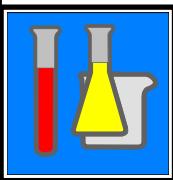




THE SOCIETY FOR ORGANIC PETROLOGY



NEWSLETTER

Vol. 30, No. 4

December, 2013

ISSN 0743-3816

31st TSOP Annual Meeting

Sydney, Australia

September 27th to October 3rd, 2014



Photo courtesy of Kaydy Pinetown.

Abstract submission and Registration available now!

TSOP 31st Annual Meeting

September 27th – October 3rd, 2014

We are pleased to announce that arrangements are well underway for the 31st Annual Meeting of the Society for Organic Petrology which will take place in Sydney, Australia, from 27th September to 3rd October 2014.

The meeting provides an opportunity to showcase international research on different aspects of organic petrology and related fields in a relaxed and welcoming atmosphere.

Details for the meeting can be found on our website at <http://wp.csiro.au/tsop2014>. Abstracts and registration forms can now be submitted. Feel free to advertise this event widely and don't hesitate to contact us if you have any questions.

We look forward to welcoming you to Sydney!

Kind regards,
TSOP 2014 Organising Committee



The Society for Organic Petrology

TSOP is a society for scientists and engineers involved with coal petrology, kerogen petrology, organic geochemistry and related disciplines. The Society organizes an annual technical meeting and field trips; sponsors research projects; provides funding for graduate students; and publishes a web site, a quarterly Newsletter, membership directory, annual meeting program and abstracts, and special publications. Members may elect not to receive the printed Newsletter by marking their dues forms or by contacting the Editor. Members are eligible for discounted subscriptions to the Elsevier journals *International Journal of Coal Geology* and *Review of Palaeobotany and Palynology*. Subscribe by checking the box on your dues form, or using the form at www.tsop.org. Contact Paul Hackley phackley@usgs.gov if you do not receive a bill or have any other problems with a subscription. For the best prices on subscriptions to AGI's *Geotimes*, see their web site at www.geotimes.org/current

TSOP is a Member Society of AGI and an AAPG Associated Society

The Society for Organic Petrology Newsletter

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GUIDELINES:

The TSOP Newsletter welcomes contributions from members and non-members alike. Readers are invited to submit items pertinent to TSOP members' fields of study. These might include meeting reports and reviews, book reviews, short technical contributions including those on geologic localities or laboratory methods, as well as creative works such as poems, cartoons and works of fiction. Photos, graphs and other illustrations are welcomed. Low-resolution images are discouraged, as they cannot be reproduced well in print. Articles are preferred in Microsoft Word, RTF or plain text formats.

Contact the Editor:

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Address Changes

Please report any changes in address or contact information to: Paul Hackley, TSOP Membership Chair, phackley@usgs.gov

Members can update their own information by logging into the secure TSOP website:

www.tsop.org/mbrsonly/

The TSOP Newsletter is published quarterly by The Society for Organic Petrology and is distributed to all Society members as a benefit of membership. Membership in the Society is open to all individuals involved in the fields of organic petrology and organic geochemistry. For more information on membership and Society activities, please see:

www.tsop.org

For purposes of registration of the TSOP Newsletter, a permanent address is:

The Society for Organic Petrology,
 c/o American Geological Institute,
 4220 King St.,
 Alexandria, VA 22302-1520 USA

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Newsletter Submission Deadlines

March Issue: March 5th, 2014
 June Issue: June 5th, 2014
 September Issue: September 5th, 2014
 December Issue: December 5th, 2014

President's Letter

The December newsletter heralds the conclusion of yet another very successful and rewarding year for TSOP. As we so often tend to do at this time of year, I sat back and reflected on what happened in the world of TSOP during 2013. The highlight of the year of course was the Annual Meeting in Sosnowiec-Katowice, Poland. The pictures published in the September Newsletter say it all. It was a great success and so once again, I extend sincere thanks to Dr. Magdalena Misz-Kennan, Professor Krystyna Kruszewska and members of the local organizing committee in the Faculty of Earth Sciences at the University of Silesia in Sosnowiec for their tremendous effort in organizing a very successful and enjoyable meeting and pledge our ongoing support to the editors of the Meeting Proceedings volume.

Awards are an important part of what TSOP Committees spend much of the year promoting and evaluating. TSOP celebrates excellence in research by making two significant awards in Organic Petrology and Geochemistry. I would like to extend our congratulations to the winners of the **2013 Dalway J. Swaine Award**, Drs. Richard Sakurovs, Lilin He, Yuri B. Melnichenko, Andrzej P. Radlinski, Tomas Blach, Hartmut Lemmel, and David F.R. Mildner for the Best Refereed Paper in Coal and Hydrocarbon Source Rock Geochemistry; and to Drs. Neil S. Fishman, Paul C. Hackley, Heather A. Lowers, Ronald J. Hill, Sven O. Egenhoff, Dennis D. Eberl and Alex E. Blum, the deserving recipients of the **2013 Ralph J. Gray Award** for the Best Refereed Paper in Coal and Organic Petrography. If you read on, you'll find more details of these awards in the Newsletter. Be sure to check out these two excellent publications!

Awards don't happen without a lot of work and effort on the part of some dedicated members who serve on the evaluation committees and so I would like to extend our sincere appreciation to the members and Chairs of the Ralph Gray and Dal Swaine Award Committees for their work. Thanks also to our Distinguished Service Award Committee which was unanimous in commending Paul Hackley of the USGS in Reston, USA for his outstanding service to TSOP. I am also extending our sincerest thanks and congratulations to Paul for his tireless support of TSOP.

On the subject of Awards, do you think one of your colleagues or coauthors deserves recognition for their outstanding contributions to research, teaching or for service to TSOP during the course of their career? Then,

I encourage you to consider nominating a coauthor or colleague for the John Castaño Honorary Member Award. Vice President Shifeng Dai will preside over the nomination and selection committee this year and will provide information regarding candidate qualifications and nomination procedure.

I am pleased to report that the TSOP Research Committee chaired by Prof. Colin Ward, continues to focus on the completion of TSOP -ICCP Dom Atlas project. We are all looking forward to the publication of this international guide, reference and data base on dispersed organic matter. Past President, Isabel Suarez-Ruiz has agreed to lead this charge and we hope to see the project concluded next year.

