

## Reproduction in Sculpture: Dilution or Increase?

### INTRODUCTION

Ed Allington

TinTin is reeling backward, a dynamic spiral beneath his feet, Hergé's sign indicating movement. Snowy is beside him mimicking the 'take' and emphasising it. In one hand TinTin holds a suitcase, under his arm a parcel which contains an Arumbaya fetish, perhaps the very one he has just travelled through South America to find. He is looking into a factory where Arumbaya fetishes are being mass produced. Shocked, his other hand grasps his brow, there is a spray of sweat drops, his cap floats in the air and his head is surrounded by black stars to show the enormity of the problem. How will he ever find the original fetish? For all the copies replicate its characteristic fault: a broken ear. How will he discover the unknown knowledge it contains and then return it to the museum from which it was stolen?

Hergé's story of TinTin and the Broken Ear hinges on the reader believing that there should be only one authentic fetish. A reasonable enough assumption. Yet our experience shows us otherwise; the practice of sculpture is dependent upon reproductive techniques, and most major museums display versions of the same famous statues. If we were to ignore the thrust of Hergé's story for a moment, it would also be quite reasonable to believe that TinTin's shock is unfounded, for perhaps this factory is where the museum itself manufactures replicas of its most celebrated pieces to sell. Yet even if this were the case TinTin would still need to reel with shock for without the original, the factory would be providing copies without proper authority. Sculptures proliferate, reproduce, are replicated with and without the artist's approval, with and without the direct involvement of the artist's hand.

Indeed it can be said that a large part of the pleasure, the sheer beauty, of sculpture lies not within what Lucy Lippard has described as its classical sense – 'Sculpture, in the classical sense, is like architecture, necessarily stable (statue, as in stasis and status quo)'<sup>1</sup> – but in its very instability, its almost sexual ability to reproduce. This exhibition is an attempt to openly offer this aspect of the wonder which sculpture can generate to those who look at it, and those who study it. It focuses on the reproductive techniques used in its manufacture, on works where the artist has had to replicate hand movements, where the artist has not touched the work at all. It is an exhibition which spans a vast period of time. Although modest, this survey may to some extent offer an insight into why sculpture has become in the modern era such a vital and wide-ranging activity, the phenomena which Rosalind E. Krauss has described as sculpture in the expanded field.<sup>2</sup> By glimpsing some part of sculpture's hidden but long history of unstable identity, so very familiar to its practitioners, perhaps the reason why so many contemporary sculptors chose to work in materials commonly thought of as 'not sculpture', while never doubting that they are indeed sculptors, will become clearer.

The issues raised by reproduction in sculpture range from simple questions of technical interest to complex issues of authority, authenticity and ethics. From

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<sup>1</sup> Lippard, Lucy R., *Tony Smith*, Thames & Hudson, London, 1972, p.9.

<sup>2</sup> Krauss, Rosalind E., *The originality of the avant-garde and other modernist myths*, MIT Press, 1985, p.276.

questions of virtue and quality to political questions relating to the availability of, and dissemination of knowledge. Picture our comic image of TinTin once more and imagine this time his shock is due to the thought that should the Arumbaya fetish prove a fake, the subsequent loss in value of the factory's products could lead to closure, which would in turn leave its workers unemployed. An absurd image, but a real issue. Reproduction in sculpture is an economic as well as an aesthetic construct. This is not the place to expand this discussion, but perhaps a brief description of the key points around which the debate must move would be of use, beginning with that which is largely absent in the exhibition.

## THE IRRESISTIBLE LURE OF THE 'UNIQUE'

In his essay 'An Original in Sculpture', Jean Chatelain describes the dramatic changes which occurred in the arts when centuries of traditional workshop practice based upon the celebration of copying, of pupils emulating a master, who in turn strove only to perfect his craft, were swept away:

'The revolutionary upheaval which shattered the traditional workshop system and the advent of an individualistic philosophy, followed the rise of romanticism and the development of the art market and speculation, destroyed this unity and substituted a hierarchy among the arts. All these factors contributed in fact to the emergence of a new concept, that of the artist as an inspired, exceptional being, endowed by providence or by nature with a gift for creating, innovating – for doing what others had not yet done – and so personal, so spontaneous, was this endowment that it could blossom only within the context of total liberty, supporting neither guidance nor hindrance'.<sup>3</sup>

Chatelain then goes on to describe the implications of this momentous change: "Since it is the creative gift that makes the artist, it is by its innovative nature that a work of art is to be characterised. A true work of art is one which has never been done before: in short, an original work".<sup>4</sup>

The concept of the artist as an inspired being changes the entire practice of sculpture: 'It comes to the point where any work realised by the artist himself is an original work. On the other hand, any reproduction of an artist's work made by someone else, no matter what the process might be, is without real artistic value and therefore of an inconsequential price, for it no longer gives direct evidence of the creative impulse. It is an object ; it is not a work'.<sup>5</sup>

This change in practice, despite being seriously undermined by developments in sculpture since the 1960s, has left us with important and lingering legacies, among which we might list the phenomena of the art work (which needs the personality of the artist in order to sustain itself) and, more pertinent to our subject, the curious paradox of the reproduced unique work.

## THE CURIOUS CASE OF THE FIRST OR ORIGINAL EDITION

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<sup>3</sup> Chatelain, Jean, 'An Original in Sculpture' in Elsen, Albert E., ed., *Rodin Rediscovered*, National Gallery of Art, Washington, New York, Graphic Society, Boston, 1981.

<sup>4</sup> Ibid p.275.

<sup>5</sup> Ibid p.276.

It would seem logical, to think that all original works should be by definition unique. However a combination of economic necessity and the fact that reproductive techniques are inherent to the practice of sculpture, have defied this logic. This is how Chatelain explains the paradox: ‘This new conception of a work of art inevitably brings about a classification of the arts which will tend to differentiate in more or less exact and telling terms between on the one hand, the noble or fine arts, and on the other, the applied or decorative arts. Let us put forward other, less commonly used terms, yet ones which to our minds seem closer to the point: the ‘simple’ arts and the ‘compound’ arts.’<sup>6</sup>

Chatelain describes the simple arts as: ‘...those where the work is brought to term by the creative artist himself.’<sup>7</sup> and the compound arts as: ‘...those where the achievement of the work requires the intervention of – in addition to the creating artist – one or more craftsmen who give the work its definitive form.’

