NATIONAL COLLEGE OF ART AND DESIGN

CRAFT DESIGN : CERAMICS

CREATIVITY AND ILLNESS

BY

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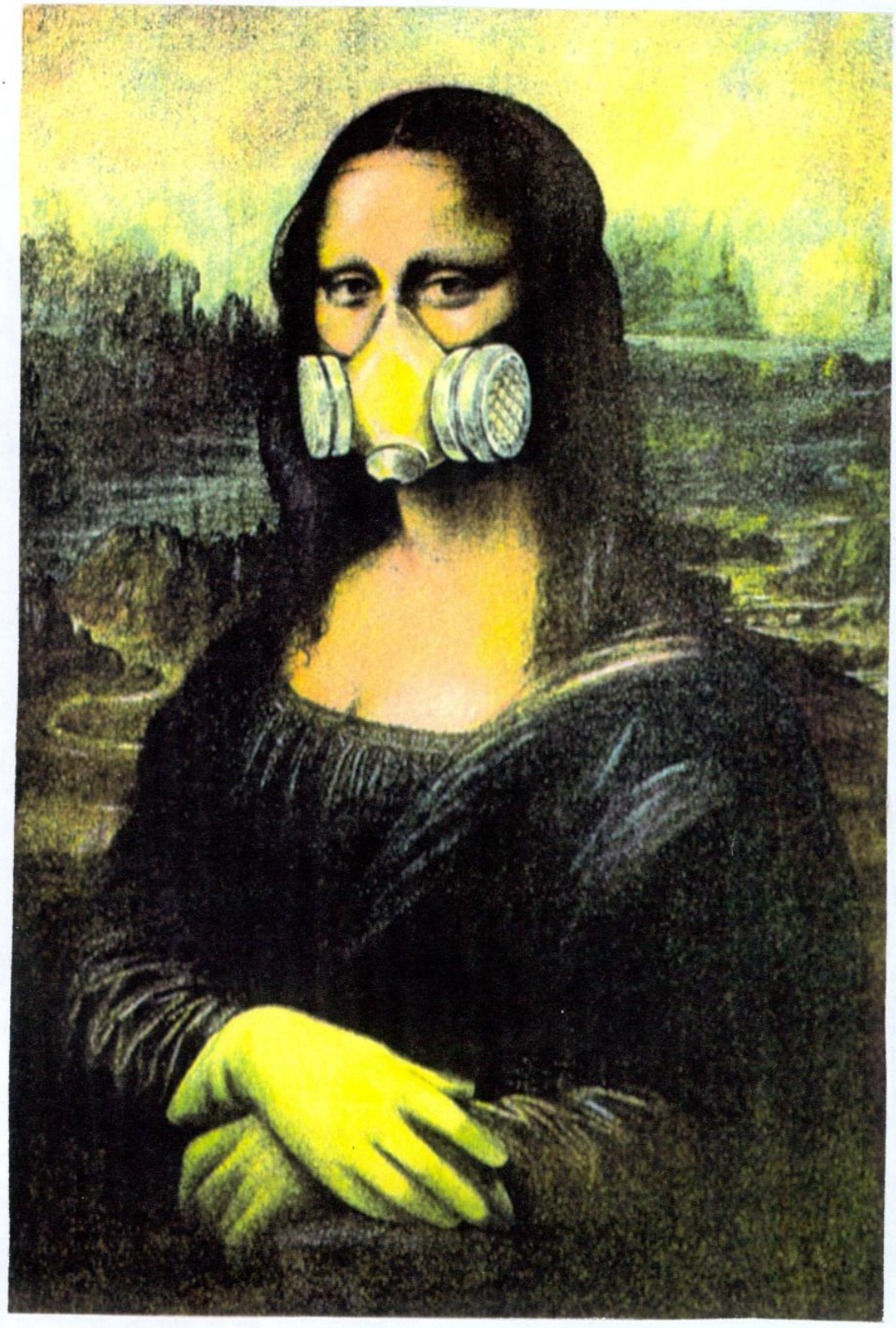

Fig.13: Creating Art Is Not All Smiles is the title of a poster issued by the School of the Art Institute of Chicago, which conducts a program to acquaint artists with the hazards involved in materials they are using.
Illustration by Doug Huston.

