July 1997

Touch - PAPER

The Newsletter of the Open University Chemistry Society

OUCS at SET97

Paul Everett reports

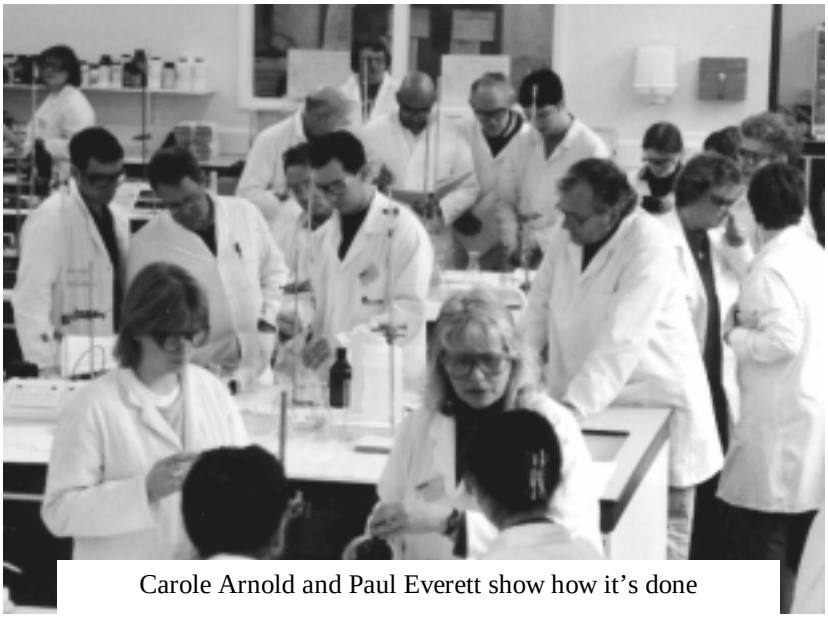
Water, water everywhere but is it pure? **was a collaborative project between the University of Huddersfield and the Open University as a one-day practical session on water quality for the general public in the Huddersfield region. The day was envisaged as being an activity to help the public discover for themselves that science is accessible, understandable and enjoyable, and has real useful purposes for everyday life.**

The practical was similar to that undertaken on the T102 summer school; testing a river for water quality, both biologically and chemically, upstream and downstream of a possibly polluted tributary.

The sun shone gloriously on the tutor training session held on March 16. Although most things went without difficulty, the river flow had to be measured with home-made ginger biscuits as an emergency substitute for yellow plastic ducks and dog biscuits (the tutors went without their mid-morning snack all for the sake of science).

The public day, March 23rd, dawned drizzly, misty but with occasional sunshine.

Five OUCS members, Carole Arnold, Paul Everett, Janine Grochocinski, Carol Houghton and Peter Piper, acted as tutors for the day, leading a trip to five sites along the River Holme. Assessments based on sight, smell, river flow and the biological profile were made at each of the sites. Water samples were also collected for testing in the laboratory during the afternoon.



Carole Arnold and Paul Everett show how it's done

Among the interested onlookers were the campsite manager and his dog. Donations of dog biscuits excess to requirements were used to appease the manager, whose land the river ran through.

Half of the party was herded into the river for a group photo with nets and waders, bowls and rulers. No one fell in, but wet feet were the order of the day when demonstrating the technique of 'kick' sampling for collecting samples in the biological assessment of water quality.

The real chemistry came after lunch with a laboratory session analysing the water samples collected at the various sites. Tutors demonstrated various analytical techniques including biochemical oxygen demand (BOD) using a potassium permanganate titration, the detection of various metals and ions with spectroscopy, and measuring suspended solids, pH and conductivity. Members of the public then enthusiastically went off to weigh and titrate as if they had done it all their lives.