The practice of sculpture usually involves some use of what Chatelain describes as the compound arts: ‘More over, the debate is not simply theoretical and abstract, for the compound arts require the intervention of highly qualified artisans using materials which are oftentimes considerable and costly. If one wants to ensure continuity of these craftsmen and their skills, they must be given a minimum amount of regular work, that is reproduction.’<sup>8</sup>

The basic role on which this compromise is founded is that the ‘matrix’ from which the skilled artisans work to produce the original edition should be made by the creating artist’s own hands and that their final completion be overseen by some agreed authority, usually, but not always, the artist. The notion of the first edition is simply that of all technically possible copies from the ‘matrix’. The first will be usually considered the most noble, beautiful and accurate, and the first edition will usually be small in number (under 10 examples). The reason for this is usually a balance between what is economically most advantageous to artist, artisans, agents and buyers alike. Sometimes the ‘matrix’ can only sustain a certain number of copies before failing. Sometime however, the notion of the original edition is used to fallaciously promote exclusivity which brings us to the very opposite of the first edition, the concept of mass-produced art.

## THE EDITION ENDLESS

If the ‘matrix’ created by the artist is capable of sustaining prolonged use, at the required level of quality, why shouldn’t the artist make a huge number of copies, thus making the sculpture widely available at affordable prices to all? Although an admirable ambition, this has rarely been achieved. Perhaps the most impressive example of such a limitless or mass-produced work of art were the **Disposables** of **Les Levine** (not in exhibition), 1,000s of vacuum-formed plastic sculptures which he produced from 1962 until about 1967.

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<sup>6</sup> Ibid p.276.

<sup>7</sup> Ibid p.276.

<sup>8</sup> Ibid p.276.

‘Thousands have sold, and some have thrown them out. They’ve probably been sold to only ten or twelve people who could be considered collectors; this means that many people who have never owned a work of art have gotten involved with the activity of collecting. You see it’s like Keynesian economics: it’s not what you produce that’s so important, but turnover and circulation.’<sup>9</sup>

The ‘Madonnenfigur’ by Katharina Fritsch is another example of the same urge to not close off the ‘matrix’ but to keep it continuously available; an open acceptance that there is no logical reason in this case to close the edition, an action which renders the image inevitable or unstoppable. Levine’s disposables, an action he is continuing in essence with his bill board projects,<sup>10</sup> describe the antithesis of the first edition. Whereas Fritsch offers the image not closed by exclusivity, Levine offers the potential of art which could be sold in a supermarket. Jack Burnham comments:

‘The plastic disposables are a structural paradox, their production and sale as art produce a double bind. They challenge the market mechanisms which restrict the supply of certain art works, making it clear that this restriction is due not to rarity or scarcity, but to economic strategy. Levine thus notes that Noland’s stripe paintings could easily be manufactured like awning fabric with strip frames to match, at virtually no decrease in quality. If this is so, then the perpetuation of high art in the midst of mass-production is nothing short of social hallucination. By signing contracts with department stores for the sale of millions of disposables (\$1.25 each), Levine is filling a niche in the ecology of art economics – and in the process may make as much money as Kenneth Noland. Hence Levine, as an artist, sees little use in uniqueness or pseudo-uniqueness, but only in well considered business methods, a juxtaposition of kitsch and high art which brings to mind the methods of Frank Zappa.’<sup>11</sup>

Levine’s disposables do refer to the idea of pseudo-uniqueness, if only because of the reproductive technology used. The ‘matrix’ is potentially capable of sustaining massive replication, yet although the disposables are obviously not Kitsch, Burnham has to refer to Kitsch mass production, even though he qualifies it by reference to the subversive musical creations of Frank Zappa. Why?

## KITSCH TRANSFORMATIONS, OR THE TASTE WHICH TASTES BAD

Up until now we have discussed the main formats of reproduction in terms of sustainable quality, with only the hint of the potentially dubious content inherent in such an aesthetic construct; the unclosed ‘matrix’ as offered by Katharina Fritsch; or the potential increase offered by the **Disposables** of Les Levine. Yet no sooner is this increase made available, than the potential of failure of absolute decrease appears to dash all hopes of sculpture as a free art form. The immediate description would be that reproduction beyond a certain level is automatically axiomatic of bad taste or Kitsch. This simplistic and convenient compression of the issues of mass production

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<sup>9</sup> Les Levine quoted in Burnham, Jack, *Great Western Salt Works, essays on the meaning of post-formalist art*, George Braziller Inc, New York, 1974, p.39.

<sup>10</sup> ‘Of course since then I have made many various kinds of multiples. I consider the outdoor bill board project I do to be disposable’. Letter from the artist, October 9 1994.

<sup>11</sup> Burnham, Jack, *Great Western Salt Works, essays on the meaning of post-formalist art*, George Braziller Inc, New York, 1974, p.39.

and mass art is however destroyed by Herman Broch's definitive lecture 'Notes on the problem of Kitsch' where Kitsch is directly related to the rise of Romanticism and the cult of the unique.<sup>12</sup>

Broch begins by correcting a major misunderstanding upon the nature of Kitsch, which is generally understood to be a property of objects rather than an issue of perception: 'I shall not talk strictly about art but, about a fixed form of behaviour with regard to life. Kitsch could not, in fact emerge or prosper without the existence of Kitsch-man, the lover of Kitsch; as a producer of art he produces Kitsch and as a consumer of art is prepared to acquire it and pay quite handsomely for it.'<sup>13</sup>

Kitsch is irredeemably linked to the idea of reproduction because Kitsch is an anti structure and as such is always parasitic. This is the important issue; Kitsch is a finite system. It is closed. Reproduction in art, does usually, sadly, equate with Kitsch. But this is not because reproduction is a closed or finite system, it is not. Herman Broch's main point is worth quoting in full:

'...we can illustrate why Kitsch resulted from Romanticism, and why it must be considered a specific product of Romanticism. And in fact if knowledge, and in particular scientific knowledge, can be defined as an infinitely developing logical system, the same can be said of art in its totality: in the first case, the Telos of the system (a goal suspended in infinity and at an infinite distance) is truth; in the second it is beauty. In both cases the final objective is the platonic idea. It seems regrettable that love is also a platonic idea, an idea that cannot be attached by means of the many unions to which man is constrained (this, incidentally, explains why love songs are all so sad); but as love can scarcely be considered as a system, there may be some hope left for it. But wherever the goal is unquestionably unattainable, i.e. in structures which, in the manner of science and art, move relentlessly forward according to some inner logic from one discovery to the next, which meant the goal remains outside the system, then the system may and should be called open. Romanticism is inclined in exactly the opposite direction. It wishes to make the platonic idea of art – beauty – the immediate and tangible goal for any work of art. Yet, in so far as art remains a system, the system becomes closed; the infinite system becomes a finite system. Academic art, which involves a continual search for rules of beauty, with which all works of art must comply, makes things finite in a similar manner. We cannot, of course, identify Romanticism with academic art, not are Kitsch and academic art identical (although the latter is one of the most fruitful areas for the influence of Kitsch); but nor should we overlook the common denominator underlying all these phenomena, which consists of their tendency to render the system finite.'<sup>14</sup>

