which the component parts can neither be handled nor separately identified. Many authors have recognised a variety of plant remains in coal, and the specific identification of these organisms and tissues has made good progress; but such work is truly palæontological, and the points of interest in it are the organisms and not the coal mass of which they form a part.

From another point of view coal is a rock, but, unlike most rocks, the nature and orientation of its component parts are scarcely known. One or the most distinguished of living geologists once said to me. that he would like to have available about microscopic sections of coal rationalised data comparable with those already obtained by petrologists about thin rock sections. The present paper is a contribution in that direction. It is an attempt to present systematically certain observations made incidentally in the course of the joint researches Dr. R. V. Wheeler and I have been following out on various other aspects of the hydra-headed "coal-problem."

In this paper the only type of coal dealt with is British palaeozoic (Coal Measure) streaky bituminous coal, the kind or coal which every household and most factories employ. The appearances of the microscopic sections of Cannels, Bogheads, Anthracites, and "Lignites" are each distinctive and significant, but they are not dealt with at all in the present paper.

The actual coal chiefly used in the research was the various bands of the Hamstead Colliery (Birmingham), and to Mr. L. Holland, the manager, and the Company, I am much indebted tor facilities to collect the coal myself *in situ*, and for various courtesies; also to Mr. P. S. Lea I am indebted for carefully selected samples from the "Eight-feet seam" from West Cannock Colliery, S. Staffordshire. The observations were checked and snpp1ernented by the examination of various other bituminous coals from widely separated localities.

In their text-book on the Petrology of Sedimentary Rocks, Hatch and Rastall (1913) describe ordinary coal as follows: "The humic or bituminous group includes the ordinary house, cooking, and steam coals, of which the appearance is so familiar as scarcely to need description. As a rule, they consist of a series of alternating bright and dull layers; in the latter only can remains of vegetable tissues sometimes be seen."

This may be taken as summarising a prevalent view; but, as will be seen on reference to p. 484 below, a, conflict of opinion exists about the presence of plant tissues in the "dull" or the "bright" layers; some of the leading authors taking a vie\v opposite to that of Hatch and Rastall, and stating that it is only in the "bright" layers that tissues are to be seen.

Preliminary Statement of the Present Contribution.

Essentially the present contribution to the subject consists in the explicit recognition not of mere "dull" and "bright" bands, but of *four* distinctive and visibly differing portions forming the mass of an ordinary bituminous coal; and the demonstration of the fact that these four portions can be recognised and separated from each other both macroscopically, by hand, and microscopically in thin sections; and that, further, these four portions react so differently to certain simple chemical treatments as to indicate that, their chemical molecules should be substantially different from each other. Diagrams of these points, and of the relations of the four constituents to each other in an ordinary sample, as well as colour illustrations of the same in thin sections, are given.

These four distinguishable ingredients, all of which, in varying quantities, are to be found in most ordinary bituminous coals, I name provisionally as follows :-

(i)Fusain*	The equivalent of "mother of coal," "mineral charcoal," etc., of various authors.
(ii)Durain†	The equivalent of "dull" hard coal of various authors, the "Mattkohle" of Germans, etc.
(iii)Clarain†	Together the equivalent of "bright" or glance coal of various authors, the "Glanzkohle" of Germans. Sometimes the "bright" coal of an author seems to be the vitrain only.
(iv)Vitrain†	(Conchoidal fracture, brilliant in appearance.)

* *The French name, adopted into English by J. J. Stevenson (1911-13) and Stopes and Wheeler (1918), to replace our native unwieldy and misleading names "mother of coal" "and " mineral charcoal."*

† *The first use of new terms suggested by the present author, and each based on a, Latin root descriptive of the substance and terminated in -ain to match fusain. The latter word is a French word used by geologists in a specialised sense. It is based on the Latin* fusus, *and its application to the "mineral charcoal" came about in a circuitous way. The roots I have chosen are obviously and directly descriptive.*

[These names, I am fully aware, do not represent chemical entities (with the possible exception of vitrain), but they do represent tangible entities of the same useful order as "jet," "granite," or "cheese."]

The generally "streaky" or banded nature of a seam of coal is of varying orders of magnitude, and as one magnifies a banded piece of coal more and more it becomes increasingly apparent how finely laminated it may be. Hence, a diagram of the arrangement of the bands natural size, magnified by 4, and another by 10 or even 20 diameters, may all show essentially similar lenticular intercalated lamellar structure.

In hand specimens sometimes bands two to four inches or more in thickness may be all "dull" coal, little, if at, all, streaked with "bright;" and perhaps above or below that may be three or four inches of glossy "bright," only finely streaked with dull. Most coals, however, are more mixed than that, and the average "dull" band is from a quarter of an inch or more in thickness, and is all through visibly streaked with fine lenticels of "bright," while the "bright" portions are streaked with very variable bands of "dull." Both the "dull" and the "bright," both the fusain and the vitrain, are all essentially lenticular masses; these are often so horizontally extended and so thin that they create the impression of being fine horizontal bands. With very few exceptions they lie approximately parallel to the bedding plane of the deposit. The fusain is the least regular in its arrangement, but on thewhole its more wedge-shaped portions tend to lie so as to be most apparent on the surfaces which are split parallel to the bedding. The appearance of fusain has very often been described.

The fourth ingredient, the vitrain or brilliant bands, have been less considered in the past, but are, as a matter of fact, particularly interesting. These brilliant bands, in a favourable sample, are very definitely deliminated from the rest of the coal, much more so than are either the ordinary bright clarain or the dull durain from each other, which, owing to the finely lamellar nature of the coal in which they are interlarded. are sometimes hard to separate. The true vitrain, however, generally forms a very definite and often sharply straight-cut band, varying from 2 to 6 or 8 mm. thick. There are, of course, brilliant streaks of smaller size, down to almost hair-like flecks. The larger, however, are the more typical vitrain zones. They are notably less numerous and less in quantity in most coals than are the ordinary glossy bright clarain, and in some coals are scarcely to be found. They should be carefully distinguished from the very glossy almost vitreous thick zones of bright coal sometimes forming a great quantity of a seam, which, however bright, will always show streakiness however subdued. A true piece of pure vitrain is not streaky even with a magnifying glass.