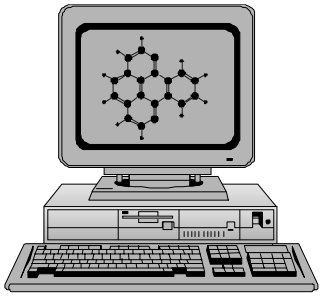
The day ended with a summary, bringing together the results from all five sites. Volunteers were then asked to help compile a display of the day's events for the district libraries.

The following day Radio Leeds broadcast the event, and it appeared in many local newspapers.

Generally it was a very successful venture to be repeated in the future, possibly being adapted to suit schoolchildren or teachers.

ISIS/Draw 2.1

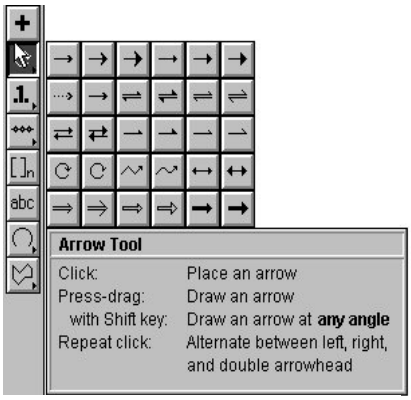
A review by Frank Hollis



In the last two years almost 200 people have taken advantage of the agreement between OUCS and Molecular Design Limited (MDL) to distribute ISIS/Draw 1.2 to its members. Now MDL have released a new version of the program. So, instead of the normal ISIS/Draw tutorial, I shall try to give you some flavour of this latest incarnation.

For those of you who have not tried version 1.2, ISIS/Draw is a program for drawing molecular structures. It won't create wonderful, 3D, colour pictures. What it will do is create high quality 2D drawings of structures, just like you'll have seen in the organic chemistry units from S102 onwards.

What really makes it so useful is that it understands chemistry. If you try to make a pentavalent carbon atom ISIS/Draw will spot it and warn you of your error. But it knows that charged atoms have different valences, so that N^+ requires four bonds. You can also set it up so that it automatically adds the correct number of hydrogens to atoms.

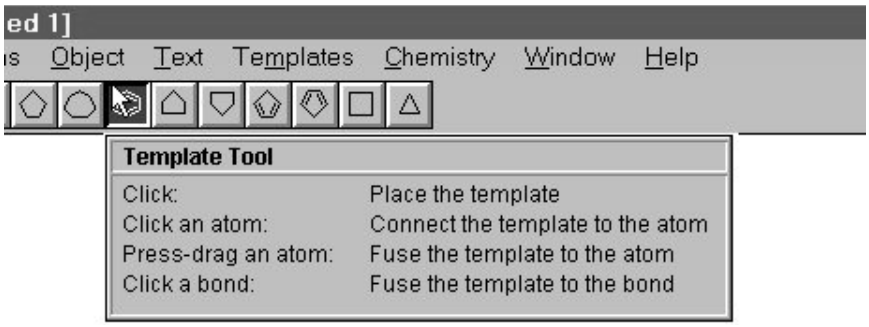


A flyout tool

ISIS/Draw 2.1 does all the things that the previous version, and little extra. What has changed is the user interface.

With the old version it could take several actions to get the desired tool. Now all the most common tools are easily available. Most of the buttons on the Toolbar will fly out to provide multiple options, as with the arrow tool shown above. The flyouts also contain information on how to modify the tool by dragging or using extra keys.

The idea of flyouts has also spread to the template bar. If you press (rather than click) on a template button a flyout giving help on the various methods of positioning the template are displayed.



Flyout hints for templates

These changes make the program a lot easier to use as you no longer have to hunt around for the tool you need and you don't need to swap between the sketch and structure screens.

There is also comprehensive help, including a 14 page Quick Start guide for you to print out. The rest of the Help is much more comprehensive than in version 1, with step-by-step guides for some of the more complicated tasks.