We saw a significant rise in membership during the latter part of 2013 with 12 new members joining our ranks since the Poland Meeting. After a brief decline in recent years, it is very encouraging to see our ranks growing, especially when governments and institutions worldwide continue to exercise fiscal restraint. As you can see, the Newsletter is an ideal vehicle for introducing our new members. TSOP Council is well aware of the impact the current economic climate has had on travel restrictions especially as our international membership base has expanded and our annual meetings are being held in some very exciting venues these days. The TSOP Newsletter is not just a vehicle for communicating to our members, it plays an ever-growing and important role in keeping us all connected and documents the growth and vitality of our Society. The Newsletter is your newsletter -use it to share your ideas, publish small increments of research and research updates, submit interesting photos, requests for information. Be proactive! The Newsletter is also a lot of work and so I want to say how much we truly appreciate the tireless efforts of our Newsletter Editor, Rachel Walker.

While it is exciting to gain new members, we sadly have to say "Goodbye" to lifelong and priceless ones. The world of Organic Petrology has within the space of a few weeks, lost two of its great pioneers, Professors Duncan G. Murchison, Newcastle, U.K and Aureal T. Cross, Michigan, U.S.A., both acclaimed teachers, researchers, mentors and giants in the fields of organic petrology and paleobotany, both John Castaño Honorary Members of TSOP. Duncan was named the John Castaño Honorary Member of TSOP in 2002; and Aureal in 2005. They have left us a great legacy.....we remember them with fondness and thanks and great admiration and will

honour them by continuing their work. They will be sorely missed!

Lastly, as you can see, preparations are well under way for the 2014 Annual TSOP Meeting in Sydney, Australia. Kaydy Pinetown, and our local Organizing committee are compiling an exciting program which includes a field trip to the Hunter Valley, and a short course in addition to two day of technical sessions. Many of you are already planning to attend and this edition of the newsletter contains all the preliminary information and links to the meeting website so can you plan ahead for travel, technical presentations, registrations.

Finally, on behalf of all TSOP Council Members and Committee Chairs, thank you for your outstanding efforts and contributions to TSOP this year and Season's Greetings to all.... and since New Year is a time for looking forward, let us look forward to a successful and productive year in 2014.

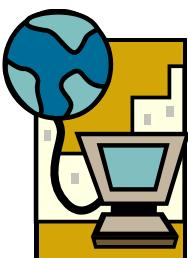
Best wishes to all,

Judith Potter

TSOP President, 2013-2105

Web Site News

Literature References Updated on Web Site



The set of 33 categories of organic petrology literature references at <http://www.tsop.org/refs/> is a very well-used part of the TSOP web site. They have now been updated for 2013. We greatly appreciate Brian Cardott's work in maintaining these lists, and I apologize for not putting the 2012 updates on the site last year.

Links to the 2014 TSOP meeting in Sydney, Australia, have been added to the site, and other updates are in progress. If you have any material for the web site, please provide it to me at xidg@verizon.net.

David Glick
Internet Committee Chair

New TSOP Members



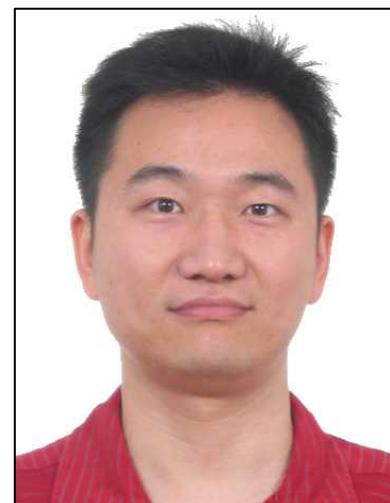
Yaofa Jiang

Dr. Jiang received his degree in 2007 from the China University of Mining and Technology for work in coal geology and petrology. After graduation from Nanjing University in 1978, he has worked in the Jiangsu Institute of Coal Geology. Since 1985 he has dedicated himself to scientific

research on coal petrology, coal geological exploration and aspects of coal geochemistry and engineering geology. He published the book of "Atlas for Coal Petrography of China" as an associate chief editor in 1996.

Yongchun Zhao

Dr. Zhao received his degree in thermal engineering in 2008 from the Huazhong University of Science and Technology. His research interests include mineral transformations and trace element emissions and controls in coal combustion and gasification processes.





Taofik Adedosu

Dr. Taofik Adewale Adedosu received a B.Tech (Hons) in Pure and Applied Chemistry from Ladoke Akintola University, Nigeria, in 1997, an MSc in Organic Chemistry in 2001, and his PhD in Organic Geochemistry from the University of Ibadan, Nigeria, in 2009. Currently he is an Associate Professor of Chemistry at Ladoke Akintola University where his research focuses on the applications of organic geochemistry to oil and gas exploration and environmental studies.



Yanbin Yao

Yanbin Yao is an associate professor of geology in the School of Energy Resources, China University of Geosciences in Beijing. He received his Ph.D. in 2008 from the China University of Geosciences in Beijing, and he won the award of Author of National Excellent Doctoral Dissertation of PR China in 2011. He has a broad experience in the realm of coal and coalbed methane geology.



Omid Haeri
Ardakani

Dr. Ardakani studied geology at the University of Tehran in Tehran, where he obtained his B.Sc. degree in geology in 1993 and M.Sc. in sedimentology in 1997.



Xiaodong Zhang

Dr. Zhang received his PhD in 2005 from the China University of Mining for studies in coal and coalbed methane geology. His current research at the School of Energy Science at Henan Polytechnic University includes coalbed methane resource evaluation, mechanisms of coalbed methane production, and dynamic changes in coal reservoir permeability during coalbed methane recovery.

He received his PhD in 2012 from the University of Windsor in Canada, where his research focused on the geochemistry and origin of diagenetic fluids and paleohydrology of Paleozoic carbonates in southwestern Ontario. Currently, he is engaged as a postdoctoral fellow at the Geological Survey of Canada where he investigates the organic petrology and reservoir character of unconventional hydrocarbon resource plays.



Margo Corum

Ms. Corum received her degree in biology and geology from George Mason University in 2000. In 1996 she joined the U.S. Geological Survey where her research interests include biogeochemistry and geochemistry including coal bed methane and methanogenesis. Since 2010 she has focused on unconventional reservoirs

and the national assessment of potential for carbon sequestration, work which she has presented at meetings of TSOP in 2011 and 2012.



Ao Wei-Hua

Dr. Wei-Hua received his PhD in Energy Geoengineering in 2013 from the China University of Geosciences and MSc in 2005 in Geochemistry. His research has focused on the distribution of trace elements in coal and mining waste.

