

Editorial

The past 12 months have seen two major events, Brexit and the election of President Trump, that have shaken the world and the consequences for the scientific community at large are not thought to be particularly favourable. However, I have no doubt that when we have recovered from the shock, some way of pursuing research into the areas of current interest especially in the UK and the US, not least those relevant to carbon, will pick up again.

In the meantime, your committee has been hard at work and we have a number of meetings, for which we shall be asking your support in attending. In the immediate future, we have the new format organised by the RSC Faraday Division where all the associated member groups, of whom we are of course one, will be taking part in a 3-day meeting at Warwick University in April. The BCG is organising possibly two sessions, on diamond research and on nanocarbons over the course of the meeting. We shall also be holding our AGM, a notice of which is included here together with minutes of the previous AGM, during this meeting, on April 11th at 6.30. Later in the year, over the UK August bank holiday, NanoteC17 will take place, this year at Nantes. Further details are given in this newsletter. There also a couple of other conferences not organised by us, including of course Carbon 2017, which will be of interest.

The really major news is that the British Carbon Group will be hosting Carbon 2021 in London. This may seem a fair time off yet but conferences of this size need a lot of planning. Suitable accommodation and lecture facilities have to be booked well in advance. I am sure that members of the BCG will support this by taking part and in particular, we shall be looking for more active participation in the way of helping with organisation and running of the conference, which will certainly attract several hundred delegates.

Prof. Emeritus Harry Marsh has been a major figure in carbon research for very many years. Many of you will remember the invited lecture he gave to Carbon 2016 at Aberdeen on 50 years of carbon research. He has sent me a memoir of his personal life that is included in this newsletter and that fills out some the details he gave in his previous talk. It's always good to have a record like this that does put an historical perspective on much of the corpus of carbon knowledge that we can perhaps take for granted. By coincidence, I notice that this is also the 50th edition of our newsletter. Unfortunately, I do not have a complete set and if anyone does have some of the earliest copies, it would be good to make up this deficiency. In the meantime, we owe our thanks to the efforts of previous editors and contributors for this achievement. May I conclude by my usual request for material to publish in future editions, whether it be related to carbon science or even the history or personal recollections of pioneers in this field such as those of Harry's.

As we go to press, we hear of the sad news of the death of Prof. Mildred Dresselhaus of MIT. She was a major figure in the world of carbon research and was an Ubbelohde lecturer of the BCG: a full assessment of her work and tributes to her will appear in the next issue of this newsletter.

The British Carbon Group

Notice of 2017 Annual General Meeting

Notice is hereby given that the 2017 Annual General Meeting of the British Carbon Group will be held on Tuesday, April 11th, 2017 during the Novel Carbon Session of the Faraday Division, Joint Interest Group Meeting (April 11th – April 13th, 2017) at the University of Warwick, Gibbet Hill, Coventry, CV4 7AL, from 16:30 to 16:50.

The business of the Meeting is as follows: -

1. Apologies for Absence
2. Minutes of the previous AGM (Held at the Grand Harbour Hotel, Southampton, May 9th, 2016) and published in this Newsletter.
3. Chairman's Report
4. Treasurer's Report
5. To Receive Notice of the Representatives of the Sponsoring Bodies
6. Election of Officers and committee members.
7. Any Other Business

At the 2016 AGM the Chairman, Vice-Chairman, Treasurer and Secretary must stand down and are not eligible for re-election. Nominations for these positions are invited. In addition three positions of ordinary Committee members fall vacant this year and nominations for these are also invited.

Nominations duly proposed and seconded and with the consent of the nominee, should be received by the Honorary Secretary before April 4th, 2017 at the following address:

Dr P. C. Minshall
Oldbury Technical Centre,
Oldbury Naite,
South Gloucestershire
BS35 1RQ

Or by email at peter.c.minshall@magnoxsites.com

THE BRITISH CARBON GROUP

Minutes of the 2016 AGM held at the Grand Harbour Hotel, Southampton, 9th May, 2016.

Present

Malcolm Heggie (Chairman), Norman Parkyns (Vice-Chairman), Tony Wickham (Hon. Treasurer), Peter Minshall (Hon Secretary), committee members Izabela Jurewicz and Nassia Tzelepi, and 7 BCG Members.

Apologies for Absence

Peter Branton, Chris Ewels, Geoff Fowler, Julie MacPherson and Sergey Mikhalovsky.

Minutes of the Last AGM

The minutes of the previous AGM, held on April 16th, 2015 at the British American Tobacco Group Research and Development, Southampton and previously published on the British Carbon Group's web page were accepted as a true record. [Proposed: Norman Parkyns, seconded: Tony Wickham, accepted *nem con.*]

Matters Arising

There were no matters arising.

Chairman's Report

Good evening and welcome to the Annual General Meeting of the British Carbon Group. The British Carbon Group exists to encourage, support and publicise carbon science in its many forms: from nuclear graphite to coal, activated carbons to diamond, nanomaterials to novel electrochemistry, and so on. The Group is affiliated to three societies, The Royal Society of Chemistry, the Institute of Physics and the Society for Chemical Industry. Most of our members are drawn from these bodies, but we also have a few subscribing members who are not affiliated to one of these societies.

The Group organised a number of meetings in 2015, the first of which was '*The Many Faces of Carbon*' held here in Southampton in April. This interesting and distinctive meeting of some 30 delegates listened to seven speakers on a wide range of carbon topics. This was followed in September by NanoteC15, our annual, international conference on Nanotechnology in Carbon and Related Materials. Prof. Nicole Grobert organised the meeting in the Oxford's Corpus Christi College, of which she is a fellow, and the 50 or so delegates enjoyed the relaxed friendly atmosphere, the historical college setting and first class science.