In studying minutely the four different portions of a coal, one point should be borne in mind concerning the samples used; and that is, that they should all four be selected in sitn, and as near to each other as possible. In the mine, therefore, blocks should be cut out, each showing all four ingredients as well differentiated and as nearly contiguous as possible. In this investigation I worked with well banded blocks about 6 by 8 inches cube. In the course of the work a large portion of each sample block is broken up, and the zones where the intercalation of the "dull" and bright is very fine, are useless for the isolation of the pure ingredients, as they cannot then be separated by hand. It must be recognised further that both durain and clarain can really never be got absolutely free from some streaks of each other, but if in the durain there are only few and hair-like streaks of elamin, and in the clarain only few and hair-like streaks of durain, they can serve for all practical purposes as pure enough to indicate- the relative characteristics of really pure clarain and durain. With care, both fusain and vitrain can be separated by hand from favourable samples in a really pure state.

The Appearances of the Four Ingredients with the Naked Eye, i.e., *their Macroscopic Appearances.*

Fusain occurs chiefly as patches and wedges, somewhat flattened parallel to the bedding plane, and often with rather square-cut ends. It consists of powdery, readily detachable, somewhat fibrous strands. The orientation of the fibrous structure tends to be lengthways in relation to each wedge, and the various wedges on a bedding plane lie at various angles to each other, so that in any given light some appear dull and some glisten according to the direction the light catches the fibres.

The fusain is readily separated from the rest of the coal (which is all .firmer than it in texture) by delicate scraping with a blunt knife, when the short, fibrous strands and small, sharp-pointed, irregular fragments fall freely on to a paper laid so as to catch them.

Where, as may happen, a thick wedge of fusain is contiguous with a true vitrain band, the fusain may appear as though embedded or sunk in the vitrain (*cf*. the text-fig., 2 *f*). The fusain can then be entirely scooped out, leaving exposed on the vitrain the hollow in which it lay, the surface of this vitrain hollow being curved and smooth. The contact surfaces of both clarain and durain with fusain, however, are much less precise, and an impression of the fibres of the fusain is generally left on the harder durain or clarain after all the friable detachable fibres of the fusain have been removed.

Durain occurs generally as bands of very variable thickness, and when seen in a face at right angles to the bedding plane, they appear parallel to it, though, if traced far enough, they generally reveal their ultimately lenticular shape. Wider bands of comparatively pure durain are less common, but bands, 2, 3, or more inches thick are often sharply differentiated from the adjacent streaky bright clarain.

Durain is hard, with a close, firm texture, which appears rather granular even to the naked eye. However straight the: break across it, the broken face is never truly smooth, but, if looked at closely, always has a

finely lumpy or matte surface (see Plate 11, fig. 1). Generally, even in the dullest of durain bands a few (or many) flecks or hair-like streaks of bright coal are to be seen.

The intercalation of narrow bands of durain and clarain tends to increase at the junction of the broad "dull" and the broad "bright" bands, so that there is no large surface of contact between them which is sharp cut and well defined, even the purest clarain and the purest durain tend to have ravelled edges, which interlock (see text-fig. 4, junction between *c* and *d*).

Clarain occurs generally as bands of very variable thickness, and when seen in a face at right angles to the bedding plane they appear parallel to it. Like durain bands, they are ultimately widely extended lenticular masses. Clarain, even when considerably streaked with durain, has a definite and smooth surface when broken at right angles to the bedding plane, and these faces have a pronounced gloss or shine. This surface lustre is seen to be inherently banded, as well as to have bands of fine durain intercalated between its own bands (see Plate 11, fig. 2).

Vitrain occurs as definite rather narrow bands, in some instances straighter and flatter than the other bands of coal, and in some instances more obviously lenticular. True brilliant vitrain bands are often markedly uniform in thickness for considerable distances, and are commonly from about 2 mm. to 3 or 4 up to 6 or 8 mm. thick, but are very seldom much more than 8 to 10 mm. thick. The limiting layer between the vitrain and the contiguous clarain or durain is generally sharply marked and is often clean-cut definite surface (see Plate 11, fig. 3). A single brilliant band does not exhibit the fine banding detectable even in the brightest of clarain, but is a coherent and uniform whole, brilliantly glossy, indeed vitreous, in its texture. The compact vitreous band may split up readily in the fingers to small cube-like segments, but more generally they break irregularly when forced, as with a penknife point, when the curved irregular faces have well-marked conchoidal fracture (see Plate 11, fig. 4). As was mentioned in connection with fusain, the contact-surfaces of vitrain with the other ingredients of coal tend generally to be well defined with a firm, hard, and glassy face.

Effects of the four Ingredients on the Photographic Plate.

The four ingredients are differentiated by their potency in making images of themselves directly (contact photos.) on sensitive plates.

Small pieces of approximately pure durain, clarain, and vitrain were placed on a negative, together with a little of the powdered fusain. All were taken from one sample.

By the method first described by Russell (*cf.* Russell, 1906, 1908, and used by Platt and Wheeler, 1913), a contact photo. was obtained.

The banded appearance of the contact photos. from blocks of ordinary streaky coal has been observed by the previous workers; the interest and novelty of the present photo. (for which I am indebted to Dr. Wheeler) lies in the very noticeable difference in intensity of the images made by the vitrain and the other parts of the coal. This can be seen on Plate 11. fig. 5, at A. That the brilliant vitrain should be the portion of the coal to make the most intense image on the plate is a point the significance of which is better discussed after some of the other characteristics of the four constituents have been considered.

Behaviour of the four Ingredients with certain Chemicals.

Work with a variety of chemicals is being undertaken, but the present paper is intended mainly to lead up. to the microscopic distinctions between the four constituents, so that only two relevant chemical treatments will be noted here.

