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## Cutting Edge – Lasers and Creativity Symposium at Loughborough University Thoughts/review

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My first urge upon leaving the symposium (a full and intense day) was to learn more about the physics of lasers. The thought struck me during the day that if lasers are light (and I strongly supposed or at least thought I recalled that they were) then there was an important parallel between my current work and this new process; that of the utilisation of light to draw, in terms of the use of projection, *drawing* the prepared image on the chosen surface reflects the use of lasers to *draw* onto the selected material. This is an observation which goes not much further than that as of course it should be mentioned that all visual arts necessarily rely upon light and our light sensitive organs (eyes) to exist at all. That light, as a physical emission bears an essential relevance to visual arts can hardly be denied but in any case it is used more directly as a constructive creative tool in some disciplines than others, photography being perhaps the most obvious of these. The term 'photograph' translates literally as *light drawing* and projections were used in art in the form of a camera obscura long before the technology existed to record the image. I have been employing photography as research tool and constructive element recently and the nature of it is central to the installation. Both still and moving image are created from and expressed with light. It is worth noting Roland Barthes' criticisms of cinema at this point and his observations in *Camera Lucida* that moving image is a necessarily different medium from still photography with an alternative relationship to past and present (being a time based art form). That film is a passage through time and not a record of a single moment removes what he describes as *the noeme* or *essence* of the still image, which is *that-has-been*. This is hardly irrelevant to my use of the relationship between still and moving image to discuss the symbiotic relationship between place and space.

### Lasers

The word *laser* as it has come to be accepted was originally formed from the acronym Light Amplification by Stimulated Emission of Radiation and *to lase* is a back-formed verb derived from this. That lasers could be considered as light is a broad truth as they are indeed a form of electromagnetic radiation, though their frequency does not fall within the visible spectrum. Lasers rely on an initial emission (gain medium) which is the element to be stimulated and then amplified. These may fall within the ranges of X-ray, ultra violet and infrared though it is the infrared lasers which are commonly employed for cutting and welding purposes in industry. These are typically generated using a carbon dioxide laser,

one of the earliest to be developed in 1964. CO<sup>2</sup> lasers are the highest powered continuous wave lasers, currently available with an efficiency of up to 20%.

## Selected Creative Applications by Current Practitioners

**Sián Bowen** has developed her current practice from a background of hand cutting and references Japanese Kimono stencil cutting traditions in discussing the background of her work. In 2006 she was Guest Artist at Kyoto Art Centre, Japan and her work employed the use of a replica folding tea house (the Japanese word for which translates literally as *firefly basket*) originally made for use within a temple. This paper folding structure was used as an inspiration for displaying work which involved the use of laser cutting to reveal elements of layered hand worked papers. Though constructed from 2D references, this work naturally moved into three dimensions through this structure and made use of space and light to give the cut work a physical context. She discusses the validity of machine worked versus “hand touched” outcomes but concedes that the process behind the laser cutting technique (preparation of digital files etc) goes some way to redressing this balance and that the incorporation of hand drawn layers all but invalidates the question. From my perspective, her work presents interesting solutions for moving two dimensional techniques into three dimensional space and includes a sensitive use of light which appropriately focuses the main qualities of cutting without being overly self aware of the application of New Media. This technique is not forgotten however and she recognises that the act of burning is a process that leaves physical traces, visible and odourous and refers to the concept of *creative damage*.

**Jenny Smith** is a Fine Artist with a background in painting and printmaking who is employing laser cutting techniques to explore the dialogue between digital and traditional media. She is interested in exploring the potential present in recognising and utilising accident. Working with dribbled paint, the digital traces of these are then cut around to produce complex lattices which appear as though a ghost of the paint has been dislocated from the surface. She also discusses the time take to prepare the files for cutting and recognises that her inexperience with digital packages have generated many accidents which were important in developing the work. She also notes that time is a necessary parameter in the actual cutting as use of the machine is expensive and therefore limited. She draws parallels between her experience of the process and the work of Zen Painters who spend many hours carefully preparing ink before executing a brief burst of creative movement in which the entire outcome is realised. That this is a necessary constraint on her work is, she reflects, an important punctuation which facilitates self evaluation and further development.

**Sarah O'Hana** is a jeweller who has recently been employing laser cutting to manipulate titanium. Though she has been working with lasers as one of many methods for cutting, she has been particularly exploring the heat-reactive nature of titanium to produce a range of

colours on the surface of the metal. She has been working closely with scientists and engineers in the Laser Research Centre at the University of Manchester and has made some interesting developments in the application of the technology. She has found that graphite, being a conductive material, if applied to the surface will intensify the heat at the point of contact with the laser and has used this unexpected discovery as a form of mark making. She also notes the important practical consideration, that being a highly reflective metal, the laser bed must be tilted to prevent the beam bouncing off the titanium and back into the laser unit. In her presentation she discussed her relationship with the scientists and how this exposure to alternative methodologies has changed her own research practice. It was later raised in the panel discussion that the perceived boundary between arts and sciences is becoming increasingly eroded and that creative development in the use of technology such as this is catalysing the establishment of these relations. Another point of particular interest to me that was raised in her discussion was that in her frustration with the utilisation of the technology she had remarked to one of her colleagues “why can’t you just attach a pen to it?” This question was raised when she was seeking to employ a more direct relationship between the medium and her own drawing practice. Though her colleague had been concerned with safety implications of this request, further scientists had since approached her to suggest that such modifications to the interface would be simple to make and that they would be happy to investigate the possibilities if funding were to be made available. It struck me then that this technology is still very much evolving and as well as the noted increase in prevalence of related equipment in education that it will not be long before it is not just a physically commonplace technology but that the interface will be far more intuitive and accessible also. Sarah is now beginning to investigate laser cutting of silver.

**Sarah Silve** is currently working at Brunel University and exploring the potential in lasers not just for cutting but also for forming various metals. She has been developing various methods for bending and folding and has been achieving form through loss of surface area and through manipulating the temperature of the laser to effect bending either toward or away from the beam. Her work takes the form of vases and dishes though it has really been the research that has driven her progress, not the outcomes. Her talk raised issues around the nature of data input to some machines and the user interface with the controlling software. This highlighted the continuing distinctions between arts and sciences but at least demonstrated that these apparent gulfs are not insurmountable.

**John Angus**, a textiles specialist, presented a wide selection of laser applications which he had facilitated in the work of his students. The main work presented involved the commission of making a large scale lace mould which was used to create cast concrete panels as architectural details. Other applications presented included creating wood blocks for printing, embossing, cuts in materials which were then folded to effect self stitching, bending metal and texturing glass.

## Personal Practice and Potential Application of Laser Cutting Technology

Following the symposium I have identified several possible applications of this technology to my work. In the first instance these include:

- Cutting paper/other materials to project through
- Shaping paper/other materials to cast shadows in projections
- Drawing and mark making on various surfaces
- Stencil making for use in the traditional drawing phases
- Precise cutting and kiss-cutting of paper to create plans which may then be folded to create 3D structures
- Cutting and marking of Perspex which may be projected onto/through
- Embossing of papers, cards and fabrics to create textures which may then be projected onto

The next step in realising any of these needs to be practical however and it will not be until I can secure such access that tests can be made. I am hoping the machinery at MMU will soon be operational, however alternative options may include approaching other local institutions or seeking external paid access, such as in some arts/crafts shops, though these will be expensive and necessarily limited.