Simultaneously with NanoteC was the sixteenth International Nuclear Graphite Specialists Meeting (INGMS-16), organised by our Hon. Treasurer, Prof. Tony Wickham at the National Leadership

College, Nottingham. A stimulating four day meeting of science and engineering lectures as attended by 90 delegates and opened by a fascinating, personal, historical view over radiation damage in graphite from Prof. Peter Thrower, in the 2015 *Ubbelohde lecture*. These are annual lecture series from distinguished contributors to carbon science are in honour of the late Prof. A. Ubbelohde who was a key figure in UK Carbon Science.

The year was rounded off by *Carbon@Christmas* held at the headquarters of the SCI in London and which included lectures on diamond, activated carbons and graphene. During this meeting the *Carbon in Industry Award* was made to Prof. Steve Tennison of MAST Carbon on behalf of the SCI. Although there was an excellent science programme, the number of registrants was disappointing at only 24.

It is always a pleasure to give awards in recognition of excellence in carbon research. The British Carbon Group administers two such awards, the *Brian Kelly Award* and the *Roger Taylor Memorial Award*. At Carbon 2015 I was pleased to present the *Brian Kelly Award* to Dr. Graham Rance of Nottingham University for his paper on *Palladium Nanoparticles in Catalytic Carbon Reactors*. The *Roger Taylor Memorial Award* was made at the biennial ACNS meeting in St Petersburg, where the organisers presented it to Dr. Mandana Amiri from Iran for her paper, *Functionalisation of Carbon Nanoparticles*.

It was with considerable sadness that we heard of the recent death of Professor Sir Harry Kroto FRS, Nobel Laureate. The global carbon community will feel this loss keenly and there will be many occasions in the coming year to celebrate his life and achievements. In particular, there are plans for a Kroto Medal, and BCG will certainly contribute to this award in memory of the life and career of our most distinguished member.

Looking forward, the BCG is bidding to hold the International Carbon in 2021 in London, and we are anticipating a great meeting here at Southampton, organised by Tony Wickham. Later in the year there will be equally stimulating meetings: NanoteC16 in Dublin, organised by Dr. Izabela Jurewicz with others, and INGSM-17 in Vienna, organised by Prof. Tony Wickham.

Finally, it only remains for me to thank the officers and committee of the British Carbon Group for their support and help in the past year, especially those who have organised meetings. I would particularly like to thank Peter Branton, who has had to step down from the committee because of changes within his organisation. Peter has worked tirelessly for the BCG, organising and hosting the Spring meetings for several years.

I should note that there are vacant places on our committee and if anyone here is interested to join the committee, please come and see any of us afterwards, or contact us through the learned societies.

Thank you for attending and I hope you enjoy the rest of the meeting.

Treasurer's Report

The accounts for 2015, in the RSC format, were presented by Tony Wickham.

Total income was £81,012.15 and total expenditure was £92,937.64. The balance on 1st January, 2015 was £50,047.08 and on 31st December, 2015, £38,121.59. There was thus a deficit of £11,925.49 for the year. In response to a question from the floor, the Treasurer confirmed that the deficit arose from the need to make substantial payments in advance for this meeting in Southampton and will have been removed by incoming funds in 2016. The turnover of the Group is such that we continue to be registered for VAT. The Treasurer considers that the current financial position of the Group is very healthy with the prospect of maintaining a small surplus for 2016, to be spent on awards and bursaries.

The meeting accepted the accounts as presented [Proposed: Norman Parkyns, seconded, Peter Minshall] and thanked Tony Wickham for his excellent work with these complex accounts.

To Receive Notice of the Representatives of the Sponsoring Bodies

The following will be notified to the sponsoring bodies as representative for 2016:

RSC Norman Parkyns

IOP Peter Minshall

SCI Geoff Fowler

Election of Officers and Committee Members

As no nominations for Chairman, Vice-Chairman, Treasurer or Secretary had been received, the meeting agreed to suspend standing orders and appoint Malcolm Heggie, Norman Parkyns, Tony Wickham and Peter Minshall for further terms of office as Chairman, Vice-Chairman, Treasurer and Secretary, respectively.

Izabela Jurewicz and Sergey Mikhalovsky were proposed by Norman Parkyns and seconded by Nassia Tzelepi as members of the committee.

As the number of nominations was less than the number of vacancies, they were elected unopposed to the committee.

Any Other Business

There being no other business, the meeting closed at 7.20pm.

Forthcoming conferences

RSC Faraday meeting, Warwick University, April 11th-13th 2017

The RSC Faraday Division, unlike the Physical Chemistry Division of the American Chemical Society has never held a scientific meeting at which all the component Groups have taken part. The current President of the Division, Prof Eleanor Campbell FRS has instigated a pioneering 3-day meeting with the aim of drawing the constituent parts together. The British Carbon Group committee is supporting the meeting and we have two sessions, one on diamond research and the other on nanocarbons. We have two major speakers booked for the sessions, science of diamond by Prof Joerg Wrachtrup (our session II on Wed morning) from MPI Stuttgart and Dr Thurid Gspann (Cambridge, Engineering) on carbon nanotubes in our session I Tuesday afternoon on nanocarbons.

Plenaries which include Fraser Stoddart, Nobel prize winner for molecular machines are part of the meeting. Details of registration and accommodation are available on the RCS website <http://www2.warwick.ac.uk/fac/sci/chemistry/news/events/faraday2017/>

NanoteC 2017, Institute of Materials, Nantes, August 30th-September 2nd, 2017



The banner features a red background. On the left is a 3D molecular model of a carbon nanosphere. The main text reads: **NanoteC17** Carbon Nanoscience and Nanotechnology, 30 August - 2 September 2017, Nantes, France. Logos for IMN and The British Carbon Group are on the right.

www.nanotec-conference.net

NanoteC is one of the longest running series of international nanoscale carbon conferences in Europe (since 1998). It brings together scientists working with nanoscale carbon materials: nanotubes, graphene, diamond- and fullerene-related nanostructures. While each of these materials attracts its own



dedicated community of researchers, NanoteC draws on common themes and allows researchers to share insight into this unique element at the nanoscale.