(i.) *With 10 per cent. KOH in Water+twice the Volume of 50 per cent. Alcohol* the behaviour of vitrain is interesting. Small pieces (about 3 x 5 or 4 x 6 mm.) of pure vitrain placed in this solution, without any previous treatment, and left in the cold, become slightly swollen and softened without the addition of any acid or any other chemical substance. In three or four days pieces in this solution acquire the consistency of hard cheese or soap, and with an ordinary razor thin flakes can be cut from them.* The vitrain alone, however, is affected in this way. The clarain largely breaks down when touched after being in the solution, and is hard and irregular to the razor's edge. The durain becomes so friable that any attempt to cut it with the razor breaks it down to a hard, gritty powder.

* *As a similar behaviour has been described for the run-of-mine* Lignites, *it should be remembered that the coals dealt with in the present paper are typical hard, true black, bituminous, palæozoic coals; and that one of the standard criteria of distinction between lignite and true black coals is the fact that aqueous solutions of potassium hydrate dissolve the former to some extent, with a brown solution, but do not affect the latter.*

The penetrating power of alcohol should not be forgotten in considering the behaviour of coal to weak caustic solutions in it: a solution in water alone has not the same effect.

(ii.) *With strong Nitric Acid +a few Drops of Hydrofluoric Acid, followed later on by Neutralisation.*

Otherwise untreated samples of coal, of the three specified ingredients of coal other than fusain, placed in the mixture of acids, all tend after some days to break down to some extent, and the acid becomes tinged with brown. If left in the cold the pieces do not entirely disintegrate, but remain as smaller pieces. If after a week or so the acid is poured off, the pieces drained and then neutralised with strong potassium hydrate, they may still retain their solid nature. If the black solid mass is now placed at the bottom Of a relatively large vessel, and water added in quantity, a proportion of each goes into solution as follows :-

Vitrain goes completely into solution if care is taken to select quite pure samples of vi train. With the rapid addition of water there is at once formed a quantity of frothy "head," which ultimately, but very slowly; settles down. The "solution" looks quite black in bulk, but

when it fills a thin tube and is held against the light, it is seen to be a clear tea-coloured liquid, containing no floating particles or suspended jelly-like precipitate. Exact measurements of quantities are not yet significant, but I found that 2 grm. of pure selected vitrain yield, with the addition of the necessary water, half a litre or more of a solution so strong that it looks coal-black in bulk. Where the vitrain is quite pure there is no undissolved *débris* at all; but if fine streaks are visible in part of the original material, a few small spores and fine *débris* may be found at the bottom of the flask.

Clarain also goes largely into solution; the "head" of froth, however, is less in quantity and subsides more quickly. After standing, some *débris* settles at the bottom of the vessel, and this *débris* has, under the microscope, certain definite characteristics (see p. 478). The solution appears quite black in bulk and clear tea-coloured in a fine tube.

Durain forms no real froth, and the "solution" is rather paler than that of clarain, at first looking equally dark, owing to the number of very minute opaque particles suspended in it. After standing, the *débris* settles down and is seen to be considerable in quantity. Its microscopic appearance is described below (p. 478).

Fusain forms no froth and no true solution, the water generally remaining colourless, or being no more than straw coloured. The particles of *débris* are very heavy and numerous, settling more quickly than from the other coal ingredients (*cf* p. 478).

In order to present these differences graphically, equal weights of each of the four coal constituents were taken, treated ultimately with equal amounts of water, allowed to stand overnight so that the *débris* settled, the clear solution then decanted off, leaving in each vessel 20 c.c., with the *débris*. Each vessel was then well shaken up, so that whatever was in each was mixed and held in suspension, and then from each a narrow tube was filled. These four tubes were standing vertically, when settled the contents presented the appearance shown in fig. 5, Plate 12 (coloured illustration).

The proportion of *débris* thus separated was much greater in the fusain tube than in the others; and in the tube the particles settled relatively quickly; and were big, black and opaque. The durain tube showed less *débris*, filling about one-third of the tube when the particles had settled, and the particles themselves were smaller, and not all opaque, but some were brown and translucent, while the solution was tea coloured, and in it were for long suspended fine amber coloured fragments of plant tissue.

The clarain tube showed still less *débris*, about one-sixth or less of the tube settled quickly, but for some time the finer generally amber coloured and clear particles of plant tissue, spores, etc., remained suspended in the clear solution, which was the colour of strong tea.

The true pure vitrain had no *débris*, save for an intrusive speck or two. The clear solution was strong tea coloured.

Micro-photos of the *débris* of the above experiments show some of their characteristic features. The three photos were all taken with identical illumination, magnification, and time exposure. The fusain *débris* (Plate 11, fig. 6), is almost entirely composed of angular, fibrous, sharp-pointed fragments of very varying size, black and opaque.

The durain *débris* (Plate 11, fig. 7) is largely composed of irregular but more polyhedrally shaped fragments, black and opaque, some of which have transparent edges; mixed with the opaque particles are clear, irregular fragments, which appear to be portions of the broken up walls of the macrospores. Scraps of cuticles, and so on, are sometimes seen, but are seldom recognisable. The opaque fragments generally preponderate in at least about the proportion of three to one.

The clarain *débris* (Plate 11, fig. 8) is much finer as a rule, and consists preponderatingly of clear, brown and amber coloured fragments of irregular size and shape. Mixed with these are some opaque black granules and fragments, possibly due to small inseparable streaks of durain. In the clear clarain *débris* can be recognised many cuticle fragments, pieces of or complete spores, and also oval or rounded particles which I have come to the provisional conclusion represent the cell-contents in a special condition, from which the surrounding cell walls have been dissolved away.

Clarain *débris* repays study with the high magnification, but for comparison with the other two *débris* it is shown in the figure on .the same scale.

The Appearance of the Four Ingredients in Microscopic Sections of Untreated Coal.

