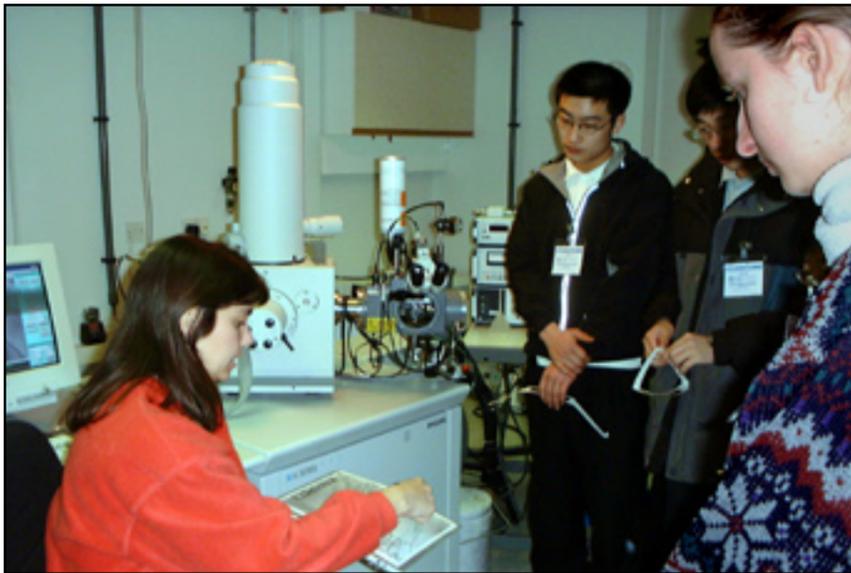




TSN News



Aspirin or What?

Judith Harden, JIC

Clare Lowery, my TSN partner and Head of Chemistry at Langley School, brought her group of upper 6th chemistry students to visit JIC. The students had prepared a sample of aspirin at school, and were eager to test its purity and compare it with commercially produced aspirin. To this end, we enlisted the help of Richard Mithen and the mass spectrometer, Shirley Fairhurst and the NMR, and Marcus Durrant and the IR spectrometer.

After an initially disappointing trace from the mass spec., NMR and IR traces gave much more encouraging results, demonstrating to the students the importance of building up a picture from several sets of results.

Kim Findlay provided a very interesting and entertaining demonstration of the SEM.

Many thanks to all those who gave their time and expertise so willingly – a great start to my TSN experience.

JIC facilities help develop school materials

Charles Hill (Wymondham College) has obtained an embryogenic line of *Medicago truncatula* which he is hoping to develop with a tissue culture protocol for use in schools using a plant protection medium additive (PPM). This considerably reduces the need for sterile facilities. Wendy Harwood (JIC) kindly made available the facilities for the initial subculturing of the plant material to establish stocks before trials with PPM. Enquiries to Charles Hill (hillch@lineone.net).

New Members - Welcome

Mr. Alan Mackie, Research Scientist, IFR

Dr. Karen Butterworth, TSN (JIC)

Dr. Tobias Kieser, Project Scientist JIC

Dr. Sue Angell, Project Leader, JIC

Miss Rachel Adlam, Research assistant, JIC

Mrs. Alison Jones, Science Coordinator, Stradbroke First school

Mrs. Margaret Baker, Headteacher, Tacolneston First School

Miss Lesley Connelly, Science Co-ordinator, Diss Junior School

Mr. Adrian LaChapelle,

Science Coordinator, St Augustin's Primary School

Ms Catrin Parry-Jones, Teacher, Larkman Middle School

Mrs. Catherine Bates, Teacher, Lodge Lane First School

Mr. Richard Spencer, Teacher, Sprowston Middle School

Miss Liz Saunders, Science Co-ordinator,

Freethorpe Primary School

Ms. Elizabeth Drake, Teacher,

Long Stratton High School

Mrs. Denise Grant, Teacher,

St. Edmund's Primary School

Miss Vicki Ward, Teacher, Hethersett Middle School

Mrs. Heather Ware, Deputy Head, Brooke Primary School

TSN School Loan Kits

Available now:

- Seeds (KS 1,2)
- Microscopes (KS 1,2)
- Microscope (KS 3,4)
- Flexcam kit (KS 1,2)
- Torso (KS 1,2,3,4)
- Skeleton (KS 1,2,3,4)
- Heart (KS 1,2,3)
- Germes (KS 1,2,3)
- Plant Movement (KS 2,3)
- Forces and Motion (KS 1,2)
- Spectrophotometer (KS 4,5)

Coming soon:

- Sound (KS 1,2,3)
- Light (KS 1,2,3)

For details go to www.tsn.org.uk

Teacher Scientist Network

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'I did' or 'It was done'?

Sir Robert May responds

Last year TSN members were asked what they think is an appropriate writing style for a scientific report. Should the style be direct; 'I measured the height...', 'We found...', or should it be passive; 'The height was measured...', 'It was found that...'? Which style is appropriate for a research paper? Which is best for children's written work in science lessons? Most thought the passive style is more appropriate for scientists writing research papers and some thought this style should also be used by older school children. Following the TSN survey an article in the New Scientist (19/7/01) by Rupert Sheldrake put the case for all children as well as scientists to adopt the direct style.

Phone calls to the Examination Boards and the major Scientific Institutions indicated that they are, in the main, undecided in the matter. However, in a letter to the TSN, Sir Robert May, President of the Royal Society, robustly promotes the case for using the direct style:

Dear Mr. Chennell

Thank you for sending me a copy of TSN News. I enjoyed the opportunity to see it.