Elemental carbon shows remarkable variety in properties via simple covalent bonding, however other systems (for example containing nitrogen or metals) are becoming important and provide alternative components with unique mechanical and electronic properties. Nanotechnology requires an understanding of these materials on an atomic level and this will be the central theme.

This year NanoteC will be in Nantes, on the west coast of France. The weekend the conference finishes, there is a huge free jazz festival with stages across Nantes (from classic to modern) – the perfect opportunity to chill-out after intense and interesting scientific discussions!

Invited speakers

Doctor Ewen Campbell

University of Basel, Switzerland

'Ion Trapping and Fullerenes in Space'

Professor Stephen Irlle

Oak Ridge National Labs, Tennessee

"First principles approach to chemical modification in nanocarbons"

Professor Gun-Do Lee

Department of Materials Science and Engineering, Seoul National University

"Defect modelling and transformation in graphene"

Professor Takashi Uchida

Bio-Nano Electronics Research Centre, Toyo University, Kawagoe, Japan

'Metallic Endofullerenes'

More speakers will be added, please watch this space!

Conference Topics

Conference topics include, but are not limited to:

- Synthesis and characterisation of carbon nanomaterials
 - New chemical routes to novel nanocarbons (cycloparaphenylenes, nanocones, nanoscrolls, ...)
 - Fullerene science and technology, carbon astrochemistry
 - Graphene and carbon nanotubes
 - Nanomanipulation of nanocarbons
 - sp^3 nanocarbons (nanodiamonds, ...)
 - Optical and electronic properties of carbon nanomaterials
 - New nanocarbon based devices (sensors, detectors, PV, fuel cells, electrodes, supercapacitors, ...)
 - Nanocarbon hybrid materials (nanotube filling, ...)
 - Computational modelling and simulation of nanocarbons
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- Graphene Oxide and related 2D materials
 - Industrial materials engineering, production scale-up, purification, treatment and recycling
 - Toxicology, bio-compatibility and bio-composites
-

7th International Conference on Carbon NanoParticle-Based Composites

June 26 – 28th, 2017, Dresden

Scope and History

CNPComp2017 will gather the international scientific community working in the field of composites filled with carbon nanoparticles (CNPs), including nanotubes, graphene or related materials, and other nanocarbons. It builds on a series of successful conferences on carbon based nanocomposites that originated from the European research network CNT-NET. This year, CNPComp2017 is organized in conjunction with and as a special symposium within the Europe Africa Conference 2017 of the Polymer Processing Society (PPS). Participants may attend other PPS symposia, especially on June 29, and benefit from an excellent platform for scientific exchange.

Topics

- Preparation (synthesis, processing, or assembly) of CNPs and CNP constructs for applications in composites
 - Surface treatment, functionalization of CNP materials and characterization of the resulting surface/interphase behaviour
 - Characterization of intrinsic CNP structure and properties relevant to composites
 - Preparation and processing of CNPs composites, by blending, infiltration, or other methods, including subsequent conversion by moulding, stacking, or welding
 - Additive manufacturing using CNP components
 - Hybrid systems, combining different types of CNPs or other nanofillers
 - Hierarchical nanostructured composites, developing architectures at multiple length scales, particularly in conjunction with conventional structural fibre reinforcements
 - Characterization of CNP dispersion, distribution, orientation, within the matrix, and the associated influence on the matrix microstructure and properties
 - Evaluation of CNP composite properties: mechanical, electrical, thermal, and optical characteristics, and emerging multifunctional performance
 - Modelling of CNPs and their composites, both processing and performance
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- Specific applications and opportunities for CNP-containing composites

The meeting has traditionally focused on polymer matrices, but contributions on metallic or ceramic matrices are welcome.

Submission of abstracts

Abstracts for CNPComp2017 can be submitted through the website <http://www.pps2017dresden.de>.

Please be sure to assign your contribution to the special symposium Nanocarbon Based Composites - CNPComp.

The abstract submission is open until February 28, 2017. Please submit your abstracts for contributed talks and posters at the registration portal at <http://www.ppsconferences.org/r3/login.asp>.

If you have questions regarding scientific affairs of CNPComp, please contact Petra Pötschke (poe@ipfdd.de). For the technical organization, please contact Kerstin Wustrack (wustrack@ipfdd.de) or Juliane Bendzko (bendzko@ipfdd.de).

Chairpersons

Petra Pötschke (IPF Dresden, Dresden)

Milo Shaffer (Imperial College, London)





Reports on meetings and conferences,

Kroto Memorial Meeting, and 9th Ubbelohde memorial lecture, University of Sussex, 26th August 2016

In April 2016, Sir Harry Kroto NL sadly passed away. To commemorate his enormous personal and scientific impact and achievements, a meeting was held at Sussex University on the 26th August 2016. The morning started with a British Carbon Group meeting discussing carbon nanoscience, which featured fascinating lectures by a number of major international carbon nanoscientists; Eleanor Campbell, John Maier, Moribu Endo, Mauricio Terrones, Nori Shinohara, Paul Dunk and Steve Acquah. The lectures reflected the vast range of interests that Harry shared in Carbon science

The meeting began with the 9th Ubbelohde memorial lecture, which was given by Prof. Eleanor Campbell FRS.

The title of the lecture was “From free-flying Fullerene to Carbon Aerogels” and she started by recalling that she was doing work of laser ablation of polyimides using mass spectrometry with nanosecond resolution, when they accidentally found C_{60} plus other clusters of carbon atoms of much higher molecular weight. This was just after the original discovery by Kroto and his colleagues. She later collaborated with Prof Krättschmer to investigate the matter further. C_2 fragments got ingested into the fullerene structure. Later collision experiments between He and C_{60} showed that there were two mechanisms for He capture to form an endohedral fullerene. At low energies, the He atoms could just slip into the cage structure whereas at high energies, the cage was broken open but then re-formed. They developed a method for up-scaled collisional formation of the endohedral $Li@C_{60}$ and also showed that it was possible to insert two or even three Li ions. Experiments between C_{60}^+ and neutral C_{60} enabled metastable, fused higher fullerenes to be made at collision energies > 100 eV.