A number of carefully selected blocks and small pieces were cut without any treatment save that necessary for sectioning by the grinding method. The coal is consequently quite unaltered (save for the permeating canada balsam mixtures which attach the sections to the glass) both in appearance and essential structure. The microscopic appearance of the four constituents are most noticeably different and characteristic, as will be apparent on reference to Plate 12, figs. 1-4 (coloured).

Before describing them in detail, I wish to say a word about coal microsections, many of which have been described by various authors. In several publications there are available for reference a number of excellent photographic reproductions of the structure and appearance of various coal sections. The reader should specially refer to Lomax (1911, 1915); White and Thiessen (1913); Jeffrey (1914, 1915); and Hickling (1917); and for critical references to the literature to Stopes and Wheeler (1918). All the illustrations above quoted show the finely stratified lamellar nature of the material in the coal sections, among which are recognised various' plant tissues, resin bodies and other things in the coal.

Many carefully marked banded pieces of coal, and also small pieces composed of each separate ingredient as pure as could be obtained were cut into sections in the course of the present work, and from them the persistence of certain characteristics in each of the four types was made evident Describing the four ingredients now recognised in the order hitherto followed :-

The *fusain* (which, though friable, at times forms patches or lenticels in the coal, from which more or less complete sections can be cut) is almost black, opaque, and when it shows the cellular structure of tlie wood

from which it was formed, it reveals the walls as much thickened and the cell lumina as being generally empty. When the section is approximately at right angles to the direction of the wood fibre, an appeamnce as shown in Plate 12, fig. 1 (coloured), results. This illustration, though in natural colours, looks almost black and white, save at s where is the gleam of an adjacent spore, showing the colour contrast between fusain and the other portions of the coal in section.

The botanical nature of the various plant fragments sometimes identifiable in the fusain does not concern us here; their general optical effect varies but little whatever species they are.

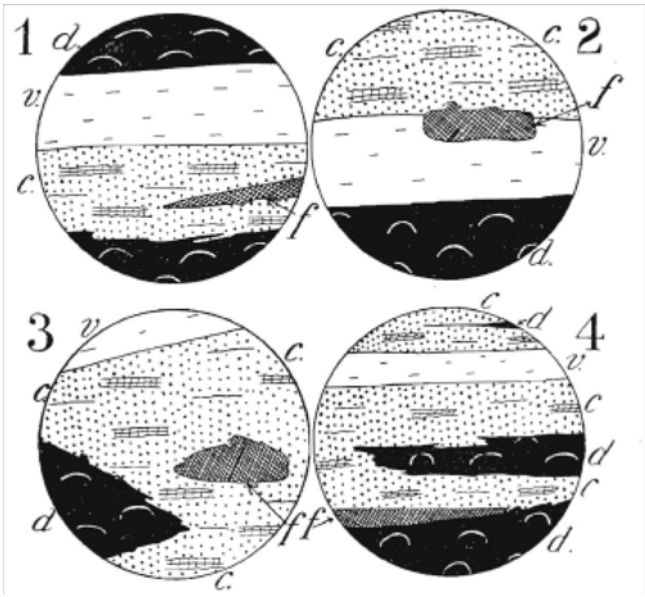
The *durain* being firm and hard in texture is more easily cut and ground than fusain, but as it tends to be rather granular, it is more difficult to finish finely than the more coherent and softer clarain. Sections show a granular matrix of roundish or polyhedral fragments, the majority of which are blackish and opaque. The granules are closely packed and form a coherent mass, but mixed with them are the most characteristic spore exines. These may be whole or in fragments. The macrospores are most conspicuous, and their very thick exines are clear and brilliantly coloured, almost red, though when thinner they are reddish gold to pale gold or amber colour. In durain the ground mass of rather opaque granules, and the large clear macrospore exines tend to preponderate, see Plate 12, fig. 2 (coloured). There mayor may not be a number of small microspores mingled with the granules forming the bulk of the durain. Throughout the texture of the less pure, streaked durain are seen in section small, clear, generally lenticular bands or flecks of a more golden colour. These are the streaks of clarain which so commonly lie interbedded with the durain (*cf.* p. 474). The purer the durain the fewer of these clear patches are to be seen in the section. These should be distinguished from certain other light coloured bodies sometimes to be seen in the durain, viz., the supposed "resin" bodies and other small distinctive granules. These, though sometimes locally abundant, are less characteristic of durain than of clarain. One may say that, on the whole, durain is essentially composed of a high proportion of opaque, fine granules, with many macro- and microspore exines scattered through it like currants in a pre-war pudding. Even in a small streak of durain the spore exines tend to be flattened and oriented so as to lie parallel to the general bedding of the coal seam.

The *clarain* is the easiest portion of the coal to cut into good sections, and is the most interesting to the palæobotanist, for in the clarain lie the greatest variety of recognisable plant tissues and structures. Clarain is essentially clear, as contrasted with the opacity of durain. There may be in it clear bands and zones showing much disintegrated plant substance, also bands of clear cuticle, spore exines, "resin-bodies," and other structures of various shades from pale yellow to a rich reddish-amber, the great majority of which are translucent or semi-translucent (though among them may be some opaque granules and particles), and among this variety of material plant stem tissues, leaf-tissues and so on may be preserved and may even fill the whole area of the sections. Plant tissues so preserved are also essentially translucent, though colour contrasts of the various minute structures present make the cellular tissue evident. There are also, of course (see p. 475), the opaque streaks of durain which are common in clarain, and should be looked on as an impurity in it. As a general rule, one may say of clarain that it is essentially translucent in thin section, and the purer the clarain the more are all its components of some degree of translucency [see Plate 12, fig. 3 (coloured)]. Even in a small area of clarain, that forming a fine bright streak in a dull piece of durain, for instance, the arrangements of the materials in it tends to be parallel to. the general bedding of the coal seam. Comparison of a number of sections with the various published illustrations makes it clear that clarain is the happy hunting ground of the palæontologist in search of preserved remains of the tissues com posing coal, and fortunate it is for him that so large a proportion of most ordinary seams are more or less pure clarain. In it remains of all kinds are to be found, ranging from very small fragments up to preserved stem tissues running for inches unbroken in the coal. It appears that the richer detail and variety of structures in the clarain, more or less pure, have attracted most recent workers, and have formed the basis of the great majority of the good illustrations hitherto published on the micro-structures in coal.

