Nora Fok. Neckpiece. Splash
1999, knitted clear nylon.

A Sense of Wonder Frances Julie Whitelaw

The second ACJ Conference was held 19-22 July 2000 and was hosted by the University of Central England in Birmingham

As well as the contributions from the invited speakers there were exhibitions, trade stands, concerts and tours to the Jewellery Quarter and the School of Jewellery, the Innovation Centre and other local places of interest. The delegates were mainly British ACJ members but others came from all over Europe, the United States and even Australia.

The Chairman's address has not been included in this resumé of the conference, but those who attended will not forget Mike Press who tried so hard and successfully to keep to the packed timetable. He gave a thoughtful introduction to the event and kept things moving with humour and only the occasional reprimand.

The Conference ended with a dinner and dancing somewhere in Birmingham. The food wasn't memorable, but the dance most definitely was, with music and entertainment provided by the band DoreenDoreen. It was a wonderful way to close a stimulating and enjoyable conference.

The cost of printing means we have opted to provide brief summaries of the presentations, where these have been provided by the speakers. The interviews and panel discussions have not been included in this document due to the difficulty of obtaining accurate reportage. In some instances no papers were provided in advance and these essays have been written from notes taken at the time.

Beauty in Science Dr Jean Futrell

Part of the keynote address to the conference

The path of scientific discovery in the 20th Century was to reduce scientific questions to the lowest common denominator, to simplify experiments to the smallest set of variables that define the problem. Reductionism science was extraordinarily successful but left unanswered the question of how the well-described components work together, and this can no longer be ignored.

The 21st Century challenge to science and technology is to understand complex and collective behaviour. How do systems evolve over time and how do they interact with each other? How can we understand the natural systems, ranging from living organisms to our vast universe, over enormous ranges of time and space? Can we predict when systems are stable or unstable, whether local order will be maintained or whether minor perturbations will collapse into chaos?

Artists have much more experience than scientists in processing information and reducing it to a concept that can be expressed visually. In many areas of science we are fully convinced that the laws of physics and chemistry rigorously apply but do not rigorously define outcomes. Understanding how environments (boundary conditions) and interaction over time (dynamics) are responsible for systems behaviour is a major challenge. Using sophisticated computers to model systems behaviours to answer 'what if' questions is a critical part of modern science. Computer graphics and visual images are the essential medium for understanding and interpreting results to scientists and non-scientists alike.

It is my assertion that art and science converge in the communication of ideas through images. One example of this convergence is the merging of science and art in the mathematics of fractel, a central part of chaos theory. Fractels are curves in three-dimensional space that result from combinations of linear and non-linear equations generating ever-changing images on the computer screen. They describe dynamic systems that are sometimes chaotic and sometimes stable, including evolving natural phenomena. Fractel images are a new art form as well as a description of much of the observable universe, from microscopic organisms to whole galaxies.

Feed the Fury: Art meets Science Pamela Martin and Peter Chatwin

This illustrated talk covered the most recent work of Peter Chatwin and Pamela Martin, which was exhibited in the beautifully restored Birmingham School of Art. The pieces on show were a series of large panels inspired by collaboration with an entomologist who specialises in the study of bees.

At the beginning of this joint project they didn't really know what the outcome would be, but eventually themes emerged which although not obviously linked to the insect imagery are closely influenced by natural phenomena and geology.

The slide presentation included the source material from the entomologist, tiny details carefully illustrated and enlarged to the point of becoming abstract. The techniques used to produce the coloured veneer panels were also shown at different stages, from the initial dyeing to the final results. Strong and vibrant colours dominated, with layers of stained wood veneer built up to create flowing abstract 'landscapes' of tone and pigment.