Her current work uses femtosecond-resolution photo-electron spectroscopy (PES) to probe the properties of very diffuse Rydberg-like excited electronic states of fullerenes, known as Super-Atom Molecular Orbitals (SAMO).

She is also interested in the current industrial problem of CO_2 removal from stack gases from gas-fired power stations. Mesoporous active carbons with adsorbed amines had been shown to be quite effective for this purpose. This reference to the carbon aerogels of her title brought a most fascinating account to a close.

Norman Parkyns

Report on Annual World Conference on Carbon - CARBON 2016

The CARBON Conference took place this year in State College (USA) at the Penn State University from 11th till 15th July 2016. On Sunday (10 July), before the International Conference for researchers who sought guidance regarding the virtues and liabilities of the various sp^2 hybridized carbon materials, the workshop on “CARBON MATERIALS ACROSS DIMENSIONS” was organized by Prof. Mauricio Terrones and Prof. Ljubisa Radovic. Both, were at the same time the main Organizers of the Carbon Conference. Here, I would like to mention inspiring lecture delivered by Prof. Mildred S. Dresselhaus, who gave us general overview of carbons materials: 1D, 2D and 3D.

As a PhD Candidate, I was given the chance to have a poster presentation entitled: “Formation of filamentous and folded carbon from renewable resources” in the panel of S7: Fullerenes, Nanotubes, and Other Curved Nanostructures. We (me and my Supervisor, Prof. Marek Lieder) presented work on the carbon structure origination received from sustainable and renewable carbon precursors. In the above mentioned study, we have shown efficient synthetic procedure for the filamentous/folded N-doped carbon nanostructures production and their complex characterization. 1D and 2D carbonaceous materials are growing in importance because of their use for different applications as well as energy conversion and storage, sorbents, catalysis (used either as a catalyst or as a catalyst support on its own). Among different carbon precursors, biomass can serve as a renewable source for their production. In my recent research I am focusing mainly on chitosan which enables in-situ doping of Nitrogen into Carbon framework. The microporous structure is easily manufactured

using salt mixture and chitin-derived substance. It leads to amorphous and partially graphitized carbon with the formation of nanoarches. During the past years, folded nanostructures with both homogeneous (nanorings, nanoribbons) and variable (nanospirals) radii of curvature have been intensively investigated. It has led to a vast new research area in search of inexpensive materials for different applications. However, the generation of flattened carbon nanostructure still need further studies and discussion. Carbon Conferences provide a platform for the discussion in carbon related research area.

The motto of the conference was: “Common fundamentals, remarkably versatile applications”, I can state that the topic fulfilled all aspects of CARBON on its own. Outstanding scientific and technological contributions in the field of carbon materials and related materials were also honoured. The Conference Dinner was organized which took place in the Beaver Stadium in American style. There were also many scientific networking opportunities.

Summarising, a participation in a world-known conference is a credible opportunity for scientific development. For early-stage researchers the network’s training is always valuable in their further career. Therefore, I greatly appreciate financial support from the British Carbon Group.

I am looking forward for the next conference which will take place in Melbourne.

Maria Rybarczyk

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Carbon 2016: the World Conference on Carbon

The Carbon Conference this year took place in Pennsylvania, USA from 10th July till 15th July 2015. It was great opportunity for me to attend this conference with a travel bursary from The British Carbon Group. On the conference I was offered the chance to present the results obtained during my first PhD year with a poster entitled “Conductivity versus active sites in metal-free oxygen reduction reaction electrocatalysis”.

My research, focusing on nanocomposites of graphene and biomass-derived hydrothermal carbon materials, is based on the synthesis and characterization of carbon-carbon nanocomposites as electrocatalysts in an oxygen reduction reaction (ORR). The ORR plays a critical role in fuel cell and many other energy storage and conversion system. Although metallic platinum (Pt) and Pt-based alloys are currently recognized as the most popular and efficient electrocatalysts for ORR, the high cost, limited resources and low stability have severely hindered the large-scale applications of Pt in this field. Therefore, the development of Pt-free electrocatalysts for ORR with improved catalytic activity and durability is highly desirable. Carbon materials has long been an

ideal electrode material for energy conversion/storage system due to their unique physical and chemical properties. Biomass, such as glucose, chitosan, etc. as the precursor of biomass-derived carbon material, is highly accessible and have sufficient amount in storage on earth. They are therefore ideal alternatives for electrocatalysts in energy conversion systems. However, as they usually present very limited surface area and pore volumes, as well as electric conductivity, their application in energy storage/conversion system is severely inhibited. Meanwhile, graphene, as the basic building block of other important carbon allotropes, is expected to exhibit a combination of fascinating properties, such as outstanding thermal and electrical conductivity. Graphene-incorporated HTC hybrids are thereby synthesized using abundant and renewable biomass material.

The five days' conference was impressive with five plenary lectures (given by Andrea Ferrari, Jeff Dahn, Konstantin Novoselov, Michael Strano and Dongyuan Zhao) and over 300 oral presentations, focusing on the remarkably versatile applications of carbon materials. On Wed 13th July a "Carbon Medalists Roundtable" was moderated by the former and current Editors-in-Chief of the Carbon Journal, for a discussion of the future of carbon materials. The oral presentations were classified into ten different sub-seminars. The new and exciting results presented motivated me to keep working in this interesting field, while the new concept and prospective view proposed by those senior researchers offered more comprehensive understanding into this field. The poster session was carried on every day after oral presentation, offered precious opportunities to early-stage researchers to present their research and set-up network. I deeply appreciate the British Carbon Group for supporting my participation in this Carbon Conference by offering the travel bursary, and this conference for offering me such a good chance to meet, talk and share ideas with the world-wide researchers working in this field, which is always important for early-stage researchers for both their current research and future career development. The picnic at PSU Arboretum on Tue 12th July and the banquet on Thu 14th July also offered opportunity for participants to interact with each other under a relative relax condition.