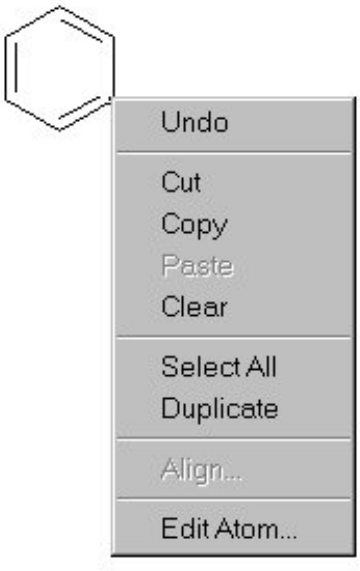
All of this means that it is perfectly easy to use ISIS/Draw without ever having seen a manual.

Another addition is the introduction of context sensitive menus that drop down if you right-click on an atom, bond, molecule or piece of text.

However, all this new functionality comes at a price. The program takes up around 10 MB of hard disk space and has a minimum requirement of a 486 with 12MB of RAM. The PC version is a 6 MB download that includes separate versions for Windows3 and Windows95. The Helpfile is another 3MB.

There is also a Macintosh version available that is also a 10 MB download

At present OUCS has no plans to distribute this version, just because of the time involved in having to copy it across to eight floppy disks for each copy.



Right-click for a dropdown menu

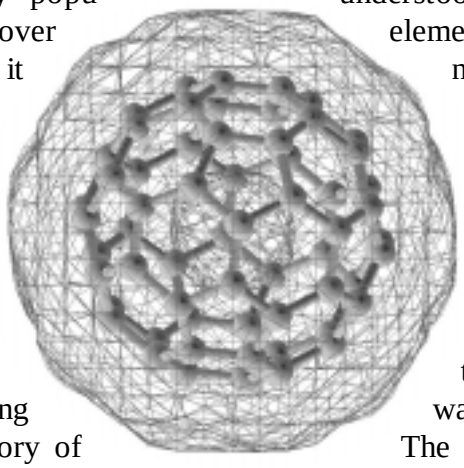
If you would like a copy of the program then point your Web browser at http://www.mdli.com/prod/download.html

Version 1.2 is still available. Send a formatted floppy and an SAE to Frank Hollis.

The Most Beautiful Molecule

An Adventure in Chemistry

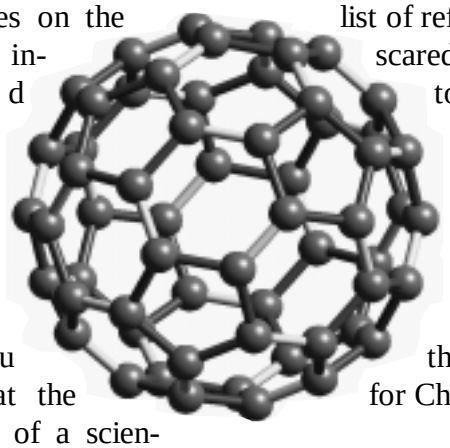
Hugh Aldersey-Williams ISBN:1085410 303 2



Books about science have been surprisingly popular over the years. First it was the physicists that caught the imagination, culminating in Stephen Hawking's record breaking "A Brief History of Time". Then the biologists started getting into the act, with Steven J Gould leading the way, only to be overtaken by Richard Dawkins. But what of chemistry books? Surely we have tales to tell that are just as interesting as black holes, or the Burgess Shales?

This book tells the story of the discovery of Buckminsterfullerene. This was one of the most unexpected advances ever in the history of chemistry. Carbon must be one of the best understood of all the elements. When a new form of the element was discovered many chemists must have checked the calendar to make sure it wasn't April 1st.

The book concentrates on the people involved which makes the whole story come to life. You learn that the dry tone of a scientific publication disguises the competitions, personality clashes and sheer serendipity that makes up a scientific discovery. If you liked "The Double Helix", then you'll like this book.



The author has decided that the reader will appreciate the story much more if they understand the chemistry involved. Concepts such as Hückel diagrams, mass and nuclear magnetic spectroscopy and hybridisation of *sp* orbitals are all covered. There is also a comprehensive list of references which is not scared to point the reader to the relevant scientific journals.

At the moment the book is only available in hardback and, at £18:95 is expensive. Get those orders in early for Christmas.

