

# ICATS NEWS

AUTUMN 2018



## EDITOR'S NOTES

Ali Green

It has been a very busy year for ICATS with a good deal of positive change and a packed schedule of events to attend.

This edition launches with the excellent IFEAT Conference in Athens which united my twin passions: the aroma trades and the ancient Greeks! It was a privilege to present ICATS Annual Report at the Conference and to meet last year's winning student Ruth Bare. As you will see, the lectures offered a varied overview of all the newest research in the aroma trades from ancient perfumery to the roles of regulatory bodies today.

The Autumn saw the ICATS team travel to London's Royal Society for the IFRA UK Fragrance Forum, which had an excellent series of lectures on a wealth of sensory topics. In the Spring, ICATS team member Mandy Burns made her way to Amsterdam for the annual Flavour Talk Tabletop exhibition, enjoying a feast of innovative presentations on all that is new in the world of flavours. The year of events as ever finished with the British Society of Perfumers' annual New Materials Symposium, where the ICATS team enjoyed discovering what's new in the world of fragrance creation and ingredients and discovering who had won what in the evening's award ceremony.

Throughout this year, a good deal of work has been going on with two ICATS projects. Firstly ICATS has now become financially independent and a limited company in its own right, although we are still based within Plymouth University's Research and Innovation zone. Secondly, we have been completing the thorough overhaul of our online presence and branding identity – the culmination of two years of work that began with a graphic design student competition at the prestigious Plymouth College of Art. As I write we are in the final stages of completion and about to go live with the new website so watch this space!

As ever, please don't hesitate to contact me with any stories that you would like me to cover. I hope you enjoy reading this edition of ICATS News.



UNIVERSITY OF  
PLYMOUTH

ICATS  
International Centre for Aroma Trades Studies

IFEAT



# THE IFEAT 2017 CONFERENCE IN ATHENS

## 40 YEARS OF IFEAT

ALI GREEN

It would be an understatement to say that I was excited about the location of the IFEAT Conference in September 2017. Athens is a city close to my heart and was home to many of my favourite authors around two and a half thousand years ago; I was really looking forward to showing my colleague Sharon Heard around as well as to hearing about the very latest in the Aroma Trades from the expert lectures on offer. The Conference hotel The Intercontinental provided the very best of contemporary Athenian luxury, combined with views over the ancient and modern cityscape. Our hotel, The Coral, was in a very peaceful location next to the sea and provided an excellent haven from the busy Athens streets within easy reach of the Conference.

After registration and a leisurely lunch in the Plaka area of Athens we got ready for the Welcome Reception. When we arrived at the Intercontinental Hotel, we were greeted by priestesses with olive crowns and a series of full-size replica Ancient Greek statues. There was plenty of excellent food, all accompanied by various styles of Greek music. The Conference really got off to a great start with a thoroughly convivial atmosphere where we were able to touch base with lots of old friends to ICATS as well as meeting current and several prospective students. It was a propitious start to the 40 year anniversary celebration of IFEAT with the tone just right for the large diversity and number of delegates and their needs – no mean feat as there were a record number of delegates this year (1,237) with over 900 attending this reception!

On Monday morning, Sharon and I liberated our display material from the hotel storage cage with the help of the Secretariat and were able to set up in a prime position. Leaving Sharon to man the stand on what was a very busy day, I went to the lectures in the morning including the first instalment of the legendary double act of Professor Wlasyslaw S. Brud and Richard C. Pisano Senior. documenting the 40 Years of IFEAT presentation. Please see the following article that gives detailed content information on all the lectures given at the conference.

In the evening we had a special invitation to a party on the roof garden hosted by Ultra International. It was a lovely evening bringing the day to a close with fabulous views of



the floodlit Acropolis and Athens skyline – thanks to all at Ultra for such a pleasant get together.

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# RUTH BARE

## IFEAT MEDAL-WINNING ICATS STUDENT

We would like to extend our congratulations to the IFEAT Medal Winning ICATS student 2017 Ruth Bare, who received her medal from Raul Amigo in Athens. Ruth graduated with a degree in Biochemistry and had initially been destined for a career in medicine, but realising that this path was not for her she accepted a post with CPL Aromas. The rest, as they say, is history and Ruth really felt she had found her calling in the fragrance industry. She has been thrilled with the support offered by CPL. *"I have been given the opportunity to grow and develop, starting in the Compounding Laboratory then Quality Control and more recently being based within the Regulatory Department. I am grateful for the company's support in allowing me to take up a course of study linked directly to the fragrance industry."* She then began the ICATS IFEAT Diploma Course in Aroma Trades Studies and really dedicated herself to completing all her assignments and dissertation to an extremely high standard. She says of the course, *"I found working through the various modules on the IFEAT Diploma course to be both enjoyable and stimulating. As a result, my view of the world of fragrance has been broadened."* As well as incorporating academic rigour, we endeavour to make all of our modules varied, relevant and interesting to the students working through them, so it is really gratifying to hear that Ruth has enjoyed her time on the course. She says of her award, *"For me, winning the award is a real privilege and that, coupled with the invitation to the IFEAT conference in Athens, has been the icing on the cake."* We would like to once again congratulate Ruth on her award and wish her well in her future career.



# FRAGRANCE FORUM

## SCENTS AND SENSIBILITY: (WITH HOMAGE TO THE 200TH ANNIVERSARY OF JANE AUSTEN)

### 7<sup>TH</sup> ANNUAL FRAGRANCE FORUM, 12<sup>TH</sup> OCTOBER 2017, ROYAL SOCIETY, LONDON

MANDY BURNS

Sharon, Kate and I spent a happy hour packing goody bags on the evening of the 11th and enjoyed a very pleasant evening with Julie and Eliza from IFRA. We would like to thank them for their hospitality ahead of the event. Thanks too to the staff of the Royal Society for looking after us so well.

The day itself was most enjoyable, taking a multi-faceted look at how "smell" permeates fields as diverse as health, science, art and design.

After a welcome from Lisa Hipgrave, UK Director of IFRA, we were straight into **Sniffing it Out – Scent and the Animal Kingdom**, presented by Dr Claire Guest, from Medical Detection Dogs.

Staying with the theme of human health, Professor James Logan from the London School of Hygiene and Tropical Medicine gave an intriguing insight into **How to Make a Mosquito Invisibility Cloak** and an entertaining look at why some people never get bitten by this ultimate blood sucking machine.

#### SESSION TWO

In Session Two the focus changed to *Scent and Our Surroundings* and opened with Dr Christina Bradstreet, from the National Gallery fascinating us with **Art, Smell and Sanitation** in and around the time of the "Great Stink". Christina looked at nineteenth century depictions of smell and how smell became visible and influenced interpretation of art, whilst acknowledging that some of the nuances may be lost to the modern day eye.

(These three lectures are discussed in a lot more detail in the article following).

Kate McLean, Canterbury Christ Church University and Dr Daniel Quiercia, Bell Laboratories, presented on **The Impossibility of Mapping the Smellscape**.

Kate is an artist and designer who has created smell maps celebrating the complex smells of cities and considering themes such as "What does a city smell like?", "What is the human perception?" Her approach is similar to that of a photographer i.e. perception of a city would depend on



who was taking it, at what time of day or season the image is captured. Smells, she believes, are elusive but can have strong connections to emotions and memory. Starting with Paris she remembered someone saying, "I may forget some of the sights and sounds ... but not the smells". Some examples may be perfume, fresh French bread, wine, rain on a spring day, the coffee, fresh flowers – a plethora of smells. In an experiment, she provided smelling tests to see where the aromas took people, many being reminded of people or locations. In Amsterdam, the theory was expanded to look at episodic smells, ambient smells, ephemeral smells etc. and developed a "scent note" according to the intensity and reflection on the smell and its association. After four days, 44 people and 650 aromas she was able to break smells into rough categories e.g. warm and spice and map the source of the smell and its intensity. Her work considers alternative sensory modes for both individual and shared interpretation of place and from it she has been able to develop both maps and smell walks. More on Kate's work can be found at <http://sensorymaps.com/about/>

Dr Daniele Quercia added more on the project looking at Design for Urban Beauty. This work looks to rate urban landscapes by what makes people happy or unhappy e.g. mapping happy paths and recommending beautiful routes and considering how some may be beautiful visually but not necessarily good in other ways e.g. smells. The work also considers how smells can influence memory and emotion e.g. a first kiss. He considered the nose as a big



data machine which can potentially discriminate more than a thousand odours; he feels city planners only deal with the management of less than ten bad odours out of a trillion which is both negative and over-simplified. Smell is hard to measure but smelly maps looks to try and celebrate the complexity of city smells and capture an entire city smellscape from social media data e.g. Flickr or tweets. More on projects such as smell maps and happy maps at <http://goodcitylife.org/smellymaps/project.php#>

#### SESSION THREE

Session Three moved us on to *Scent and Psychology*. Dr Clare Jonas introduced **Synaesthesia**, a fascinating condition where senses can become blended e.g. music might appear to have a shape or a smell and/or a colour. Some will associate words e.g. human tastes like beans. People with synaesthesia tend to have distinctive characteristics or personality traits e.g. creativity, mental imagery, memory and tend to be worse at maths than other people. They are also likely to be more open to experiences, particularly artistic. She considered cross modal correspondences – interactions between two or more different sensory modalities e.g. which goes better with a high pitched tone and which with a low pitched tone using pictures of coffee beans and orange juice (Crisnel et al (2013) and which scent goes better with a round shape? E.g. pepper beans and raspberries. (Hanson-Vaux (2013). However, cross modal correspondence is not universal and there are changes across cultures (Levitan et al (2014)). Dr Jonas considered factors that differentiate synaesthetes and cross modal correspondences and these were being conscious – synaesthetes are aware, specificity e.g. cross modal correspondences are quite general but synaesthesia can become very specific e.g. not just red but blood red or carnation red. Only a few people are synaesthetes and where there can be wide cross modal agreement, synaesthetes are idiosyncratic. It is possible to become a synaesthete by losing one of the senses, using psychotropic drugs or by training e.g. presenting a single letter in the correct colour, asking a participant to recall what colour the letter should be. Training took about nine weeks (Bor et al. 2014)). Finally, Clare looked at the implications of cross modal correspondences for packaging e.g. is there a match between colour and perfume? Guessing the colour of wine



from an odour e.g. melon, cherry, butter, cocoa, cinnamon or straw. More will be covered on the web site [www.bittersuite.org.uk](http://www.bittersuite.org.uk) which is currently under construction.