As Broch so clearly states, the real issue is one of open or closed generative systems. Reproduction is obviously not a closed concept. Which is why sculpture, being inherently reproductive, has moved beyond its original monumental confines into a completely open indefinable system, into the expanded field. It would seem that we are left with the conclusion, infinitely debatable though it is, that Romanticism, a movement essential to the advent of modernism and a movement which leaves a long

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<sup>12</sup> Broch, Hermann. 'Notes on the problem of Kitsch'. Lecture to Faculty of German at Yale University in Dorfles, G., *Kitsch, An Anthology of Bad Taste*, 1969, Studio Vista, p.69.

<sup>13</sup> Ibid p.49.

<sup>14</sup> Ibid p.6.

and complex legacy in relation to the unique and the reproduced, has somehow been closed off. Are we now moving on to an era beyond the historically brief notion of the Romantic and hence beyond the notion of Kitsch? One thing is sure, that period of art from the end of the 1950s until the beginning of the 1970s where the end of art was so often stated, probably marked no less than the death of Romanticism and a return to instability; to an open system.

#### CHANCE ENDLESS SYSTEMS OR DO HANDS MATTER OR NOT?

Of the key issues relating to reproduction in art, that of the artist's hand is probably all that remains. Even though we have already defined its essentially Romantic origins, perhaps the last word on this should belong to Sol Le Witt. I have never forgotten meeting two artists in the Paula Cooper Gallery in New York who introduced themselves as Sol's hands, like cowhands. As art workers who were simply tending the stock of art. A necessarily unhealthy animal who we all believe will do well.

'Since the functions of conception and perception are contradictory (one pre – the other post fact) the artist would mitigate his idea by applying subjective judgement to it. If the artist wishes to explore his idea thoroughly, then arbitrary or chance decisions would be kept to a minimum, while caprice, taste and other whimsies would be eliminated from the making of the art. The work does not necessarily have to be rejected if it does not look well. sometimes what is initially thought to be awkward will eventually be visually pleasing.'<sup>15</sup>

Le Witt's statement, 'will eventually be pleasing' is indicative of an open system, a teleological system as Broch defines it. This exhibition aims to describe thus the sheer beauty of sculpture as an open reproductive system.

#### BUT WHAT OF TINTIN AND THE FETISH, LEFT FREEZE FRAME?

Fetish, has been sold to a collector who is mortified to find the piece has a dubious provenance. The crooks arrive on the scene, there is a struggle in which the original Arumbaya fetish breaks to reveal a diamond, its kernel of truth, which rolls into the sea as do the crooks. The fetish is broken, its secret lost. With curatorial thoroughness the Arumbaya fetish is returned to the museum. The story has turned full circle and we leave the cartoon strip with a vignette of the fetish on its plinth. As in the first frames, on the first page, a museum attendant whistles an air from Carmen. The only difference is that now the fetish is restored or rather it is repaired, and badly. It is the same but not the same.

#### MORAL: THINGS JUST WON'T STAY ORIGINAL HOWEVER HARD YOU TRY

End of story? not quite.

In Paris, on the corner of Boulevard St Germain and the Rue Saint Jacques is a shop devoted to the devotee of the bande dessinée or comic strip. If you wish you can go there and buy an Arumbaya fetish, broken ear and all. It's a bit expensive for a

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<sup>15</sup> Le Witt, Sol; 'Paragraphs on Conceptual Art', in *Art Forum*, June 1967.

replica of something which never actually existed other than as a picture in a cartoon strip, but it's solid believe me, and it looks good. It is available as part of a limited edition after all. I haven't bought one yet, but I'm thinking about it.

*A text commissioned to complement a conference and exhibition organised by the Centre for the Study of Sculpture, December 10, 1994 – January 30, 1995.*

## CATALOGUE OF THE EXHIBITION

### BEN DHALIWAL

The impact of the multiple on the history of art has been enormous. Throughout the Renaissance, Antique sculpture was excavated in Italy and around the Mediterranean and as this happened theories developed which were intended to provide a chronology and authorship for some of the finds. Many of these theories formed the bases, methods and language of art history and archaeology as it is studied today. One problem which scholars in the Renaissance encountered, and which repeatedly obstructed the writing of an accurate history of Antique sculpture, was their failure to appreciate that the sculptures which they were studying were often Roman copies of Greek originals. Nevertheless this archaeological activity helped to spread the cult of the Antique further a field and as more sculpture was excavated and major collections began to be established, guide-books were introduced. An example of this is, *Sculpturae Veteris Admiranda* 1680 by **Joachim von Sandrart** (1606-1688) which lists the main Antique sculptures and their precise locations in Rome.

From the Renaissance onwards, both Antique and contemporary sculpture began to be reproduced, sometimes in plaster, sometimes in stone by pointing, and also by lost-wax casting in bronze.

## THE TECHNOLOGY OF REPRODUCTION

Historically, most sculpture has been reproduced either by pointing in stone or by casting in bronze; occasionally both methods were used on the same piece of sculpture. It is hard to know which of the two processes developed first. The Ancient Greeks acquired the technique of lost-wax bronze casting from the Egyptians in the 7<sup>th</sup> century BC and it seems likely that pointing was employed from at least the 4<sup>th</sup> century BC. The Greeks from that period onwards regarded works by previous generations as Classical and therefore worthy of reproduction. Although bronze was the preferred material for making sculpture because of its plastic flexibility and its portability, marble was far cheaper and more readily available. Technical problems arising from reproducing the balance of the free standing hollow bronzes were circumvented by introducing transversal props. Many statues originally conceived in bronze were reproduced in marble in the workshops of Ephesus, Smyrna, Paros, Thasos, Pergamum and Magna Graecia.