Vitrain is, in my experience, unobtainable pure in large sections, as true vitrain occurs almost entirely in thin bands, which tend to break into small segments. In section, when pure, its essential characters are its translucency (in which it resembles clarain) and its structureless and uniform texture, in which it differs from all other parts of coal. As it is technically difficult (my own cutter and Mr. Lomax, to whom I sent samples, find it impossible) to grind down this substance to absolute uniform thickness over the whole area of the section, the section has a.reas shading from pale gold to ruddy brown, but these obviously depend on the varying thickness of the slice examined: the mass is, uniform in its structureless nature. Plate 12, fig. 4 (coloured), shows the yellowish to dark amber colour of the uniform mass. Scratches show up on the surface very annoyingly, and are due to minute irregularities even in the finest polishing stone; they are unduly conspicuous in photos., but when the eye examines a number of sections it readily detects the essential uniformity of the vitrain, and its structureless nature, as of a hardened glue or jelly. In it may be seen an occasional isolated spore, or a fine streak of durain may have been included, but if the purest, most brilliant vitrain is selected, it is essentially homogeneous. The illustration given on Plate 12, fig. 4 (coloured), illustrates this, though imperfectly, and offers a contrast to the standard sections of durain and clarain (Plate 12, figs. 2 and 3).

There is, consequently, in *pure* vitrain no banding or differentiation of parts in relation to the bedding plane of the deposit, though any individual mass of vitrain generally itself forms a horizontally extended band, lying parallel to the bedding of the coal.

The original thesis of this paper is borne out in the above details of these very various observations, and I think we may now see in ordinary bituminous banded coal four recognisably distinct and differentiable ingredients, for which I propose the names fusain,



TEXT -FIGS. 1-4.-Diagrams of micro-photographs of sections of "streaky" bituminous coal, indicating the characteristic distribution of the four ingredients: *c*, c1arain; *d*, durain; *f*, fusain; *v*, vitrain.

durain, clarain, and vitrain. These four, though difficult to separate completely, and ever tending to be interbanded and to penetrate each other, can yet, in most ordinary banded seams, be recognised by the naked eye, locally pure, and obtained by hand separation nearly pure. Such separated samples from a few adjacent inches of coal show marked differences: (i) in their effect on sensitive plates, (ii) in their behaviour with various solutions, (iii) in the quantity and character of the debris they yield under treatment, (iv) in the microscopic details of this debris, (v) in the microscopic appearance of the substances in thin, ground, untreated sections. Further, in their chemical analyses, distillation products, and so on they differ; but these features will be dealt with by Dr. Wheeler.

The above data apply particularly to the well-banded, relatively undisturbed coals of the Midlands, of which the Hamstead Colliery yields excellent examples. In some other seams, particularly those visibly affected by earth movements, the whole of the coal may have been slightly dislocated and altered in minute steps, which, though not affecting either the bedding of the roof and seam, or the coherence of the seam, may yet have destroyed the interbanding of the four ingredients, as described above. Such coal may all look very "bright,"and may have only the streaks of fusain to represent the "dull." An example of such a coal is seen in part of the Pentre seam of South Wales, in which one might search for long before finding a block with anything but "bright" and fusain in it.

Naturally, in order to obtain any light on the characters of these four constituents, my endeavour was to obtain samples which contained the ingredients in layers of sufficient size and purity for the respective substances to be dealt with nearly pure. In most banded bituminous coals such samples can be found if sought for, though they may be insufficient in bulk to handle easily. The coal in bulk is generally composed of masses more intermingled, so that small bands or lenticels of one or the other ingredient are interbedded, and only separable by hand with great labour.

In general, therefore, sections of coal which have formed the subject of the investigations of previous workers will be found to contain at least two, and probably more, of the four constituents so laboriously separated in the present work.

It may be useful, and is certainly in keeping with the attempt to obtain a parallel to petrological knowledge, to give in a clear diagrammatic form the orientation of the ingredients generally to be observed. The accompanying four diagrams in the text (text-figs. 1-4) built up of conventional symbols representing each of the four above-named ingredients, illustrate the kind of distribution of the ingredients likely to occur in sections, taken without any special selection, from an average finely banded piece of bituminous coal.

These diagrams actually represent a low scale of magnification, four diameters, but, owing to the laminated nature of the coal, were more finely laminated regions taken and multiplied five or even ten times this, it would be possible to find areas which could justly be represented by the same diagrams.

An interesting feature to note is the comparatively straight line of contact between vitrain and either clarain or durain adjacent to it, when cut at right angles to the bedding plane; while the contact surfaces between clarain and durain tend to interlock in fine laminæ. Fusain tends to form irregular patches and wedges or lenses, which may have very small jutting projections into either the durain or clarain (see text-fig.) and in the vitrain may lie sunk in a comparatively smooth hollow (text-fig. 2).

As these four ingredients of coal which I provisionally delineate are none of them (with the possible exception of vitrain) actually homogeneous, nor are chemical molecular units, they do not even approximately represent the crystals in a petrological section of a rock; nevertheless, when represented on a low scale of magnification and in diagrammatic fashion, it may not be devoid of suggestiveness to compare such sections with those so useful to petrologists.

I hesitate to elaborate the matter at this early stage, but it seems possible that we have here a first step in the building up of an exact knowledge of the "physiography of coal sections," though the nature of the case debars the development of the theme from following quite the lines of the "microscopical physiography of minerals" laid down by Rosenbusch.