To round off our day Sarah Hyndman invited us to **Wake up and Smell the Fonts! Type Tasting**

Sarah's work is ground-breaking in that it looks at blending the psychology of communication with perception of typefaces in a cultural context. Type can be a visual code and visual language influences our senses and can influence our perception of product. For example, fonts used on packaging may influence our perception of that product in terms of cheap or very expensive. Typeface can also turn a word into a story evoking smell, a memory or a sound. An old fashioned wrapper, for example, can conjure childhood memories. By understanding this code and the multisensory nuances it may be possible to use visual language to nudge consumer behaviour. Sarah believes that considered choice of type face on products may encourage healthy eating and be a key to battling obesity. Her session finished with an experiment challenging our perceptions of wine using multisensory techniques and our choice of type face. If it holds true then I'm a complex and sharp wine with crisp notes. Not bad as my favourite wine has to be a lovely chilled Chablis! <https://www.sarahhyndman.com/>

# FRAGRANCE FORUM

## AN IN-DEPTH LOOK AT THREE LECTURES

MANDY BURNS

**ART, SMELL AND SANITATION – THE TIME OF THE GREAT STINK: DR CHRISTINA BRADSTREET, NATIONAL GALLERY**

Close your eyes and journey with me to the banks of the Thames where we are visiting a dark and dangerous time. It is 1858. It is intolerably hot. Imagine the sights of the city, those shadowy shapes just visible in the sulphurous smog – ships on the river, sellers on the banks, carts on the road – some carrying the dead in lead coffins, for the horror of cholera is tangible and claiming thousands of lives daily. Most of all imagine the stench for we are in the time of the Great Stink!

It was a time when the Thames was loaded with 14,000 tons of sewage a day, smoke belched from developing industry and the new trains, and streets were lined with decaying animal corpses and rotting vegetation. Overcrowded slums, walls cloyed with faeces, spilled out contents of chamber pots and occupants with unwashed bodies. Soap was highly taxed so rarely used and even those with water closets found the new sewage systems clogged with tons

of horse manure. Most used the cess pit at the end of the street, but if that was full and there was no money to pay for its emptying, people just added to it from their slop buckets and other wastes, some from slaughterhouses. 'Toffs' passed by clutching their 'tussie mussies' and scented handkerchiefs because the link between miasma and disease was still considered a truth.

Edwin Chadwick in the Metropolitan Committee Proceedings (Parliamentary Papers 10, 1846:651) recorded, "All smell is, if it be intense, immediate acute disease; and eventually we may say that, by depressing the system and rendering it susceptible to the action of other causes, all smell is disease"

No surprise then that in this mid-section of the nineteenth century, art was not being positively inspired by scent! The Pre-Raphaelites, however, did not altogether silence the sense of smell, though representations were entirely negative. Dante Gabriel Rossetti lived by the Thames and lived in fear of cholera, suffering as he did from throat ulcers and general ill health. His unfinished painting *Found* depicted a flame haired prostitute by the Thames; the idea of miasma is evoked from the waters and shallow graves and it is then just a short step to making a connection between the air surrounding the girl and her assumed moral corruptness. John Roddam Spencer Stanhope lived very near to Rossetti and his 1859 painting, *Thoughts of the Past*, painted just one year after the Great Stink, shows an open window onto the Thames. Contemporaries would have thought of the infiltration of the stench into the room and the interrelationship of her red hair (invoking the Magdalene), the smut on the window and coins on the table leaving no doubt as to her being a fallen woman. She is tainted by the very air that she breathes. George Frederic Watts' *Found Drowned* again depicts the correlation between stench, vice and death as a fallen woman lies drowned by the side of the river, her dress flowing in the water. Watts cleverly uses light to contrast her body with the grimy city landscape in the background of the painting.

The latter nineteenth century was to be a time of change, heralding in new developments in science and sanitation that would give a different sense of perspective to scent in art. Dr Bradstreet referred to it as a period of olfactory neutrality – a blank canvass for perfume creation and aesthetic pursuits. This was due, in no small part, to major improvements in public health acts, out of town cemeteries, improved control of industrial odours and the abolition of the soap tax. Many houses now had plumbing and the fear of miasma was losing its grip as germ theory became more generally accepted in the public conscience. Urban reformers, perhaps inadvertently, were finding ways to remove bacteria – the real cause of disease.

Artists began to portray air and scent in a far more positive way. Luciano Friere, for example, in *Perfume dos Campos*



(*Perfume of the Fields*) shows his protagonist breathing in the air of the hills despite industry in the background. Perfume was also becoming more affordable and this was shown in an erotic sensual way in Rossetti's *Lady Lilith* and *Venus Verticordia*. Perhaps Rossetti was still displaying a little anxiety in his *Pandora* where there is perhaps a hint that the connection between scent and havoc had not fully disappeared - just what might be released from that box with the scent rising?

By the late nineteenth and early twentieth centuries water demons and miasma had been replaced by fairies and water spirits, for example in the work of Lalique for Coty. It was a new era, full of possibilities, for both art and perfume.



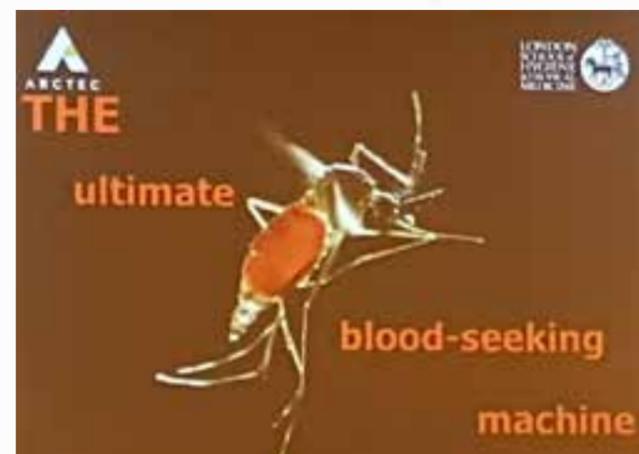


Professors Logan's team is also working on other transmitters of pathogens in relation to e.g. Zika and Dengue

Their research also found that mosquitoes carrying the malaria parasite are more attracted to human body odour than uninfected insects. If experiments relating to beer, garlic and curry were not enough we were treated to smelly socks. It seems that the very clever and continually evolving parasites seize control of their hosts and boost their sense of smell. Insects infected with the most deadly form of parasite were placed into a container along with nylon stockings that had been worn by volunteers for 20 hours – i.e. a way of collecting body odour. They repeated the experiment with uninfected insects. Mosquitoes carrying the deadly parasite were three times more likely to be attracted to the smelly socks. The scientists believe the parasites are somehow able to manipulate and adapt their hosts' sense of smell enabling them to find a victim quicker. This means the parasite is more easily passed on into the blood stream and ensures the longer term survival of the parasite and of course the spread of disease. If research can show how they are doing this then new attractants may be found for infected mosquitoes that will assist trapping techniques. If traps could be developed that only target malaria mosquitoes then it could result in fewer insects becoming resistant to insecticides. This would be a major breakthrough in the fight against malaria which causes over 600,000 deaths per year with about 90% of deaths occurring in Africa.

James and his team are also involved in coordinating clinical trials on commercial products including repellents, after bite treatments and improving protection provided by existing repellents. They are also looking at commercial viability of new wearables e.g. clothing and footwear that will repel mosquitoes and may even detect malaria.

By understanding more about mosquitoes and their incredible sense of smell, we can develop better ways to control one of the world's most formidable forces. Who knows? Maybe one day soon there really will be a human invisibility cloak - well at least as far as mosquitoes are concerned!



**HOW TO MAKE A MOSQUITO INVISIBILITY CLOAK: PROFESSOR JAMES LOGAN, LONDON SCHOOL OF HYGIENE AND TROPICAL MEDICINE.**

It wasn't wizardry or gothic vampirism but still a fascinating expose of the clever mosquito – the ultimate blood sucking machine and why it finds some of us very attractive indeed.

Mosquito-borne diseases affect more than half the world's population, diseases transmitted by insects account for more than 17% of all infectious diseases.

Although bigger people do get bitten more, beyond that it is all about the smell of the individual. Prof. Logan found that the bodies of "attractive" people (those who always get bitten) contained more of a chemical called kairomones while the unattractive emitted allomones that seemed to repel mosquitoes

We were entertained by some amusing research relating to sweaty feet, body bags, beer and curry. In one experiment human volunteers were sealed in a foil bag to collect odour as they grew sweaty. The odours were then piped into a tube alongside another tube free of human odour. Mosquitoes were released and buzzed into the smelly tube in their droves. Food smells, it appears, have little influence but body odour does and it seems that the principal factor in determining chemical makeup is genetic.