John Castaño Honorary Membership Award Call for Nominations

Deadline: May 31, 2014

TSOP members are invited to nominate the scientist of your choice for the 2014 John Castaño Honorary Membership Award, The Society for Organic Petrology's highest honor (www.tsop.org/honmem.htm). The award acknowledges distinction in a scientific discipline of significance to the Society, in recognition of contributions in research, service to TSOP, or

education. The John Castaño Honorary Membership conveys life membership in the Society. It is named in honor of John Castaño, one of our most active Houston-based founding members. John served as inaugural Vice-President, and later, as President of TSOP. He was an organizer of three TSOP meetings in the Houston area, and was made an Honorary Member in 1995. John served TSOP in many capacities until his death in 1997; a memorial article was published in the June 1997 issue of the TSOP Newsletter.

If you would like to suggest a candidate for the 2014 Castaño Honorary Membership Award, **please submit a letter of recommendation and a brief vita of the nominee to *Dr. Shifeng Dai (China University of Mining and Technology, D11, Xueyuan Road, Haidian District, Beijing 100083, P.R. CHINA; E-mail: daishifeng@gmail.com) by May 31, 2014*.** It is suggested that supporting letters of recommendation from colleagues and other scientists accompany the package. Emphasis should be placed on the significance of the nominee's work.

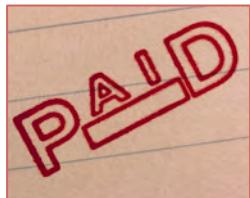
Nominations will be reviewed by the Castaño Award Committee and results will be announced at the Annual Meeting. The selection process is confidential and nominees do not have to be former or current TSOP members.

The committee evaluates research, service and educational impact on the following criteria:

- Research contributions include work that demonstrates a high degree of originality and serves to advance the science of organic petrology or related disciplines. Nominees must possess a sustained international record of professional publication and achievement.
- Nominees recommended for service must demonstrate significant contributions to TSOP in a leadership role. Their service must have enabled the Society to stimulate interest and promote innovative research in coal geology. Contributions include educational activities, administrative duties, or the development of the Society.
- Nominees recommended for education must demonstrate a high degree of dedication and significant impact as a teacher of organic petrology or related disciplines.

Dr. Shifeng Dai
TSOP Vice-President and
Chair of the Honorary Member Selection Committee

TSOP DUES REMINDER!



A reminder that TSOP dues payments are due on or before **January 1st**.

We encourage you to arrange your payment now so that you can continue receiving the benefits of TSOP membership and support the society and its work.

Why not consider saving the hassle and postage by taking advantage of our Dues Prepayment Incentive? When you prepay your dues four years in advance at the regular rate of \$25/yr we will give you the fifth year free!

We encourage members to use our convenient online dues payment system. You can use it to pay by check/cheque (US Members), money order, wire or credit card. Login at www.tsop.org/mbrsonly and select 'Online dues payment' or go to www.tsop.org/dues. Please note that all credit card payment processing is via PayPal and you don't need a PayPal account to use it. This saves the society about 70% or more on transaction fees.

A copy of this year's dues form can be downloaded from the website by following the 'Dues' link from the main page (www.tsop.org).

Thank you for your interest and support of TSOP and we look forward to a renewal of your TSOP membership.

Institutional Memberships



We'd like to make the members aware that membership in TSOP is also open to any organization having an

active scientific interest in organic petrology or related fields. TSOP especially encourages institutions to join at the special **institutional rate of \$75/yr** and help support the goals of the Society. See the website for details: <http://www.tsop.org/join.htm>

Become
A Member

Photos for Online Member Directory

Calling all members to submit a photo of themselves to the Online Member Directory section of the TSOP website. Get to know your fellow TSOP members and help to recognize each other at the next TSOP meeting! The names of members with photos are highlighted in the dropdown selection list of the Online Directory.

Photos of all sizes are gladly accepted but the web display is restricted to 150x200 pixels. Therefore, all larger images will be cropped and resized to provide an image of appropriate size.

So send us a photo for the directory at silo.admin@tsop.org. And to join in the photo fun, here's one of the Editor herself – Rachel Walker:



31st Annual TSOP Meeting Sydney, Australia September 27 – October 3, 2014

The 31st Annual Meeting of TSOP will be held in Sydney, Australia from September 28 to October 3, 2014. This represents the 10th anniversary of the successful and highly acclaimed Sydney meeting held in 2004, and again provides an opportunity to showcase international research on different aspects of organic petrology in a relaxed and welcoming atmosphere.

The meeting will start on Saturday, September 27, with a short course on “Application of Organic Petrology” presented by Claus Diessel (Univ of Newcastle) and Walter Pickel (Coal and Organic Petrology Services). A pre-meeting field trip will be held on Sunday, September 28, to examine the coal geology of the southern Sydney Basin. As well as the Permo-Triassic stratigraphy and the magnificent coastal scenery, this trip will allow participants to visit a coal seam gas extraction plant, examine outcrops of coal seams and associated strata, and travel over the spectacular engineering structure of the Sea Cliff Bridge.

The meeting itself will be held at the Rydges World Square Hotel, in the heart of the city’s entertainment precinct. Close to restaurants, theatres, museums and other attractions, including Darling Harbour and Chinatown, this hotel has excellent accommodation and conference facilities. A range of other accommodation options is also available nearby. The conference venue is conveniently located with respect to Sydney Airport and Central Railway Station, as well as to Sydney’s bus and train network.

On Monday, September 29, a short course on “Digital Core Analysis – Theory and Applications for Unconventional Reservoir Assessment” will be presented by Alexandra Golab (Lithicon) and Andrew Fogden (ANU). The course will focus on three-dimensional X-ray micro-CT imaging of coal, shale and organic-rich rocks, and its integration with other systems to evaluate features such as porosity and fracture networks. Technical sessions will be held over the following two days, along with the traditional TSOP Business Lunch and the Conference Dinner. These will be followed by a field trip to examine the Early Permian coal deposits of the Hunter Coalfield, Sydney Basin, including a visit to an open-cut coal mine in the Muswellbrook area, inspection of laboratory facilities

for coal seam gas analysis, and a visit to one of the world-renowned wineries in the region.

Themes for the Technical Sessions include:

- Organic petrology for unconventional gas
- Microbiology of organic-rich rocks
- Fugitive emissions and CO₂ storage
- Coal behaviour during utilisation
- New techniques in organic petrology and geochemistry

The program is intended for people from a wide range of areas in organic petrology and organic geochemistry, including researchers and practitioners in both the coal and petroleum industries as well as those with more academic interests in natural organic matter. Participation by students is especially encouraged.

Sydney has a number of attractions apart from the meeting to make the trip worthwhile. A special Partners’ Program is being planned, with visits to the Royal Botanic Gardens, the Sydney Opera House, and a cruise across Sydney Harbour to the beach-side area of Manly, as a further encouragement for spouses and family groups.