## POINTING

The technique of reproducing a sculpture by pointing is an arduous one requiring lengthy preparation and considerable skill. The sculpture to be reproduced is placed in a frame commensurate with the size of the block of stone which will be used to

make the copy. The pointing device is fixed to this block of stone. The end of the pointing machine arm with the calibrated point is then used to measure distances from the outer edge of the frame to strategic points on the sculpture's surface. The arm is then fixed in position and the block of stone is drilled to the equivalent distance. The whole process is repeated at strategic points all over the surface of the sculpture, drilling into the block from which the copy is to be made. Often, when enough drill marks have been made, the surface of the block of stone takes on the 'porous' appearance of coral or sponge. The sculptor or studio technician then chips away the outer layer to reveal the rough outline of the sculpture copy beneath. This is then worked over and finished as appropriate to the subject matter.

Although very time consuming pointing is largely mechanical and for many years it was the work of the sculptor's assistant and formed part of the artist's apprenticeship. Thus the subject is often covered in sculptor's studio manual *Istruzione Elementare Per gli Studiosi della Scultura* 1802 laboriously explains for the student the process by which sculpture is reproduced, enlarged and reduced.

Because of the rhetoric of spontaneity promoted by the early British Modernist cult of direct carving, the process of pointing has almost fallen into disuse. However Pointing Machines are still manufactured in this country by Tiranti and Sons. The use of the machine is demonstrated in their publication, Alex Miller's *Stone and Marble Carving*, 1948 and is illustrated in Charles Sargeant Jagger's book, *Modelling and Sculpture in the Making*, 1933.

The labour intensive nature of pointing combined with the increased demand for sculpture from the middle of the 19<sup>th</sup> century onwards inspired the search for a mechanical alternative to pointing. When Benjamin Cheverton voiced the opinion to the Royal Institute of British Architects that 'Sculpture then, in its technical aspect, is a mechanical art, and mechanical sculpture is the perfection of it', he was voicing a sentiment which was quite widely believed in Victorian England and his invention was but one in a long line of mechanical encroachments upon the sculptor's art. Benjamin Cheverton's 'Sculpturing Machine' was not a new idea when it was patented in 1844. The conviction that it might be possible to reproduce sculpture mechanically in the round was one which had occupied James Watt's attention in the last years of his life c.1815, when he was immortalised in a bust made by Francis Chantrey. Watt produced some startling results by ingeniously adapting the principles of a medallion turning lathe, but he died before he was able to realise his ambition of making his own reproduction of Chantrey's bust of him. Cheverton's machine however differs markedly from previous attempts to realise the construction of a carving machine in that it was capable of making both enlargements and reductions from an original. The tracing point and the cutting tool are mounted on a carriage which slides on a bar pivoted on a ball joint. Their interconnection allows them to move together longitudinally with respect to the bar and to carve recesses which would otherwise be inaccessible. The original sculpture is mounted upon vertical spindles so that it may be rotated by hand when required. Cheverton designed his machine initially for carving marble, but found that it produced the most satisfactory results carving in ivory, a medium which he preferred for its opacity.

Throughout the second half of the 19<sup>th</sup> century carving machines continued to be developed and refined. *The Morning Post* of August 3 1903 congratulated the

novelist Sir Arthur Conan Doyle and sculptor W. G. Jones for having the entrepreneurial insight in 'bringing before the country an invention which will do all of the work done by the pointer and in a twentieth of the time'. Conan Doyle and Jones had secured exclusive rights to the invention of a Signor August Bontempi, of Naples, and the only working model of his machine then in existence. The machine was demonstrated in a disused factory in Battersea before a jury which included the sculptor Sir Thomas Brock RA and Mr Brindley of the firm of Farmer and Brindley. Brock evidently 'declared the utmost astonishment' at the speed of the machine and his sentiments were echoed by Brindley. *The Morning Post* heralded the machine as 'Remarkable' and predicted that 'while the machine will not do away with the necessity for the artist's finishing touches in the case of delicate work, it promises entirely to do away with the long and costly process of pointing'.

The importance of not doing away with the artist was something which Cheverton was at great pains to impress upon the members of the RIBA in 1837. 'It is the artist who must take the first step. It must be his hand to catch and embody the ideal creations of his imagination, or to light up with a refined intellectual, or impassioned expression of the otherwise literalitie of mere lineament and form. The artist accordingly avails himself of all the mechanical helps he can find – if therefore the machinist brings to his aid a more efficient instrument, so perfect indeed as to enable him to take a facsimilie of his original model, he assists him to accomplish that which by present imperfect he cannot hope although he desires to effect'.

Despite Cheverton's rhetoric, the days of marble and certainly of ivory as popular media for contemporary sculpture were numbered, and by the end of the 19<sup>th</sup> century a revival of bronze casting had begun which brought with it a new series of technological developments in the reproduction of art.

## LOST WAX BRONZE CASTING

Lost wax bronze casting by the direct method requires that the object to be cast is modelled in terracotta or plaster and covered with a layer of wax onto which the finer details of the sculpture are worked. Long strips of solid wax are stuck at strategic points on the surface like spines on a porcupine. This wax model with its various extensions is then placed in a mould and a 'scrim investment' (a mixture of clay and plaster) is poured over it, leaving the ends of the wax extensions outside the mould. When the investment has hardened, it is heated and the wax is poured out leaving a cavity the same shape as the now melted sculpture. Into this space then is poured molten bronze. The air in the cavity escapes through the spaces left by the wax extensions and is replaced by bronze which cools and hardens. The scrim investment is then chipped away leaving a hollow bronze copy of the destroyed wax original. Finally the bronze extensions are cut away and the finer details of the bronze's surface are worked over and the patination applied.

From the above method, further moulds can be made, but this is time consuming and expensive. Instead a process by which the original wax, clay or plaster sculpture is reproduced in a harder, more permanent form, such as plaster was conceived. This more durable version could not only lend itself to being cast again, but also retained the advantage that if any disasters occurred in the casting from this secondary model, the original remained intact and further attempts could be made.

This process is well illustrated by Jacob Epstein's sculpture 'Baby Asleep' of 1904, in which all three stages of the casting are shown. The first model is made in wax, an extremely pliable material which can be worked quickly. From this wax the plaster would have been made and from this plaster, the final bronze would have been cast.

The technique of casting, this time in iron, has been exploited by Edward Allington in his 'Brackets for the River Exe Project'. Working from the artist's drawings, the brackets were carefully measured by the founders, Down and Sons, and then constructed as patterns in wood from which moulds were taken. The use of casting is ironic here because the object cast, the bracket, is normally a carved ornamental feature on the façade of a building. The bracket recalls historical misinterpretations of Vitruvius from Philibert deLorme to Abbé Laugier which have suggested that classical orders were derived from nature – that columns are a survival of trees which supported the very first buildings – and therefore that the carved acanthus leaf capital is descended from tree foliage. Here Allington uses a wooden mould to create a metal object which imitates a carved stone object, which itself imitates a natural organic object.

