

THE SUSS-EX CLUB

NEWSLETTER No. 48, Summer 2019

Edited by Adrian Peasgood

In this issue:

Forthcoming events

Recent programme

Obituaries

FORTHCOMING EVENTS

Thursday 5 September

Harvey's Brewery Tour, 6.30 pm - 8.45 pm

We have arranged a tour of the historic Harvey's Brewery in Lewes. This will be on Thursday 5 September starting at 6.30 pm and finishing at about 8.45 pm. We will be told about the art of beer brewing and be shown how the famous Harvey's ales are produced. At about 8.00 pm after the formal tour has ended, we will be given a chance to sample, at Harvey's expense, their various products so this should provide a fitting end to the evening.

The number of places we have for the tour is strictly limited by the brewery to a maximum of 25 so tickets will have to be allocated on a first come first served basis. The cost will be £5 a head and the booking form with instructions for payment is at the end of this Newsletter. As I have had to pay for all the tickets up front, please can you make your cheques payable to me, Colin Finn.

We should meet just before 6.30 pm in the Harvey's Brewery yard, which is located over the River Ouse bridge in Cliffe High Street, Lewes, opposite Bill's Restaurant.

Parking is easy. You can either park free in the Tesco car park or in the public car park off Friars Walk (behind the Premier Inn).

Do come. It will be an entertaining event.

Colin Finn

Thursday 3 October

Visit to the West Pier Centre and the i360

We will assemble on Thursday 3 October at the West Pier Centre (WPC) for a 5.00 pm talk by Fred Gray on 'Seaside Architecture and the role that Brighton has played in its development'.

WPC is located in one of the arches a few steps to the east of the i360, postcode BN1 2FL.

Fred is Emeritus Professor in the Centre for Community Engagement, and the author of several books on the history of the seaside, including one on the history of the West Pier.

After the talk we propose to go on the 6.30 pm flight on the i360 and then, for those up for it, over to the Regency Restaurant for a fish and chip supper. Sunset on that date is just after 6.30 so this will be a twilight flight and a different experience if you have only been on the i360 in the daytime.

At this stage I would just like to know if you would like to come on the visit and/or the restaurant (please reply to S.P.C.Pavey@sussex.ac.uk) so that I have an idea of numbers for a group booking. If you live in BN1, BN2, BN3 or BN41 postcodes you are eligible for the annual Resident Membership scheme, which gives one half price admission; for details see the i360 website. Alternatively an annual pass (unlimited flights for 12 months) is only £30. A pre-booked group would cost around £13 each.

I will do a further circulation at the beginning of September about the visit with final arrangements.

Steve Pavey

Wednesday 18 December

Christmas party

A date for your diary – this year the joint USPAS / Suss_Ex party will be on Wednesday 18 December. I am expecting that arrangements will be similar to last year but I will write again with full details and a booking form once we have everything confirmed.

Steve Pavey

RECENT PROGRAMME

Wednesday 29 May

Royal Pavilion Gardens

The weather smiled upon us one morning at the end of May for a first rate tour with the Head Gardener, Robert Hill-Snook. Robert enlightened a group of about a dozen members about the history of the gardens and the various design styles that have been used over the decades. He explained that it was never intended to be a flower garden (hence the emphasis on greenery) but was designed to offer unexpected glanced vistas of the Pavilion and Dome through the trees and shrubs and to bring a taste of the countryside into the town.

We also learned about the practical problems caused by the sheer pressure of numbers using the gardens, which have resulted in the gardens being marked as ‘at risk’ by Historic England. After the tour we took a well-deserved coffee and cake in a nearby Italian café and, as we sat down, the heavens opened!

Steve Pavey

OBITUARIES

Professor Robert Thomas MRSC

This obituary was originally published by the Royal Society of Chemistry at:

https://www.rsc.org/Membership/AboutRscMembership/Obituaries/R_Thomas_Obituary.asp



1927-2018

Bob Thomas was born in Edinburgh on 21 February 1927. He was educated at Emmanuel Boys School, London, and then at the University of London in a Special Two-Year Degree in Chemistry. He began his PhD studies in 1947 at the London School of Hygiene and Tropical Medicine under the supervision of Professor Harold Raistrick, a UK pioneer in the study of microbial metabolites. Working on metabolites of the mould, *Alternaria tenuis*, Bob isolated two new crystalline compounds and unambiguously elucidated the structure of one of them, alternariol, showing the other to be one of two possible monomethyl ethers of alternariol.

In January 1952 he married Joan Barron and they set sail for Melbourne where Bob took up an appointment as a Senior Research Officer with the Commonwealth Scientific and Industrial Research Organisation's Protein Chemistry Laboratory and commenced a study of the degradation of cellulose by fungal enzymes. He continued to work in this area on moving to a post at the National Research Council, Ottawa, where he spent most of 1955.