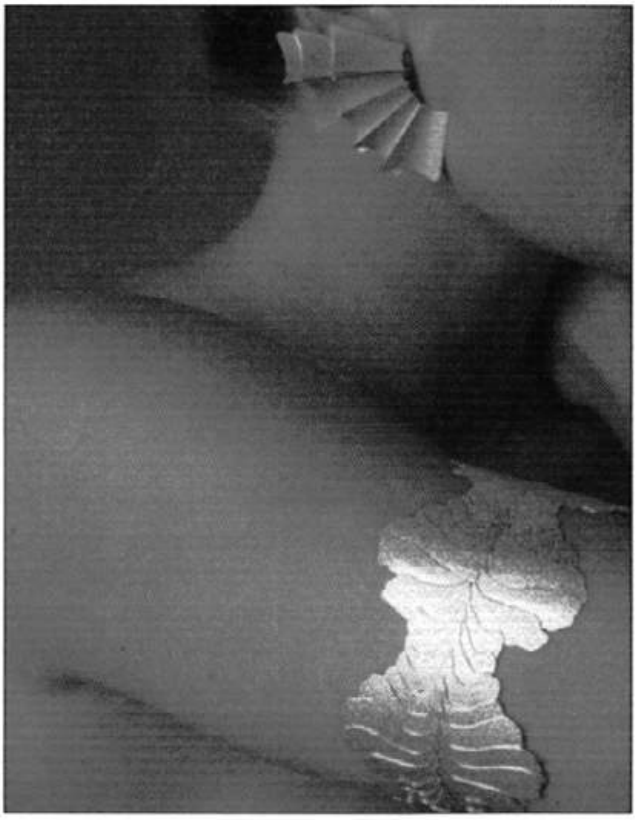
Visiting the exhibition brought the slide show to life. The panels were arranged in a fairly small room, avoiding a claustrophobic sensation because of the high ceiling and the natural light from the windows above. The work could be viewed both from outside the circle formed by the panels and from inside.

Firestain-Resistant Silver Alloys: Germanium

Peter Johns and Richard Fox

The two speakers gave separate presentations about the development of a new alloy of silver.

Peter Johns was working at Middlesex University researching silver alloys with a view to minimising oxidation when he was approached by the French company Metaleurop S.A., which was looking for new uses for Germanium. This metalloid is found as a by-product of lead and zinc production. It was first isolated as an element in the late 19th century but it was not until the 1940s that it was commercially used for its properties as a semi-conductor. In its solid state it is brittle, with a melting point of over 930C, and light-retaining, optical properties. It was this which held out hope of reducing the gradual tarnishing that takes place on the surface of sterling silver, as well as firestain. Early tests totally replaced the copper part of the sterling silver to produce an Ag and Ge alloy which although beautifully bright was unacceptable because of its brittleness and poor working properties.



Scilla Speet Resistance welded Argentium Sterling bracelet and earrings. Photo; Graham Mursell

Experiments continued and it was realised that an alloy with the desirable working properties of sterling silver could best be achieved using the germanium as well as the copper but remaining within the traditional ratio of 92.5% silver. The alloy which was eventually developed has been extensively tested and resists tarnishing, does not get firestain, is more ductile than sterling silver and needs less annealing.

This new alloy needs greater care when being heated as it will crack if moved during soldering and has a different appearance at annealing temperature. It can be successfully soldered with lower grades of solder, and to avoid overheating problems 'easy' solder is recommended. For best results the hearth area should be kept dark to allow the temperature to be watched.

Richard Fox began to do experiments with germanium from the point of view of a maker looking at its potential for laser welding, spinning, milling, machining, fabrication and casting. Germanium silver seems to retain its malleability longer between annealing than sterling silver with none of the problems of firestain or tarnishing, and it can also be precipitation hardened in an ordinary domestic oven. Richard now uses the alloy regularly and has developed several production pieces as well as one-off commissions. Work can be designed using techniques which might otherwise need more frequent annealing, such as milled surfaces, spun pieces or raised work.

Beyond the Physical: The Reachin Haptic Interface

David Poston

The process of conception and making is familiar to us. We think, we draw, we model and modify until we arrive at a design which we can commit ourselves to making. Often the making process is frustratingly slow, physical activity far outstripped by the creative thinking process.

Creating three-dimensional ideas is also difficult, not natural to many, as evident in the essential two-dimensionality of so much supposedly 3D work. Making what we have thought of is often difficult, the result disappointingly less than we imagined. Exploring three-dimensional ideas by pencil drawing takes a lot of skill. If the ability to explore the idea this way is limited, the design, the end product, will be less than it might have been.