A study on a group of identical and non-identical twins and how they reacted to mosquito bites seemed to confirm this hypothesis. In the trials, mosquitoes were released down Y shaped tubes choosing which twin they wanted to bite by turning right or left. Identical twins had a similar level of attractiveness whereas non identical differed.

It seems therefore, that genes control how attractive we are and what odours our bodies emit. Once the genes and specific chemicals can be identified drugs could be developed to regulate the body to repel mosquitoes.

**SNIFFING IT OUT. DR CLAIRE GUEST, CHIEF EXECUTIVE, MEDICAL DETECTION DOGS**

Those of us who love dogs will already know that they are amazing, really angels with wet noses and if you are very lucky they will come into your life and work their magic. Should more proof be needed then look no further the work of this charity and the remarkable sensitive noses of our canine friends as they become literal life-savers. Their sense of smell can be as much as ten million times more sensitive than ours.

Dogs in this charity work in one of two main areas - in medical detection and in management – medical assistance. In the former they are helping to find cancers that other tests may miss – faster and less invasively.

In humans, the normal metabolic processes are altered by disease and may result in the production of volatile organic compounds. Evidence based research shows that the dogs can detect these compounds by smell and so help in the fight against cancer and other life threatening diseases. The training of these bio-detection dogs to recognise the odour of these compounds in e.g. urine, skin swabs, faecal or breath samples is complex and uses a carousel technique. Dogs are currently in training for work on urological cancers, breast cancer, colorectal cancers, Parkinson's and malaria. The charity is also exploring possibilities for use in detection of other cancers e.g. lung and animal cancers and conditions such as cystic fibrosis.

Major research is underway focusing on dogs being used for second line support in difficult to diagnose cancers, for example, prostate. PSA antigen tests have 75% false positivity and therefore often require biopsies to confirm the presence of cancer. Biopsies could become a last resort if this research is successful and it is certainly looking promising. It could mean that effective diagnosis could be made at a much earlier stage and without invasive procedures. Dogs may even be able to deliver a "maybe". At this stage work continues to find biomarkers of what the dogs actually smell. Discovery could lead to the development of electronic noses and mass testing equipment in GP surgeries.

Research on Parkinson's is being conducted in association with Manchester University. There has been no improvement in medication for Parkinson's for many years and no definitive test: finding a chemical odour which the dogs could detect on skin swabs could have massive implications for early detection of Parkinson's and potentially other neurological conditions.

Another exciting development relates to malaria; in association with Durham University and this may well lead to the exploration of other viral and bacterial infections and to the development of new medication.

Claire believes that her own life was saved by her dog Daisy whose persistence led Claire to check out a

breast problem and to find a deep and difficult to detect malignancy.

The other main element of the work of the charity is on management with the medical alert assistance dogs who are trained to detect changes in their owner's odour triggered by a disease and alert them to take action. Medical Alert Assistance Dogs work directly with an individual as part of the family. Stephen and Molly were given as an example. Stephen has type 1 diabetes and started on insulin at three. Getting doses right is a tricky business in children but Molly can monitor Stephen at every moment to warn of any changes in blood sugar levels. She is able to bring Stephen his testing meter, alert adults and can even undo the zip of his rucksack. This gives Stephen and his family much greater control of the condition and more peace of mind. Better HbA1C levels have been recorded in many cases of those individuals working with dogs, so longer term health benefits are evident. On similar lines, the charity has been working with Addenbrooke's Hospital looking at the difference that the dogs are making to people with impaired hypoglycaemic awareness.

Dogs are able to work through the night due to their polyphasic sleep patterns and this is invaluable when they work with people susceptible to diabetic comas. The dog is able to keep nosing and pawing until the person wakes to a point of taking action.

Work has also started in relation to Addison's disease and nut allergies but this is at a very early stage.

MDD relies solely on donations so please take a look at their website for various ways in which you may be able to help these waggy miracle workers. @MedDetectDogs – twitter and <https://www.medicaldetectiondogs.org.uk/>



# FLAVOUR TALK

CELEBRATING THE 10TH ANNIVERSARY OF THE TABLE TALK  
BARBIZON PALACE HOTEL, AMSTERDAM: 14TH MARCH 2018

MANDY BURNS

The event this year was organised in association with the British Society of Flavourists and on this, the first day, 28 companies were showcasing their materials and 8 organisations were represented in the Services Exhibition, including ICATS.

It had been a rush to get things up and running. David Baines and John Rigby hosted the pre event meal and were then back at the hotel setting up tables with the night staff. It was 3.30am before John got to bed and we were all setting out our wares by 6.45am so it was all go. The first day was the busiest with some 219 delegates.

Key themes included difficulties in the availability of raw materials e.g. grapefruit, vanillin and high costs of those that were obtainable. Sourcing, authenticity

and certification were important issues and there was also much discussion about halal and kosher certified ingredients so this is obviously a growing market. "Naturalness" was still a talking point.

When not on the stand, I attended the table top sessions and managed nine during the day. Presentations varied in quality but all were interesting in different ways.

My first port of call was to **De Monchy Aromatics**. This was a really stimulating start as they were demonstrating a wide range of products and pulling extensively on their expertise in citrus. The full range is given in the programme and I will let you have a copy of that. We tried Orange Juicy Extra for adding top notes to orange formulations, adding authenticity but at a lower cost. This was also available for halal and kosher customers. The Lime Expressed was delicate and with a zestiness not possible from distilled lime. Three terpeneless oils were presented – lemon, grapefruit and Petigrain Paraguay. The petigrain is often used in neroli fragrance applications but can be used in flavouring, for example as a modifier in ginger. Three products were presented that were manufactured in the UK with considerable investment to ensure compliance with EU natural legislation and to ensure purity. These were Linalyl Acetate, Massoia Lactone and Delta Dodecalactone. These could be produced economically too, which was an added advantage. The final product presented was Nootkatone EU natural ex biotech. This used a different process to produce enzymes in a range of purities and created a woody note with hints of pepper and sandalwood.

**Biolandes** presented four main black tea products based on their extensive range of natural extracts. The first was Mate Absolute 60%/MPG made from mate leaves, giving balsamic/tobacco type notes. Their Blackcurrant Absolute was fruity with green notes. Elder Flower extract was very delicate with honey notes and the Orris Absolute was the most powerful with both woody and floral notes. The company sources all its own raw materials.

An event wouldn't be an event for me without visiting the fabulous **Robertet** who had set up their *Bistro Chez Robert*. As always their presentation was colourful and creative,

beautifully showcasing their pepper collection. The first was Cubec Pepper CO2 Extract, partly using berries of Indian origin to give spicy, woody, fresh/herbal flavours. The Tasmanian Pepper was not a real pepper but gave basil, spicy, pesto complements. Part using fruits from India, the Bengal Pepper gave spicy, woody, balsamic notes. Another "not real" pepper was Nepal Pepper which was fruity and floral with grapefruit notes and produced a slightly numbing effect on the tongue. The Madagascar Black was spicy and pungent - my favourite, I think. The final tasting was Sichuan Pepper, again not a real pepper, and this was spicy and metallic with notes of lavender and bergamot. Sadly no champers this year but we were given some yummy peppery macaron.

**Isobionics** was my next table where Marc and Lucas showcased four products made from sugar in a brewing type fermenting process. Their products are always stable and available and use no pesticides. The first was Natural Beta Bisabolene with a flowery and citrus odour suitable for a wide range of products such as beverages, food, fragrances and skin care. It is kosher and halal certified and compliant to EU and US food grade regulations. The Natural Nootkatone had a grapefruit and woody top note and again complies with kosher, halal and food grade regulations. They also exhibited a synthetic Nootkatone. The final tasting was of Natural Valencene which had a typical orange/citrus aroma and tasted just like haliborange to me!

**Lionel Hitchen**. This is an interesting family owned company. Their success, they feel, is due to the relationships built over many years with suppliers and customers and the fact that they can do small runs which keeps them competitive. They were presenting citrus and herb and spice extracts. Their first was a high specification lime using high vacuum distillation and Persian Limes. It had an intense and full lime flavour and they process orange and grapefruit in the same way. Clementine Oil 5-Fold was sourced from South African fruit and with improved solubility. Bergamot Oil Terpeneless has sweet floral and citrus notes. From the herb and spices extracts they showed HiPer Fennel developed for use as ingredients in beverage flavours. It is manufactured by short path distillation and retains the full, intense and fresh flavour of the fennel seeds. The Hi Per Ginger Cochin is a recent development made from dried roots and complementing the Ginger Nigerian. It will be of no surprise to those who know me that my personal favourite was the Chilli Chipotle Soft Extract, an aqueous ethanoic extraction of smoked, dried red Jalapeno chillies for adding a warm, smoky note to beverage flavours. Their next extract was Galangal which was completely new to me. This is a root of the ginger family and often used in Asian cuisine. The Black Pepper Washing was developed for use on its own or as a building block for more complex flavours and the final tasting was Chilli Birds Eye Washing which could also be used on its own or for more intricate flavourings.

**Synerzine**: The representative, Dinh Phan, presented from a lap top which was not easy to see on the large round table. This is a relatively new company (formerly Pyrazine Specialities) hence there is no current web site. A little more information can be found on Dinh Phan's LinkedIn page. They are currently doing considerable work with the University of Georgia aimed at the Asia/Pacific region and working towards halal certification. They sell over 1200 products, mostly pyrazines, typically synthetic rather than natural. Some are produced in the U.S but some in China.