The participation in this world conference on carbon is a very impressive experience for my scientific career development.

Mo Qiao

Queen Mary, University of London

Another Perspective on Carbon 2016, and a Look Ahead to Carbon 2021

As members who are as long in the tooth as I am may recall, I have had a hand in the organisation of a couple of 'World Carbon Conferences', most memorably Newcastle on Tyne in 1996 and Aberdeen (Robert Gordon

University) in 2006. UK conferences used to come around quite regularly – now the standard interval is currently set at 15 years, which takes us to 2021. More on that in a moment.

First, some thoughts on Carbon 2016, to which I travelled by car from my cousin's home near Philadelphia. A pleasant drive of about three hours, and I thought that the car might be useful if I and any colleagues needed to 'escape' for a while. I didn't.

In general, the Penn State folks and their carbonaceous colleagues from other parts of the USA did very well. Especially, and unexpectedly, in the provision of alcoholic refreshment, even for every poster session (although the accompanying nibbles were a bit meagre). There were some oddities – they didn't publish paper timings or room numbers in the abstracts book, which was still a huge and heavy tome to carry around – we were all supposed to connect up to a special app in order to figure out which room to go to, and when. They had assumed that most delegates would stay in 'streams' in the sub-seminars but, of course, few did, and there were crowds of people both staring wildly at their phones or thumbing madly through the book trying to figure out if they would be in time for a paper in a different seminar, and wondering where it might be (the room allocations changed daily). I had a keynote talk on the first morning, and it was the opposite of the 'Farewell Symphony', with delegates arriving constantly through my 30 minutes. Still, better than a previous similar keynote situation in Beijing (2002), when the Chinese chairman insisted I start my talk to an empty room ("to keep to time") when the Plenary was busily over-running its slot in the main hall!

Another peculiarity was they had not ensured that every poster had a delegate registered to deliver it. There were swathes of gaps in the poster boards, and a number of abstracts which had interested me were unaccompanied by any poster or presenter. Conversely, there was a very interesting poster from Graftech colleagues which was not in the abstract book. At least, I haven't found it yet. Maybe it was all a dream – but we had a seriously interesting discussion about the work. Whatever it was. Heigh Ho...

As something of a professional when it comes to conference organisation, these things bother me. I was not the only delegate irritated by these oversights, and they are easily avoided. In both Newcastle and Aberdeen we printed the timetable in the abstract book in four parallel columns, so you could see *exactly* what was going on, and when. Which brings me back to 2021. Or forward, if we want to be pedantic!

Following initial investigations by Geoff Fowler, and a presentation from me to the European Carbon Association committee while at Penn State, we shall be hosting the event in London in 2021 at my old seat of learning, Imperial College. They have a huge 'Great Hall', adjacent breakout theatres sufficient for four parallel sessions (and maybe five, which seems to be the current 'norm' and we'll do it if we have to...), excellent facilities for lunch and for posters... lunch on the grass around the Queen's Tower sounds good, if the weather holds. And if it doesn't, everything will be under cover. Aberdeen in 2006 gave us baking heat, so who knows...

and we hope to arrange dinner at The Natural History Museum. All delegates can get *en-suite* accommodation on site if they wish to avoid high London hotel prices so, overall, it looks like we are set for a very successful and popular event in a prime tourist location.

We are therefore committed to a HUGE effort, and the work basically starts NOW. We need support from our leading academic colleagues in all areas of present (and future??) carbon research, from what remains of industrial carbon activity, and anyone willing to turn their hand to reviewing submissions, planning timetables and so forth. The British Carbon Group has done this before and has always put on a great event, and we shall do so again. At present, I am working with Geoff and the rest of the officers and committee in getting things in motion and the necessary reservations in place. An initial organising committee needs to be identified by the end of this year. It is entirely due to the success of previous events that we are sufficiently financially secure that we can undertake such an organisation without too much concern but, of course, Carbon 2021 presents a golden opportunity for appropriate sponsors to reveal their hand (and their wares): our mailboxes are open now for promises of help and funding, and our bank account for donations!!

And finally, it is Melbourne 2017. I wonder how many of us will go to that? It is the first time that the carbon conference has been just a part of a larger event, in this case symbolising 150 years of Australian chemistry, and you can attend any of several other parallel conferences with no additional fee. And then Madrid 2018 – now that's a bit more likely! I just attended an IAEA conference in a large complex nearby the Barajas airport, and Carbon 2018 will be in a nearby large complex nearby the Barajas airport, so that's an easy one! 5 minutes by free hotel transit to the in-house venue, from where metro access to the inner city is very cheap and easy. Japan 2019 (Osaka I think), Lexington KY USA 2020, and then, US. London 2021. So much to do; so little time...

Get thinking, *now*, on how *you* can contribute to Carbon 2021. Anything from reporting the earth-shattering conclusions of your current carbon research to designing the flyers and the website to volunteering to get the presentations uploaded on the right computers for the right rooms. With apologies to Tesco, "*Every Little Helps*"

I'm happy to receive suggestions and to take notes of anyone who would like a job. <mailto:confer@globalnet.co.uk> When we have a formal organising committee set up, you'll get the call!

Tony Wickham

General news and notices

Carbon 2021, London

As you will have read in Tony's report above, the baton has now been passed to us to organise Carbon 2021. As he says, this now puts a lot of responsibility on the British Carbon Group to organise a conference worthy of the occasion. We have a tremendous amount of really exciting work on carbon research and technology taking place in the UK and here is a chance to showcase it with the best of the World's. Your committee has also made preliminary decisions. The venue will be London, where we shall take advantage of the excellent conference facilities at Imperial College. However, that is just the start and there is a tremendous amount of work to be done and we shall be calling on the whole carbon community here to support us. In particular, we need willing hands to serve on the various committees and we shall be delighted to have volunteers but don't feel surprised if a friendly hand falls on your shoulder to ask for help.