Further information on the meeting is available from the TSOP website. Abstracts of papers for presentation should be submitted by May 31, so start preparing papers and arranging funding make the trip. Subtitled *Organic Matter Down Under II*, it is a meeting not to be missed.

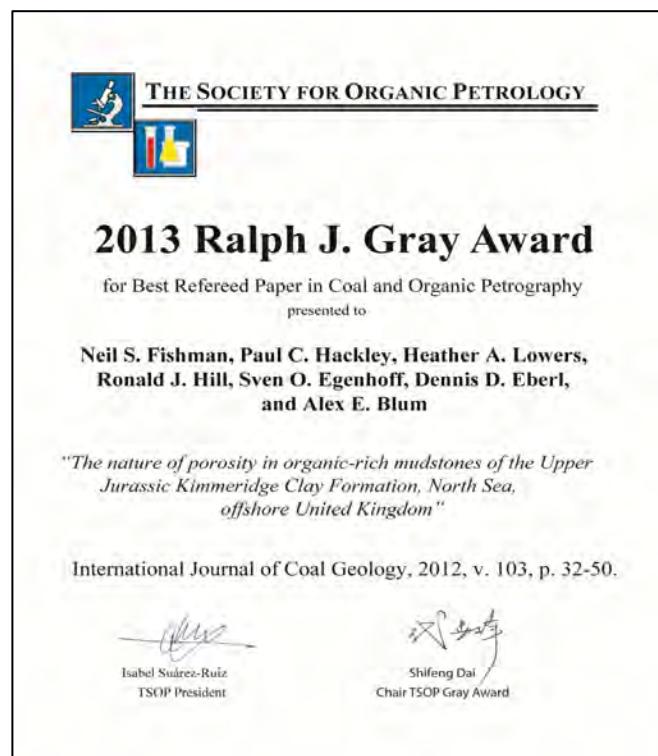
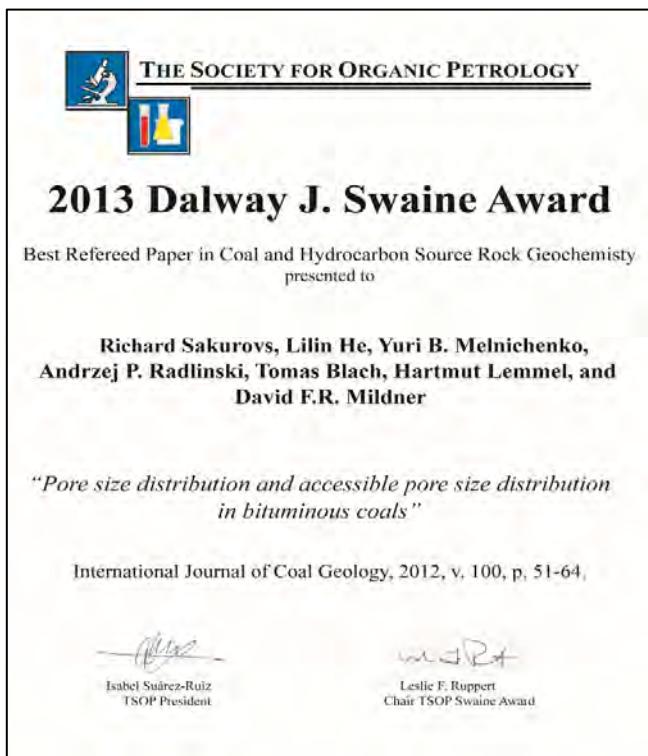
Further information is available from the meeting website at <http://wp.csiro.au/tsop2014> and the TSOP website at <http://www.tsop.org>, or from:

-
- +
- Kaydy Pinetown – kaydy.pinetown@csiro.au
 - Colin Ward – c.ward@unsw.edu.au



**Dalway J. Swaine Award
Best Paper in Inorganic or Organic
Geochemistry**

**Ralph J. Gray Award
Best Paper in Coal or Organic Petrology**



The Dalway J. Swaine Award is awarded yearly to the best refereed paper in inorganic or organic geochemistry and/or mineralogy of coal published in the previous calendar year.

Above is a small version of the award certificate presented to the 2013 winners of the Swaine award.

If you have a paper that was published in 2013 that you would like to submit for consideration, please email it to Maria Mastalerz at mmastale@indiana.edu before March 30th, 2014.

For more details, please refer to the TSOP website page on the Dalway J. Swaine Award:
www.tsop.org/swaineaward.htm

The Ralph J. Gray Award is awarded yearly to the best refereed paper in coal or organic petrology published in the previous calendar year.

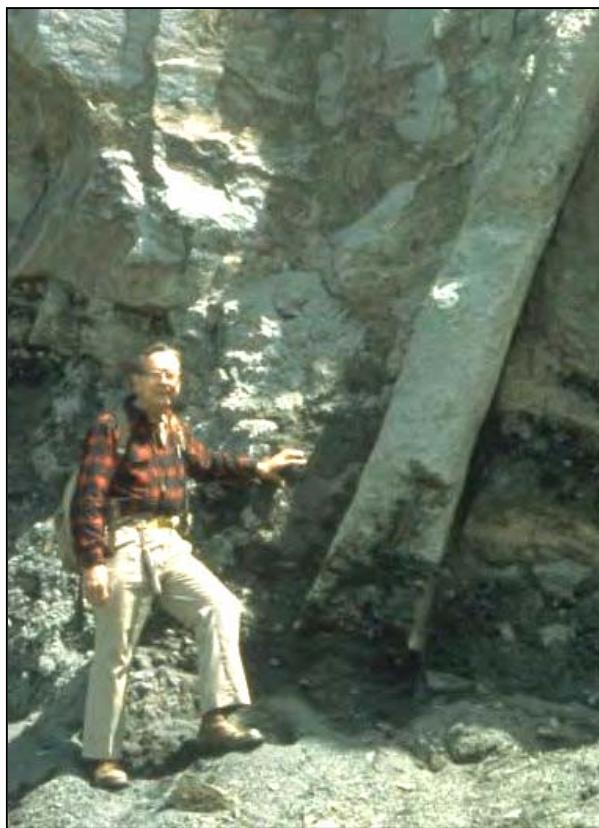
Above is a small version of the award certificate presented to the 2013 winners of the Gray award.

If you have a paper that was published in 2012 that you would like to submit for consideration, please email it to Ozgen Karacan at cok6@cdc.gov by March 30th, 2014.