While the present recognition of four distinct ingredients in coal is, so far as I am aware, new, many authors have noted the banded appearance of coal, and particular attention has been paid to the "dullf and, "bright" zones. The early and most excellent paper of Karsten (1826), in which the "matt" and "glanz" coal layers were not only described but correlated with preliminary chemical examinations, has been followed up by Rogers (1843); Dawson (1859, 1866, 1871); Grand 'Eury (1882); Renault (1882); Von Gümbel (1834); Wethered (1885); Gresley (1892); Seyler (1907); Barsch (1908); Stevenson (1911); Dowling (1911); Grout (1911); Lomax (1911); Pringle (1911); White and Thiessen (1913); Hatch and Rastall (1913);

Grummitt and Hickling (1914); Jeffrey (1914); Lomax (1914, 1915); Strahan and Pollard (1915), as well as by many references of minor importance.
In these statements there is much difference of opinion, some authors stating that plant structure is found only in the "dull," others that it is found only in the "bright" coal. A detailed consideration of the views of Dowling (1911), White and Thiessen (1913), and Hickling (1917) is essential, but must be postponed to a later paper, when I hope to go into the matter more fully.

The lack of all preserved structure in "bright" coal maintained by various authors, and its jelly-like nature, suggested by Dowling, for instance, in my opinion indicate that the term "bright," as previously used, has covered both the bright clarain and the brilliant vitrain, differentiated in the present work, and also the secondary "brightness" resulting from natural agencies acting on a coal like the Pentre. So that in the past some authors have meant by "bright" the structureless brilliant vitrain, while others by the same word have meant the bright clarain which so often is full of plant structure; hence has arisen the directly conflicting statements about the presence of plant structure in "bright" and other coal.

PAPERS QUOTED IN THE TEXT.

editor's note: these are not reproduced here

DESCRIPTION OF PLATES.

PLATE 11-The plain Plate.

Fig. 1.- Photograph of natural broken surface of durain. At right angles to the bedding plane. Natural size.

Fig. 2.- Photograph of natural broken surface of clarain. At right angles to the bedding plane. Natural size.

Fig. 3.- Photograph of natural broken surface of small block of banded clarain in the centre of which is a broad definite band of vitrain. Note: In the photograph, owing to its brilliantly refractive nature, the vitrain shows as a broad white band. At right angles to the bedding plane. Natural size.

Fig. 4.- Broken surface of vi train showing irregular conchoidal fractures. This was split parallel to the bedding plane. Natural size.

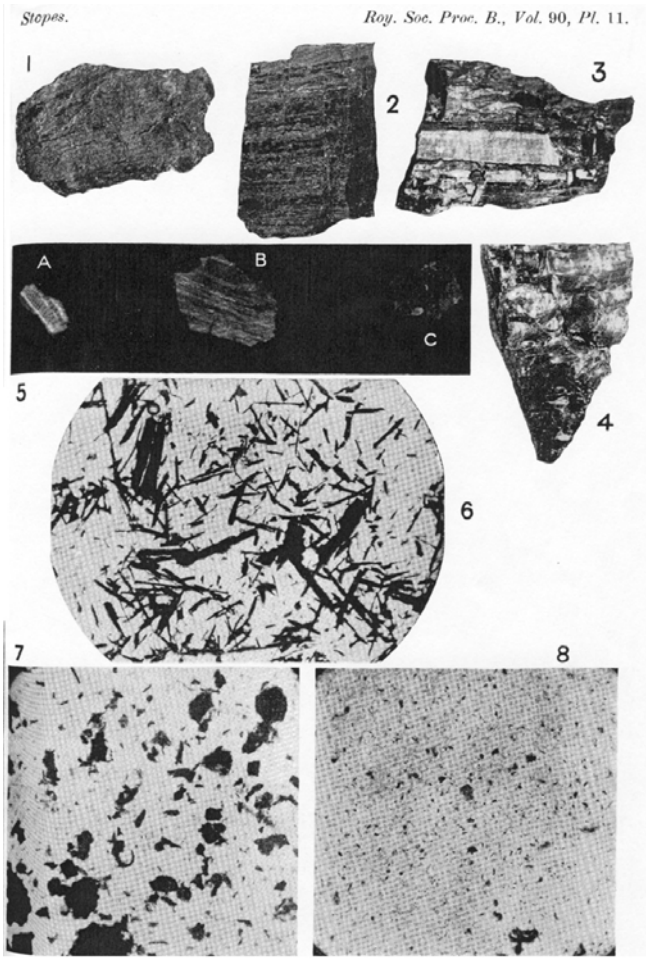
Fig. 5.- Contact photo. made by placing A, durain, B, clarain, C, vitrain, on a negative and enclosing them in a darkened chamber. Notice that the image obtained thus directly from the various ingredients is much stronger from the vitrain than from the others.

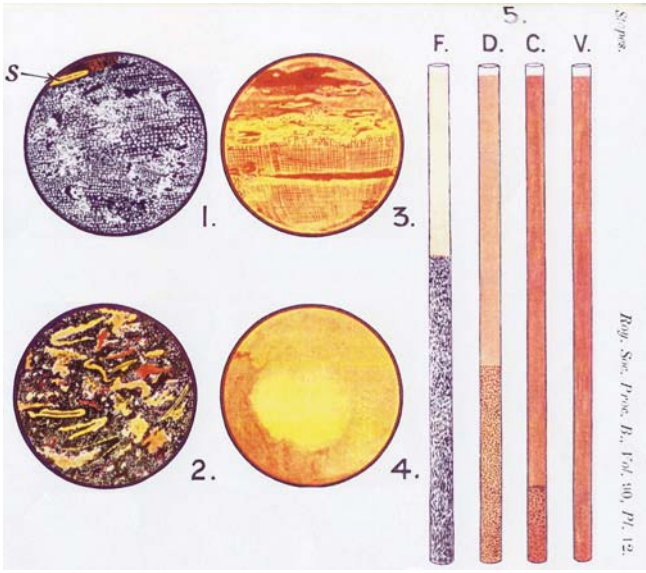
Figs. 6, 7, and 8 are all of micro-photographs of the *débris* obtained by treating the three ingredients by the method described on page 477. The three photographs are all taken on the same scale of magnification and with the same time exposure.