Frank Hollis

Buckminsterfullerenes - Harry Kroto

It's not often that the Nobel Prize for Chemistry goes to a Briton. It's even rarer to have the opportunity to see a winner so soon after the award of the prize. That's why I took my family along to the University of Hertfordshire one foggy November morning, to a lecture by Sir Harry Kroto on the ups and downs of his research to produce this new polymorph of Carbon.

Buckminsterfullerenes are produced by evaporating a graphite rod in low pressure helium. The resultant soot is extracted with benzene which, on evaporation produces dark amber crystals. The molecule of C_{60} is made up of 20 hexagons and 12 pentagons, just like the footballs I have repaired over the years. The pentagons (the black bits on a football) are required to make the carbon sheet curve into a sphere. The same shape was used by the architect Richard Buckminster Fuller to produce his famous geodesic domes.

The lecture was enjoyed by all my family and we left Hatfield feeling much wiser.

Janet Smith

REVISION

Yes, I know that you've not even been to Summer School yet. But it is time to start thinking about the exams already.

According to The Sciences Good Study Guide (the set book for the new Science Foundation Course) here are some of the important points for your revision.

- *Identify the central questions at the heart of each section of the course.*
- *Make time to attend tutorials during the revision period.*
- *Keep in touch with other students and tutors to broaden your ideas and maintain contact with reality.*

OUCS are holding two events this year which will allow you to combine all three of these.

University of York

Revision Weekend

The revision weekend at York continues to expand. As well as the normal coverage of all the chemistry courses being run this year, there will be sessions for S102, and S271. So if you're doubling up physics with your chemistry you'll be able to kill two birds with the single stone. The Revision Weekend runs from Friday evening through to Sunday afternoon (3rd to 5th October). It's an intensive couple of days with tutorials morning, afternoon and evening. But most people still manage to socialise in the evenings.

If you'd like to attend, or require more details, contact Carol Arnold (address on back page).

Revision Day

Some people find it difficult to attend the Revision Weekend, due to the distance, time, or money.

For those people OUCS also runs a Revision Day, held at Danbury Park Conference Centre at Danbury, near Chelmsford .

Danbury Park

This year the Revision Day will be covering S246, S247, S343, S344, ST240 and, for the afternoon only, S442.

It will be held on Saturday 20th September. The day runs from 8:45 until 16:30 and includes lunch.

The tutorials are focused on the important areas of the course, giving you a good guide to planning your own revision.

Contact Sue Whitaker (address on back page) if you want to attend.

One problem I always find with revision is trying to sort out which bits of the course are the most important. Nobody can be expected to learn and memorise the whole of a course.

I found the Revision Weekend to be very helpful in this regard. After my brain had stopped aching and I'd checked through the notes I'd made and handouts I'd been given, I realised that the amount of material I had to commit to memory was a lot less than I'd expected. For my courses I reckon that going to the Revision Weekend had raised my final grade by one level. The tutors at both events are all OU tutors, many of them members of the full-tine staff.

When I study ST240 I shall definitely be attending both the Revision Day and the Revision Weekend. This course of action was very popular last year (the first year that the revision day had been run).

Frank Hollis

OUCS News

Conference Report

As those of you who read Sesame will have noticed, the ChemSoc presented a motion to the OUSA Conference at Loughborough in April.

One of the proposed measures to cut costs is the reduction/removal of Home Experiment Kits. The whole of Conference agreed with the decision to oppose these cuts.

OUCS has been affiliated to OUSA for just over two years. This allows us to have our voice heard at the highest levels of the University.

If there is a matter that you feel OUCS should put before Conference 1998 then please send your proposed motion to Pat Wilson for discussion at the AGM.

AGM

Birmingham

November 8th and 9th

Last year, for the first time, the Chemistry Society held its AGM as a separate event. Those that attended had a very good time. So we're holding it in the same place - The Great Barr Hotel, Birmingham this year.