INTRODUCTION

Creativity is the desire to work from one's inner self, to translate one's thoughts and feelings into whichever medium one wishes. If I were to ask you to think of an artist you admire, what would your initial thoughts be? Would you get an immediate image of the artist and the works of art that you are familiar with? Or would you think of the artist in the making process - working frantically in his/her studio? Would anyone ever think of the artist or his/her health; that the artist may be suffering, that pain and discomfort had to be confronted in order to produce the work of art? It would be even worse to think that the artist was made seriously ill due to the materials he/she had been using. Personally, I would not have considered the health of the artist when looking at his/her work if it had not been for the fact that I myself became ill due to the effects of the materials I was using in my work.

A study of the relationship between the suffering and the work of artists who have been severely ill may enhance our understanding of their art. I myself cannot agree with critics who claim "that it is only the work itself which is worthy of serious interest and that the personal background of the creators is little more than anecdotal"(1). Since my illness I have become increasingly aware of the hazards involved within the crafts industry, that working with certain materials can threaten your life. Many art materials are dangerous because their toxicity is cumulative - "the seeds of ignorance may come to harvest in your body in twenty years or so"(2). This essay does not pretend to unearth original scientific theories in possible connections between creativity and illness. What it does, is inform artists about the hazardous materials with which they might be working and their subsequent ill effects. To add to our understanding of the creative process and its possible ill-effects, I shall be discussing some artists who have had their health affected due to the nature of their work. A study of this kind would, I think, be interesting even if one only agreed with George Bernard Shaw that "Disease is not interesting; it is something to be done away with by general consent and that is all about it"(3).

There is however, more kindness in Goethes view that "our own pain teaches us to share the misery of our fellow creatures: it is through suffering and pain that we can identify with them: happiness may be incomprehensible, pain is readily understood"(4).

Three women, Niki De Saint Phalle, Jane Lanyon and Diana Hobson, whose work will be covered in detail became seriously ill due to the materials that they were using. Saint Phalle and Lanyon were both working in different mediums using different materials before any health problems occurred. It was not until they became ill that they became more aware of how dangerous certain materials could be, materials which they were coming into contact with on an everyday basis. Hobson fell seriously ill due to the nature of her working methods. The work produced by these three women differs enormously, from the medium they have used, to the nature and content of the work. Subsequently, their present illnesses differ. I will describe how they have come to terms with their illnesses and how this affected their work. By using these three different cases, I hope to give an overall view of the potential hazards involved in working in an art and craft environment.

The toxicity of various materials and the effects of particular dusts and fumes on the human body are being constantly investigated and monitored by medical and safety organisations. This is not good if the artist - the person using these materials is unaware of the consequences. As knowledge of the technology of ceramics grows and we become aware of the possible dangers from handling and firing the ceramic materials, there is a tendency to over-react. Clearly the only way artists can save their health is to close up their studies, throw down their materials and find a less hazardous job. This, of course, is out of the question. If we, as artists, are made more aware of the dangerous substances, then disciplined and taught how to use these substances properly, we will be leaving ourselves less at risk. We must find ways in which they can be minimised or avoided. However, the materials are not alone in causing ill-health. Stress can result in a massive strain on the health of the artist. This can lead to break-down and loss of energy. Not only must we reassess the materials we use and how we use them, but how we work and burn our energy in a productive manner.

On the obverse side of this issue, artistic creativity has the power to heal. Many people have been cured of their illness by occupational therapy. Pottery is used widely as an aid to recovery. Many people improve the quality of their lives by taking part in art courses and many hospitals house their own pottery workshops. So, creative art has both good and bad sides to it - it is the latter that few people take notice of. Naturally, many artists seem more interested in the creative process and the end result rather than in the breakdown of the toxicity

of various materials. In order to improve the quality of an artists' life, health and safety must be given as much respect as the work being created.

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(3) Sandblom, op cit, p. 20

(4) Sandblom, op cit, p. 21.

CHAPTER 1 - NIKI DE SAINT PHALLE

Niki De Saint Phalle, born into a prosperous aristocratic family in Paris, was two when her banker father moved the family to New York. She had a difficult childhood and even as a child rebelled against the woman's role that was marked out for her. At 18 she eloped with an aspiring young poet and novelist Harry Matthews, but only a couple of years later, Niki suffered from a nervous breakdown and had to spend a period of time in hospital. It was during her time in hospital that she began painting and after she recovered she continued with this. She held her very first exhibition in St Gallen in Switzerland in 1956. This was of great significance to Niki, who felt that although no professional art training, she was becoming a fully fledged professional artist. At the age of thirty she reached an important decision in her life: she would start a new life - alone (1).