Fig. 6. - *Débris* of fusain. Note the sharp angular shape and tlte solid black appearance of the fragments.

Fig. 7. - *Débris* of durain. Note the more polyhedral shape of the black fragments and the presence of a number of less opaque ones.

Fig. 8. - *Débris* of clarain. Note the small number of black fragments and the high proportion of clear or nearly transparent fragments. Just above the centre several spores can be seen. Note also the much smaller size of the fragments from this material than from the other two.





News from TSOP

2008 Graduate Student Grant Program, the Spackman Award

The Society for Organic Petrology (TSOP) invites applications for graduate student research grants, the Spackman Award. The purpose of the grants is to foster research in organic petrology (which includes coal petrology, kerogen petrology, organic geochemistry and related disciplines) by providing support to graduate students from around the world, who demonstrate the application of organic petrology concepts to research problems.

Size of the Spackman Award: Monetary awards up to a maximum of $1,000.00 US will be granted. TSOP will also provide Merit Awards, in the form of certificates redeemable for TSOP publications, to top-ranking applicants not receiving grants. The program awards a maximum of two grants each year. All applicants are invited to enjoy a year's free student membership in TSOP.

Use of the Spackman Award: Grants are to be applied to expenses directly related to the student's thesis work, such as summer fieldwork, laboratory analyses, etc. A portion (not to exceed 25%) of the funds may be used to attend TSOP Annual Meetings. Funds should not be used to purchase capital equipment, to pay salaries, tuition, room, or board during the school year. Funds must be spent within 18 months of receipt of the award.

Application Deadline: TSOP Spackman Award application deadline is **May 15, 2008**. Grants will be awarded in September, 2008. Detailed information and an application form is on the TSOP web site http://www.tsop.org/grants.htm or applications may be obtained from Suzanne J. Russell, 2218 McDuffie St. Houston, TX 77019-6526 U.S.A. mailto:sjruss@sbcglobal.net

TSOP Student Travel Award

The Society for Organic Petrology (TSOP) announces the availability of funds to support student travel to attend the ICCP-TSOP Joint Annual Meeting to be held in Oviedo, Spain, September 21-27, 2008. See http://www.incar.csic.es/iccp_tsop/ for more details about the meeting. Up to $500 USD will be awarded per student. Funding is available for several awards, and TSOP is actively working to raise additional funding to support more student travel.

Students interested in applying for the TSOP Student Travel Award should send:

1. A copy of their abstract to be submitted to the Oviedo meeting.
2. A letter requesting travel funds clearly stating how attending the Oviedo ICCP-TSOP Joint Annual Meeting will help their research.
3. A letter of support from their primary faculty advisor.

All the above items should be sent electronically to Dr. Peter D. Warwick, Chair of the Committee to Promote TSOP, at mailto:pwarwick@usgs.gov.

Deadline for application is May 31, 2008.

Know Your Coal Petrologist #32

Grinning from ear to ear with a selection of samples - who cares about grubby knees? Answer page 23.

Standardization Working Group - Round Robin on Bituminous Coal

As announced at the ICCP Meeting in Victoria (see Newsletter No. 42, Minutes of Com. 1) a round robin on a Permian bituminous coal from Queensland (Australia) of medium rank b-c (according to ISO 11760, formerly also known as high volatile bituminous) will be run.

The aim of the round robin is apart from the advantage that applies to all round robins that the participants can check themselves against a larger number of other analysts and have another sample in their lab that can be used internally as reference or for training:

To check on variability of maceral sub-group analysis results, esp. the distinction between Telo- and Detrovitrinite and Fusinite and Semi-Fusinite.

As previous round robins have shown, a satisfactory level of agreement between analysts and laboratories is normally only achieved on a maceral group level. It is hoped that this round robin will provide information/data which might help to decide, if progress could be achieved by re-defining the macerals in question or by other means or if we have to live with the fact that maceral groups are our limit (as far as comparison with other analyst goes).

ICCP Members, who in addition to those who have signed up already, want to participate, please contact Walter Pickel (mailto:walter.pickel@organicpetrology.com) . The samples will be sent out with detailed instructions later in April.

Open invitation to join the working group 'Gasification Products characterisation" (Commission III)

At the 2007 ICCP meeting in Canada a new working group was proposed under Commission III, namely "Gasification WG". As the proposed convenor of this WG, I would like to invite all interested parties to participate, and further advance the understanding of the carbon conversion processes occurring during gasification from a petrographic perspective.

Gasification is a process that converts carbonaceous materials into carbon monoxide and hydrogen. Feedstocks include coal, petroleum, petroleum coke, biomass, and natural gas. The gaseous products can be processed for use as an energy source, and / or as a material for the production of a variety of chemicals and/or liquid fuels. Coal gasification as a power generation technology (IGCC), as well as coal to liquid (CTL) options for fuels and chemicals, are gaining popularity due to the ready availability of the raw material (coal) globally, as well as positive environmental issues associated with these technologies over combustion technologies.

Gasification performance is dependant on, among others, feed type (organic and inorganic composition) and gasifier configuration (of which there are many different types). Towards optimising process efficiencies, an in-depth understanding of the coal petrography and resultant char morphology is required, to build an understanding of the carbon conversion process occurring during gasification (including pressurised systems). Carbon carry-over in gasification ash, and gasification products, are other aspects requiring consideration.

Whilst the main focus area of the WG is likely to be around coal gasification, it does not eliminate the consideration of other solid feed types, including, for example, co-gasification (coal and biomass).

A formal proposal with aims and objectives will be made at the 2008 ICCP meeting in Oviedo, but all comments and builds would be most welcome prior to the meeting as well.