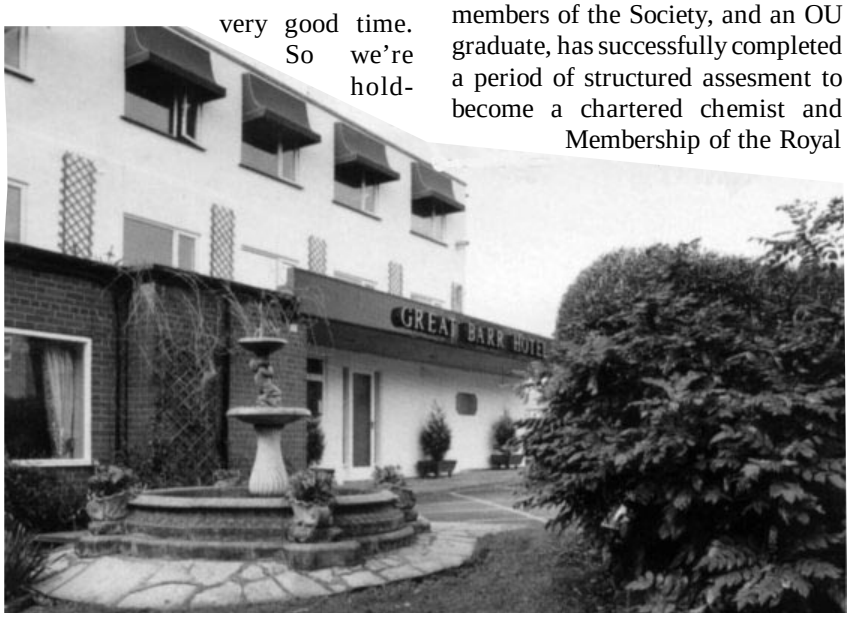
The AGM itself will be held on the Saturday afternoon. There are several proposed changes to the Constitution, most of them to formalise the regional organization of the ChemSoc. There are also elections for all the committee posts (except for the Chair).

Pat Wilson has volunteered to take on the secretary's role after Annie Brittain had to give it up. Pat, and all the current committee members are standing for re-election. Other nominations should be sent, with a nominator and seconder, to Pat by August 24th.

After the AGM there will be some talks (hopefully as interesting as last years). Then a three course meal followed by a murder!

On the Sunday morning, after a leisurely breakfast, the Presidnt's Symposium will take us to lunchtime.

Further details from Carole Arnold (address on back page).



The Great Barr Hotel - Birmingham

Carole Arnold C.Chem MRSC

Carole Arnold, one of the founder members of the Society, and an OU graduate, has successfully completed a period of structured assesment to become a chartered chemist and Membership of the Royal Society of Chemistry.

Many of you will know Carole from, amongst many other things, her sterling efforts to ensure that the Revision Weekend has run so smoothly and successfully for the past six years.

On behalf of our members, the committe wishes to congratulate Carole on her achievements.

The Litmus Test

You'll have seen those bits in papers and magazines where celebrities are asked a list of questions. We're planning on introducing something similar in TouchPaper but we need your help. What questions would you like us to ask, and who would you like us to put them to? Suggestions on this, and any other ideas to Frank Hollis.

We'd also like to put in a letters page. However, it's a bit difficult if nobody writes. What do you like/hate about chemistry, the OU, OUCS, life?

Mike Leigh

Dr Mike Leigh died on April 6th, following a short illness. Mike, who was 54, was a chemistry tutor and tutor-counsellor in the Eastern Region for many years. He will be greatly missed by his friends in the OU community.

Mike was my tutor-counsellor and one of my tutors for four years running. He was invariably cheerful and helpful. His knowledge was prodigious and his enthusiasm was infectious. It was largely Mike's encouragement and references to "When you do second level chemistry..." that made me do more chemistry - and then some more chemistry.

If you knew Mike then perhaps you'll join me in raising a glass, preferably full of his favourite Green King IPA, and saying "Cheers!".