For more details, please refer to the TSOP website page on the Ralph J. Gray Award:

www.tsop.org/grayaward.htm

In Memoriam
Aureal T. Cross
1916-2013



Aureal Cross as scale for a fossil tree trunk at the Joggins Fossil Cliffs, Nova Scotia, Canada, 1992.
Photo by John Calder, Nova Scotia Dept. of Natural Resources.

Professor Aureal T. Cross passed away in East Lansing, Michigan on December 1st, 2013. Prof. Cross was a widely known figure in the world of organic petrology and will be greatly missed. In 2005, he was awarded the John Castaño Honorary Membership Award for his significant contributions to teaching, coal geology, and paleobotany. The passages below are a compilation of material from material from T.L. Phillips 'Bibliography of Aureal T. Cross', Int. J. Coal Geology, 2007, Vol. 69, 1-2, p.1-20, a laudation originally published in the March 2008 TSOP Newsletter and material supplied by several TSOP members.

An Ohioan by birth, June 4, 1916, in Findlay, Hancock County, Aureal T. Cross grew up an Iowan on a dairy farm near Waterloo at Castle Hill. He was the second of five children of Congregational Minister Raymond W.

and Mrs. Myra Jane Coon Cross. On a history and music scholarship at Coe College in Cedar Rapids, Aureal was drawn to L. R. Wilson's physical geology course and the summer reconnaissance trips. Graduating from Coe College in 1939 with an honors thesis on pollen analysis, Aureal completed his Masters in 1941 and a PhD thesis in 1943 at the University of Cincinnati with J. H. Hoskins on Pennsylvanian age plants from coal-balls. During 1942–1946 he taught premedical U.S. Navy students at the University of Notre Dame with a 1943–1944 leave as a National Research Council Fellow. His assignment was to work with James M. Schopf at the U.S. Bureau of Mines Central Experiment Station, Pittsburgh, to find additional coking coals nearer existing steel mills for the WWII effort. Using an untried method of examining crushed raw coal samples microscopically under oil, they were able to determine coking coals in Colorado, Utah, Oregon and Washington before the war ended.

Aureal and Christina Aleen Teyssier met during 1943 in Pittsburgh and married in 1945. Aureal replaced K. E. Caster, his paleontology mentor, for three and one half years (1946–1949) in the Geology Department at Cincinnati, and did field mapping for the Ohio Geological Survey during the summers. From 1949 to 1957, Cross established productive graduate training and research programs in the West Virginia University Geology Department and the West Virginia Geologic and Economic Survey where he had dual appointments. His move (1957–1961) to Exploration Geology at Amoco's Pan American Petroleum Corporation Research Center in Tulsa, Oklahoma, permitted him to develop and supervise a major palynological research group. The return to academia (1961) at Michigan State University in East Lansing resulted in one of the most comprehensive graduate training programs in paleobotany, palynology, biostratigraphy and paleoecology in North America. Over his teaching career, he graduated a total of more than 70 students, many of whom have gone on to be major contributors in the field. These include Ralph Gray, himself a previous recipient of Honorary Membership from the Society.

Although Aureal Cross officially retired in 1986, he continued working on research projects, publication of manuscripts, attended professional meetings, and kept in touch with several generations of his students as well as with many colleagues. With his passing, the organic petrology community has lost one of the living links to individuals who built the foundations of modern paleobiology in the early 20th Century.

The Dr Aureal T. Cross Endowed Graduate Fellowship at Michigan State University will represent a lasting memorial to the legacy of Professor Cross. Further articles about Aureal T. Cross and his life can be found at the following links:

Michigan State University Memoriam to Aureal T. Cross:

<http://ns.msu.edu/index.php/2013/12/in-memoriam-aureal-t-cross/>

Canadian Association of Palynologists: Conversations with Aureal T. Cross:

<http://www.scirpus.ca/cap/people/person20.htm>

TSOP Member Awarded for Most Influential Papers for 2012

Two papers published by Dr Shifeng Dai in the International Journal of Coal Geology in 2012 have been awarded as "**The Most Influential 100 International Papers in 2012 in China**". The 100 papers were selected from the 190,100 internationally published papers in 2012 which had their first authors from China. The two papers were included in the special issue "Minerals and Trace Elements in Coal" of IJCG.

The two papers are:

Dai, SF; Ren, DY; Chou, CL; Finkelman, RB; Seredin, VV; Zhou, YP. Geochemistry of trace elements in Chinese coals: A review of abundances, genetic types, impacts on human health, and industrial utilization. International Journal of Coal Geology 2012, 94, 3-21

Dai, SF; Zou, JH; Jiang, YF; Ward, CR; Wang, XB; Li, T; Xue, WF; Liu, SD; Tian, HM; Sun, XH; Zhou, D. Mineralogical and geochemical compositions of the Pennsylvanian coal in the Adaohai Mine, Daqingshan Coalfield, Inner Mongolia, China: Modes of occurrence and origin of diaspore, gorceixite, and ammonian illite. International Journal of Coal Geology 2012, 94, 250-270

Congratulations to Dr Shifeng Dai for his awards!

Could the Next New Cancer Drug Come from Kentucky Coal Mines?

James Hower brings us news of collaboration between the University of Kentucky's Center for Pharmaceutical Research and Innovation (CPRI), the Kentucky Geological Society (KGS) and the Center for Applied Energy Research (CAER). The idea behind the program is to collect samples from unusual environments throughout the Commonwealth, with the goal of finding new, unique organisms that produce natural products that could potentially be used to develop new drugs with an initial focus on treatments for cancer, infectious disease and inflammation.

Many of our existing effective drugs are made by microbes. For example, erythromycin — an antibiotic used to treat a range of infections — is a natural product formed by bacteria found in soil. The anticancer agent doxorubicin is also another example of a microbial-produced natural product.

Through collaborations with CAER and KGS, the CPRI team has the opportunity to study products taken from Kentucky underground and surface coal mines, thermal vents from underground coal mine fires, mining reclamation sites and deep-well core drilling operations for carbon sequestration.

The initial collaboration with CAER involved studying emissions, and the corresponding microbes, associated with underground coal fires. The heat of the fires combines with the varying flora and mineral makeup of each site to create a distinctive environment for sampling.

"We decided that the coal fire sites were a very good starting point, because they are fairly unique," said Jim Hower, principal research scientist for Applied Petrology in Environmental and Coal Technologies at CAER. "They're really a prime target for sampling."

Through KGS' core drilling operation, the CPRI team has also accessed samples from deep underground — in fact, during drilling in the Eastern Kentucky Coal Field earlier this year, more than 40 samples of drill cuttings from depths ranging from 100 feet to nearly one mile underground were collected and sent to CPRI's lab.