> *"I loved my family dearly" she explains "yet I felt that there was no other way for me to exist than to devote my life entirely to my art" (2).*

It was during this period that she began to acknowledge her own aggressions, first by collecting guns, knives and meat cleavers in order to create assemblages. Then she proceeded to shoot at plaster panels with paint embedded in the plaster (fig 1,2). She used these weapons to threaten all the men who were in a position to inhibit her emotionally or physically. After some time the process of shooting gained increasing importance so that the male attributes of the symbols became relatively insignificant. Focusing on women alone became more important to her. She considered the various roles of women in society which she represented in reliefs and sculptures - brides, women giving birth, mothers, whores, witches.

For Niki De Saint Phalle these images of women merge in a single woman whom she affectionately calls Nana, and of which she has produced innumerable examples. All female characteristics are combined in this one figure which is a tribute to all women and to the artist herself (fig. 3, 4, 5). These are clumsy, yet endearing female figures up to eight feet high, made of wire mesh frames, stuffed with rags, covered with liquid polyester and painted in garish colours. From the moment they were displayed at a Paris gallery in 1965, the outsize women with enormous breasts and hips and tiny heads, dancing, standing on their heads or about to take off on little wings, captured the imagination of young and old alike. In the art

Fig.1:Niki De Saint Phalle,March 1962:The first shooting event sponsered by the Everett Ellis Gallery and held outside a beach house at Malibu,California.

Figs. 2,The finished

Shooting Painting 1962.