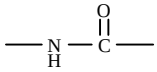
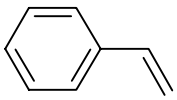
Sue Parsons

Puzzle Time

By Ann Mander - ST240 Tutor

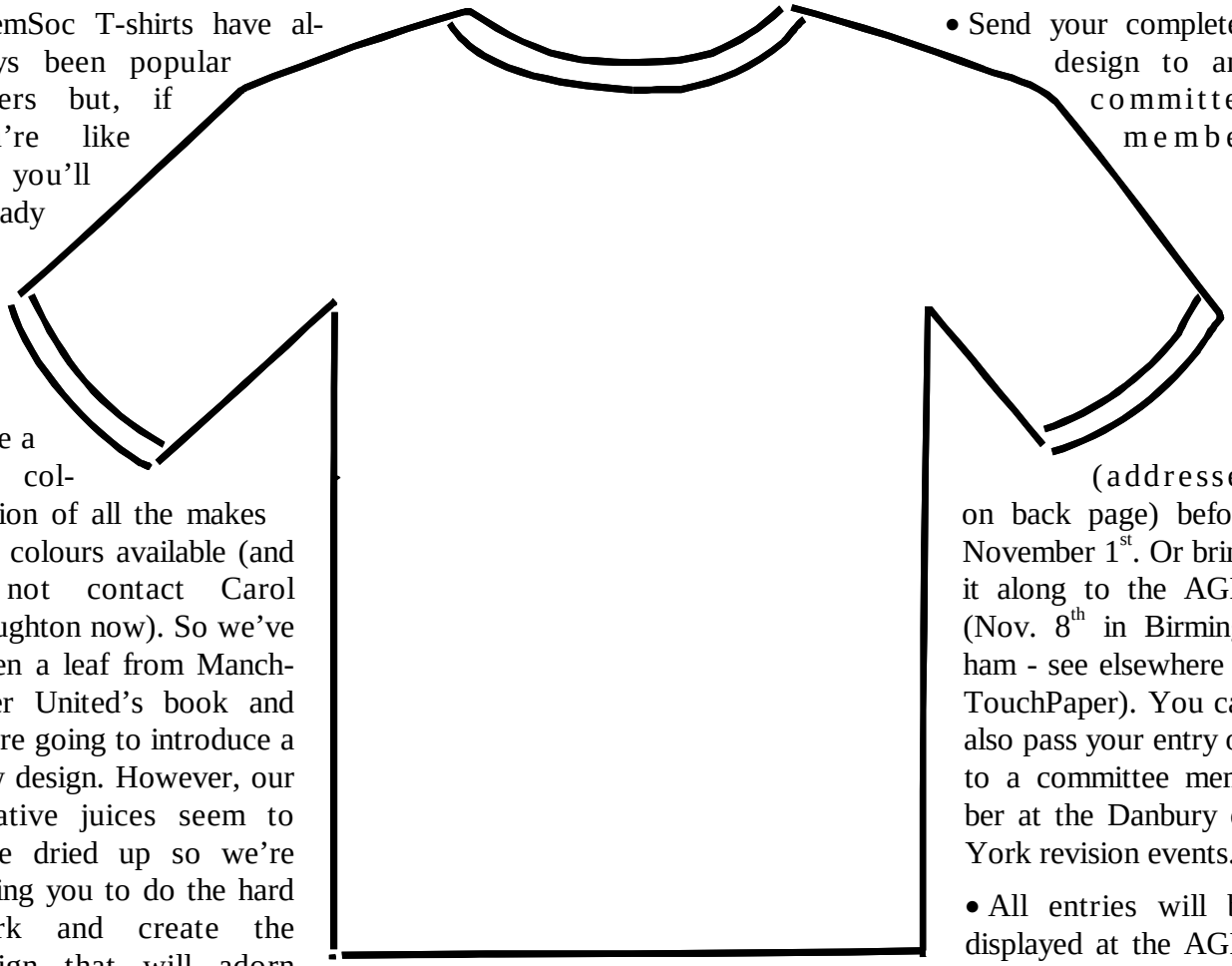
	Item						Material						Colour					
	Bottle	Bag	Thread	Cup	Saucepan Handle	Packaging	Nylon	Cotton	Low Density Polyethylene	Polyester	Bakelite	Polystyrene	Red	Orange	Yellow	Green	Blue	Purple
Al																		
Chris																		
Matt																		
Ellie																		
Esther																		
Polly																		
Red																		
Yellow																		
Orange																		
Green																		
Blue																		
Purple																		
Nylon																		
Cotton																		
Low Density Polyethylene																		
Polyester																		
Bakelite																		
Polystyrene																		