Dr Nikki Wagner
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South Africa
Tel: +27 (0) 11 717 7540
mailto:Nicola.wagner@wits.ac.za

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★ Accreditation Programs

- Maceral Group Analysis of Coals
  convenor: Dr Kimon Christanis
  Department of Geology
  University of Patras
  26500 Rio-Patras, GREECE
  Phone +30-2610-99 7568/Fax+30-2610-99 1900
  mailto:christan@upatras.gr
- Vitrinite Reflectance of Coals
  convenor: Dr Kimon Christanis
- Coal Blend Analysis
  convenor: Dr Isabel Suárez Ruiz
  Instituto Nacional del Carbón - CSIC
  Apartado 73
  33080 Oviedo, SPAIN
  Phone +34-98-511 9090 / Fax: +34-98-529 7662
  mailto:isruiz@incar.csic.es
- Vitrinite Reflectance of Dispersed Organic Matter
  convenor: Dr Alan Cook
  7 Dallas St
  Keiraville
  NSW 2500, AUSTRALIA
  Phone +61-2-42 299 843 / Fax +61-2 4229 9624
  mailto:alanccook@ozemail.com.au

For more information, contact the convenors of the programs.

See page 11 of this Newsletter.

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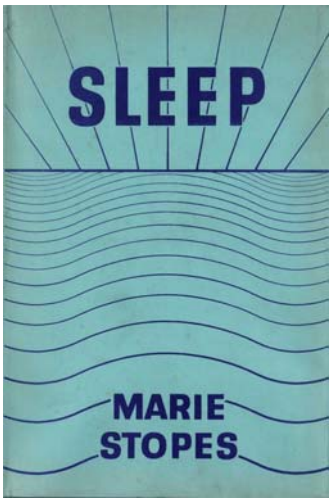
DEADLINE FOR NEXT ICCP NEWS :

16TH JUNE 2008



Answer to Know Your Coal Petrologist #31, 32

Morwell power station in the Latrobe Valley of Victoria is burning the infamous brown coals of the region. Richard Sykes (#32) is certainly looking most pleased with himself with his collection of samples. Both photos Peter Crosdale at the Wollongong 1990 post ICCP field trip.

WHAT'S HAPPENING

3 - 4 April 2008
The First World Coal-To-Liquids Conference, Paris, France
http://www.world-ctl2008.com

20 - 23 April 2008
AAPG Annual Convention and Exhibition, San Antonio, Texas, USA
http://www.aapg.org/sanantonio/

26 - 29 August 2008
7th European Coal Conference, Lviv, Ukraine
Contact: Dr. Andriy Poberezhskyy,
mailto:igggk@mail.lviv.ua
http://www.geofuel.lviv.net

21 - 27 September 2008
ICCP / TSOP Meeting, Oviedo, Spain
Contact: Isabel Suárez-Ruiz
http://www.incar.csic.es/iccp_tsop
mailto:isruiz@incar.csic.es

29 Sept. - 2 Oct. 2008
25th Annual International Pittsburgh Coal Conference, Pittsburgh, PA, USA
http://www.engr.pitt.edu/pcc/2008%20Conference.htm

2 - 8 November 2008
XI Latin American Congress on Organic Geochemistry, Isla de Margarita, Venezuela
http:// www. alago.com.br

16 - 19 September 2009
Third Symposium on Gondwana Coals, Porto Alegre, Brazil.
Contact: Zuleika Caretta
mailto:zuleika.carretta@pucrs.br

19 - 27 September 2009
ICCP / TSOP Meeting, Gramado (Porto Alegre), Brazil.
Contact: Wolfgang Kalkreuth
mailto:wolfgang.kalkreuth@ufrgs.br

Planned Future ICCP Meetings

2010 Belgrade, Serbia

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ICCP Handbook

★ *International Handbook of Coal Petrography 2nd Edition (1963)* (in English) as CD ROM
PC and Mac Compatible
Requires Adobe Acrobat Reader Ver. 4 or above
ICCP / TSOP member - **20€** (including postage)
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★ *International Handbook of Coal Petrography, supplement to the 2nd edition*, second print (in English) 1985 - **24€**

★ *International Handbook of Coal Petrography, 2nd supplement to the 2nd edition* (in English) 1986 - **8€**

★ *International Handbook of Coal Petrography, 3rd supplement to the 2nd edition* (in English) 1993 - **16€**

Prices do not include shipping unless stated or cost of money transfer.

Atlas of Anthropogenic Particles

A digital atlas of anthropogenic particles largely derived from fossil fuel sources. The atlas contains 543 images grouped by source and by site of occurrence. For details, see ICCP News No. 39, November 2006 pp 55 - 56.
Cost: **16€** including postage

ICCP Training Material on Vitrinite Reflectance Measurements in Dispersed Organic Matter

A CD and set of 4 polished grain mounts to be used as training material for learning about the appearance of dispersed vitrinite in rocks and about the measurement of its reflectance. Only a limited number of grain mounts are available. CDs can be purchased separately. For details, see ICCP News No. 39, November 2006 pp 53 - 54.
Cost:
CD + polished sample set **40€** including postage (ICCP / TSOP member)
CD + polished sample set **120€** including postage (non-members)
CD only **16€**

Corrections ICCP News #42

Please note the following corrections to ICCP News #42 November 2007. My apologies for any inconvenience caused.

- last page in Forthcoming Meetings. The date for the Porto Alegre meeting is given as 2008 instead of 2009
- page 22, right column. Convenors of the Fly ash Working group are both I. Suárez-Ruiz & B. Valentim - my apologies to Bruno for his omission
- page 39, right column, first paragraph. Isabel's full family name is Suárez-Ruiz and not just Suárez - my apologies to Isabel.

The Old Earth

More lovely than when young
In ardent verdure once more the sweet earth
Wreaths her green brows again with sapphire crocus flowers
Gleaming more lovable in her old age
Than in he myriad years of unloved youth
Before man saw her, when no flowers she wore.

Stopes, M.C. (1939) Love Songs for Young Lovers. G.P. Putnam's Sons, New York. 70pp.

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