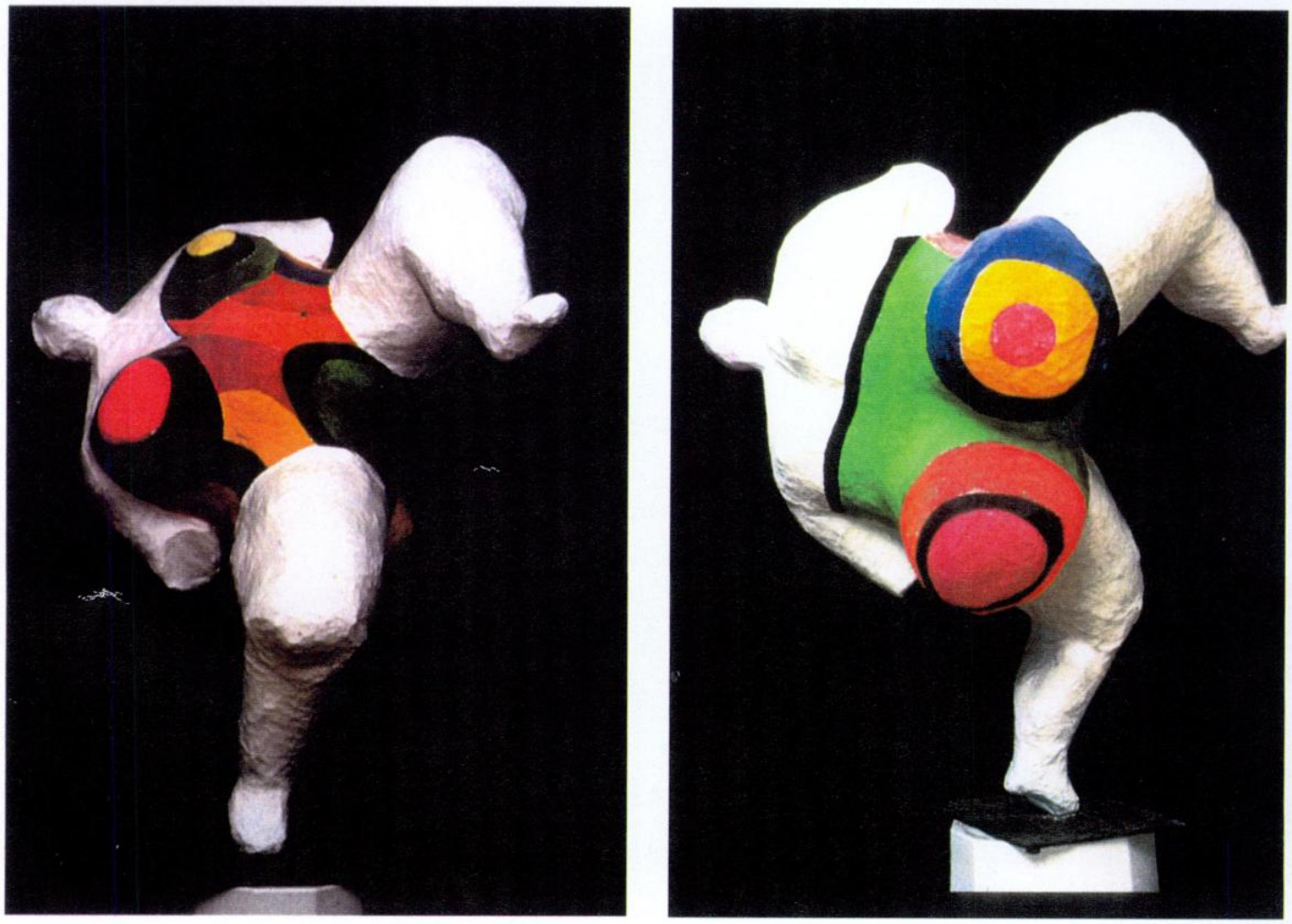


Fig. 3: Niki De Saint Phalle, Dancing Nana "Anna" 1966, Height 123cm.

Fig.4:Niki De Saint Phalle,Gwendolyn,1966/1990,262X200X125cms.

Fig.5:Niki De Saint Phalle,Black Rosy ,1965/1966,225X150X85cm.

world, the Nanas created a sensation. Critics hailed their good humour, their delight in high colour and their sardonic insight into human nature. "My aim is to bring joy"(3), Niki has said again and again but she rarely mentions the sacrifices and suffering she has made for her art.

Absorbed in her work, she failed to notice the damage to her health caused by the polyester she used to coat and weatherproof her structures. The long term inhalation of the toxic dust and debris resulted in this liquid chemical attacking her lungs that later developed into emphysema which does not recede. In 1976, she began losing weight, developing coughing spells and had difficulty breathing. Eventually she collapsed. She was flown to hospital in Switzerland where doctors diagnosed an acute viral infection caused by an allergy to Polyester and complicated by pneumonia. With these `breathing problems' certain parts of her life had to be readjusted, changes which she has to deal with every day for the rest of her life. She carries out breathing exercises, laughing exercises, yoga, meditation and from time to time, she has to resort to medication to facilitate her breathing, and depend on oxygen cylinders. During the wintertime she has to go to a hotter climate as the cold brings on the symptoms.

It was in this period of her life that pain began to play with her health and emotions. In a letter dated 1991, she says

> *"Dear Mother,*
>
> *Danger was present from the first moment. I would learn to love danger, risk, action, I would be plagued all my life with asthma and respiratory problems - double Scorpio - chart to overcome all obstacles, to love obstacles"(4).*

And so, with these feelings and strength, Saint Phalle battled on. Determined to continue using polyester, she started wearing goggles and an oxygen mask when exposed to the poisonous fumes. This did help her a lot until she began feeling pain in her hands and arms; Rheumatoid Arthritis was the doctor's diagnosis.

In order to fight the pain, Saint Phalle continued to work as hard as ever. In her letters (5), she speaks of the times she spent shooting the plaster panels.

"I was shooting at my own violence and the violence of the times. By shooting at my own violence I no longer had to carry it inside me like a burden. During the two years I spent shooting I was not sick one day. It was great therapy for me"(6).

She goes on to say

"I was tempted to return to shooting when I suffered extreme depression and also while I had rheumatoid arthritis - I could hardly walk - I wanted to shoot my way out of the disease" (7).

At this point she felt she wanted to shoot with anger and revenge at being given such a cruel and painful disease. By using her imagination she could, in a creative way "shoot herself better". She wanted to be in control - to master her pain and the only way she could achieve this would be to make it her art. Questioning her existence she feels that she has become more aware of life due to her pain.