Six ST240 students were asked to bring in items made from different types of polymers to their next tutorial. From the clues, deduce which student brought in which item, its colour and the material from which it was made.

1. Chris Stallite's saucepan handle, which wasn't blue or purple, was made from a thermosetting plastic.
2. Ellie Ment brought in a yellow item made from an addition polymer. It wasn't packaging or thread.
3. Esther Bond's cup was made from a polymer with  linkages between the monomers. It wasn't orange or blue.
4. The red item (which wasn't the packaging material) was made from a biopolymer. It was brought in by Matt Erial.
5. The green bottle was made from a condensation polymer, unlike Al Keen's item, which was made from a polymerised form of the monomer 

This is not an easy puzzle (thank Ann Mander for that) so I think that we'll have to offer a prize for the first correct solution pulled out of the hat. Send your list of answers to Frank Hollis.

COMPETITION
Design a T-Shirt



ChemSoc T-shirts have always been popular sellers but, if you're like me you'll already have a full collection of all the makes and colours available (and if not contact Carol Houghton now). So we've taken a leaf from Manchester United's book and we're going to introduce a new design. However, our creative juices seem to have dried up so we're asking you to do the hard work and create the design that will adorn OUCS member's chests into the next millennium.

There are a few points to note:

- If you use the Open University logo there are numerous rules you have to follow. These are so strict and convoluted that it is best avoided.
- Cost will be taken into consideration. The smaller the number of colours you use, the cheaper the T-shirts. We will accept designs with a front & back but these will also be more expensive.
- Draw your design on the T-shirt blank or an A4 sheet of paper. Make sure that you make a note of the intended colours of the print and the shirt itself.
- By entering the competition you give your permission to OUCS to use your design for any purpose.
- Send your completed design to any committee member (addresses on back page) before November 1st. Or bring it along to the AGM (Nov. 8th in Birmingham - see elsewhere in TouchPaper). You can also pass your entry on to a committee member at the Danbury or York revision events.
- All entries will be displayed at the AGM and will be voted on by all attendees.
- The winner, and any other entrants that OUCS choose to use, will be given a T-shirt of their design.
- Don't forget to put your name and address somewhere on your design.
- If there are sufficient entries, there will be a separate prize for the best children's entry. Tell us your age if you want to enter in this category.

We may want to use your design for items other than T-shirts (mugs, coasters, hats, reproduction 17th century merkins, etc.). If you think it would be better if it were altered in some way for these alternate uses then tell us how.

Frank Hollis

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- A brief guide to scientific literature -

It has been long known.....I haven't bothered to check the references
It is known .....I believe
It is believed .....I think
It is generally believed .....My collegues and I think
There has been some discussion.....Nobody agrees with me
It can be shown .....Take my word for it
It is proven.....It agrees with something mathematical
Of great theoretical importance.....I find it interesting
Of great practical importance.....This justifies my employment
Of great historical importance.....This ought to make me famous
Some samples were chosen for study.....The others didn't make sense
Typical results are shown.....The best results are shown
Correct within order of magnitude.....Wrong
The values were obtained empirically.....The values were obtained by accident
The results are inconclusive .....The results seem to disprove my hypothesis
Additional work is required .....Someone else can work out the details
It might be argued that .....I have a good answer to this objection
The investigations proved rewarding.....My grant has been renewed
Synthesised according to standard protocols.....Purchased