**Horner International**: Jerry Horner led this session on botanical extracts. The first tasting was a mint chocolate extract. He explained that the company has a good stock of vanilla so can be very competitive on pricing. The Mountain Maple Bark Extract is sweet and aromatic and has been in very high demand. The Bourbon Whiskey Oak Extract was interesting and the intense red Hibiscus Blossom extract is deemed useful for a wide range of products. Pepper is in demand and their Szechuan Pepper Distillate is light and therefore suitable across ranges. The final tasting was Oil Soluble Cocoa Extract which was rich and creamy.

**Symrise**: The taste kit consisted of 3 flavours; Rose Oxide which was fruity and delicate with green and herbal notes that can be used in tea, peppers and lychees, for example. A new material Lactojasmome which was creamy with coconutty and mango notes was also presented along with Carvyl Acetate, which could mainly but used in spearmint and grapefruit flavours. We tasted three lollipops one with just the lactojasmome, one with the lactojasmome and the rose oxide and one with all three included. The same was then done using yoghurt dip as a medium; this accentuated the coriander, lemon and pepper notes.

My final stop of the day was **Naturex** where a number of interesting extracts were up for tasting. They were presented very inventively using colour to set up expectations of bitter, sweet, salty etc. The first was loomi fruit, which is Middle Eastern in origin. This fruit is becoming much more popular and the extract is cost effective to produce for citrus and smoky notes. The rose fluid extract was characteristically floral and cannot only be used in confectionary, but also in beverages, yogurts and strawberry jam and some savouries. There is considerable interest in florals in the market. Like the rose, the orange flower extract was Moroccan in origin with a fruity note. The Brazilian Yerba Mate powder extract had bitter, herbal and leafy notes. A new flavour to me was the St John's Bread roasted solid extract, Mediterranean in origin and often associated with fenugreek giving a cocoa note. Oak chips toasted solid extract was from the USA and used actual wood giving obvious barky notes and smoky nuances.





## DAY 2: THE FUTURE OF FLAVOURS IN EUROPE: OPPORTUNITIES, TRENDS AND CHALLENGES

Speakers in the morning sessions focused on Consumer Dynamics. First up was Professor Charles Spence of the University of Oxford on **Gastrophysics** and **Multisensory Perception**. This was a fascinating presentation considering impacts on the perception of food and where that perception resides. He postulated that there can be huge disconnects between expectation and actual flavour and how sampling foods in sequence can influence the design of a meal or simply a mouthful. Eating, he argues, is a complex, multisensory experience.

He related a story of being in Japan on a hot day and seeing a green ice cream which he expected to be mint or pistachio. His initial reaction was immediate distaste because it was green tea. On other visits, knowing it to be green tea, he found it enjoyable and refreshing. Heston Blumenthal, a chef he has worked with many times, tried out a pink crab sorbet which he thought was perfect. His diners however complained that it was too salty because the colour had suggested a sweet, perhaps strawberry flavour. In later weeks a name change to a "savoury ice" modified user perception and led to a greater enjoyment of the dish, which was no longer considered to be too salty. Professor Martin Yeomans, of the University of Sussex has found, in his research, that enjoyment of food is created by mind, smell, taste, memories, environment and emotion.

Consideration of these factors in the dining experience can help both chefs and consumers to look at food in new ways. Sound can be very relevant and can significantly influence the eating experience e.g. crunch sets the right expectation for freshness and increased enjoyment. Soggy crisps may taste the same as crunchy Pringles but would not be enjoyed. Sound can, therefore, be a driver of snacking behaviour. Some restaurants and even airlines have tried sounds with food e.g. seafood was perceived to taste better when presented with sounds of the sea and Blumenthal tried serving a sea food dish with a conch shell and headphones.

In a Synaesthesia event, guests were given four spoons – one red, one white, one green and one brown/black. The chef recommended starting with salty, then the bitter spoon, then sour and finally to end on a sweet note, but gave no indication which spoon was which. Diners were asked to arrange their spoons left to right in the order recommended by the chef. 75% did as the chef intended showing that taste can be associated with different colours. Responses to colours can though be changed over time and Prof Spence noted that marketers once veered away from blue but many now use bright blue to sell their products e.g. blue vodkas and the Blue Magic range.

However, it is not just about sound and sight; there are far more connections between the senses than have, perhaps, been previously considered. Atmosphere and environment, even the colour, shape and weight of furniture, crockery and cutlery can subtly influence behaviour and perception.

Atmosphere can have a significant effect on how much we eat and drink as well as how much we would spend on them. Professor Spence quoted some research conducted in a supermarket. When French music was played in the wine section 77% of the red wine purchased was French and only 27% German. When German Bier Keller music was featured only 23% of wines purchased were French and 73% German. In one report it was shown that when music in a bar gets 22% louder, patrons drink 26% faster!

In 2013 in London, the Singleton Sensorium involved 500 people over three nights. Three rooms were set up and decorated in different styles. One aimed to recreate an English summer afternoon with grassy green sights and sounds, the second used tinkling, high-pitched sounds like wind chimes in a red room where everything was round and smells were sweet. Finally, there was a woody room with sounds of creaking floor boards, scents of a forest etc. Over the three evenings people were given a glass of whiskey and a score card noting the grassiness on the nose, the sweetness of taste and a woody after taste. They were also asked how much they liked the whiskey. After

three nights the ratings of the very same whiskey differed with comments about grassiness being more intense in the first room, its sweetness in the red room and its woody aspects accentuated in the woody room. It was enjoyed the most in the woody atmosphere.

In a colour lab, 3000 people were tested and each given a glass of Campo Viejo Rioja in a black glass. Participants were asked to taste the wine, first under standard white lighting then under red illumination and finally under green. Different music was played in each case with the type of music chosen for its 'sweetness' in the red lighting and its 'sourness' in the green light. There was a 15-20% change in perception according to the background colour and music: red and sweet music accentuated a perception of fruitiness and the green/sour music brought out fresher notes.

Oddly, it has been found that 25% of people ordering tomato juice (usually in vodka) only do so when in the open air. The theory is that this is due to the strong umami flavour which is enhanced by the engine noise and so it becomes a form of a self-medication.

There could well be longer term health benefits from an understanding of this research, for example in ways to encourage those with diabetes to eat less sugary foods, to eat less for dieting purposes or for those with Alzheimer's disease to perhaps eat more.

The research has obvious implications for those presenting food and drink to consumers in dining experiences and in marketing especially due to the trend of gastro bombing. 40% of British diners now snap what they eat to post on Instagram or similar social media platforms and the percentage is increasing. Food porn is a massive internet market.

In Oxford, Professor Spence conducted an experiment in a college where a salad was served to 160 diners either as just a regular salad or one arranged to look like one of Kandinsky's paintings – but using the same ingredients. Diners were willing to pay more than twice as much for the same food when it looked more visually attractive.

The sight of our favourite foods when we are hungry really excites the brain with a 24% increase in blood flow! "We eat first with our eyes" and the brain really cares!

Professor Spence generously gave a copy of his book *Gastrophysics* to all delegates. It is fascinating. There is, of course, far more detailed information in the book and many more examples, plus information on a possible genetic influence on taste and a potential link between a liking for bitterness and psychopathy. There is much more on the implications for marketing and healthy eating too and some scary thoughts about what might happen when our food sources start to run out. I will, of course, pass the book to the office and recommend it as a good read.

## MARKET INSIGHTS AFFECTING THE EUROPEAN FLAVOUR INDUSTRY: JAMIE RICE, FOOD-TRENDING.

Jamie began with a historical perspective on the use of flavours and spices and their initial function in magic and medicines. In more modern times, of course, technology evolved to boost flavour with high impact aroma chemicals. With the advent of E for Additives everything changed with consumers no longer trusting chemicals in food and drink, believing them to be dangerous and toxic. This really wounded the food industry which began to look more to nature with spices and extracts etc..

The ingredients market is worth 12 billion Euros and flavourings around 6 billion. Consumers spend around 1,600 billion pa. Dominant areas of flavourings include sweet and fruity, seasonings. Flavourings for marinades, rubs, glazes and ready-to-use sauces show a high growth rate. In commodities, sweet and fruity flavours form the largest market but there is a slow growth in areas such as yoghurts, butter etc..

Seasoning, herbs and spices are now worth \$1,714,000,000, with wide use in meat products. Flavouring extracts and materials are worth \$838,000,000, mostly used in ready meals, meat products, snacks, and increasingly in beverages. Enhancers are used to give ethnic flavours and BBQ flavours which are also increasingly high in value.

What will he predict to happen in the next three to five years?

### 3 Challenges

- Slow-down in food and drink interests globally so difficult in terms of growth opportunities
- Static to declining category growth
- Extreme market fragmentation – possibly the biggest challenge.



Large multinationals used to dominate the industry, but now there is intensifying competition from small innovative companies, who are often fair trade and offer locally-produced goods. He felt that with the expanding customer base small set ups could be the next big thing and so flavour companies will need to be able to supply small quantities to myriads of customers.