"If I could conquer this unbearable pain, I would be stronger, stronger than death. This great Lady Death who fascinates and frightens me. She doesn't exist. Do I exist? If I suffer so much, I exist" (8).

During this period in her life (1982) Saint Phalle was involved in creating a Tarot Garden (fig 6 & 4). This huge sculptural garden, set in Garavicchio, of Tuscany, Italy, invites us to anticipate her company - a universe of colours, images, monsters, phantoms and myths. It was her lifelong desire to live inside a sculpture and this dream of hers became reality, thanks to her Tarot Garden. It seems that she is searching for protection, for somewhere to keep herself safe. She wanted to create `an undulating round space without any right angle to attack her'.

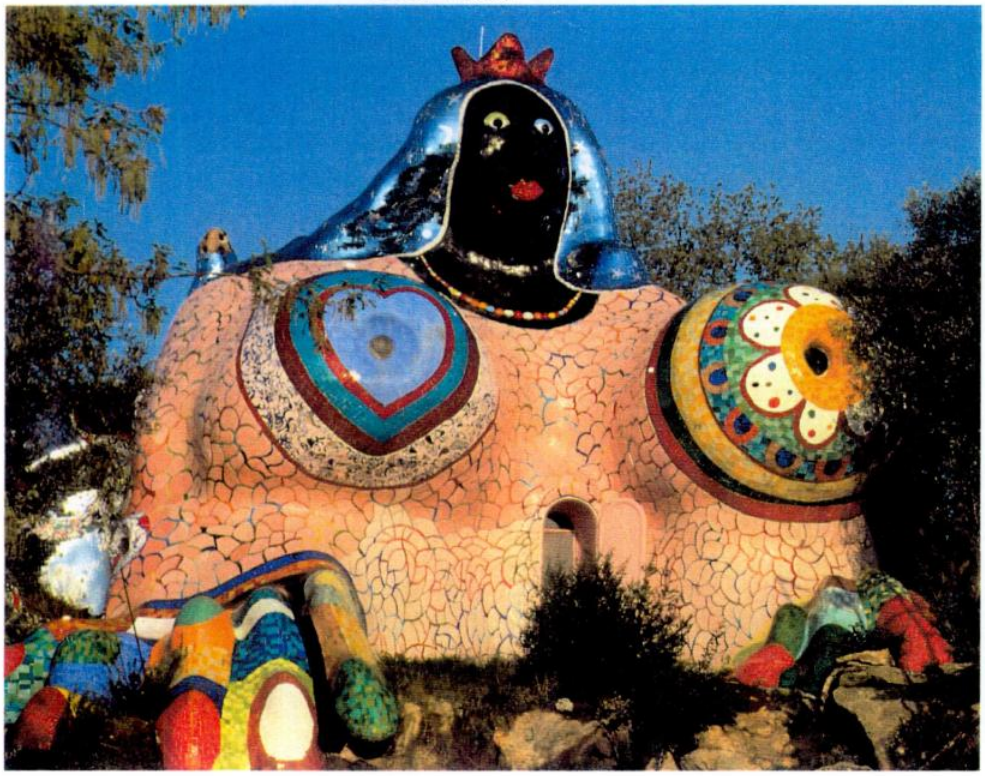
"I wanted to invent a new mother, a mother Goddess and in these forms be reborn. A breast - "I would sleep in a breast" (9).

Here Saint Phalle goes back into her inner self - she wants to create a comforting mother as a means of recovery.

Her first year's living in this new comforting creative mother ("The Empress", fig 7, 8, 9) were fraught with pain. Saint Phalle, a determinedly headstrong woman, felt that she could

Fig.6:Niki De Saint Phalle,The Castle Of The Emperor,The Fool(Card 0),The Magician,The High Priestess,Jean Tinguely's Wheel Of Fortune(Card X), Justice (Card VIII) and L'Arbe De La Vie,1980/1985.

Fig.7:Niki De Saint Phalle,TheEmpress,
1980/1985.



[6]Fig.8

Fig.9

Fig.8 and 9:The interior of The Empress is used as a studio.

conquer the pain on her own. "For reasons that are incomprehensible to me today, for two years I didn't want to see a traditional doctor. I was going to conquer the pain. I didn't ever take an aspirin. I was convinced that with my willpower I would cure myself. The experience of pain became very important to me"(10). She watched the disease progress each day. Her ability to sculpt lessened - she became the "transparent shadow of herself" (11). She wanted to live at any price, the cost didn't matter, but life!

