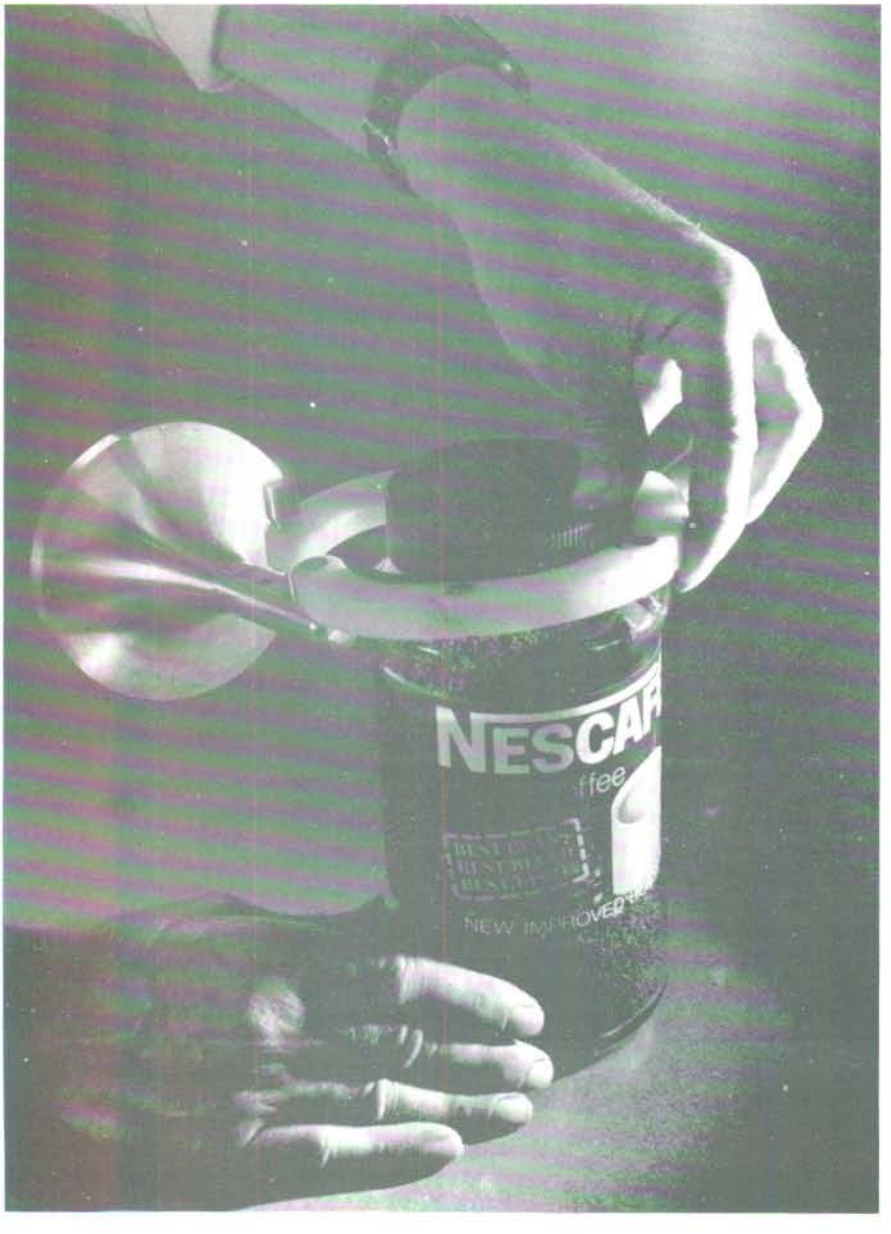
Mal Evans
Orange Hill High School

Project 'JAM'
(Jar Air Mechanism)

This project was initiated as a standard item of coursework related to the Oxford Board's 'O' level in CDT. The problem posed, that of removing tight lids from screw-top jars, was taken directly from a past Oxford paper.

The new 4th form group to which this problem was presented, consisted of 21 boys and 7 girls. The group was to be taught primarily by myself, but with occasional assistance from other departmental staff who were sometimes available.

The project topic when announced, got a mixed reception (not a pun!), the boys feeling initially that there *was* no problem here, as *they* had never encountered any difficulty in removing lids from jars!