Computer Assisted Drawing (CAD) and computer solid modelling offer a way out of this. These programmes provide a good deal of drawing capability. The model can be drawn and viewed in 3D, can be manipulated in 3D space and can, ultimately, be exported for manufacture by rapid-prototyping technology, an amazing liberation from the toil at the bench, and from the need to master conventional metalworking skills.

But CAD takes a lot of learning, perhaps a year of considerable practice to become reasonably proficient. The way it is based on x, y, and z axes is a constraint upon the imagination, an artificial and un-liberated way of working. Consequently many people do not take to CAD, do not feel that sufficient freedoms are gained for the considerable investment necessary to become proficient.

Give me the instinctual use of my hands every time, the mark of the pencil, the cut of the saw and the graver, the working of a file. In a dream world we would be able to make in our minds the fully three-dimensional model of our idea. Making without the constraints of gravity, the conceptual freedom would come from being able to place the individual elements in space, letting the connections grow between these key points.

An idea, a fusion of technologies through a simple concept and clever software, Reachin suddenly moves us a whole jump forward towards this dream.

Imagine. In front of you is a 3D image in full stereo, your eyes naturally defining its location. You reach out and, sure enough, you touch it, feel the form, the texture and the resilience. If you can see it and feel it then the object must be real. But this is just a desktop computer with a haptic interface, with co-location. Technology can sometimes be wonderful.

We are working in full 3D, so our idea has a dimensionality we could never give it on paper or on a flat screen. And we can actually feel what we are doing: since the model we are creating is effectively in space, we can build from different directions simultaneously and revolve and manipulate it as we wish. Imagine for a moment the conceptual freedom this confers.

Reachin de-skills the design operation in a number of ways, principally by returning the user to an instinctive level. But, unlike most other designed tools, it does not narrow a specialist function but liberates the application, making the conventionally impossible feasible...

As you will now realise, describing Reachin is very difficult, because it is about personal instinct and experience. Even if you closely watch someone else using it you won't really get the point until you get your own hands on. Which is why the organisers asked us to bring it to the Conference for you to feel for yourself.

The potential applications are legion, so what can it offer jewellery? Perhaps I won't tell you my thoughts, but Ann-Marie Shillito at Edinburgh College of Art is just starting a haptic research project using Reachin, and I believe that The Jewellery Industry Innovation Centre led by Peter Taylor is planning a joint development project with Birmingham University.

The theme of this conference is 'The amalgam of art, science and technology'. When you try Reachin you may see it as a potential technical embodiment of this amalgam, and you may be inspired to be one of those who develops the means to apply this new tool.

The Jeweller who mistook herself for a Doctor

Laura Potter

Laura Potter, Rosary 1998. Silver, resin, tablets

The subject in question is a female jeweller living and working in South London who presents with an unusual case: suffering from a rare form of professional schizophrenia. Her academic qualifications and present working environment are undoubtedly those of a jeweller or silversmith, yet a creative approach has been cultivated which borrows extensively from certain scientific modes of practice. These apparent delusions may pose a threat to the general public, and the extent to which she may harm herself and any professional reputation is uncertain. What is evident is that this jeweller is experiencing an increasing tendency to mistake herself for a doctor.

It was during the secondary period of her education that a severe conflict of interests was first diagnosed, and a vocational confusion has persisted well into adulthood. That she took the artistic option and specialised in metalwork is, with the benefit of hindsight, not as perverse as it seems. The traditional tools of the jeweller are not dissimilar in form to some surgical instruments, and are largely identical to some used in dentistry. It is possible that she studied historical literature outlining the development of modern medicine, and its relationship to the search for that most prized metallic element: gold.

The initial phase of this infiltration can be clearly identified in sketches and models from an early period. One particular range of objects was devised as a series of mechanical contrivances or 'treatments' for dealing with the common symptoms of illness such as an upset stomach, high blood pressure, or insomnia. She proposed that such items were of benefit to physical health through contemplation of their function rather than direct ingestion. Despite claims that these medicines were for 'allegorical' use only ('not to be taken literally') they were labelled and packaged as pharmaceutical products. Most significantly, they were available only on prescription, signed of course by the 'doctor' herself.