> *"Suffering is also living", she says. "My intelligence remained along with my imagination and my eyes. I would learn to direct others since I was no longer able to work for myself" (12).*

It was not until she found herself in hospital in 1982, vanquished by pain, that she realised that pain had proven stronger than herself. The pain, she realised, had finally become her master. Certainly none of the thousands who have admired the Stravinsky fountain next to the Pompidou centre in Paris would have suspected that its vividly coloured figures were created in agony. A combined project by Saint Phalle and Tinguely, inspired by the music of Stravinsky, its witty, provocative plastic statues and elegant constructions have feelings of joy and life surrounding them. Yet when Niki began making the models in 1982 she was in great pain.

> *"Eventually it receded", she says "because I found the right medicine"(13).*

This "medicine" was an intuition that there must be a reason for her "suffering".

> *"I understood that perhaps the pain in my hands was meant to make me use my eyes more intensely, to form the shape of my figures with my inner eye so completely that my hands would have less to do. As soon as I realised this, my pain lessened"(14).*

It was during during February 1982 that her "Earth monsters" were replaced by "Skinnys". This was a new mood, a change in direction. This work was created to reflect her damaged lungs. The "Skinnys" breathe. They are air sculptures with mythological subjects. They were created using a mixture of plaster, chicken wire, polyester, fibreglass, light bulbs and paint. After many years of working in volumes, small, big and enormous, the skinnies appeared. They are very thin in volume, like drawings in the air. You can see through them

as they are largely composed of negative space. Saint Phalle invites the spectator to look through the sculptures. She says

> *"Air has come into my life, my lungs were severely damaged by working with polyester, breathing deeply, exercise, walking, feeling closer to nature changed me"(15).*

These sculptures reflect that change from pure volume to line-drawing her illness, brought about a dramatic change. The colours remain strong and vibrant with more of an emphasis on the colour blue. In her letter she explains

> *"Dear mother",*
>
> *I will show everything, my heart, my emotions, - green - red - yellow - blue - violet. Hate, love, laughter, fear, tenderness"(16).*

The main framework of her "Skinnys" is blue; perhaps she is suggesting the fear one experiences while going through the trauma of being out of breath, the feeling of being out of your depth, feeling alone. On looking through De Saint Phalle's skinny's we are made more aware of nature living and breathing around us. In one of the pieces titled "Sun Goddess" (fig 10), a bird figure stretches up towards the sky with its wings held out as if trying to fly away. But on its head sits a small circular shrine with light pointing north, east and west. Within the shrine is a tiny figure which seems to resemble one of the old dancing Nanas. The bird looks restricted. In her book "The Wounded Animal", Niki talks of her love for birds. "Birds are messengers from our world to the next. My Guardian angel is a bird" (17). Perhaps these birds are being used in the skinnys to help keep her safe, to help her survive. Maybe to feel that her Guardian Angel is being allowed to breathe, allowed to feel air, fresh air, thus helping Saint Phalle feel well.

From the beginning, Saint Phalle's varied works have been influenced by the events occurring at particularly crucial times of her life.

By introducing these air totems into her creative life I feel that she is physically inhaling air and helping herself and her lungs breathe more easily.