As discussion proceeded however, it transpired that some of them had! and, of course, as the discussion proceeded further to consider those weaker than the norm, they became aware of those who did not have the male physical strength advantages. What about elderly people with arthritic hands? or for some reason having insufficient strength in their hands and fingers – what about girls?! The girls of course readily accepted the problem, they had encountered this difficulty many times and there were situations in the kitchen when you needed to tighten jar lids securely as well as remove them afterwards! – and what about elderly people? and those generally who might be handicapped in some way? This really concerned them!

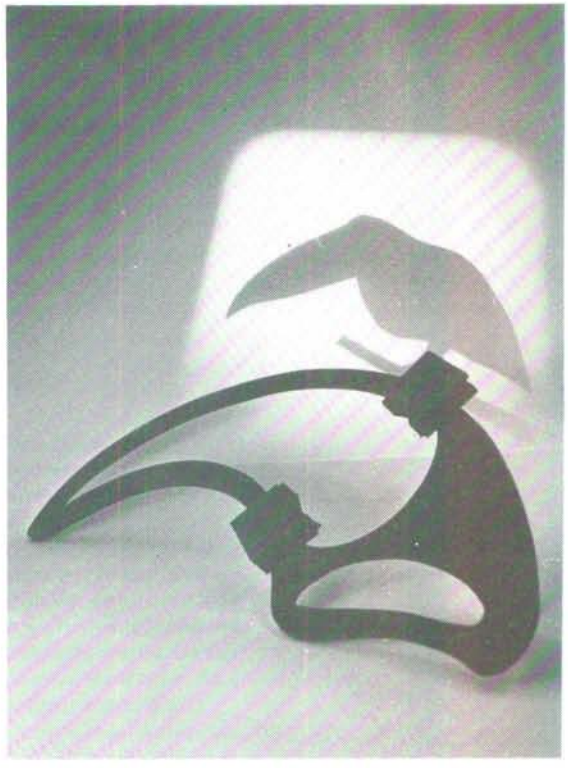
So, off we all went, in search of a simple effective answer to the problem – quite a tall order for 14/15 year olds particularly, one would have thought, the girls, who had only one year's experience of designing and making things anyway. It so happened that during the latter half of the year, a letter arrived concerning the 'Young Inventors Awards' which were in turn related to the 'Homeware and Hardware Exhibition' at Olympia. I felt that here was an opportunity to add further realism and incentive to the project, and, as it happened, what we were doing particularly suited the requirements.

I decided to ask initially, if any of them would be interested in competing, and most were. As it was virtually impossible to bring the work of all 28 to a stage which satisfied the entry requirements in the time available, each pupil's project was assessed in terms of suitability and progress. The work of six of the girls and five of the boys would meet the deadline (an interesting comparison??).

To be honest, some of the devices that the boys produced (as I said to them at the time) would look better placed in a garage jacking up a car, than in a kitchen taking lids off screw-top jars! Most accepted this criticism with good humour and in the spirit in which it was levelled. From my point of view, the main educational aims had been achieved; they had each followed a detailed design process in considering the problem and their devices would indeed take off tight lids from screw-top jars – even if they were also capable of jacking up cars!
Some of the proposed solutions were very cleverly and painstakingly arrived at – a sequential mechanism which unfortunately relied on the elastic strength of a loop, which if formed from a material strong enough for the task in hand, would need a Herculean operator! There were sliding jaws which moved in curved inclined planes, pivoting hooks, wedge devices, spring loaded moving platforms, cone sections which moved in converging arcs, the Kitchen 'Toucan', a device based on arcs tangential to two circles of differing diameters etc.

Each pupil's work consisted of two A2 'design sheets', a working drawing + models/Prototypes and a written (or typed) report.

Kitchen 'toucan'



Of particular interest in this project was the work of the girls, and some of their reasons for choosing to take Design, their philosophies and career aspirations given in answer to a questionnaire are both interesting as well as sometimes amusing!

Lilian Chong
Although Art is my favourite subject, I find Design the most interesting as it covers most aspects of life. It helps us to understand people's needs and once you've achieved something successfully, you will feel satisfied. I enjoy the practical side of Design more, although the thinking side helps to improve our imagination and the theory lessons help us to acknowledge the materials available and their individual uses, as well as the different methods and machines we can use.