If you would like to volunteer or have ideas about this conference, please don't hesitate to come forward. You can contact any of the committee members:

Malcolm Heggie malcolm.heggie@gmail.com

Tony Wickham confer@globalnet.co.uk

Geoff Fowler g,fowler@imperial.ac.uk

Norman Parkyns norman.parkyns@tesco.net

Peter Minshall plvsmin@aol.com

Website

I hope that most of you will have noticed our new and improved website, now hosted by Wordpress. We are very grateful to Nassia Tzelepi our Webmaster, assisted by Chris Ewels for setting this up. This newsletter will be posted on it in a few weeks. Nassia will I am sure be pleased to receive suggestions, preferably constructive, about it.

Chris has also set up a Twitter account for the Group in response to a number of requests. I am not a Twit(terer?) myself, which betrays my age perhaps but here is the address for you to get going.

@BCarbonG BCGroup

I hope that's enough. It's got a link to the new website

Faraday Discussions

Faraday Discussions are well known to RSC members but maybe less so to those of the IOP. They date back over 100 years and were instituted by the Faraday Society, now the RSC Faraday Division, to encourage multi-disciplinary meetings of the highest quality where experts from physics, chemistry and biology could exchange their views on scientific topics. Chris Ewels gave his very favourable impressions in a recent newsletter (Spring 2015-it's on the website) of the Discussion on "New Advances in carbon nanomaterials". This gives an excellent review of the type of meeting and how it serves its purpose in getting interaction among scientists of different disciplines.

The Faraday Division is trying to look ahead in promoting new topics for Discussions and you are all invited to put forward your ideas for what could make a good meeting in the general area of carbon research. As a rule, the Discussions are organised scientifically by a small group of distinguished scientists, preferably of international reputation in the field, so you might bear that in mind and suggestions of topics could be accompanied by possible names that could associated with them. Any ideas could be communicated to the Group's Chairman, at Malcolm.heggie@gmail.com .

The Brian Kelly Award

This annual award was established in 1996 in memory of Brian Kelly, a leading authority on graphite physics.

The award is intended as a travel grant for students and early career researchers with up to ten years postdoctoral experience to attend the annual International Carbon Conference. Anyone living or working, at the time of that conference, in the country where the conference is held is **not eligible**. As a consequence, applications will not be accepted from the Australia on this occasion.

The award is made upon the basis of an appraisal of THREE documents: (1) the extended abstract or paper as submitted to the CARBON 2017 conference, (2) a short CV and (3) a commentary provided normally by the candidate's supervisor or close colleague. Self-nomination is permitted. The Award Committee of the British Carbon Group will determine the successful applicant.

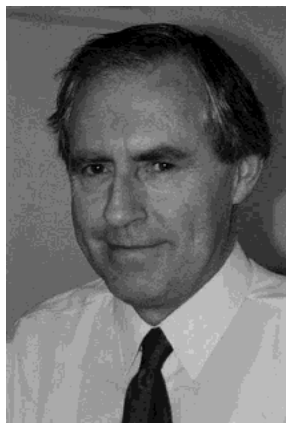
The closing date for applications for CARBON 2017 will be Monday 7th **May 2017**.

The award is currently five hundred pounds sterling (£500) and is presented at the time of the conference. It is a condition of the award that the winner attends the conference and presents his or her paper either orally or as a poster.

Applications may be transferred electronically to the Chair of The Brian Kelly Award Committee, Ms. Nassia Tzelepi, at nassia.tzelepi@nnl.co.uk or, exceptionally, mailed to her at the following address:

Ms Nassia Tzelepi, MBA CPhys CEng MInstP
Research Fellow in Graphite Technology, NNL Central Laboratory
Sellafeld, Seascale, Cumbria CA20 1PG, United Kingdom

The Roger Taylor Award 207



Emeritus Professor Roger Taylor (1935-2006)

The British Carbon Group is pleased to announce The Roger Taylor 2017 Award in memory of the distinguished scientist Professor Roger Taylor (1935 – 2006), Emeritus Professor of Chemistry at the University of Sussex. During his career, he published 350 scientific papers and six books and made a significant contribution to the high international reputation of chemistry at Sussex and was the winner of the RSC Josef Loschmidt prize in 2002. The inaugural award was made in 2013. With the discovery of C₆₀ and the other fullerenes, he was known for research related to the preparation and characterization of novel derivatives of fullerenes, especially those having fluorine, hydrogen, alkyl and aryl group addends; and time and again producing novel structures such as the holey fullerenes, saturnene, triumphene, functionalized dimers and the fullerene trannulenes.

The award is intended as a travel grant for students and early career researchers with up to ten years postdoctoral experience to attend an important international meeting for the advancement of fullerene and related science such as the functionalisation of carbon materials including carbon nanotubes and graphene.

Professor Taylor was a keen participant in the series of biennial conferences organized by Professor Vul and colleagues in St Petersburg, formerly known as IWFA (International Workshop on Fullerenes and Atomic Clusters), now operating as "Advanced Carbon Nanostructures" organized by the Ioffe Institute (<http://acns2017.org/>). The award is thus to attend and present at this conference.

The Roger Taylor Award is generously funded by the Taylor family as an endowment to the British Carbon Group and it is intended to make this final one award with a bursary of £800.

The Award is international and consequently is open to scientists living and working in any country and of any nationality, with one exception which is that anyone living or working, at the time of the conference, in the country where the conference is held is **not eligible**.

The award is made upon the basis of an appraisal of THREE documents: (1) the extended abstract or paper as submitted to the conference (only one paper is permitted for the purposes of the award), (2) a short CV (with the date of the award of PhD if applicable) and (3) a commentary provided normally by the candidate's supervisor or close colleague. Self-nomination is **not** permitted. The Award Committee of the British Carbon Group will determine the successful applicant.

The closing date for applications will strictly be 4 p.m. BST, 15th May 2017. No submissions after this time / date will be accepted.