## THE REPRODUCTION OF ANTIQUITY

Greek sculptors of antiquity were, broadly speaking, anonymous craftsmen whose reputations have reached us through the writings of others and they conceived much of their work with the expectation that it would be reproduced in one of the above mentioned ways. Among the specific names of sculptors whose work and reputation has survived that of Polykletios ranks high.

Polykletios of Argos was active between the 450 and 500 BC when because of the desirability of commemorating Olympic athletic performances in provinces beyond Athens, the marketplace for sculpture was at its most buoyant and increasingly high standards were being set by sculptors and workshops working in competition with one another. No known sculptures by Polykletios survive, but many exist as copies.

The name and reputation of Polykletios survive largely because of a text or 'Kannon' in which he attempted to set down the fundamental relationship of anatomical proportions within the human figure. Only fragments of the text survive, but Polykletios' theories were enshrined in his most famous sculpture the 'Doryphoros' or 'Spear bearer' which was thought by the ancients to represent the male nude at its most harmonious; between youth and manhood, activity and response. Polykletios also made a companion figure, the 'Diadumenous' or 'Soft/supple youth', for which he is known to have received the unusually high fee of 100 talents. It must be remembered that both Polykletios' statues and his *Kannon* emerge from a culture obsessed with physical prowess and athletic performance and that a theory of proportion had its implications outside the arena of sculpture.

Like the 'Doryphoros', the 'Diadumenous' was extensively copied in various versions, the most complete of which is at Delos. It is hard to pinpoint the precise identity of the figure but the attribute of the quiver in the Delos version has led some scholars to believe that Apollo is the subject. For a while, Polykletios' *Kannon* set a standard for the appearance of sculpture and his figures were highly influential. The

Diadumenos was not discovered until the 18<sup>th</sup> century, and then not identified until the middle of the 19<sup>th</sup> century, at which point his impact on western art through the countless related Antique copies which were already known was first appreciated.

By the middle of the 18<sup>th</sup> century a significant trade had been established reproducing Antique sculpture for an expanding audience of European Grand Tourist consumers and connoisseurs. In Rome a new development was inaugurated with the commercial publication of small bronze statuette reductions after the Antique produced at a price attractive to the ordinary gentleman traveller. Three rival manufacturers supplied these mantelpiece sized copies; Righetti, Boschi and Zoffoli. Righetti was probably the most successful and Giacomo Zoffoli (1731-1785) and his son Giovanni (1745-1805) were Righetti's chief rivals. Both Zoffoli and Righetti set the same price on their bronze reduction of the Farnese Flora which retailed at 18 zecchini. The original 'Farnese Flora' is an overlife-size (3.42 metres) standing, draped female sculpture, which was discovered during the Renaissance (at least before 1536) which was thought unremarkable until the middle of the 18<sup>th</sup> century, when it was briefly attributed to the sculptor Praxiteles. It is now thought to be a Roman copy of a Greek statue of Aphrodite from the 4<sup>th</sup> century BC. Because of the size of the sculpture, relatively few copies of it exist. It was however extensively copied as a reduction. This reduction is probably a copy from the copy made in 1773 by the sculptor Vincenzo Pacetti.

Another statue produced by Zoffoli and Righetti was the Capitoline Antinous, with which Zoffoli undercut Righetti by 3 Zecchini. The 'Capitoline Antinous' was not discovered until 1733 when it was excavated from the site of Hadrian's Villa at Tivoli. The sculpture was bought by Pope Clement the XII, restored (given a left arm and leg) by the sculptor Pietro Bracci, and placed in the then newly established Capitoline Museum. The statue was extensively admired and copied, notably by Marchand and Jacques Saly for the King of France in 1741. The Zoffoli reduction is taken from a less accurate model than was usual.

## REPRODUCTION AS PROMOTION

Historically, reproduction in sculpture has been used by artists and occasionally their clients as a form of promotion. In the case of portraiture the publicity for the subject is also beneficial to the sculptor, and occasionally vice versa. Portrait busts of monarchs and statesmen have often been reproduced and as diplomatic gifts or exchanges with other figureheads. When Gianlorenzo Bernini executed his marble portrait of Pope Gregory XV in bronze, two copies were ordered the same year, one of which went to Cardinal Ludovico Ludovisi, the Papal Nephew, the other to the Cardinal Scipione Borghese, the previous Papal Nephew and Bernini's patron. In recognition, of his talent Bernini received the Cross of the Knights of Christ from Gregory XV which brought with it a substantial pension, and the same year (at the age of twenty-two) he was also elected Principe of the Academy of St Luke in Rome.

As the status of sculpture changed, artists also had copies made of their ideal and inspirational sculptures, usually as exercises in self promotion, or at very least to obtain maximum value from a given work.

As well as reproducing their own work, some contemporary sculptors found it advantageous to publish the work of others. Like Giacomo and Giovanni Zoffoli in 18<sup>th</sup> century Italy, John Cheere, a contemporary London-based sculptor, retailed a popular range of reductions after the Antique, including the 'Farnese Hercules' and the 'Farnese Flora' and a variety of Busts of Classical Philosophers from his premises at Hyde Park Corner. Unlike his Italian counterparts his preferred media were plaster and lead. These inexpensive materials were carefully disguised as patinated bronze with the judicious application of dark coloured paint. The fashion for decorating the upper shelves of Palladian country house libraries with inspirational busts of ancient and modern literary figures assured Cheere of a ready market. Two busts of Greek Philosophers from the Library of Temple Newsam House are a testament to this. Unlike Zoffoli whose range of products was derived exclusively from the Antique, Cheere sold an extensive range of works by contemporary British artists like Michael Rysbrack, Louis Francois Roubilliac and Peter Scheemakers.