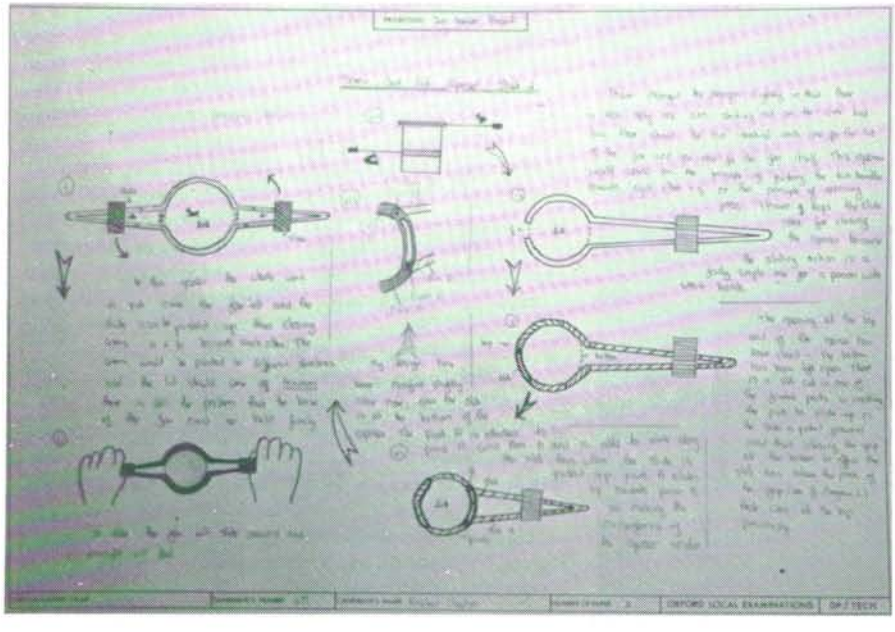
Design and Technology sounded exciting and because it was more useful than cookery or needlework, both of which could be learnt in the spare time. But now I find it useful in other subjects e.g. Geography, where we had to find out about how steel was produced.

When I leave school, I would like to go to Art college and if possible get an A level in Art and Graphics. After college, I would like to take up a job as a Graphics Designer.

Kirsten Clayton
I chose Design and Technology for various reasons:
(i) Design and Technology was a mixture of academic and practical, and to be able to do something practical is a restful change (sometimes!).
(ii) My better subjects tend towards the Arts e.g. English, History, and I don't do so well at Maths and Science and really I couldn't make a career in either of the former so I took a subject which took other skills apart from artistic ones.
(iii) I tend to be a very forgetful, scatty person and in design and technology it is necessary to be very precise and definite and to formulate your ideas clearly.
(iv) Design and Technology gives experience in practical skills such as working on the machines, turning wood, etc. I find that by taking Design and Technology I approach problems differently and even solve them differently. I thought that Design and Technology was quite boring when I did it in the third year, but now that I've really become involved in this problem I find the subject fascinating.

I'm still not really sure what I'd like to do when I leave school. Most of all I should like to become an actress, but acting is not the most secure of professions and I will probably do something to do with medicine, either a doctor or medical researcher, or perhaps a barrister, thus combining acting and English!

Below: Work by Kirsten Clayton



Sara Devitt
I chose design because I liked it best out of the four subjects I had available. I was told by Mr Evans that I was quite good at design so I thought it would be worthwhile taking it up. And lastly I find design quite interesting as well as practical.