As a result of this unhealthy interest in the chemistry of modern medicines, pharmaceuticals have been engineered directly into jewellery pieces: anti-depressants, contraceptives, analgesics and dietary supplements. These works are especially revealing in that they manifest a perception of the social status afforded to medical practitioners. Subverting the spiritual function of a rosary and replacing the symbolic beads with painkiller tablets, is a clear attempt to deify the physician. This illustration of medical devotion is a measure of scepticism in theological supposition. Clearly, she advocates the worship of logic and statistic at the altar of the General Practitioner.

A disturbing tendency is demonstrated, to regard drugs themselves with a degree of sensitivity, almost reverence, usually reserved for materials of extreme rarity and timeless beauty. A string of contraceptive pills, fashioned to mimic seed pearls, is a celebration of their capacity to empower the female gender. This work seeks to uncover the role of jewellery as 'bait' when used to ornament the female body: what greater emblem of sexual freedom, or availability, than the contraceptive pill?

Some of the most disturbing work stems from detailed investigation into substances that are definitely harmful, specifically those toxic to humans. Predictably, of major concern are those metallic elements that pose a threat to physical or mental health. A lead engagement ring unquestionably utilises the toxicity of the metal for conceptual effect. The abstract 'pain' suffered in an emotional relationship is now real, caused by the gift of a poisonous token of affection. Manipulation of the archetypal surgical tool, the scalpel, has resulted in a neckpiece that literally stabs the wearer in the back. In the light of her outward pretence of some form of medical authority these pieces are entirely irresponsible.

The question of perspective remains unanswered: does she understand that health care is the subject of her jewellery, or is she under the misapprehension that the cause of medical science can be furthered using accessory design as a kind of autogenic, alternative therapy? This inclination toward the use of jewellery as a metaphor for the human condition is a recurrent phenomenon, and is further evidence of a determination to combine the themes of Applied Art and Applied Biology. The work does not evolve in a conventionally craft-oriented manner. Pieces are 'formulated' as three-dimensional answers to medical or psychological questions – trying to eradicate all trace of aestheticism and sentimentality. In some cases the total absence of sensitivity leads to an explicit, almost confrontational response.

There is a distinct possibility that someone who demonstrates this type of obsessive behaviour could eventually ruin his or her health. This person already invites an unnecessary level of medical attention; the regular visits to Accident and Emergency wards are entirely unwarranted. Of utmost concern is that this unique disorder could become a form of research-fuelled hypochondria. She is aware that she is perfectly healthy, but fabricates convincing symptoms as an excuse to visit the doctor's surgery for fresh inspiration. The pieces, which treat jewellery as a psychiatric study, may hold the true key to the problem; this young woman is in urgent need of an analyst. It has also transpired that people are inclined to give her unsuitable presents such as medical instruments and surgical detritus.

In conclusion, this jeweller should in no way be encouraged to act as a medical consultant. It is crucial that she should never be allowed to give lectures pretending to be a doctor.

Mokume Gane Ian Ferguson

An understanding of mokume, the layering of materials developed in the orient, started from curiosity about the Japanese tradition of sword making. Souvenirs of swords and Samurai sword furniture reached the west in the 19th century. Early descriptions of the production methods made the false assumption that solder was used in these multi-layered objects. It was only in the latter part of the 20th century that this technique has been rediscovered and researched. Eugene Peikenowski met his wife whilst studying in Japan, and the couple returned to work in America where Ian Ferguson later studied.

Originally from Australia, Ian's education and research has taken him around the world in pursuit of knowledge of this Japanese metal work. His early experiments involved heating the 'sandwiches' of metal and slamming them together with a huge drop hammer. This is not a reliable method for producing sheets made up of several layers of metal. Experiments with the technique led him to the conclusion that heat and pressure would need to be applied simultaneously for the best results.

Diffusion bonding was developed by the aerospace industry combining heat and high pressure to overcome the problems of oxidation. If the metal surfaces become oxidised over time, and for some metals this is as little as 2 minutes, they will not bond effectively, as with any soldering operation the surface must be free from oxide for the process to be successful. As mokume relies on a bond being formed across the whole surface of each sheet in the 'sandwich' this is particularly important.

Ian Ferguson has developed a furnace with a high pressure chamber to compress blocks of layered metal at around 600C, depending on the composition of the 'sandwiches'. His experiments have moved away from the traditional Japanese alloys of copper and silver, and he has made mokume bowls from bonded aluminium alloys, iron and silver, titanium and copper.