John Cheere's reduction of Peter Scheemakers' life-size Figure of William Shakespeare in Westminster Abbey was almost certainly taken from Scheemakers' original terracotta maquette (now lost). Scheemakers was a Flemish artist who worked very successfully in England for the majority of his life. His sculpture of William Shakespeare was the work which made his reputation. The cult of Shakespeare grew rapidly in the first half of the 18<sup>th</sup> century, and in 1739 it was thought that the Bard should be commemorated with a monument in Westminster Abbey. The overall design was given to William Kent and Scheemakers was able to manoeuvre that he should be given the commission without competition. The likeness of Shakespeare was taken from 'The Chandos Portrait' (not in the National Gallery) which was thought to have been painted from life by the actor Richard Burbage. Scheemakers succeeded in infusing the work with a life which the painting, despite its period authenticity, lacked and in doing so made himself one of the most celebrated sculptors in England. The popularity of both Shakespeare and Scheemakers' statue was massively augmented when the statuette was taken up by the Derby Porcelain factory around 1758 and reproduced on a rococo scroll base. The figure continued to be reproduced in various ceramic bodies throughout the second half of the 18<sup>th</sup> century. Examples are known made in Biscuit Porcelain, Copeland Parian and Staffordshire Salt Glaze Stoneware. Thomas Wedgwood also made a version in Black Basalt in 1769 probably as a merchandising response to the Shakespeare Jubilee.

The publication of sculpture often bridged the gap between high culture and mass culture. One sculptural medium which was always on the fringes of artistic respectability and which frequently relied on serial reproduction to sustain its practitioners was wax modelling. One of the technical advantages of wax modelling was that it could be reproduced relatively easily by making an intermediate plaster from which further waxes could be cast. The nature of the medium's subject matter, the portrait-required that sculptors rely on other means than the reputation of their works to solicit commissions. Wax modellers were, usually independent practitioners who often lead almost itinerant lifestyles. Setting up makeshift studios in the premises of other businesses, jewellers, booksellers or toymakers, they would take orders and execute likenesses of sitters in a fraction of the time that a portrait painter would need.

Samuel Percy used the local press to advertise his services, announcing to prospective clients of Tunbridge Wells that he 'has now arrived & shall now receive orders for likenesses for a short time...at the Great Rooms on the Walks, where numbers of specimens may be seen of Subjects taken from life and after demise'. Percy continues, 'the shortness, cheapness and similitude to the human face, give [waxes] the preference to any method attempted in the miniature way. In *Gore's Liverpool General Advertiser* 1782 we find 'No formal sittings [are] necessary, nor half the time taken up which professional portrait painters are obliged to use'. Percy was born in Dublin in 1750. In 1780 he came to England and worked the fashionable provincial towns like Brighton, Chester, Liverpool and Tunbridge Wells before settling in London and specialising in Wax Tableaux Vivants featuring such scenes as 'The Death of Voltaire' and 'Frederick the Great in his last Illness'. Percy was also an accomplished portraitist as his likeness of Richard Reynolds shows.

Reynolds was an important Quaker philanthropist, a member of the new class of wealthy self made industrialists in 18<sup>th</sup> century England amongst whom the realism of Wax Portraiture found favour against the fashionably heroic classicising tendencies of contemporary portraiture. That Reynolds' portrait was reproduced is not at all surprising. In an age before the invention of photography, wax modelling was frequently a less expensive alternative to painting, and more informative than cut silhouettes. T. R. Pool, one of Percy's contemporaries, charged 10 guineas for a portrait modelled from life, but made 'free of expense the Head of a Gentleman, on receiving a guarantee for twenty Copies'.

The process of casting made possible the mass consumption of small scale sculpture and broadcast sculptors' reputations, but the success of this kind of promotion was restricted by size. Large scale marble works presented different problems. Works were often commissioned on the strength of the customer's approval of the maquette, so clients who bought sculpture were probably sufficiently experienced to make the imaginative leap between reductions and full scale works. However, such conditions presumed the presence of the patron in the studio. In cases where this was impossible, drawings could act as intermediaries.

In the first half of the 19<sup>th</sup> century it proved not only more educational for sculptors to work in Rome, the home of antiquity, but also more lucrative, as Rome was the city in Europe which was most likely to attract members of the sculpture-buying classes. Although British sculptors flourished and prospered in Rome, their location there presented something of a problem for prospective British patrons. In 1844 Prince Albert asked the sculptor John Gibson to send designs by English sculptors working in Rome for marble statues to be placed in the recently acquired Osborne House. Among the artists whose work Gibson represented was his ex-student William Theed (the Younger).

As a result of Gibson's recommendation in 1848, Theed returned to London to work in the royal palaces. Before leaving Rome, Theed made a statue of Narcissus, (the sculpture is signed 'W Theed/Romae 1848'). This languid standing male nude belongs to a tradition informed by Polykletios' 'Diadumenos' and other works by the Antique sculptor, notably 'The Westmacott Youth', which were widely known in Europe at this time. Three versions of this sculpture are known; one, in the Royal Collection at Buckingham Palace, another in the gardens at Anglesey Abbey, the third

is at Temple Newsam House, Leeds. Leeds City Art Galleries own a suite of drawings of sculpture by English sculptors working in Rome at this time, drawn by Paolo Guglielmi, an Italian engraver. Among these are two drawings for statues in the Leeds Collections, one of which is Theed's 'Narcissus'. The relationship between the drawings and the sculptures remains unclear. Each drawing bears the title of the sculpture, the artist's name and in all but one case, the size and the price of each work. Theed's 'Narcissus' bears the inscription:

*height 4" 2 ½ in Narcissus at the Fountain*  
*Price £200 Wm" Theed Sculptor P Guglielmi*

It seems likely with the inclusion of such information that the drawings, like the designs sent by John Gibson to Prince Albert (they may even be the designs sent by Gibson), were advance publicity intended to solicit commissions for copies. The other drawings in the suite are: 'Hindoo Girl: Lala Rookh' after a sculpture by Henry Timbrell, 'Glycera', 1848, 'Nymph of Diana Returning from the Chase' 1835 and 'Nymph Removing a Thorn From a Greyhound's Foot 1850, all by Richard James Wyatt. (This last sculpture was left unfinished in Wyatt's studio at the time of his death and is said to have been completed by John Gibson). The sculpture is now at Temple Newsam House, Leeds.

It was not only artists working abroad who sought to promote their work through repetition. Francis Chantrey (1781-1841), who worked for the majority of his life in England and set foot in Rome only briefly as a tourist and to buy Carrara marble, was probably the most successful portrait sculptor of his generation. One of Chantrey's most important pieces was his bust of the writer Sir Walter Scott (1771-1832). Chantrey's first bust of Walter Scott was executed in 1820, and it is significant that Chantrey asked the writer to sit for his bust rather than, as is more usual, that the subject commission the work. He presented the finished work to Scott for his library on the condition that Scott would sit for another bust for Chantrey to keep in his studio. Chantrey made two copies of this bust, one for the Duke of Wellington and another for Sir Robert Peel. This bust was one of Chantrey's best sellers as it was considered a very respectable addition to many an institutional and private library. Several copies were made by his studio which was one of the largest and busiest in Victorian England.