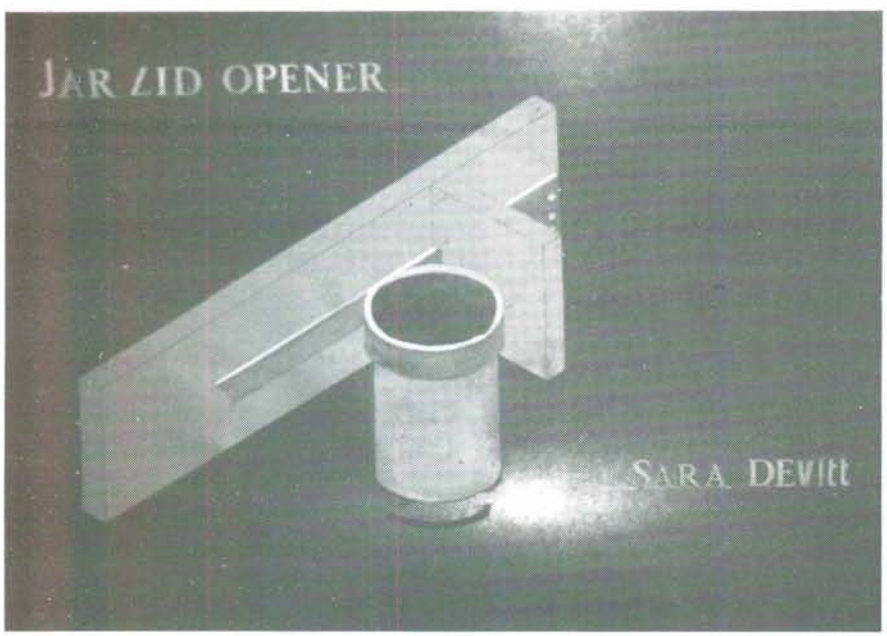
Nina Pawar
There were no 'ifs' or 'maybes' about choosing design and technology because since the first year o Orange Hill I have wanted to take design O-level. Why?
(i) My dad is a hospital consultant architect, and I do admire the work he has done so I'd like to see what design is like.
(ii) From the choice of doing needlework, cookery and design, design is the better option, because the other two options can be learnt at home and design involves a lot of thinking.
(iii) I think the idea of being confronted with a design problem is a challenge, and after one has solved a problem, however trivial it is, one has achieved something.
(vi) Design can never be boring or uninteresting because we study different aspects of design.
(v) By doing design one can become more aware about the world around and other people's needs.

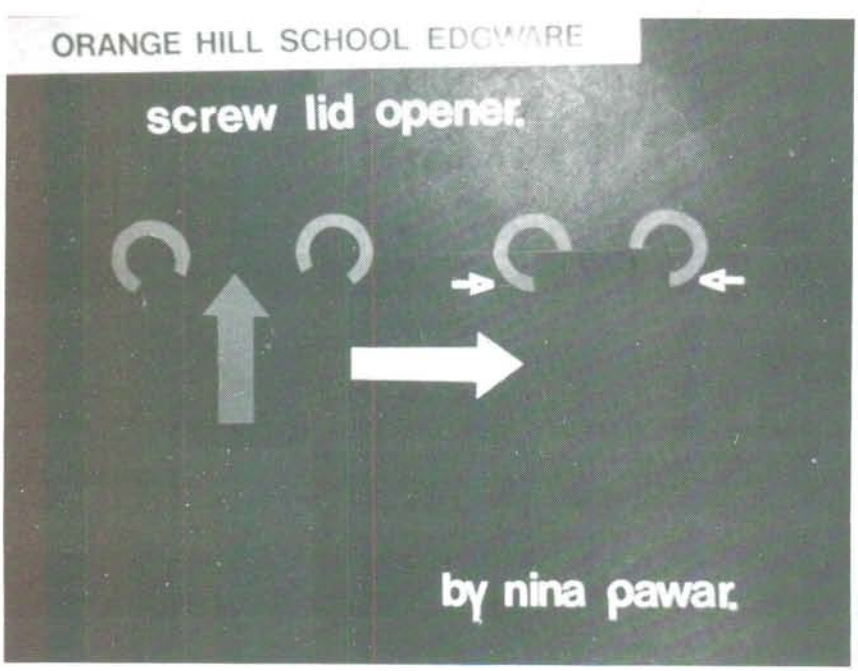
So when I leave school I've left myself three options, one to enter the medical field; the positior

I've considered include: doctor, physiotherapist, cardiac physician or a gynaecologist. Again my dad who's gone through two major heart operations has prompted these ideas because at the time I did read about the heart and its disorders and found the subject interesting. The other reasons for this choice were: I am interested in science and how its knowledge is used to help the sick and I think healing and helping the sick is a positive contribution to happiness. Another option has been influenced by design while doing a project on plastics. I received a sheet on careers in the polymer industry because it is a forward-looking industry on which all of us depend so I'd like to be a technologist or laboratory technician, because I'd like to be responsible for running a lab or a research project and I'd like to decide on how to approach problems, and how to solve them.