Trends are key to adding value and looking at business opportunities e.g. health and convenience where there are growth rates of 6-10%, but trends need pinning down. This was, of course, a plug for his own company and what they could offer but he did identify five strategic trends: -

1. Bolognasia – a reinvention of dishes to look healthy and more sustainable e.g. addition of spices or use of alternative meat sources such as goat.
2. Mindfuelness – new products targeted to improve cognitive function with use of flavours to enhance avocados, seeds, roots etc.
3. Retail by-pass – the ways products are reaching consumers via new channels. There can now be direct liaison between manufacturer and customer allowing for more personalisation and direct consumer feedback e.g. recipe boxes.
4. Waste not waist not – with rising obesity and costs of health care we must look to portion sizes and the elimination of food waste.
5. Kitchen style production – consumers are increasingly wary of large-scale manufacturing looking at more artisan markets and small-scale food products on smaller batch production



**PROFESSOR BARBARA SIEGMUND OF GRAZ UNIVERSITY OF TECHNOLOGY: FLAVOUR ANALYSIS AND SENSORY EVALUATION AS TOOLS TO UNDERSTAND THE FLAVOUR OF FOOD.**

Professor Siegmund talked us through the basic techniques of flavour chemistry and presented case studies relating to the flavour of honey and of Aronia Melanocarpa juice. In sensory evaluation, the aim is to understand the consumer and products they like the most with the subjective use of untrained panellists (consumers). Her research group tries to answer questions such as “Why does a food smell like it does?” and focuses on more objective analytical evaluation to understand the properties of the product e.g. aroma, flavour, appearance etc and uses instrumental flavour analysis to understand the “off flavour” on a molecular basis. Gas chromatographic techniques and olfactory tests are applied allowing sensitive determination of flavour compounds. Highly-specialised analytical techniques are needed to identify the volatiles and the odour-active compounds frequently present in ultra-trace concentrates. She outlined some of these techniques including a multidimensional GC-GC-MS (heart-cut technique) with the option of GC-olfactometry of the regions of interest and comprehensive GC\*GC-qMS. Results are then compared against databases thereby correlating and comparing data in order to evaluate the importance of an odour-active compound to a product (only a compound with OAV higher than one is relevant to the flavour of a product).

**Case study 1:**

This looked at the flavour of honey and the investigation of eight unifloral honey samples with chemical analysis of flavour compounds and sensory evaluation (using Projective Mapping in combination with Descriptive Analysis). Samples that were perceived as similar were arranged close to one another and those dissimilar placed further apart. Multivariate analysis was used to identify four clusters including blossom honeys with floral and citrus notes, lavender with minty notes; tree honey had more bitter and caramel notes and linden medicinal notes. The second stage involved identifying the volatile oils.

**Case 2:**

Black chokeberry – a superfood with high polyphenol compounds (Aronia Melanocarpa), high vitamin content and high levels of trace minerals. The juice is good for high blood pressure, may have anti-tumour properties in the case of breast cancer and may help in lowering cholesterol. Sensory properties included high polyphenols and distinct red berry notes

**TRACEY ANDERSON FROM SENSORY DIMENSIONS LTD. SENSORY AND CONSUMER RESEARCH: NEW PERSPECTIVES**

Her company helps to improve products and their positioning in the market. She had been very impressed by the 2017 Panghorn Symposium which she had attended, particularly relating to issues such as food choice and how food products affect the emotions. The environmental context was also considered. She conceded that, in reality, testing products is most often done in central laboratories where they try to minimise external distractions but there is awareness that it is an artificial environment where perceptions and expectations might differ from more natural environments. Her company also conducts home placement and use testing and that too has its challenges as they do not always know how the tests are being applied or even IF they are being applied. However, they do try to create more representative contexts. One use of immersive technologies was on toilet blocks to try and select which two fragrances of products should be used. They first used a sensory lab environment where they were shown a picture and smelt a fragrance in a jar; this was followed by a virtual reality restroom video accompanied by flushing sounds and again involving sniffing a fragrance in a jar; the third was a home use test in a real toilet. The same result came out of all three tests but they did find that the people wearing the VR goggles and hearing the flush were more engaged and enjoyed it more. This engagement gives better prediction for commercial possibilities.

The use of a beach setting was used to test desire for beverages. Again, they used a sensory lab, a natural setting and a VR simulation using 3D picture enhancements, beach sounds etc. People wanted cold drinks more in the beach setting than in the sensory lab.

The point was that environment can influence results. Another test studied fruit flavoured non-alcoholic beers. In the sensory lab they created a beach themed room – smells of sun cream, sea spray, pina colada and a night club themed room with music, low lights and smoky smells. Testers were asked how much they liked the drinks and when they might use them. The sensory lab had no effect on the like or dislike of the product but created influence on the time of day when it might be consumed. In the immersion rooms some beers were found to be better for a party environment, with others preferred in the beach room.

Some other work had been conducted on emotion, how people feel specifically when snacking. This was a very large study with many objectives but primarily looking at sweet snacks, how they met consumer expectations and finding emotional profiles. The snacks were toffee and milk chocolate popcorn, cinema sweet popcorn, toffee, Cadbury’s Buttons and Maltesers. Forty nine couples were recruited and all experiments were conducted in the evenings. Once a week, on the same evening and



time for five weeks each couple were given one of the five snacks and watched television; a questionnaire was then administered at the end. They used an immersive context creating two identical living room scenarios with soft lighting, curtains, cushions, sofa, TV, coffee table etc. The couples could choose from a selection of TV shows e.g. *Only Fools and Horses*, *Friends*, *Fawlty Towers*, *Miranda*, *Big Bang Theory* but had to choose a different episode from the same series every week. The results produced different functional profiles with Maltesers and Buttons seen as a treat, toffee and chocolate popcorn best for special occasions and cinema popcorn was perceived as lower calorie. In terms of product liking on texture, flavour etc, Buttons were most liked followed by Maltesers and cinema popcorn.

Testers reported that all products made them feel relaxed, happy and treated. This was a bit disappointing in terms of discrimination, perhaps because people find it difficult to verbalise how they feel or maybe how they were asked about how they were feeling was wrong as it is not a conscious process. In *Thinking Fast and Slow*, Daniel Kahneman writes about subconscious system one responses which are fast, and stage two which are slower, more relaxed and considered. The questionnaire was more system two so may have elicited responses of a side of themselves that the respondents wanted the testers to see and not really how they felt emotionally. For this reason, Tracey and her colleagues began to look at tests related more to system one responses which were all computer based and looked at fast and strong associations to discriminate the snacks. The same people were used on the same evenings and times but about four to five months later. On their first visit the couples were asked to bring in their own choice of ideal snack and then to come in three times so only three snacks were assessed. Maltesers, Buttons and Cinema popcorn were still liked but this time they did get emotional profiles e.g.:

- Maltesers and Buttons = happy
- Buttons = nostalgia
- Cinema popcorn = comforted

**DR PATRICK DUNPHY, VANILLA AND FLAVOUR CONSULTANT: VANILLA IN MADAGASCAR. A MAN-MADE CYCLONE**

According to Dr Dunphy there has been a steady decline in the quality of cured vanilla beans in Madagascar but a sharp incline in price. The problems are complex and set against a background of consumer desire for natural rather than artificial flavours. Factors include,

- Climate interventions
- Vanilla curing processes
- Farmers and their issues
- The Madagascan situation in 2017 and projections for 2018

In March 2017 a category four tropical cyclone hit the Sava region in the north east of Madagascar where 90% of the vanilla is grown. It was a very severe storm reminiscent of the last major cyclone in 2004 that had massive consequences for the people and the land. The 2017 cyclone did considerable infrastructure damage, about \$400million and a consequent 30% loss of the vanilla crop. By August 2017 some cured vanilla prices exceeded \$600 per kilo – unprecedented price hike.

Vanilla curing – a number of processes are involved. Ideally collectors pick up the ripe beans from the farmers; the beans are then taken to a curing facility and kept undercover for 45 days, hot water treated to blanch them and are then sun and rack dried for 20 days and stored in batches. The whole traditional process takes 100 days and gives a rounded flavour to the beans with a vanillin content of 1-2%. However, some farmers decided to part-cure the beans themselves but the beans were not blanched or stored correctly and some were vacuum packed in the hope that prices would rise if they were stored for some time. Vacuum packing may cause a high water content which actually kills the beans.

Three other processes are possible:

- Controlled – This was developed in 1972 using the best quality ripe beans with a rapid 6/7 day blanching, chopping, fermentation and drying treatment. This process could produce 3-3.5% vanillin but with deficiencies in the overall aroma
- Quick curing – developed in Madagascar in 2013 but using immature, ripe or overripe and vacuum-packed beans with 6/7 days drying. This produced a poor quality, inferior product with vanillin of 1% or less.
- Green bean processing – chopped beans, fermented and dried followed by extraction of natural vanillin.

Dr Dunphy and his colleagues have developed an index of

curing efficiency to help stop the vanillin degrading.

The situation for farmers: Ideally, the farmers grow and ripen the beans and pass to the collectors. There are around 80,000 farmers and 6,000 collectors. Unfortunately and increasingly traffickers intercept, offering the farmers money for the beans that are often not ripe or badly partly-cured by the farmers, which are then passed through the traffickers agents to the collectors. Farmers face volatility in prices and a lack of access to resources. Few have IT skills and do not have the finance to manage disasters or pricing fluctuations so it is very difficult to deliver high quality beans consistently. Choosing to part cure beans has resulted in a much lower quality product. In Sava, theft of beans is a major problem with most of the beans taken before they reach maturity.

2017-2018: Sadly a decline in quality and reduced levels of vanillin are predicted. India, Uganda and Papua New Guinea are producing vanilla, but the output for India and Uganda is poor as quick curing only produces a universal low grade. This would be unacceptable in quality applications. Prices are likely to remain very high and even what Dr Dunphy regarded as “low-grade rubbish” was selling for \$400 per kilo. Madagascar’s reputation, he feels, is “rolling away”.

Solutions are only likely to be found if farmers can see stabilised prices and good curing rations – no vacuum packing! He feels that exporters and flavour houses need to support and advise farmers on research and development and guaranteed stable pricing to ensure best quality for customers.