Chantrey's bust of Scott was also produced in Parian. Parian is a biscuit-fired porcelain derivative which was developed in the mid-19<sup>th</sup> century. The Derby Factory at first used and refined a bone-china-based material for making reductions of statuary in the manner of the sèvres factory in France. The smooth matt quality of the unglazed ware imitated the surface appearance and feel of the marble but the surface absorbed dirt and was almost impossible to clean. The medium was further refined by Thomas Battam and T. S. Garrett at the Copeland Factory into a material which successfully imitated the substance from which it derives its name. By the early 19<sup>th</sup> century a number of English potteries were using this material and retailing reductions of sculpture both ancient and contemporary. Chantrey's bust of Walter Scott was produced by a large number of factories including Minton, Copeland, Wedgewood, Worcester, Robinson and Leadbeater and Keys and Mountford.

By the end of the 19<sup>th</sup> century an established vehicle for the promotion of artist's activities had been established in the form of journals like *Art Union*, *The Magazine of Art* and *The Studio*. The audience for sculpture had also expanded with the inauguration of public museums and galleries. The industrial and mercantile prosperity in the second half of the 19<sup>th</sup> century created a class of potential art consumers which sought to have its tastes directed and expanded by informed and well illustrated journalism. As Edmund Gosse wrote in *The Magazine of Art* 'Early Victorian Sculpture...kept up a sort of pompous mystery about their business, and could not stoop to the needs of their clients. Gibson pushed the solemnity of the craft to a pitch that was almost imbecile...' The increase in art journalism and the formation of societies for the encouragement of the arts brought the activities of the sculptor into sharp focus.

The Art Union of London had been a crusading society for the encouragement of good taste among artists and manufacturers since 1837. One of its early fund raising initiatives was to offer prizes of reduced copies of statues by contemporary artists. The campaign was hugely successful and by 1860 The Art Union boasted that 313 statues had been produced under its auspices. Its activities became more adventurous and in the 1870s Britain was talked about as having its own 'rising school in bronzed moulding'. The choice of bronze as the contemporary sculptor's preferred medium and the increased market for reductions brought into existence firms of bronze casters which specialised in reduced editions. The publication of these art bronzes began to attract criticism from those who had at first promoted it. George Simmonds, First President of the Art Workers Guild explained, 'These [art bronzes] are often copies of fine originals but most of their value is lost from the fact that they are cast in many pieces, which are then joined together, filed and chased up in a happy go lucky commercial style by a not over skilled artisan. Thus every trace of the original hand is lost'. Some artists began to realise the importance of quality control and thus became their own publishers, most notably Alfred Gilbert and William Hamo Thornycroft.

Alfred Gilbert was an artist who did much to resurrect the medium of bronze from its obliteration by decades of preference for marble. Gilbert became fascinated by the process of lost wax casting which he saw being done at foundries in Italy in the 1870s, and was lecturing on the subject by 1883. Between 1881 and 1892 Gilbert produced a series of works which explored the expressive possibilities of lost wax (Cire Perdu) bronze casting. One of the first among these was *Perseus Arming* of 1882. Gilbert said this of his work...'As at that time my whole thoughts were of my artistic equipment for the future, I conceived the idea that Perseus, before becoming a hero, was a mere mortal and that he had to look to his equipment'. Gilbert acted as his own publisher and monitored the reproduction of his sculptures. Between 1893 and 1920 Gilbert was associated with the *Compagnie des Bronzes* which satisfied his stringent standards and they first reproduced the statuette of '*Perseus Arming*' in both full size and reduction.

William Hamo Thornycroft was another sculptor who elected to be his own publisher. *The Saturday Review* of May 1880 reported that Arthur Leslie Collie, a noted art decorator 'published a bronze reduction of Mr Thornycroft's "*Gordon*" last year and has been so encouraged by the success of that solitary effort that he has opened at his gallery a little collection of small bronzes'. (This was not the first time a work by

Thornycroft had been published, In 1848, he made a reduction of a Bust of Queen Victoria for The Art Union). Thornycroft's contract with Collie stated that Collie had acquired the copyright on a reduced version of the General Gordon statue for £50 plus one fifth of the net profits. The initial edition was set at 100. Initially the statuette sold well and Thornycroft's misgivings that the project would not yield a profit were unfounded. His account book for the year 1890-91 records a profit of £179 10s 0d which represents a sale of at least 80 casts. The reduction market was however a limited one as Arthur Collie's experience showed. Having advertised himself as a publisher of bronzes for 5 years he withdrew the service and in 1906 he disappeared from trade directories altogether. The copyright on the 'Gordon Statuette' then passed to another decorator Sidney Lee Fawn, but it seems his ventures with it were equally unsuccessful, as only two statuettes with his stamp have ever come to light. It has been suggested that the bronze statuettes which were initially heralded as the saviour of the sculptors art and which might make it popular for a wider audience were simply too expensive.

A footnote to this story appears in 1938 when Thornycroft's statuette of General Gordon was reproduced once more in silver as a regimental gift from Brigadier A. H. Hopwood for the First Battalion of the Lancashire Fusiliers on their withdrawal from Tientsin (for which Gordon has planned the British concession). Lady Thornycroft administered the conditions for the reproduction, stating that the model-making should only be done by one of her late husband's pupils and that it should be approved by another of his pupils and that the model and the moulds should be returned to her. The model by Bradford-born pupil, Harold J. Youngman is now in Leeds City Art Galleries and the silver version, although not completed in time for the Fusiliers departure, was presented in June 1939.

## THE CONTEMPORARY MULTIPLE

The tradition of reproduction continues today as contemporary artists use the same and sometimes new technologies of reproduction to make sculpture. However, the use of reproduction in contemporary art differs from the preceding tradition in that contemporary multiple sculptures are conceived in such a way that multiplication is somehow defined or predicated in the work, whereas the sculptures discussed so far were all conceived as individual and coherent works of art which became multiples after the fact. Reproduction was something which was done to them, a process or transformation which the sculptures underwent. They were 'copied' and became 'copies', whereas, the multiplication of contemporary sculpture is an intentional creative strategy. Sometimes it is a method by which the artists disguise their presence in the work; by which the sculpture is depersonalised. Sometimes the multiplicity is the point of the work and sometime the point is uniqueness. To paraphrase Walter Benjamin, one of the most significant factors to affect the production of art in the 20<sup>th</sup> century has been mechanical reproduction. Artists of the late 20<sup>th</sup> century more than their forerunners have been obliged to find an appropriate response not only to the condition of industrial mass production, but also to coexistence with mass media. Although historically sculptors have generally accepted the likelihood of their work being repeated, reproduction occurred as an afterthought. Contemporary sculpture uses repetition more as self-examination. Works of art when multiplied, can look at one another. Art becomes a mirror, not of life but of Art.