The column, on page 3 about whether one should use the active or passive voice in "scientific" writing really caught my attention. I was particularly horrified to discover that "most TSN scientists say" that the passive style is more appropriate for scientists writing research paper, and that "most TSN primary and Secondary Teachers say" that they are not sure which style they think scientists should use. Admittedly, both groups agree that school children should adopt the direct, "I did", style, although even here we have the looney view that the passive

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There's more to Light than meets the Eye

Another Secrets and Science of Survival Event

The purpose of this science week event 'There's more to Light than meets the eye' was to show children how living things detect light and respond to it.

Over 3,000 children at key stages 2 and 3 passed through the John Innes Centre's Conference Centre during science week 2001. They and their teachers came to hear Mike Linley from the award-winning 'Survival' TV series, give interactive talks on how light affects the activity of living organisms. The talk, along with many interactive displays and demonstrations, included live animals and plants. Children learned how growing, moving, migrating, finding food and finding a mate are just some of the things living things do in response to light. They learned how their own eyes worked, and how insects and other animals see. They saw how some animals can see colours that we cannot see, and they saw how technology can help humans see better.

Supporting exhibits included a large working model eye, light sensitive plants, seeing what different animals see, an infra-red camera, microscope, telescope, walk-in giant camera and other demonstrations.

The TSN, John Innes Centre and Survival cooperate to produce Science and Survival events biannually during science week. Although the Survival team has now moved to Bristol, it is likely that Anglia TV will still support future events such as this one - our third Secrets and Science of Survival event. More pictures inside.



Seeing what the eye sees. One of the many exhibits on display.

style might be more appropriate for older children. At the risk of going over-the-top, I would put my own view so strongly as to say that, these days, use of the passive voice in a research paper is, more often than not, the hallmark of second rate work.

The two major general scientific journals, *Nature* and *Science*, have an interesting history in this regard. For at least the past thirty years, *Nature* has edited articles that are presented in the passive voice, to transform them into the "I did" style. To the contrary, until relatively recently, *Science* remained under the antique delusion that the impersonal forces of history rather than by real people, and it was in the habit of editing manuscripts to transform them from the active into the passive voice; I had several bitter arguments over this point, over the years. But *Science* has made great strides in the past decade, becoming (in my view) more fully competitive with *Nature* in many ways, particularly in its front material. Not surprisingly, a major change has been the switch to editing manuscripts presented in the passive voice to transform them into the active voice. The notion that it is somehow more "scientific" to suggest that some impersonal, dispassionate actor or whatever did the work – thus conferring more authority upon it – rather than the person writing the report did it him or herself, belongs to a older generation. Anyone who writes in this style today simply is not likely to be at the cutting edge.

In short, I believe that Primary and Secondary teachers should, without any reservation, be encouraging all their students – younger or older – to be writing in the active voice. That actually reflects the reality – the students are doing the work – and at the heart of science must be the recognition that it is work being done by people! In the long run, more authority is conferred by this direct approach than by the pedantic pretence that some impersonal force is performing the research!

Yours sincerely

Sir Robert May AC
President, The Royal Society

There's more to Light than meets the Eye



Mike Linley explains how animals see



The walk-in camera

Science Day at Westcliff-on-sea, Essex.

Phil Smith (JIC).

And my TSN partner Maxine Woods (Prince Avenue Primary School) always devote a whole day to a set of science activities based around a particular theme. This time we looked at environmental issues, from acid rain to recycling. The children were very involved practically and we all had a lot of fun.

Our partnership was established when Maxine was teaching in Norfolk and has gone from strength-to-strength since she moved to Prince Avenue at Westcliff-on-sea. Maxine thought the partnership would have to end when she moved out of Norfolk but fortunately TSN have continued to support us.



Seeing in 3D – giant-sized

TSN Primary Science Workshops

These workshops are for teachers of key stage 1 and 2 who want to brush up their science base in particular topics. The workshops aim to give teachers a sound base in the science topic so that they feel confident in developing appropriate classroom activities, and in using related equipment correctly and safely. The sessions link with National Curriculum (Science), the QCA Scheme of Work and our TSN school loan kits, and are a mixture of background knowledge and understanding, and hands-on practice. The second of these workshops, *Forces and Microbes*, was held in November. Other topics planned for the future include electricity, light and sound.

Primary Science Workshops are a mixture of background theory and hands-on practice



TSN Master Class

Evolution

The eighth in our series of master classes took place in November. We always have speakers who are leaders in their field for these very popular master classes, and this one was no exception. Our Speakers were:

Prof. Bambos Kyriacou (Head of Dept., Genetics, University of Leicester) who talked about the evolution of life from the pre-biotic world; how simple molecules such as amino acids arose from the primeval 'soup' and eventually led to the development of DNA and the evolution of replication.

Prof. Godfrey Hewitt (Professor of Evolutionary Genetics, UEA) talked about evolutionary genetics, genetic diversity and the mechanisms of evolution.

Dr. Robert Foley (Centre for Human Evolutionary Studies, University of Cambridge) discussed the patterns of human evolution. When did we become human? Why is Africa so central to our evolutionary history? Are humans as they are because of natural selection?

Prof. Steve Jones (University College London) is well known, not only for his science, but for his popular writing and broadcasting. He considered whether – because of our intervention – the evolutionary process might now be at an end. "Genetics answers all the questions about the human condition except for the interesting ones"

The afternoon was spent in practical work and demonstrations concerning genetic sequences and relatedness between species and individuals. After amplifying DNA samples collected from the teachers in the morning, by using standard DNA gel electrophoresis, the teachers could suggest the degree of relatedness between the individuals from whom the samples came. All the samples were anonymous and subsequently destroyed.

The next Master class, due in the summer term, is likely to be on the digital revolution. All TSN high schools and other high schools in Norfolk will be sent details nearer the time.



Prof. Steve Jones: Has evolution ended?



An afternoon exercise on DNA sequencing