**DR MATTHEW HODGES, OXFORD BIOTRANS LIMITED NOOTKATONE AND MONE –P450 CATALYSED PRODUCTION OF FLAVOUR &FRAGRANCES**

Biotrans is a small biotech company manufacturing high value chemicals using enzymes and biological processes with patented enzyme technology. Benefits include low cost of products and no high energy compounds, such as peroxides, no heavy metals and no toxic waste. Because it is greener, there is more consumer acceptance and more sustainability.

From a natural starting material a biological catalyst is used, reflecting processes found in nature, and this technology is being used to make fine, high grade chemicals like *nootkatone*, advanced materials like *resveratrol* and drugs such as statins, steroids and metabolites. In his words, they are redesigning synthesis.

With 400,000kg of grapefruit needed to make 1kg of *nootkatone*, pricing is very high but if something else is used e.g. *valencene* (from oranges) which is easier to obtain then processing can be more efficient using P450 as a catalyst. The resulting product is considered “natural” and GMO free. As it is a two-step process no labelling for GMO is required. Consistent quality can be assured and a predictable and reliable supply chain. The company is always seeking improvement in productivity and quality e.g. safety evaluations and regulatory approvals. Their product is an approved food flavour, contaminant free and with certificate of origin provided. Interestingly, there is a market for *nootkatone* as an insect repellent. To date, pricing has been a hurdle but with cheaper processing and alternatives to grapefruit it may become more of a possibility.



**DR DAVID BAINES OF BAINES FOOD CONSULTANCY EUROPEAN FOOD SAFETY AUTHORITY SETS ACCEPTABLE DAILY INTAKE FOR MSG – IS IT JUSTIFIED?**

Dr Baines made the point that MSG is found in all savoury foods and has been used for many years in Japan. A combination of Kanbu (MSG) and bonito (ribonucleotides) makes for tastier soup.

In 2000 a receptor was discovered on the human tongue which responds to the glutamate ion. Since then four more receptors have been discovered, two of which produce the synergy effect of inosine monophosphate (IMP) and guanosine monophosphate (GMP) and glutamate.

In his view there have been flaws in test protocols and such work was never repeated. Dr Baines feels that research shows a behavioural effect in rats (in large doses resulting in gastroenterology problems) but not toxicity.

In looking at MSG and headaches, the joint Food and Agriculture Organisation (FAO) and World Health Organisation Expert Committee on Food Additives (JECFA) reported in 1991 that there was no proven link to headaches or asthma. More recently, articles in the *Journal of Headache and Pain* concluded that there was no proven causal relationship between headache and MSG. Dr Baines pointed out that breast milk, in fact, contains measurable amounts of free glutamate. In his view, MSG is important to human nutrition and he believes that the ADI is based on suspect research.

# BRITISH SOCIETY OF PERFUMERS

36TH ONE DAY SYMPOSIUM, MAY 17TH 2018

MANDY BURNS

**Many delegates, ourselves included, arrived on the evening of the 16th in order to prepare for the following day, so there was much activity in meeting up with some old friends and acquaintances.**

After a warm welcome from President, Virginie Daniau, the day itself began with a very interesting presentation by Dr Claire Guillemain entitled *Law and Odeur* addressing the complexities around regulatory affairs and the many challenges involved in perfume protection and intellectual property rights.

Claire began by outlining some of the historical perspectives of the perception of smell which have led to physiological challenges. The limbic system of the brain is very primitive and more instructional. The sense of smell is associated with this primitive, feral area and has often been related to something unpleasant, even evil in the past e.g. miasma, plague e.g. *"The sense first in point of excellence, is the touch, and smelling the last"* (Buffon). This lack of interest tended to a lack of precision in vocabulary relating to smell which, in legal terms, makes for difficulties around just what is being protected – smell, formula, fragrance, odour etc. Two fragrances with different formulas can have a similar scent and two with similar formulas can have a different scent, so there is ambiguity about the object of protection and considerable interpretation relating to olfactory form and its smell.

Similarly, olfactory form relates to a more subjective and emotional response, which tends to a lack of precision in vocabulary. The smell sense is also instinctive and primitive, subjective and indescribable whereas the law demands normative, logical and rational approaches.

There are sociological challenges too. In general, human beings are intolerant of bad odours preferring to "perfume" people, products and places. Industry and technology have responded, creating more fragrances

according to the changing expectations of clients, environmental health disclosures, regulations and the entry of new players in the global market; all adding difficulties in terms of protecting perfume and fragrance.

Intellectual Property (IP) refers to creations of the mind and fosters innovation by offering creators a return on their investment. However, in regard to scent and fragrance there are limits to protection of patents, trademarks and copyrights. It is possible, for example to patent new molecules but there can be long and costly formalities to attend to and the patent will only stand for 20 years with no full disclosure requirement. Trademarks can protect a logo and it is possible in some countries to protect olfactory marks. Again, there are strange anomalies, for example it was possible to register fresh cut grass to tennis balls but the scent of Chanel No. 5 was refused "for lack of distinctiveness". Smell, olfactory and taste marks are currently not acceptable for registration in the EU as they are not clear and precise enough. Copyright would appeal to perfumers as it offers generous legal protection for up to 70 years after the death of the creator. However, in the UK scent is not on the closed list in terms of copyright.

Claire then outlined cases of litigation in the French courts regarding acceptance for copyright and in France, at least, most have ended with the decision that a fragrance is a creative expression but not in a form that is sufficiently precise and not perceptible enough to be protected by copyright. A case in the Netherlands, however, did find that a fragrance can be protected by copyright. Ironically, packaging, shape of bottle and name of product can be protected just not the actual fragrance. The big problem is not being able to describe a fragrance as it is subjective. You can protect the olfactory source but not the olfactory form.



In terms of moving forward Claire suggested that many are protecting formulae by reverting to trade secrets under the Trade Secret Directive adopted by the EU Commission in November 2013. There is also the possibility of awareness raising and lobbying for public recognition and legal protection. Science and technology may prove the most encouraging tool. Although "you still can't fax a perfume" (Lucan Turin 2007), it is now possible to send a perfume by O-note Digital Scent, so that is a promising start.

Interestingly, there was some discussion in our plenary about trying to identify traces of scents – akin to human DNA, which would be recognised as precise.

After the opening meeting, delegates were split into groups to attend individual presentations. Our first was Symrise who had prepared a most attractive room display to present *The World of Lily of the Valley*. They focused on the scent's important role in perfumery as a building block, loved for its natural freshness and its perfect complement





to citrus. It has, however, become a created scent mostly in response to the expense of extraction of the essential oil. They showcased use of the three M's, *Magnolol*, with white blossom inspiration, *Majantol* for transparent floralcy and *Mugetanol* for white floralcy. Key 15 was used as a "gentle breeze for elegance and floralcy". All were demonstrated in relation to personal care, home care and fabric care.

Agan Aroma, an Israeli company, had never attended the symposium so were keen to present both company and products. They are a subsidiary of Adama which is the sixth largest agrochemical company in the world and although they manufacture primarily in Israel and Asia, they have offices throughout the world and have formed a recent partnership with Firmenich. They see continued expansion as a global presence as the way forward. They presented Green Leaf, a powerful grassy odour with recommended usage for fine fragrance, personal care, fabric care, home care and candles. *Pomelone* is a citrusy, grapefruit ingredient with a wide range of possible applications. In the pipeline is *Astralone* which will launch in 2019 and is an oak moss fragrance (sadly samples were not provided). The company have also launched into the commercial market via *Moodo*, marketed as a smart home fragrance mixer. This device is Wi-Fi enabled and controllable from anywhere. It offers a way to personalise your environment and has a scent shuffle function to avoid nose blindness. This is their first consumer product.

Firmenich presented Z11 which is a well-known product but launched via White Biotech in 2018 with a reduced price. The new process uses white biotechnology and green chemistry to produce a renewable ingredient with a stable quality and unlimited availability. *Beyond Muguet* (Hivernal) uses a new synthesis to replace the lily flower and gives a fresh floral, green note. Two naturals were also presented, *Rose Centifolia* and *Oud Assafi*. The rose is very pricy but is a lovely sensual, natural fragrance. The other natural was Oud Assafi, the result of a long term Bangladeshi partnership; this oud adds richness and boosts woody and spicy notes. Oud prices are exceptionally high, so this is a welcome addition.

Takasago introduced three products being launched onto the market. The first was *Tanzinal* with a strong mandarin/tangerine note and particularly good for shampoo, soap and fabric wash applications. *Biocyclamol*, floral and green, is 100% bio-based, bio-degradable and made from a renewable source. The final sample was *Dextramber* which, as its name suggests, gives a woody amber note.

Our last stop of the day was Synarome Nactis Flavours. Nactis acquired Synarome in 2006 and in 2016 it acquired the F&F range of PCAS. However, disaster was to follow when in May 2017 the Chartres business unit was virtually destroyed by fire. We were shown slides of the disaster which pretty much gutted the buildings and equipment



including the Ambrarome processing facility. Needless to say they are still recovering and rebuilding. They made the most of the situation by hosting a fun sniffing stick session with us all wearing cat masks! This session was certainly different and very enjoyable. Those samples sniffed included demonstration formulas for *Aquarome 10* (Ombre and Santal), *Heliotropin* (Mimosa and Gardenia) and *Ambrarome* (Lavande and Cherry)

Our day came to a very satisfactory conclusion with dinner and dancing to accompany the awards ceremony.