If all else failed or if I were courageous enough, I'd like to go into the record/music business, because I have a very deep interest in modern music whatever variation. I'd love to produce records or run a music paper or manage a group but it's only an 'if' and it may not work. If I do become a technician or technologist I'll be able to say to myself that design did play a part in my actual getting there. If I don't, well I'll be able to look back on my projects with some satisfaction and with the knowledge that design was worth doing.

Below: Work by Sara Devitt and Nina Power. Bottom right: Kirsten Clayton





Lisa Quattromini

I chose design and technology because it was the most decent subject to choose from in that group. Also I had done design in the third year and I found it quite enjoyable so I decided to continue for O level. Design and Technology also trains the creative, artistic side of your mind and I feel that that is important for any career and to make domestic life more enjoyable and useful.

Lisa Wilkinson

I chose Design and Technology because it was the best of the four options. The others were Ceramics, Cookery (which I can't stand) and Needlework – well, I didn't actually really like Needlework.

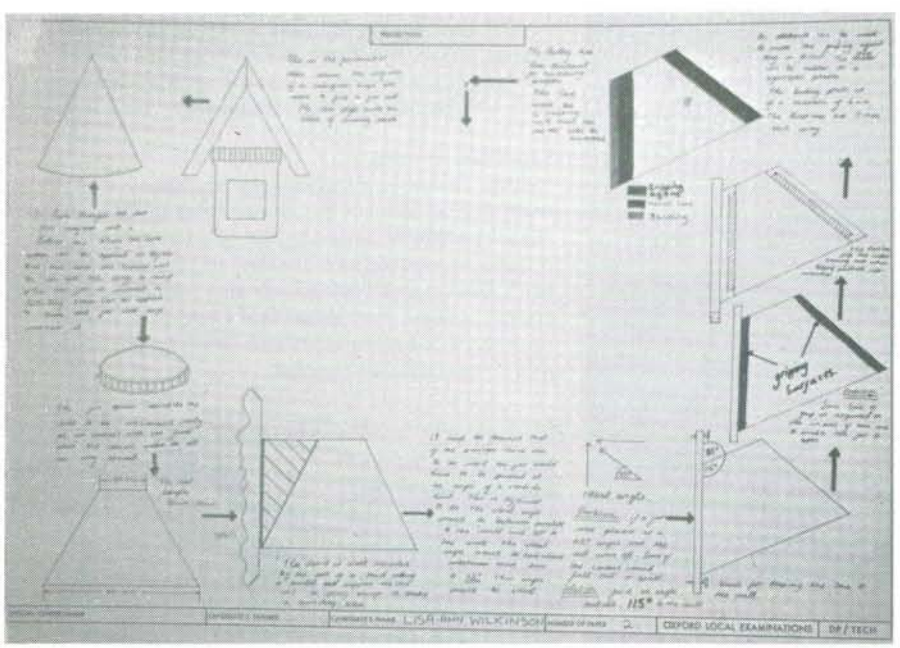
I continued with Design and Technology in the fourth year because I found it interesting and it kept my mind working. I found the thinking side of design most interesting. Now I also enjoy the practical side, though I still prefer the designing aspect.