Once samples are collected, the CPRI team places the material on media plates and begins the painstaking

process of purifying and growing each individual strain of bacteria. The team looks for organisms that are capable of producing novel molecules, and then isolates and characterizes the new compounds from these organisms. The compounds are housed in a repository and are made available to researchers across UK's campus to be entered into studies. As an example, Markey Cancer Center researcher Qing-Bai She recently discovered a class of molecules from the new repository that invoke a novel anticancer mechanism, setting the stage for further anticancer lead development studies.

To read more about this amazing cross-disciplinary project, follow these links:

<http://pharmacy.mc.uky.edu/thorson.php>

<http://youtu.be/VgIEjMviVA>

Coal deposits as promising sources of lithium

A.I. Khanchuk, V.V. Ivanov, M.G. Blokhin, N.V. Zarubina

Russian Academy of Sciences, Far Eastern Branch
Far East Geological Institute (FEGI FEB RAS)
Prospekt 100-letiya 159, 690022 Vladivostok,
Russia

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Lithium as a clean energy metal is of great significance. The strong demands for rechargeable Li batteries in power systems promote the changing prominent role of Li from industrial productions to renewable and sustainable energy storage (Scrosati and Garche, 2010). Furthermore, Li is a fuel for future power generation through thermonuclear reaction, which is safer and cleaner than nuclear fission. With the inevitable increase of Li consumption, Li global production has grown from 15,100 t in 2003 to 37,000 t in 2012 increasing by 145% during ten years (Jaskula, 2013).

Lithium is quite common in nature though it does not occur in elemental form due to its high reactivity and solubility. For instance, the total lithium concentration in the seawater is very large and is estimated as 230 billion tones (Wajima, 2006), where the element presents at a relatively constant level of 100 to 200 µg/L. It has been known since previous century that in the sea

environment Li can accumulate in sediments up to 50 µg/g (Turekian, Wedepohl, 1961). It was found that the average content of this element in sediments from some parts of Peter the Great bay (Sea of Japan) was about 20 µg/g (Blokhin, Kovekovdova, 2006; Blokhin, 2007).

There are two main Li sources to supply world industry: evaporative brines and spodumene-bearing pegmatites. Presently, brine deposits are the preferred source of lithium due to low production cost and large Li reserves. However, Li supply from brine deposits faces significant challenges in geology, market and technique respects. This suggests that other deposits including pegmatites will remain of interest and might even grow as sources of lithium (Kesler et al., 2012).

Nowadays some steps to search for new not traditional sources of valuable chemical elements are undertaken. So the first find of visible gold in ferromanganese crusts of the Pacific Ocean has been published (Mikhailik et al., 2013). It has become apparent that high carbon-content geological solids can be a perspective source of rare and noble metals. e.g. graphite-bearing rocks were demonstrated to be enriched by gold and PGE with possibility of their extraction (Khanchuk et al., 2010, 2011, 2013; Medkov et al., 2011; Zavodinsky et al., 2012).

A series of researches is dedicated to geochemistry and new approaches to precious metals and germanium recovery from brown coals (Bratskaya et al., 2009; Avramenko et al., 2012; Yakushevich et al., 2013). The correlation of recovery efficiency with the mechanism of metal-humic interactions was defined.

The initial average Li content of 15.6 µg/g for world coal was reported by U.S. National Committee for Geochemistry (Geochemistry, 1980). The latest and authentic average contents of Li (Coal Clarke values) should be 12 µg/g and 66 µg/g for world coal and world coal ash, respectively (Ketris and Yudovich, 2009). In recent years, anomalous enrichment of Li in coals was discovered in China (Sun et al., 2010 ; 2012a; Dai et al., 2010; 2012), although high Li concentrations (up to 0.1–0.3% Li or 0.22–0.65% Li₂O) in the host-rocks (not in coal) outside the coal seams were previously found in the Krylovsk and Verkhne-Bikinsk coal basins in the Russian Far East (Seredin et al., 2013; Seredin and Tomson, 2008). The average Li contents are 172 µg/g in coals from the Antaibo mine has been reported (Sun et al., 2010). The higher average Li concentration in Guanbanwusu mine was also reported by (Sun et al., 2012a): 264 µg/g in coal and 1320 µg/g (0.28% Li₂O) in coal ash.

Sun et al. (2012a; 2012b; 2013a; 2013b; 2013c) have proved firstly on the world that Li has enriched as a

coal-associated Li deposits and have great potential economic significance in the Jungar coalfield and Pingshuo district, China, according to the data of 1100 coal samples from both coalfields. It is a very interesting and important discovery. It is a new type of Li deposit. Coal has been recently proposed as a promising Li source, especially in those countries where Li-bearing brines and pegmatites are limited (Seredin et al., 2013).

Sun et al. (2012a) suggested firstly that Li in the Guanbanwusu mine can be seen as a deposit and reserves of Li in this mine are estimated to be 52,045 t of Li₂O. Sun et al. (2013a) have reported that the Li contents have reached the industrial grade of the coal associated Li deposit, and the total Li reserves have reached 2406600 tons, that is, 5157000 tons Li₂O in the No. 6 seam in the Jungar Coalfield. In addition to the Jungar Coalfield, the average Li content of 121, 156 and 295 µg/g was determined in the Coal Seams 4, 9 and 11, Pingshuo district, respectively (Sun et al., 2013b, 2013c), and the total Li reserves reached 100000, 558400 and 382600 tons, respectively. The highest concentration of Li₂O was reported to be 0.83% in the coal ash. The above values of anomalous enriched Li concentrations are close to or higher than the industrial grade of 0.2% Li₂O for the Li-bearing pegmatite deposits of China (DZ/T0203-2002, 2003). There is no industrial grade for Li in coal seams because associated Li ore deposit in coal has not been identified so far. Sun et al. (2012a) have proposed 120 µg/g as mining grade (industrial grade) for Chinese coals.

These findings are all discovered in Carboniferous-Permian coals, while Li enrichment in coals of other geological periods has not yet been reported. Lithium generally has an affinity to inorganic fraction in coals; however, some of them are also related to organic matter (Sun et al., 2013a).

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Call for Participation in the ICCP Accreditation Programs 2014-2015 Exercise

The International Committee for Coal and Organic Petrology (ICCP) is pleased to invite you to participate in the next Accreditation round. 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 (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: Angeles G. Borrego (angeles@incar.csic.es)

- **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 (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 participants fill in the **registration form** available in the following link

www.iccop.org/accreditation/accreditation-form

before the **end of April 2014** in order to 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.