The BSP charity of the year is the Bumblebee Conservation Trust and the gardeners among you may want to check out their web site for some beautiful literature on how to do your bit to save the wonderful bumble. <https://www.bumblebeeconservation.org>

Last, but definitely not least, a note of thanks to Peter Whipps for organising the event and a big thank you to Clare Guillemain for providing her slides for guidance.



# BOOK REVIEWS

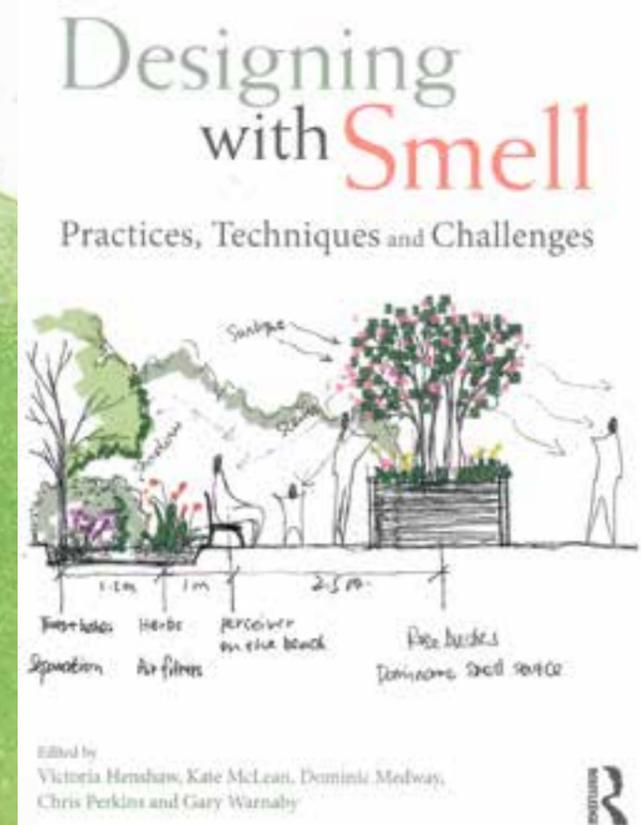
DR TONY CURTIS

## DESIGNING WITH SMELL: Practices, Techniques and Challenges

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Kate McLean  
Dominic Medway  
Chris Perkins  
Gary Warnaby

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### Afterword: Jim Drobnck

We recently reviewed Urban Smellscapes (Victoria Henshaw) and this timely book takes things a welcome step forward. Some time ago I contributed a chapter to a book entitled 'Sense and Scent: An Exploration of Olfactory Meaning'. This was an eclectic variety of approaches to odour in literature and the language of odour. My contribution was 'The Development of Odour Language between Professionals in the Aroma Trades Industry'. Pretty much standard fare in our teaching of Aroma Trades Studies. This rubbed shoulders with a contribution by Richard Griffiths 'From Sexual Arousal to Religious Rapture: The importance of Smell in the Writings of Zola and Huysmans'.

This book is equally eclectically entertaining, informative and provocative. I must declare a special interest here. Our Jo Norman (ICATS Tutor) has contributed, with her co-author Nicola Pozzani, an excellent chapter *Olfactory Education in Art and Design*. This contribution adopts a case study style of approach. I particularly liked the

second case study 'The Introduction of Olfaction across all Art and Design Programmes'. We often in the Aroma Trades have to take a highly technical view. There can be no light touch in the evaluation of safety and environmental issues. What we must also remember is there is a whole artistic creative vector where odour can be part of a holistic artistic experience.

Our readers from the flavour sector of the Aroma Trades should find Chapter 5 *The GhostFood Project: Enhancing Flavour through Personalised Smellscapes* interesting. This truly original project was to communicate environment and climate change issues. The approach was well put by the author, Miriam Songster:

*GhostFood* used eating (and smelling) as a means to experience climate change on the most personal of levels, and to encourage people to think both realistically and creatively about food and eating in the future marked by global warming and species loss. In the process, *GhostFood* provided an opportunity for people to more closely examine the relationship between flavour and smell, and the impact each has on the way we experience food.

Jo used a case study style of presentation. Here in this section Miriam brings the reader into an intimate appreciation of the participants' experience. Part of the project was to bring attention to sustainable fishing with 'Bye Bye Baby Cod'. We are brought into the totality of this innovative, integrative sensory project with this subject's quotation:

"I'm aware that I'm smelling cod and eating something tasteless and smelling of fish at the same time. When you smell your food, it really tastes something. I can differentiate between the taste of what I'm eating and the smell of the cod. So I guess there was a moment when my brain was tricked into thinking I was eating cod."

In medical science there has come a growing appreciation that the whole is greater than the parts. From my engineering perspective, I would call this a 'systems' view. You can, and often must, study the specific elements of system, however, in the performance of the overall system the whole is greater than the parts.

This is a delightful collection of diverse insights into various aspects of odours, aromas and flavours. The rich variety of approaches should bring inspiration and insight to people engaged in both the flavour and fragrance aspects of the Aroma Trades. Do read this book: there is something for everyone in it.

# BOOK REVIEWS

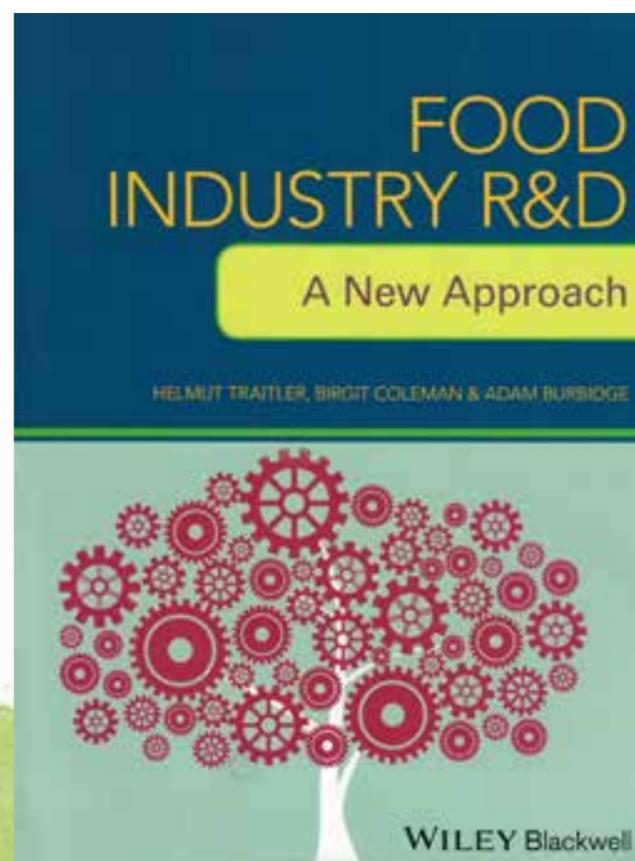
DR TONY CURTIS

## FOOD INDUSTRY R&D: A New Approach

Helmut Traitler, Birgit Coleman & Adam Burbidge

2017 Wiley Blackwell

Kindle edition £61.70, Paperback £64.95



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New product development (NPD) is essential. Kodak was a major brand and at the turn of the century no tourist attraction would be without a kiosk selling Kodak film. The current generation with their smart phones would consider it quaint that you had to send off rolls of film and wait days to see your holiday snaps. From market leader to memory brand in less than a decade, innovate or die! However, it is not all plain sailing. Everyone remembers the Dyson vacuum cleaner that relegated Hoover to history. Do we remember the Dyson twin drum washing machine? Much is written about NPD success. Not so much is written about NPD failures such as 'Dasani Pure Still Water'.

This book is doubly welcomed and I recommend it to NPD professionals, whatever their field of activity. It has refreshing new ideas and approaches to the NPD battlefield. The second is its specific focus on the Food Industry. The authors not only have a commendable grasp of current and past NPD theory but a vast experience of its application and mis-application in the real world of food.

Traditional approaches to NPD will classify some various types of NPD such as the 'new to the world product' and the 'line extension product'. With a refreshingly light touch the authors have come up with a brilliant classification scheme for NPD projects (Chapter 3: A critical view of today's R&D organization in the food industry: Structures and people):

- The business project
- The secret project
- The pet project
- The never-ending project
- The trial-and-error project
- The please-someone project
- The defensive project
- The knowledge building project

The chapter concludes with a section 'Change is needed'. Battle-scarred old NPD hands will manage a smile at this disarmingly, sometimes humorous, approach to explode some of the past NPD traps. This is not only a good read but a survival manual in the NPD jungle.

Again, the approach to intellectual property in Chapter 4 is authoritative and insightful with a wealth of pertinent industry examples yet still retains a light and sometimes almost irreverent touch at times. This is not a stodgy textbook!

A particular feature is the review at the end of each chapter 'Summary and Major learning'. This provides a succinct review and reprise of the chapter's messages and learning points. Postgraduate MBA, Technology and Engineering students will find this book achieves something rare, being both authoritative and accessible. Hardened and scarred NPD veterans will appreciate the discussion of past mistakes and pitfalls but with pertinent recommendations for better NPD management. I recommend this book to any student or practitioner of NPD. For people in the Flavour and Fragrance industry this is not merely recommended, it is a top of the 'must read' list.





## IN THE NEWS

TONY CURTIS

**A key difference between academic reports and business reports is the demand for references. This is not some theoretical issue but a major fundamental problem. Many readers of the ICATS Newsletter will be familiar with GLP (Good Laboratory Practice).** There are many good reasons for this but we will confine ourselves to 'Does the measurement process give a meaningful result that is reproducible, not only in the given laboratory, but from laboratory to laboratory and in time'. In a full academic paper, such as an ICATS dissertation, the referencing allows the reader to go back to the original source papers and evaluate the strength of evidence (e.g. sample size and sampling procedure in a market survey). In the past I was considered an academic nerd for holding such views about academic rigour. I am no longer. Since the American Presidential election, the questions of authenticity have become mainstream in not only the heavyweight broadsheets but also in the tabloid press.