At the beginning of his time in Melbourne, he had attended a lecture by Arthur Birch who was on his way

from Cambridge to take up the Chair of Chemistry at The University of Sydney. This lecture was on the proposal that many polyketide natural products are biosynthesised from linear chains of two-carbon units derived from acetate. Bob recognised during the lecture that alternariol could be formed from seven acetate units (a heptaketide) and after the lecture he discussed its structure (then unpublished) with Birch. Birch invited him to join him in Sydney to work on testing the polyketide hypothesis by feeding studies with acetate. Although tempted, he was only two months into his job with CSIRO and felt that he could not jump ship. However this meeting sparked a lifelong interest in biosynthesis in general and of polyketides in particular.

In early 1956 he returned to the London School of Hygiene and Tropical Medicine to take up an ICI Fellowship and began an investigation of the biosynthesis of alternariol using ^{14}C -labelled acetate. His next move, in 1959, was to join the Squibb Institute for Medical Research, New Jersey where he stayed for four years, investigating the biosynthesis of various antibiotics and also indole alkaloids. He returned to the UK in 1963 to take up a Senior Lectureship at Imperial

College in Professor Ernst Chain's Biochemistry Department. This was not an enjoyable time for him as he was largely constrained to work on Chain's projects rather than his own, as was his entitlement as an independent member of staff.

Fortunately, the University of Surrey offered him a position as Research Professor of Chemistry in 1969, a post which he accepted with alacrity! While there he set up and became Founding Director of the Biotechnology Unit. He launched the biotechnology company Biotics Ltd in 1983 and in 1987 at age 60 he took up an Honorary Professorship at the University of Sussex.

Independent Research and Publication

Bob began his independent work in 1956 at the London School of Hygiene and Tropical Medicine and over the next 5 years published a series of papers entitled *Studies in the Biosynthesis of Fungal Metabolites*. This embraced studies of several classes of fungal metabolites among which were phenalenones such as herquinone as well as alternariol and its congeners. The studies involved feeding ^{14}C -labelled precursors such as acetate, mevalonate and simple aromatic phenolic compounds to microorganisms and isolating the labelled metabolites. Chemical degradation then established the distribution of the radiocarbon labels in these compounds. In addition to the biosynthetic work ultimate proof of structure by synthesis was accomplished for several metabolites. The structures of some of the metabolites that he isolated resisted characterisation and were only solved in the 1970s when modern methods such as NMR spectroscopy and mass spectrometry were more generally used. As a result, publication of the structures of mould metabolites continued right up to his retirement, the final ones being published in collaboration with a German research group in 2016/18.

Over the years Bob contributed immensely to biosynthetic theory and his speculative ideas have been proved by experiment. The indole alkaloids are a large and important class of natural products including strychnine, yohimbine and corynanthine and speculation on their biosynthetic origin has abounded, with such luminaries as Sir Robert Robinson, R B Woodward and others making what appeared to be reasonable hypotheses as to their origin. It was however Bob's suggestion in 1961 that a cyclopentanoid monoterpene was involved in the biosynthesis that led to the final correct biosynthesis being proved experimentally in three simultaneous publications by the research groups of Arigoni, Scott and Battersby.

His longstanding interest in polyketides also led him to be the first to suggest that tetracyclic aromatic polyketides may be formed by two possible types of folding, one of which occurs in streptomyces and the

other in fungi. These S- and F-foldings can be identified by feeding studies with $[1,2-^{13}\text{C}]$ -acetate. His recognition of the subtle difference in the two phyla has permitted some reassignments of natural product structures and no example has yet been found that contradicts the 'Thomas Rule'.

The biosynthesis of penicillins and cephalosporin has excited the interest of many groups over the years, and in 1981, while at Surrey, Bob and his research group were able to make a significant experimental contribution to this work. It had been known that the basic skeleton of these beta-lactam antibiotics was derived from the amino acids L-cysteine and L-valine with inversion of stereochemistry of the latter to D-valine before incorporation into a precursor tripeptide. There were two possible mechanisms for the incorporation of the valine carboxyl unit of the tripeptide into the final antibiotic and Bob used $[^{18}\text{O}_2]$ -L-valine to show that one of the two isotopically labelled oxygen atoms in this carboxyl group was lost in conversion to penicillin V, suggesting the intermediacy of a nonribosomal thioester.

In 1974, while at Surrey, he was among the first to employ tritium NMR to study biosynthetic problems and this enabled him to demonstrate the locations of the labelled tritons (protons) in biosynthetic products unambiguously. He identified dehydrogenation in ring A of testosterone as being a stereospecific *trans* elimination and showed that some polyketides incorporated $[^3\text{H}]$ -acetate to yield label located in the expected positions. This was a useful advance for, in certain examples, it provided information not available from incorporation studies using deuterium-labelled precursors.