Previous applicants are welcome to re-apply.

This final award is eight hundred pounds sterling (£800) and is presented at the time of the conference with a certificate. It is a condition of the award that the winner attends the conference and presents his or her paper either orally or as a poster.

Applications may be transferred electronically to the Chair of The Roger Taylor Award Committee, Ms. Nassia Tzelepi, at nassia.tzelepi@nnl.co.uk or, exceptionally, mailed to her at the following address:

Ms Nassia Tzelepi, MBA CPhys CEng MInstP
Research Fellow in Graphite Technology, NNL Central Laboratory
Sellafield, Seascale, Cumbria CA20 1PG, United Kingdom

Professor Emeritus KSW Sing

I was saddened to read of the death of Prof. Ken Sing a few months ago. He had a distinguished career as a physical chemist specialising in the gas/solid interaction at surfaces. His book on the adsorption of gases on solids that he wrote in conjunction with his old mentor John Gregg has become a classic since its appearance in a first edition decades ago and most chemistry students will have gone around clutching a copy of “Gregg and Sing” some time in their careers.

He was an Ubbelohde lecturer of the BCG and gave a fascinating talk on the various facets of gas adsorption on what we used to call microporous carbons, now of course reclassified as nanoporous.

He was native of Devon and attended what was then the University College of the South West, now the University of Exeter and obtained his PhD under the tutelage of Dr Gregg, with whom he had a lifetime association. He established and built up the chemistry department of the new Brunel University in West London, where I had the pleasure and privilege of collaborating with him in a number of projects. He will be missed by a wide circle of former students and colleagues.

Norman Parkyns

To conclude this newsletter, I am including the following that was sent to me by Harry Marsh. Many of the older among us will have memories of the major part that he played in carbon research in the last century. He was a former Chairman of the SCI Carbon and Graphite Group, which of course merged into the present British Carbon Group. He was invited by the BCG to give a special lecture at Carbon 2008 in Aberdeen on 50 years in carbon research. For our younger members, I hope that this will be an interesting historical glimpse of the past and gives an idea of the sort of work on which our modern body of knowledge about carbon and carbon-derived materials is based.

Ndp

Memoirs of Emeritus Professor Harry Marsh of the Northern Carbon Research Laboratories, School of Chemistry, University of Newcastle upon Tyne.

1948 to 1991

These memoirs summarise how fundamental studies related to the coal and carbon industries were supported by the University of Newcastle in the Northern Coke (Carbon) Research Laboratories and the role of Professor Harry Marsh.

Early Days: 1926 to 1945

I was born (1926) into the West Durham coalfield with three collieries within a one mile radius of my home. Later, I lived in the East Durham coalfield with a colliery about 1000 yards from my bedroom window. I was educated within the Grammar School system, matriculating in 1941, with three A-levels in 1943, which enabled me to enter King's College (University of Durham), Department of Chemistry (Head: Professor Roger Clemo), with a County Scholarship. Being wartime, teaching continued throughout the summer vacations. Fire-watching was compulsory with sleeping arrangements in the top floor of the Students' Union and Army training (Officers' Training Corp (OTC)) on Wednesdays. Lectures were in the Armstrong Building with practical physical chemistry in WW(I) accommodation (site of physical chemistry and geology, later an Archaeological Museum (now demolished)).

Introduction to Coal Mining:

It was during my third year (in 1945) that the then British Association for the Advancement of Science came to Newcastle. Chemistry students were 'recruited' to lead visits to the area. It fell to me to lead a group to enter the Colliery (the *Morrison Busty*) at Annfield Plain, West Durham. This colliery was modern producing coking coal and was considered to be 'gassy'. The group was to meet in the car park. This visit was my first down a coal mine and was a little 'disturbing' to say the least because of the darkness, noise, possible danger and energy requirements for coal mining.

I graduated with B.Sc. Hons. (Dunelm) in 1945 after the war had ended.

Inauguration of the NCRL:

I must now side-track and go back to 1926. It was a period when uses for mined coal, other than for combustion, were being sought, In 1926, a group of local coal producers, coke makers and coke users began to discuss the setting up of an organisation to examine the regional problems of the coal and coke industries. The outcome was that Armstrong College was willing to set aside rooms for coal and coke research and to allow its staff and students to work there. Accordingly, the *Northern Coke Research Laboratories* (NCRL) were

inaugurated in a converted boiler-house. The accommodation consisted of a large underground laboratory, a workshop and a combined balance room and office.

Under the Honorary Directorships of Professors H.V.A. Briscoe, G. Poole, H.L. Riley, W.F.K. Wynne-Jones (Electrochemist) and D.H. Whiffen (Solid-state NMR Spectroscopist), the NCRL and an Advisory Committee, a significant role in supporting the post-war coal utilization and coke making industries was brought about. The many publications of workers over this period are compiled in several bound volumes now located in the archives of the Mining Institute, Mosley Street, Newcastle.

Ph.D. Studies:

Having graduated in 1945, and with 'experience' (?). in coal mining, Professor Harry Lister Riley called me to his Office with a suggestion that I undertake a Ph.D. study. Finance was available for the research and a personal grant would be paid. It had been reported to the NCRL that a coal being mined at South Hetton Colliery had changed becoming a '*dangerously swelling coal*'. When fed into a battery of coke ovens, the ovens violently exploded outwards and production was halted. The coal owners needed to know what was happening to their coal in the Hutton seam. This problem was to be the project of the Ph.D. study. I succeeded in identifying the problem and published the study in the journal Fuel, "*The effect of an igneous intrusion upon the properties of a Durham coal*". At a congregation in 1948 I gained my Ph.D. (Dunelm) followed by my D.Sc. (Newcastle) in 1973.



Harry Marsh, 1973, in the optical microscopy laboratory, room 167, of the NCRL in the Bedson Building, Newcastle University.