These new combinations of metals have given rise to an unexpected colour palette of unusual and beautiful hues. The time devoted to researching an industrial process that could be adapted to Ian's needs has resulted in work which is rooted in traditional technology whilst being experimental and innovative.

Lasers: A Tool for our Craft? Richard Ball, Anne Marie Carey and Sarah Silve

A pure source of radiation/light with pure colour coherence – this is the laser, and it can be controlled by pulse or used as a focused spot. The beam is focused and concentrated by mirrors and since its early development it has become ever more refined and versatile with applications across many disciplines; physics, communications, medical/ dental, engineering, and the production and processing of materials.

The laser can be used as a heat source for joining, such as a spot weld, or as a highly accurate method at intense heats for deep and narrow joints without the need for any filler. For cutting, the laser is fast, flexible and capable of very fine and repetitive cutting with the advantage of needing no surface contact which might cause marking or damage. Laser cladding is a technique for coating a substrate with another material and can be used with repeated layers of deposition. This can also be used to build up a surface pattern.

Soldering with lasers was developed for the fine electronics industry and is one of the areas of technology most rapidly transferred to jewellery. Laser joining techniques allow very complex structures to be manufactured: multiple joints, settings containing a diamond or even close to a delicate pearl. There are now a few jewellers using and developing this area of work. Tom Rucker from Germany works in platinum wire as it is strong and well suited to his lightweight delicate hollow forms, which can be laser welded with great accuracy at no risk to any other part of the piece. Not all jewellers choose to work with precious metals however. Ann Marie Shillito has taken advantage of precision-cutting for titanium, which is very hard to work by hand.

Lasers can be used to mark 2D images or patterns onto 3D forms on a wide range of metals, from niobium to silver. Birmingham Assay Office has been developing this as a non-contact marking method suitable for finished pieces, delicate objects and specialist items such as watch backs.

Sarah Silve has been working on laser bending techniques to create 3D forms from flat sheet. This 'high tech' work uses an X-Y table, which can be tilted to expose different parts of the metal and an 'unfocused' or cooler beam. The projected laser beam creates a different temperature on the exposed side so that the sheet will bend. This distortion can be exploited to create undercut, oval and many awkward 3D forms as an alternative to raising. It can also be used for surface texturing.

Many developments in this field of work are explored through university research and it is only recently that laser welding equipment has been produced for the commercial workshop. In a relatively short time however it has made its mark and is now here to stay.

Design is a Mentality Gijs Bakker

The importance of cultural roots and identity were the starting point in this presentation, which was an overview of Gijs Bakker's work. He has worked on many areas of design and has chosen not to be constrained by range, function or scale in his diverse projects, which include furniture design, industrial design, interior design, and of course jewellery. Much of the work was celebrating and teasing about the Dutch virtues of frugality, recycling, and the pressure to conform.

Amongst the pieces illustrated was work from Bakker's design group Droog, such as the door chimes made from upside-down wineglasses, the clusters of milk bottles containing 80watt light bulbs and the higgledy-piggledy bundle of boxes bound randomly for storage. There were also larger scale projects for street furniture.

Much of the work was well known to the audience as it is represented in many books detailing the developments in late 20th century jewellery design. The earliest work is sculptural and often pushes at the boundaries of what is jewellery and what is clothing. More recently Bakker has used technology and photographic images in his work, most famously in the brooch commissioned by the Amercan collector Helen Drutt English, which shows a kneeling man emptying a bucket of water, represented by a cascade of diamonds, down his back.

Science and Beauty in Anglo Saxon Jewellery

Mike Pinder

Anglo-Saxon disc brooch from Sarre, Kent. 7th Century (British Museum)

The dominant culture in England for about 600 years was Anglo Saxon and during this time Christianity was introduced. Literature of the period and archaeological evidence shows us that jewellery served a variety of functions: practical (cloak pins), cultural, religious and ceremonial. The uniting factor is a love of rich trappings and colourful objects. Composite garnet disc brooches are among the most technically sophisticated cloisonné pieces which show the skills of the 7th century goldsmiths.