In studies using $[1,2-^{13}\text{C}]$ - and $[1-^{13}\text{C},^2\text{H}_5]$ -acetate and assay by ^{13}C NMR he demonstrated, respectively, that the tetracyclic skeleton of oxytetracycline was derived from a linear polyketide and that both of the deuterium (hydrogen) atoms in its aromatic A-ring were labelled as would be expected from their polyketide origin. Further, he showed using $[1-^{13}\text{C},^{18}\text{O}_2]$ -acetate that the expected regiospecific locations of the ^{18}O -oxygen substituents in oxytetracycline corresponded exclusively to those oxygen-bearing carbons that originated biosynthetically from the carboxyl group of acetate.

He published over 60 research papers, completing his last work in his 91st year in collaboration with a German group. This was published posthumously. He wrote several reviews and co-edited three multi-author books from the three UK natural product meetings that he organised.

Business Interests

In 1983, while Director of the Biotechnology Unit at the University of Surrey, Bob started up a new company, *Biotics*, at first as a Biotechnology Consultancy specialising in the area of natural product chemistry.

However, with the aid of a grant from the European Commission he was able to begin its main activity that of setting up a laboratory facility in the School of Chemistry and Molecular Sciences at the University of Sussex to isolate new compounds from plants from all over the world. Once a standardised protocol for the extraction of plant material had been accomplished (formalised in a spin-off *company*, *Bioex*), the most important development was setting up a series of individual companies in developing countries in Africa, Asia and South America to duplicate what was being done at Sussex, with the important aim that each country (*aBiotex Associate*) would directly benefit from any discoveries made. *Biotics* would provide consultancy and technical support services and act as broker between them and individual pharmaceutical and agrochemical companies who, after screening the extracts for bioactivity, might wish to commercialise any of the discovered compounds. By the mid-1990s extraction facilities had been established in Costa Rica, Ghana and Indonesia and more than 5,000 samples had been screened.

Contributions to the Royal Society of Chemistry (RSC)

In his role at Surrey as Director of the Biotechnology Unit, it was natural for Bob to join the Biotechnology Group, a new RSC Interest Group which started up in 1987. He became a member of the inaugural Committee and subsequently was to serve as its Treasurer for 10

years, 1995/2004. He chaired the organising committee for the first 3-Day conference that the Group had ever run and this was on the theme of natural products at the University of Sussex in 1996. He followed this up with two more on the same theme at St Andrews in 1999 and at Magdalen College, Oxford in 2009.

Outside Interests

Bob learned to fly in the University of London Air Squadron in 1947 and joined the RAF Volunteer Reserve. While in Melbourne he joined the RAAF Volunteer Reserve. Flying was to be a lifelong interest and he even piloted a light aircraft when he was 89! He was an excellent squash and tennis player, enjoying games with colleagues at the Sussex campus until well into his seventies.

Family and Friends

Outside of work, Bob was a devoted husband and father. In later life he was a loving grandfather and great grandfather, too.

Bob Thomas had many scientific and other friends from all over the world, partly from his overseas jobs and partly from his travels lecturing at and organising international conferences.

His wife, Joan died in 2011 but he is survived by his three children Russell, Julie and Jacki, seven grandchildren and one great grandchild.

Colin T. Bedford and Douglas W. Young

The University *Bulletin* publishes obituaries. The following have appeared since the last issue of the Suss-Ex Newsletter:

Peter Adamczyk (*Bulletin*, 3 May)
Jim Guild (*Bulletin*, 28 June)

The Suss-Ex website

More information about Suss-Ex is available on its webpage at <http://www.sussex.ac.uk/suss-ex/>. 'Suss-Ex Club' in Google will get you there, as will <http://tiny.cc/sussex>, or you can find us in the A-Z on the University's homepage. The website has copies of past Newsletters.

The steering committee

Suss-Ex activities are organised by a steering committee, which currently comprises:

Sir Gordon Conway, Chair G.Conway@imperial.ac.uk

Colin Finn colinfinn@btinternet.com

Jackie Fuller jkfuller21@hotmail.com

Charles Goldie c.m.goldie@sussex.ac.uk

Arnold Goldman a.goldman@cowbeech.f9.co.uk

Steve Pavey miniperson2003@yahoo.co.uk

Adrian Peasgood adrian@peasgood.plus.com

David Smith j.d.smith@sussex.ac.uk

Paul Tofts uos@paul-tofts.org.uk

Helen Walker helenjwalker@btinternet.com

Ideas for the future

We are always seeking ideas for social occasions when we can meet former colleagues. Please let us have your suggestions, or volunteer to join the committee. We meet once a term, when practicable immediately before a Suss-Ex event.

Booking Form

Please include us/me on the Harvey's Brewery Tour, Thursday 5 September 2019 6.30 - 8.45 pm

Name(s) -----

your email -----

Telephone number -----

*Please return this form with a cheque for £5 a head payable to Colin Finn
22 Lockitt Way, Kingston, Lewes, E Sussex BN7 3LG
email colinfinn@btinternet.com*

It would be helpful if you could email me as soon as possible so that I can reserve your places.