Period 1948 to 1976

Shortly afterwards, I received a letter through the post from Lord Eustace Percy, Rector of King's College stating that a vacancy had arisen in the NCRL and that, if I was interested, interviews were being conducted that afternoon. I went for the interview and was asked by Lord Eustace Percy to explain, in geological terms, the origins of coals and their differences. A few days later I was offered the position and took it.

Lord Eustace Percy (Rector of King's College, 1937-1952) had greatly supported technical education in the UK. In 1944, the newly formed British Coke Research Association (BCRA) entered into an agreement with Lord Eustace Percy whereby King's College would provide staff and accommodation for the fundamental work of

the Association. The necessity for financial support from local industry and the days of the basement boiler-house were over. The NCRL operated under the aegis of BCRA reporting every six months, with reports now being located in the archives of the Mining Institute, Mosley Street, Newcastle. During the summer of 1955, I studied under Professor H. Brusset, (*École de Chimie Industrielle, Paris*) who pioneered the use of low-angle scattering of X-rays to study coal structure. By 1959, the NCRL had moved into the Bedson Building (Chemistry). In 1963, The University of Newcastle was established.

The Crisis of 1976:

In 1976, after thirty-two years, this was all to change. The UK had entered into the EEC and with it a totally new financial method for the funding of research. Monies for research were to be scrutinized very carefully and uncommitted funds were withdrawn to be replaced by contractual research. BCRA was disbanded and the financial support for the NCRL disappeared. Discussions about the future of the NCRL were immediately started, led by Professor Henry Miller, Pro-Vice-Chancellor. A decision was taken that the University would continue to provide accommodation and staff and that post-graduate training would continue provided that there was a research director.

Post Crisis:

I was asked if I would accept (which I did) this responsibility for the winning of research contracts. By 1980 nine contracts were operating in the Northern Carbon Research Laboratories with a major grant from the Coal and Steel Community of the EEC/Brussels. And so it continued until my retirement in 1991 as an Emeritus Professor. Forty nine higher degree students and about 200 post-docs and staff from International laboratories (industrial and academic) had passed through the laboratories. It was during late 1980s that the concept of a "Coal Research Forum" was developed and which is now an international co-ordinating organization.

A major collaboration programme was established with 'INCAR' (*Institute Nacional de Carbone y sus Derivativos*) in Oviedo, Asturias, Spain. This collaboration helped with the entry of Spain into the European Community.

Over four hundred publications are listed and which are now located in the archives of the Mining Institute, Mosley Street, Newcastle. Sixty seven research grants were given.

The NCRL soon became one of the top five research laboratories, internationally, studying coals and carbons. Invitations were received by Marsh to lecture on the work of the laboratories from research centres in Japan, China, Australia, New Zealand, South Africa, Poland, The Czech Republic, Spain, Portugal, France, Germany, Holland, Norway, Canada, North America, Columbia and Brazil. Sixteen international Conferences came to Newcastle (see below).

It was during this period that the concept of a '*Coal Research Forum*' was developed. The purpose of the forum was to coordinate of coal research within the UK.

Subject Areas of Research:

Coals:

Effects of igneous intrusions into coal seams.

Microporosity in coals of all ranks and critical assessments of methodology.

Surface functionality of coals.

Macro-molecular structure of coals.

Macerals in coals.

Coal combustion.

Coal carbonization, blending, preheating and the concept of liquid crystals.

Carbons and Graphites:

Carbonizations of pitches, resins and woods.

Activated carbons and adsorption processes, from gas and liquid phases.

Gasification and oxidation reactions, mechanisms.

Structural analyses.

Composite carbonaceous materials.

Awards:

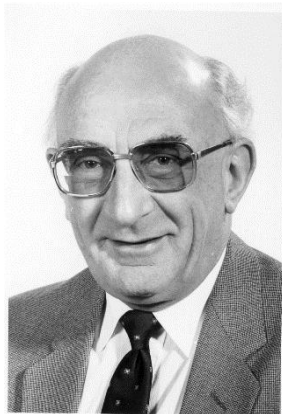
International Societies made ten awards to Harry Marsh for his contributions to the sciences of coal, graphite, and paracrystalline carbons, including the 'George Skakel Memorial Award' of the American Carbon Society, 'The Henry H. Storch Award' of the American Chemical Society', the 'Joseph Becker Award' of the American Institute of Mechanical Engineers and 'The Life-time Achievement Award' of the British Carbon Group. 67 Research Contracts were awarded amounting to £3,460.100: 31 Higher Degree students were supervised: 433 publications: 193 Collaborators in research from National and International Laboratories.

Post-Retirement:

After my retirement from the University of Newcastle upon Tyne, as an Emeritus Professor, I was invited, as a Distinguished Professor, to join the staff of the University of Southern Illinois, USA, with its established department of Coal Geology (Professor Jack Crelling). When this contract expired, after four years, I accepted an offer to work for several months in Spain, in Oviedo, in Asturias, to further promote the research of 'INCAR' (*Institute Nacional de Carbone y sus Derivativos*). I then moved to the University of Alicante, Spain, to work with Professor Rodriguez-Reinoso, an international authority on adsorption in microporous material. From here, I co-authored four books including '*Activated Carbon*', Harry Marsh and Francisco Rodríguez-Reinoso, Elsevier 2006. This book was translated into Japanese:-

活性炭 ハンドブック

It was now time to return to the UK where I undertook the reviewing of papers submitted to Elsevier for publication in their journal, e.g. 'CARBON'. Over the years I assessed over one thousand manuscripts.



Harry Marsh at the time of his retirement in 1991.

In the late 2010s I closed my associations with research into the properties of carbons. Instead, I did something quite different; I became a Volunteer Room Guide for the National Trust at Seaton Delaval Hall. Also, I am a member of a local men's club, the Willow Club meeting in Whitley Bay, where I act as its Archival Secretary.

In 1957 I married Audrey Reah and now have a daughter Rosalind Anna, a son Alistair David, married to Alison Fiona, and three grandchildren, Charlotte Emily, Amy Louise and Thomas Oliver.

August 2015