Brooches were often made in two parts, the decorated front and the clasp-bearing back, which were joined together with a rub-over bezel and an organic binder or glue. This adhesive could be heated to soften it sufficiently to allow the piece to be disassembled for repair or recycling. The decorated front combined this sticking technique with eutectic or granulation solder for the placement of foil-backed cells filled with garnet inlays cut to size. Beaded wires used in the ornamental filigree panels are sometimes as small as 2mm and the foil backing only 0.02mm thick, which indicates the craftsmen not only had the skill but that their society supported and valued them. The foil backings were embossed with a minute waffle design with up to five squares per mm, an extraordinary achievement in miniaturisation.

It would appear that all the glued elements were carefully positioned before the front panel was heated and pressed flat. The stones and cell divisions are flush, with the exception of the central domed boss or garnet setting which was tube mounted, spread and glued at the back. Beeswax is known to have been an ingredient in the adhesive, allowing the piece to be adjusted when hot and set solid when cool. Calcite has also been identified but the precise makeup of this paste is still open to conjecture as full analysis has not yet been done.

What is known is that the variety of knowledge needed to produce this work covers tool making, metallurgy, the use of mercury for gilding, the production of fine wires, eutectic soldering, as well as stonecutting and polishing. In addition to these skills the makers would have needed a reliable heat source to work copper and gold. The fact that this level of skill and knowledge was devoted entirely to the making of beautiful things is, from a modern perspective, remarkable. It is impossible to imagine such a level of science being devoted to visual enhancement in today's world.

Jewellery: Between Science and Art Nora Fok

I came to England about twenty years ago. I was working as a graphic designer in Hong Kong in a highly commercial money-making society and I needed a change. I managed to get a place on the Wood, Metal, Ceramics and Plastics course at Brighton Polytechnic, which turned out to be an ideal course for me. I was encouraged to be myself and explore materials and ideas in a way that I had never done before. This was wonderful, and this was where the work that I am doing now originated. My ideas may come from a whole range of sources – quite unpredictable, I could say, from the world around me, and my present lifestyle.

Most of my work is nylon mono-filament knitted structures. My ideas and making processes seem to come together naturally. I think in terms of my craft and I enjoy the way I can express myself through the basic craft techniques that I have developed.

As I grew up with the 'Star Trek' series, astronomy is one of my favourite themes in my work. I also love spiders' webs – it is extremely interesting to observe spiders as they weave as different species of spider have different styles of weave. I hope one day to use man-made spider silk in my work.

I have been inspired by the helix, the image of deoxyribonucleic acid (DNA) and have produced several pieces on this theme. Modern technology also allows us to see the tiniest of living creatures; the wonderfully beautiful organisms that form the food chain and may eventually end up on our dinner-plates!

Every time I see that image of water dropping onto a hard surface and rising in a crown, my heart is filled with a sense of excitement. I froze this image to put it on and the pleasure is all mine.

Pharmacopoeia Susie Freeman and Dr Liz Lee

This project was a development of the work for which Susie Freeman is well known, using monofilament knitted textile forming pockets filled with small objects, either jewel like or organic.

Collaborating with Liz Lee, a GP, brought a new focus to the technique and between them they have produced an exciting and provocative body of work, which was shown during the conference in the gallery of the Midlands Art Centre and is still touring. Their talk examined the thematic basis of the work.

Many of the pieces made use of wasted or unwanted drugs. What was most alarming is that there appears to be a vast quantity of prescribed medication which is not used. It is regarded as waste and eventually returned to the local pharmacy for destruction. A large variety of medicines was used in the exhibition to illustrate different themes: the ball gown filled with contraceptive pills, the agoraphobic's handbag made with anti-depressants, beta-blockers and Valium. In addition to the tablets themselves set in the knitted pockets, the foil and plastic packaging was used in some of the work.

Possibly the most striking work was a maternity dress made with all the pockets filled with cigarette ends. This has an obviously strong health education message – and no doubt smelled truly vile, unlike all those nice sterile packs of painkillers and sleeping pills!