CALENDAR OF EVENTS

www.tsop.org/cal.htm



2014

April:

April 6-9: AAPG Annual Convention, Houston, TX, USA. www.aapg.org

April 24-25: Ashes and Slags from TPPs – removal, transport, processing, landfilling, Moscow, Russia.

www.ecopower.ru/index.php?newsid=123

June:

June 8-13: 2014 Goldschmidt Geochemistry Conference. Sacramento, California, USA. <http://goldschmidt.info/2014/index>

August:

August 26-31: 9th European Palaeobotany Palynology Conference. Padova, Italy. www.palynology.org/upcoming-aasp-meetings

September:

September 20-26: 66th ICCP Annual Meeting, Kolkata, India.

www.iccop.org

September 27th- October 3rd: 31st Annual TSOP Meeting. Sydney, Australia.

<http://wp.csiro.au/tsop2014>

October:

October 19-22: Geological Society of America Annual Meeting. Vancouver, British Columbia, Canada. Abstract Deadline: July 29th, 2014.

www.geosociety.org/meetings/2014

For more geology event information, see:
<http://calendar.agiweb.org/index.html>





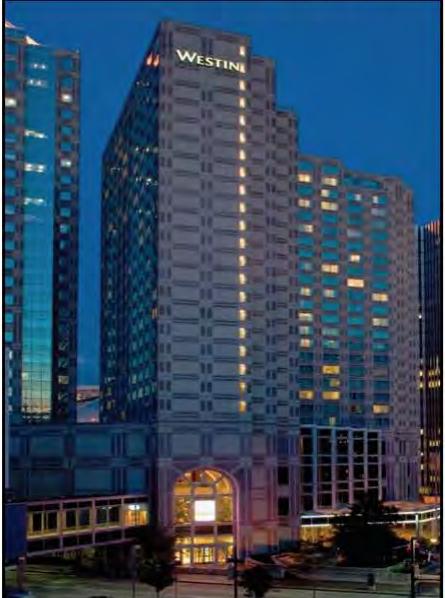
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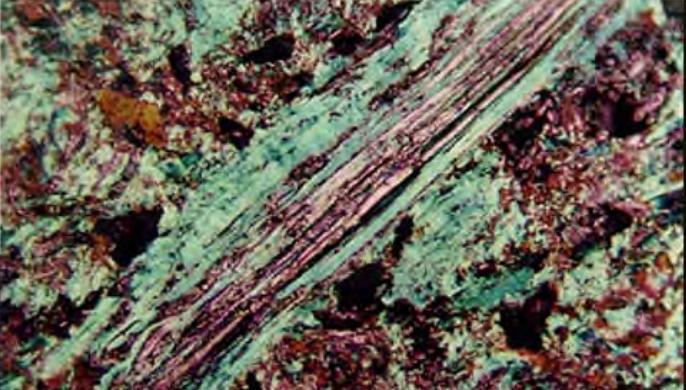
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CRELLING'S PETROGRAPHIC ATLAS OF COALS AND CARBONS COLLEGE OF SCIENCE »

NAVIGATION »
COAL MACERALS »
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PETROLEUM COKES »
QUINOLINE INSOLUBLES »
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ACKNOWLEDGMENTS »



WELCOME

The main purpose of "*Crelling's Petrographic Atlas of Coals and Carbons*" is to show what coals, cokes, chars, carbons, graphites, and other natural and man-made carbonaceous materials look like under the optical microscope with the intent of characterizing these materials for both scientific and industrial applications.

Most of the photomicrographs were taken through an optical microscope at high magnification (200x to 500x) using oil immersion objectives. All were taken in reflected white light with and without the use of a polarizer, an analyzer, and a retarder plate. In some cases, the photomicrographs were taken in fluorescent light using ultra-violet illumination.

The photomicrographs were selected to show the most common structures and textures as well as inclusions of various kinds. At this time seven "chapters" are available. However, additional chapters including vitrinite macerals, liptinite macerals, inertinite macerals, anthracites, thin sections, and dispersed organics are now being planned and prepared.

If you have any specific interests for an additional chapter please contact either Dr. Sue Rimmer (srimmer@siu.edu) or Dr. Jack Crelling (jcrelling@geo.siu.edu).

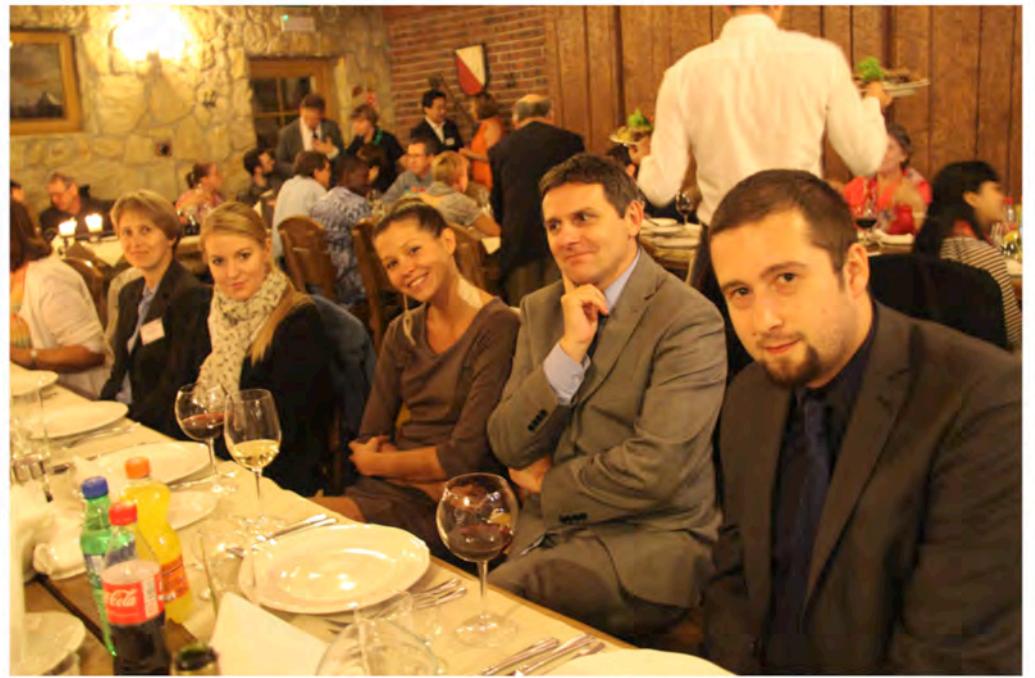
Come and visit the relaunch of **Crelling's Petrographic Atlas of Coals and Carbons** website at www.coalandcarbonatlas.siu.edu/