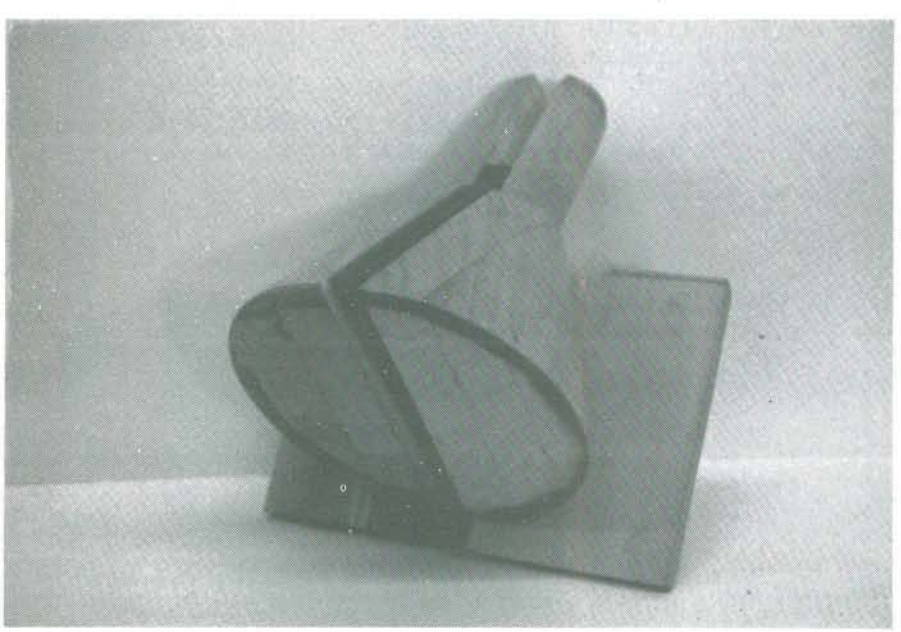
When I have done my 'A' levels I want to go to University. Then I want to take up Engineering.

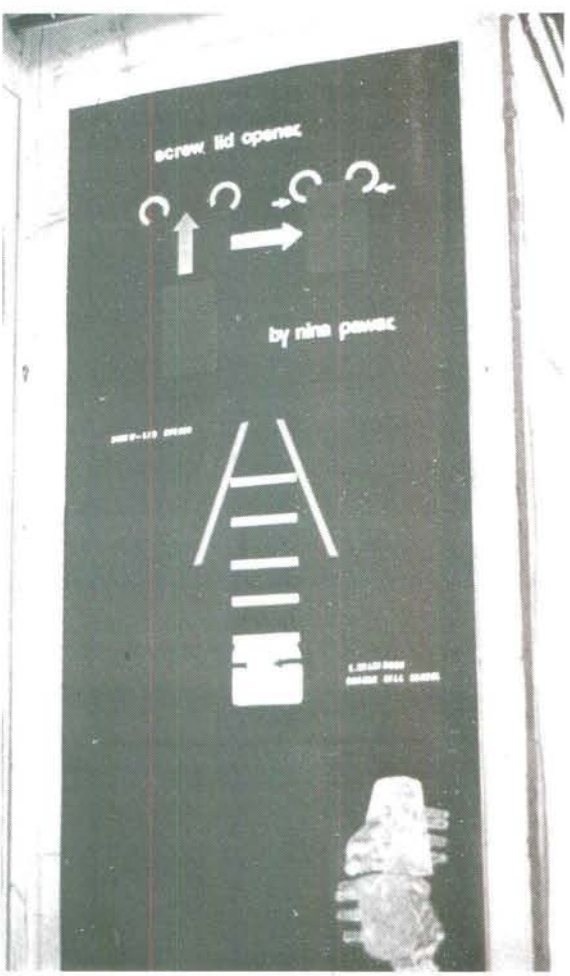
The work of these girls was sensitive, detailed and dedicated, being easily comparable with the best efforts of the boys. Their interest never flagged and their cheerfulness and enthusiasm never waned. The boys in fact knew before much time had elapsed in the course, that they would need to 'look to their laurels' to retain their 'resident expert' image!

It transpired that the work of one of the girls impressed the judges most at Olympia – Lisa Wilkinson with her design, based on a hollow cone, became runner-up.

Below and right:
Work by Lisa Wilkinson







To achieve this she had produced three different ideas, and developed one to a stage where it could well become a commercial product. (She has in fact been approached by a number of interested manufacturers). She had produced a formal working drawing, a pattern drawing, made a split pattern, produced the mould and casting, machined and generally finished a prototype product – not forgetting of course, her very explicit report!

Needless to say, I was very impressed though not surprised by the work of all the girls in this large working group, and it is clear that *all* girls should be given the opportunity to participate in this important area of the curriculum. By far the majority do not at present, and, even if given the opportunity tend not to opt for lack of understanding of the subject content – 'Better the devil we know?' – they are missing out! at the very least in their preparation to cope with their future lives in a complex technological society. That same society will also miss out if it fails to recognise and subsequently rectify this totally unsatisfactory state of affairs – and further if it fails to develop what is potentially a great asset to its future existence and progress.