The notion that mass produced objects might be used as a material from which to make sculpture is at least as old as this century. It emerges from the Dada movement and from Duchamp's concept of the 'Ready made'. Gavin Turk, Jeff Koons, Katherine Fritsch, Allan McCollom and Caroline Russell are all, in different ways, inheritors of this tradition of making art. Crucial to Duchamp's concept of the 'ready made' was the concept of the found object, which through the artist's choice becomes a work of art. Jeff Koon's 'Basketball', is such an object. Katharina Fritsch's 'Madonnenfigur' uses the same strategy. A devotional artefact is inseparably associated with mass culture whilst being surrounded by an aura of religious mysticism transcends cultural and ethnic barriers and resists contextualization. Caroline Russell's 'Displays' extend the concept of the 'ready made' Multiple to encompass packaging as well as sculpture. Her work responds to the condition of mass production by using standardised parts whose purpose is redefined within the context of the studio or gallery.

Gavin Turk's 'Font' returns to Marcel Duchamp. Using the title of Duchamp's infamous work by R. Mutt, Gavin Turk has reiterated the ambiguity of using manufactured objects to make sculpture. Turk has made a ceramic baptismal-font-shaped vessel using a slip casting technique more associated with the craft activity of pottery than the production of sculpture. Turk's 'Font' interprets the title more literally and retains its status as a multiple but to what extent it is a 'ready-made' is open to question.

Allan McCollum's 'Plaster Surrogates' reverse the previous strategy by making banal that which is normally unique. Here framed pictures usually associated with individuality and taste have been cast and turned into blank ciphers, objects onto which any meaning can be projected. The plaster surrogates developed from McCollum's 'Perpetual Photos' which photographically reproduce moments from television dramas in which pictures are used as background details.

Julia Wood's 'White Square' 1987 by contrast completely subverts the concept of the Multiple with her photographs of East London buildings which have been altered by the addition of small areas of Gouache paint. The paint marks spoil the glossy surface of the print like fingerprints. Julia Wood has taken a mass produced image and personalised it.

It is unsurprising that Edward Allington should make extensive use of casting in his work, which is so concerned with pursuing of the ghost of Classicism in western culture. In 'Metropolitan Egypt from the East/of London', Allington turns his attention from his usual preoccupation with Greco-Roman forms to explore the parent culture of Egypt. Conceived around a Sphinx plaster cast bought at the Museum of Modern Art in New York, from which the artist made further copies, this sculpture recalls an experience of Egyptian culture both ancient and modern. The inscrutable Sphinx is an emblem of the ancient and mysterious civilisation, transformed by modern mass production and retailing into a piece of universal, tourist kitsch and then ultimately into a sculpture. The colour scheme recalls the artist's impression of the country's flag as seen on the sides of Egyptian train compartments seen during a visit to Egypt made earlier in his career.

The use of casting can also be found in the work of Rachel Whiteread. Much of Whiteread's work is concerned with exposing invisible spaces by casting them. The physical use of the hot water bottle has also been subverted in that it is normally the receptacle of a hot liquid, whereas, plaster cools as it solidifies.

The artist David Connearn not only produces work under his own name, but also makes work which is exhibited under the name of sculptor Sol LeWitt. That is to say that Connearn is licensed to make sculptures by Sol LeWitt. Although made by the same person, the work of both artists is very different. Connearn makes drawings which look superficially very mechanical, but are nevertheless purely expressive. Using pen nibs of a pre-determined width, Connearn hand draws horizontal lines of an established width from one side of the paper to the other, a feat of intense concentration when lengths of two meters are involved. The drawings are both multiples and unique. It is possible to repeat the conditions of the drawing, but only Connearn can repeat the drawing.

Sol LeWitt's 'Open Pyramid' was made by David Connearn, but unlike Connearn's work, it is purely mathematical. If the conditions and the materials of the sculpture can be repeated, the sculpture can be repeated. The ambiguity is one of copyright. Much of Sol LeWitt's sculpture concerns itself with mathematical progressions and sequences. To this extent, like mathematics, his work exists *a priori*, like the geometric forms in which it is realised. Thus the individual artist, and his personal expression, obfuscate and impede rather than aid the working process. Sol LeWitt's sculptures are his own because his name is his own, otherwise they are multiples even before they are made.

Ideas of mathematical progression, draughtsmanship and individual artistic expression are brought to a logical conclusion in the drawings of Tim Head. In the drawing 'Idiot Wind' the artist has used a laser printer to repeat a scanned image. Here marks are converted into combinations of hexadecimal values which are stored in the operating system of a computer and then processed by graphics software which operates a laser-jet printer which then reproduces copies of the drawing as designated by the computer operator.

This line of enquiry is further extended into the third dimension by artists Michael Joaquin Grey and Randolph Huff who have taken computer learning programmes based on neural networks and genetic algorithms. Using these self organising systems, which are capable of simple behaviours when used in conjunction with a supercomputer, the programmes the artists have used create forms which behave like simple organisms. The forms resemble biological archetypes with life cycles, reproduction and locomotion codes and lexicons. The artists simply observe the resultant forms. Like Sol LeWitt's forms they are archetypal and almost *a priori* but they differ in that they are organic rather than geometric. The information is then converted into high resolution three-dimensional laser-moulded versions.

As shown by Grey and Huff's work, another significant contribution to the making of contemporary multiple sculptures has been the development of new technologies. Julian Opie's 'Screen Saver, Imagine you are Driving at Night', like Grey and Huff's 'Gametes', is a sculptural work generated in Cyberspace. It can be moved into the space of any other computer monitor. This virtual landscape is also an archetype, not

one specific road but an aggregate of all roads, a standardised journey which could exist as a 9cm floppy disk, itself a standard format.

Extending the notion of the recorded experience is Georgina Starr's 'Crying', a u-matic video recording of the artist standing in the corner of her studio crying. Much of Georgina Starr's work is concerned with the psychological response of the viewer to statistically repeatable circumstances.

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