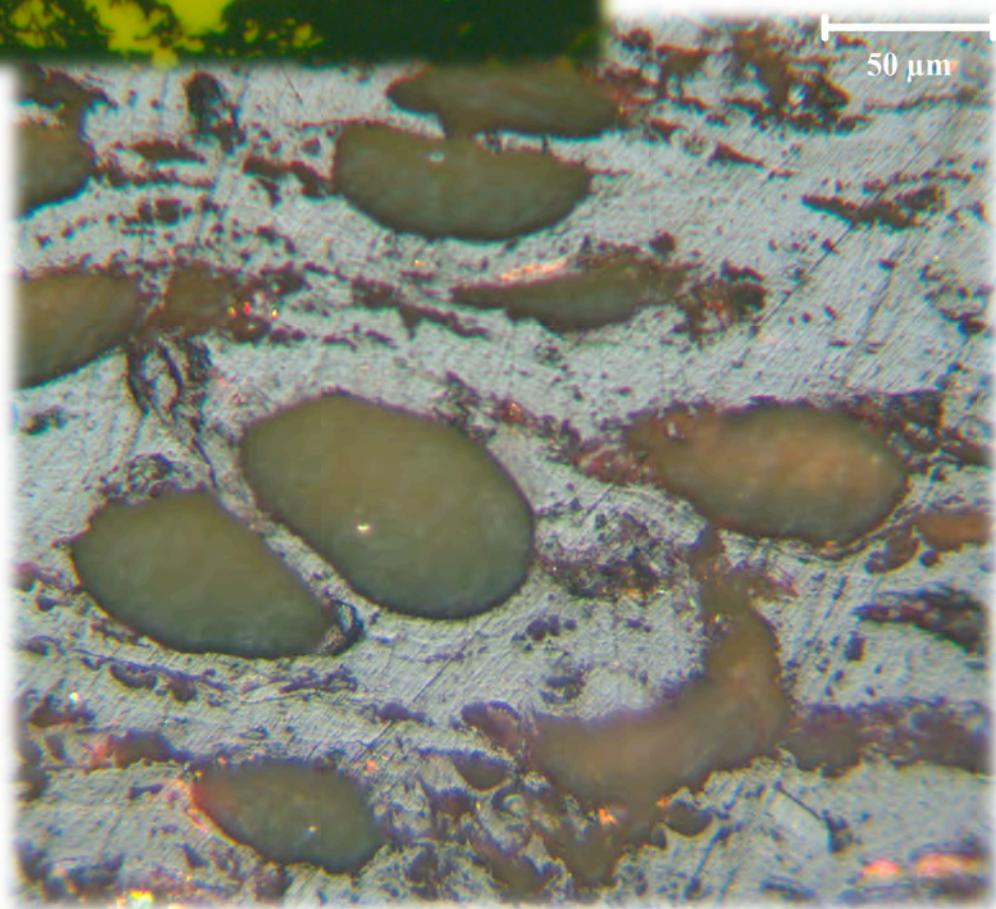
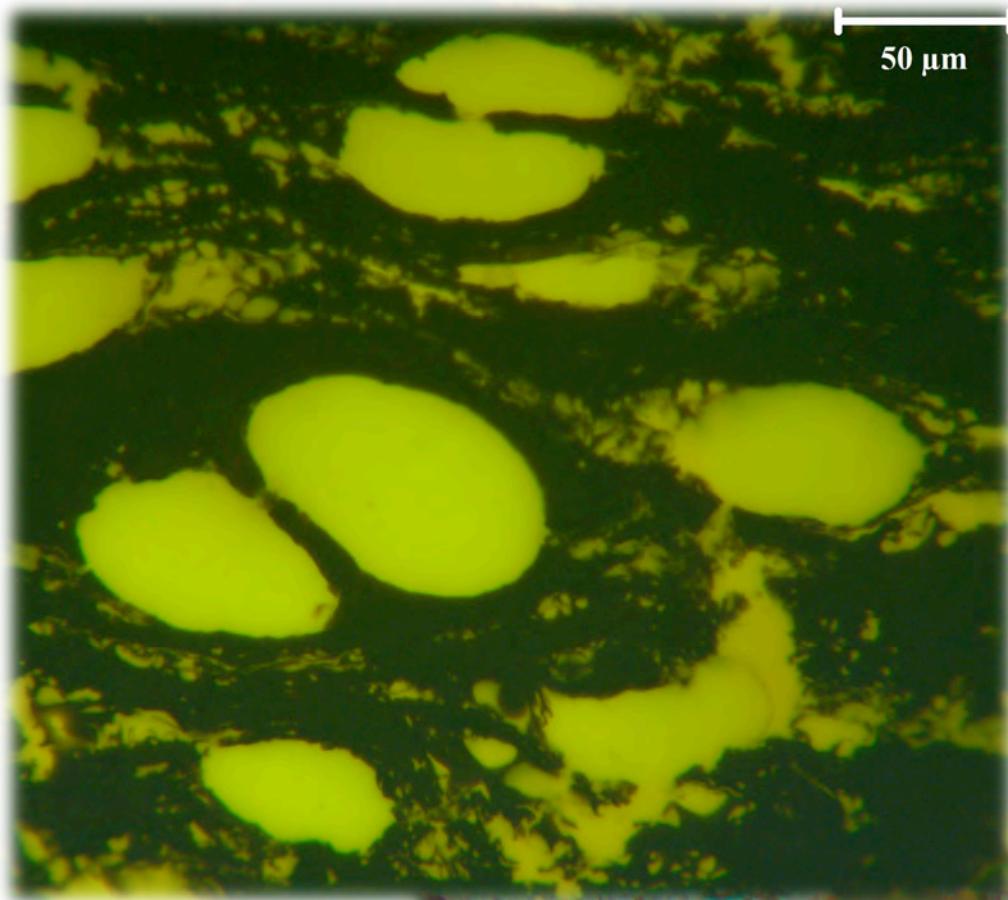
The site underwent a major redesign in 2013 and is a great reference library of photomicrographs of coals, cokes, chars, carbons, graphites and other naturally occurring and man-made carbonaceous materials.



TSOP Members waiting to go on the Wieliczka Salt Mine tour as part of the field trip for the 2013 TSOP meeting in Sosnowiec, Poland. Photo courtesy of Shifeng Dai.

TSOP Members enjoying the banquet at the Sosnowiec, Poland meeting, 2013. Photo courtesy of Shifeng Dai.





Fluorescent and plain light photomicrographs of resinite in low rank coal. Photo from the Vanderbilt University coal collection, provided courtesy of James Hower.