Susan Freeman. Come Dancing.
Photo: The Wellcome Trust

A Creative Process Marianne Forrest, watch and clock designer

Marianne Forrest

Marianne's early projects were for one-off clocks, wrist watches and pocket clocks. These pieces were designed to be comfortable to hold, with rounded forms to fit the hand. The range was expanded when she moved into production pieces and started to take on large public clock projects. A feature of all the pieces, whether large or small, is the emphasis on surface treatment. Experiments and accidents create interesting patinas and textures – spray paints, chemicals, waxes and abrading the surface all contribute to the appearance of the finished piece. Aquatic themes appear in much of the work and Marianne's enthusiasm for diving is evident in the 'diving bell' wristwatches.

The first large corporate clock was made in the late 1980s for Honeywell Computers and used the imagery of their business as a design theme. A giant pocket watch in the City of Birmingham is a direct reference to the city's part in the history of horology and jewellery. It hangs on a long chain from the ceiling of the Great Western Arcade Shopping Centre. In the large commissions a variety of materials are used: plastics are versatile and light in weight, metals are durable and can lend themselves to many surface treatments.

The theme of combining tradition with modernity was expanded further with the project for a large 'clock' for the entrance hall of the Glaxo Wellcome headquarters. The design process involved thinking about imagery which would reflect the building itself, its function, site and appearance, as well as ideas relevant to the client. As a research centre the theme of a journey of discovery was taken as a starting point and the design was built up using some traditional sketching, but most of the design and presentation was done using a computer. The 'voyage' idea also provided another opportunity for using marine imagery. The finished piece contains symbolism of knowledge and discovery and although the movement is analogue, it looks digital, thus linking past and present, old with new technologies.

The Weird and the Wonderful Sigurd Bronger

We were introduced to the sources of inspiration which appeal to Sigurd Bronger, who has a particular love of gadgets, bits of old technology, and a strong identification with engineering. These are all mixed together with the added ingredient of a quirky sense of humour to become the basis of much of his recent work.

The slides illustrated his enthusiasm for non-precious materials and for expressing ideas. There were coloured ping-pong balls worn on the shoulder like a flightless jewel, and objects beautifully boxed so that the presentation becomes as important as the piece itself. Everyday things such as the perforated plughole covers, the top of a spice jar, a manufactured sponge, were all used with wit and imagination. There were 'make your own' assembly kits for rings with a balloon to blow up, and the 'precious' egg ring supported in its exquisitely engineered frame and supplied with packaging in case of breakage.

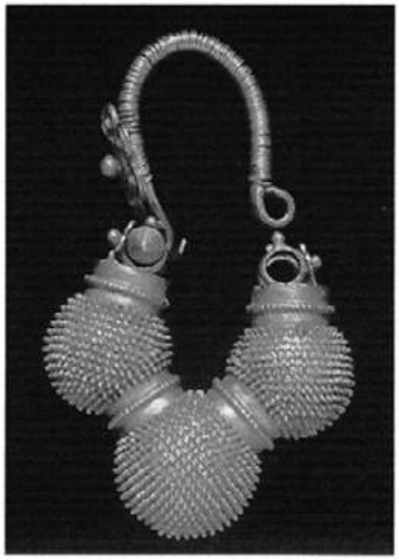
Throughout, the talk poked gentle fun at the theme of modern society and its values. The stressed-out yuppie can show his 'status' by wearing the wrist pressure gauge instead of a watch. After all, to be busy and short of time can be seen as an indicator of social standing, so why not show the pressure? Sick of wearing the company logo, don't want designer labels? You need the logo-concealing brooch with a little curtain to pull over the offending label. Perhaps you couldn't afford a bigger diamond, so the answer is the ring with a built in loupe to enlarge even the most minute of stones! On the same theme of recycled optical instruments is the magnifying brooch to enlarge the texture of the garment underneath, or even to highlight a stain or a hole!

The majority of the pieces we were shown in this humorous yet thought-provoking talk made use of engineering and scientific instruments whose original purpose was delightfully transformed and subverted.

Work of Thorns Vivienne Farmer

A study of the Indian technique of Bábul, or Khárdár

A few years ago I did an MA in metalwork conservation at the Victoria and Albert Museum. This involved a final year research project and, reverting to my original training as a jeweller, I began looking through the library of the Indian Section for documents concerning Indian jewellery. What interested me in particular was that these often included quite detailed descriptions of various jewellery making techniques, recipes for solder, or methods of refining gold or silver.