I purred with pleasure (much to the delight of my cat sitting on my laser printer) reading the August 2018 edition of *Time*. The lead article by Katy Steinmetz could have come directly from the *New Scientist*. It was entitled *REAL NEWS - THE FAKE NEWS: Botts and propagandists are just part of the problem, the bigger problem is in your brain*. The lead paragraph states:

*Sitting in front of a computer not long ago a tenured history professor faced a challenge that billions of us do every day: deciding whether to believe something on the Internet.*

The professor was reading a provocative article on adolescent behaviour. All the internet 'signals' suggested that this was a 'proper' academic source. It was in fact from an allegedly conservative splinter faction that broke in 2002 from the mainstream American Academy of Paediatrics over the issue of adoption by same-sex couples.



A research team led by Sam Wineburg found:

*Americans of all ages, from digitally savvy tweens to high - IQ academics fail to ask important questions about content.*

I do recommend, if you have access to a good University library (or on-line), you read the original article. It has taken a major issue in the technical and scientific community into the general domain of mainstream political debate. To illustrate this, I remind readers of an issue where highly questionable views are expressed on the internet 'To vaccinate or not the vaccinate young children?' One of the key aspects consider in the *Time* article is the trustworthiness of a source. The *New Scientist* is one of my favourite and trusted sources. In general, if they have reservations, these are stated in the article. Where they very rarely get it wrong they publicly retract.

This is nicely illustrated in the August 2018 edition of the *New Scientist* with a timely leading article 'The Allergy Epidemic: What are Allergies anyway?' In an accessible way Penny explores:

*Myths about allergies abound. Allergies are psychosomatic. Being too clean is causing allergies. Honey can cure hay fever..*

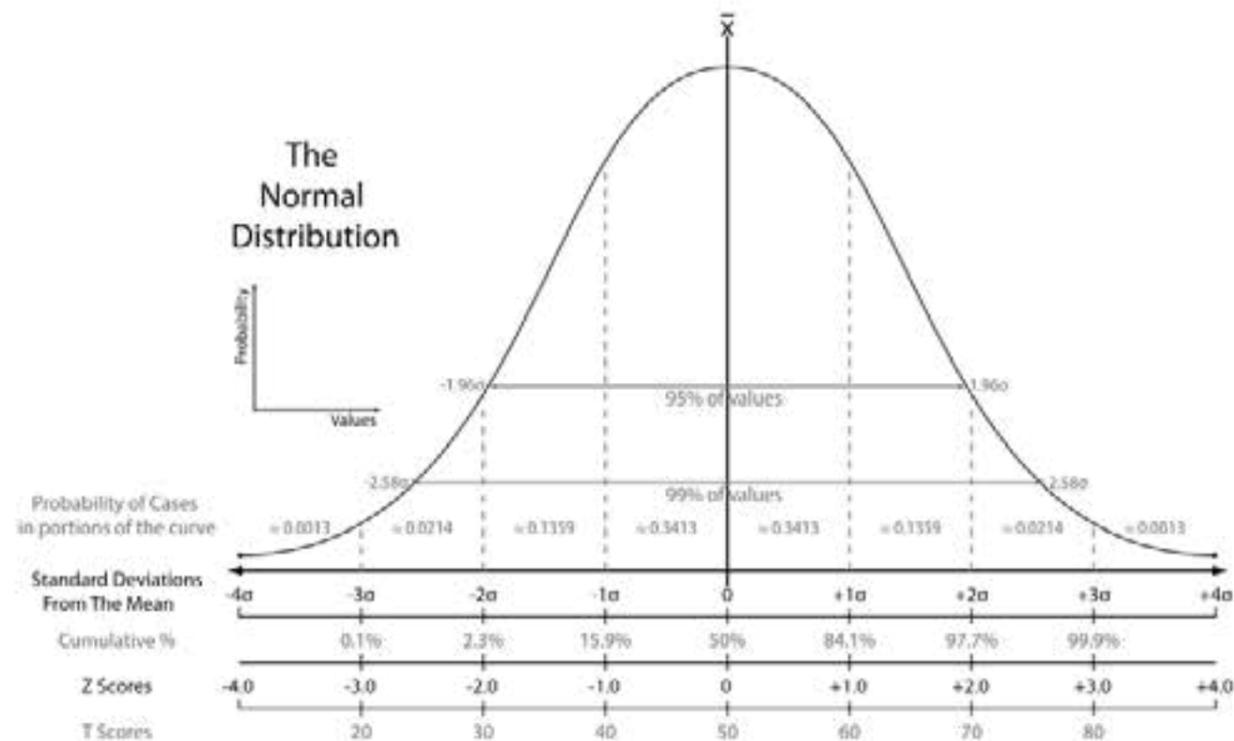
The article first discusses the basis of what they consider as allergies. These are allergies that involve a special class of antibodies called immunoglobulin E (1gE). Different 1gE trigger immune cells to release histamine and other inflammatory chemicals when exposed to allergens.

This whole topic is red hot. There is major growth. By 1991 the number of family doctor consultations for asthma in the UK had quadrupled in only 20 years, clearly something is going on, just what? The jury is still out. However, food and fragranced products are involved in the mix of issues. This is an important topic for our industry and informed balanced debate is important both within the industry and across the general public. What is most interesting is the

list given for the most common allergies: food, insects, pollen, pets (sorry cat!), household pests, latex and mould. One of the skills we aim to develop in ICATS students is not only to see what is there and evaluate it but what is not there. Fragrances are not on this list. However, they are on a second list of issues not classed as allergies of: food intolerance, chemical sensitivity, nocebo effect and rhinitis which can have other mechanisms involved.

If you forget the rest of my report do remember the word 'nocebo' effect. It is not in my old hardcopy dictionary but it does get past my Word spell-checker. The nocebo effect is a negative twist on the placebo effect. To evaluate it you must have a double-blind test procedure. The positive placebo effect is validated in a multitude of medical research papers; hence the need for double-blind tests. Any report of adverse effects (e.g. to a fragrance) that have not considered the possibility of a nocebo effect have a possible flaw. The public at large do understand the placebo effect, we need to remind them that the reverse effect can be true. Many reports on adverse fragrance effects fail this test, especially in the tabloid press and fashion magazines.

Many years ago, I ran a series of business training sessions on business statistics and mathematics (e.g. reliability of systems etc.). Part of the foundation of the course was a series of seminars on basic statistics. We used a couple of set texts, one was *How to Lie with Statistics* (Darrell Huff), this is still apparently still in print in an 2nd edition. The basic underlining theme was that 'The numbers do not tell you anything ---- until you interpret them.' I have just been reading a medical article on Alzheimers disease. What is causing the large growth in the occurrence of this? One contribution to it is that this tends to be a disease of old age. When people had a life expectancy of less than 60 years they died of other causes. Death is certain for us all. As the general age of the population increases more of us will die of the diseases associated with old age. This should not be a surprise.



Consider the case where the cause of a contamination problem was 10% caused by 'x' and 90% caused by 'y'. Clearly the direction of research and action would be to reduce 'y'. Say we reduce the amount of 'y' such that it was down to 80% but had not achieved any reduction in 'x'. The new weightings would be 20% 'x' and '80% 'y'. You can just see the tabloid headline now 'Damage caused by 'x' has doubled'. Well it has not, it was actually unchanged. I am reminded of teaching just-in-time inventory management. One of my slides showed two pictures of a river: one flowing full (high inventory) with no rocks and one flowing low (low inventory) with rocks. On each of the rocks was labelled a poor management issue e.g. high QC rejection rates; the reduction of inventory, revealed problems that had been hidden by the high inventory.

This lengthy introduction is to the issue of VOCs (Volatile Organic Compounds) and related issues (e.g. particulates) in the home. As major sources of VOC & particulates (e.g. car emissions) are reduced, other sources become relatively more important. In the context of VOCs and particulates in the home, cooking and fragranced products are making a larger contribution to the VOCs and particulates found.

Two short reports 'Is hairspray really wrecking the planet?' (*Chemistry World* April 2018) and 'Household chemicals contribute as much urban emissions as vehicles' (*New Scientist*, February 2018) are indicative of the trend. *The Chemistry World* leading article 'Every breath you take: Chemists clearing the air around indoor pollution,' Nina Notman (December 2017) is a timely review. The article does all the good 'Chemical' things you might expect

such as an evaluation of the methods of measuring indoor pollution and the theoretical modelling of contributions from various sources. Two major sources are cooking (in the developed world context: good kitchen extractor systems are the order of the day) and household & personal care products. The obvious observation is that our products are going to become under increased consumer scrutiny as other pollutant sources are reduced and/or eliminated. The second observation is that it highlights the 'systems view' we must take of our products with:

- Product life-cycle analysis, it is not just the environmental fate of the packaging we have to consider
- Interaction effects with other elements of the household system e.g. reduction in air changes in UK homes due to energy efficiency actions

I conclude with my normal plea to our ICATS Students and other readers. Please do try to take some time out for wider general reading. It does reward by both seeing the bigger picture and getting an outside view of the industry. It is important not to let ourselves slip into internal industry groupthink.

The University is committed to providing information in accessible formats.  
If you require information from this guide in an alternative format please contact us.

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