Gold 'Babul' work earring

Amongst the papers was a detailed description (by Baden H Baden Powell) of work which resembled tiny hedgehogs made by a technique known as 'babul work'. There were no illustrations of this Punjabi metalwork, but as luck would have it the Indian Section store did contain a small group of pieces purchased in Delhi in the mid 19th century.

Bábul work is simply a technique for covering gold spheres and hemispheres with an arrangement of tiny conical points around 0.6 to 0.8mm in diameter across their base. The packing is so close that they more or less cover the entire surface. The arrangement of these points is geometrical in its precision. The documents give a pretty accurate account of the techniques used by the specialist craftsmen who produced the work. It was mistakenly believed to be similar to granulation, but the punched cones were actually soldered to the main structure. In order to make the points, gold wire is drawn down 'till as fine as possible' then annealed. It is cut with 'scissors' and left to soak in oil. With a tiny hammer each shred of wire is hammered into a die of conical holes, the oil preventing any disposition to stick

I tried making these points following the description and using 0.7mm, 0.6mm and 0.4mm wire in both fine silver and gold. Working on such a tiny scale in my experiments was demanding, but with trial and error little 'witches' hats' were hammered out with a conical punch, and the 'brim' trimmed off. The process is laborious but not, as it turned out, as difficult as I had at first expected. Still following the documented instructions, the pieces were glued in place with a paste of boiled lentils and borax (about 8 parts lentil to 1 part borax). As a comparison I also tried a modern equivalent, which I made from wheat starch glue and borax. However although it made a better adhesive, it dried more quickly, which was actually a disadvantage. The process of arranging the points is a delicate process but the lentil borax glue will hold them in place. Solder needs to be well distributed without smothering the detail of delicate spines, and the whole is then heated. It is interesting that there is so little borax in this lentil paste that it hardly bubbles up at all and the carefully arranged points stay in place when heated.

The end results of the experiment matched the original examples, which was very satisfying. Further tests with hollow cone forms were less successful, but I was able to utilise my initial research in a design project when working for Julie and Paul Spurgeon on a cast range of 18 carat jewellery.

Grow your Own – Angiogenetic Body Adornment

Norman Cherry

Norman Cherry: grow your own body adornment

On a visit to the engineering department of Liverpool University I was talking to one of the rapid prototyping specialists about his collaborative work with the department of Medicine. They were working with accident victims who required substantial bone and tissue repair/regeneration and this was my introduction to the field of tissue engineering.

For some years it has been common practice to grow cells outside the body. Only recently have complex 3D tissues been grown for insertion into the body for continued growth and development. Growing body parts with a patient's own cells and a soluble structure means that the goal of transplants which are genetically compatible might one day be achievable. The advantages are that anti-rejection drugs, which are both expensive and unpleasant, can be avoided. Medical progress in plastic surgery has now been matched by its aesthetic equivalents.

For centuries people have had themselves tattooed, scarified or mutilated to indicate membership status of a group, or as a rite of passage. The homoerotic idealisation of the athletic body beautiful in ancient Greece and the present day rather extraordinary cult of 'pumping iron' are typical examples of body reconfiguration. We may not admire it, we may not approve of it, we may even be disgusted by it; it is however an act of free will and strangely fascinating.

Cosmetic alterations have a long history although it is only recently that 'nose-jobs' have become mainstream in parts of America. How does this differ from orthodontic work - a gold inlay, or even a nice little diamond for added sparkle?

The French performance artist Orlan has undergone several surgical operations to alter not only her face but also parts of her body, the videos of these operations forming her performances. She has been remodelled in the form of Venus, Diana, Europa, Psyche, and the Madonna. As part of its 25th Anniversary programme Gallery Ra in Amsterdam ran a design competition entitled 'Jewellery of the Future', for which Elisabeth Scheuble produced a 'Self Implantation Kit' intended for insertion into the scalp!

But why stop there? Why not have a three-dimensional implant of your own cells inserted under your skin and watch it grow into real cartilage or bone – real living body adornment. Like Orlan, you may find a surgeon to do almost anything you want if it's legal. I think therefore that it's only a question of time.

And the time may be nearer than you think.