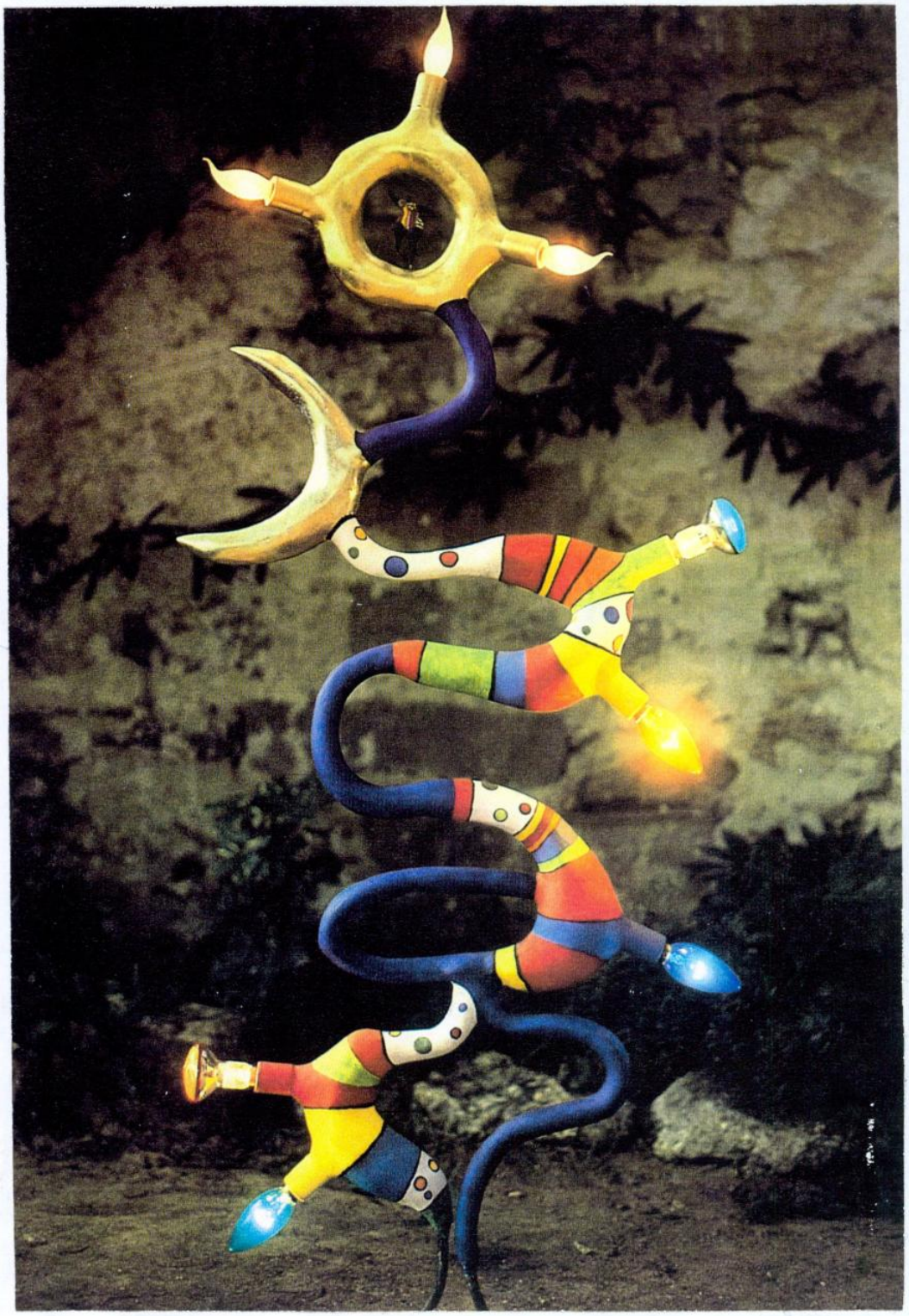


Fig 10:Niki De Saint Phalle,Sun Goddess ,(lamp),64•5"X35"X13•75"/105X38X35cms.
1980.

In February 1982, Niki also introduces her "Half & Half" heads (fig 11). Here she returns to her solid volume method. Half the head is done using her own technique and this contrasts with the other half which is an open structure with an architectural nature around it. The air flows through the head as if it were almost filtering through her eye into her brain banishing all notions of fear and pain. Her pieces are strong and vibrant but I find an element of loneliness and fear about them. Another piece "The Two-Headed Serpent" (1983, fig 12 (i)), may be a representation of her fears and struggles to overcome the pain. Here the heavy volume is used once again. The Serpent (a reptile which she strongly fears) is representing her illness. Its twisted and tangled form is tied around itself with a head on either end and mouths open as if gasping for air. It has a distressing appearance and leaves one in an uncomfortable state of mind.

The contrast from solid state to almost line drawings in air suggests that she may be comparing her ill health with that of years before when she was healthy. It may also be a way for her to come to terms with her illness by putting it alongside healthy beings. One piece in particular "Psycho Portrait" (1983, fig 12) shows a head with a snake constructed architecturally rising out from it. The image is striking and words are painted down the side of the head.

> *"I am bad .... I am wicked ... disgusting. breath. breath. breath.... the sexy snake and I become transparent".*

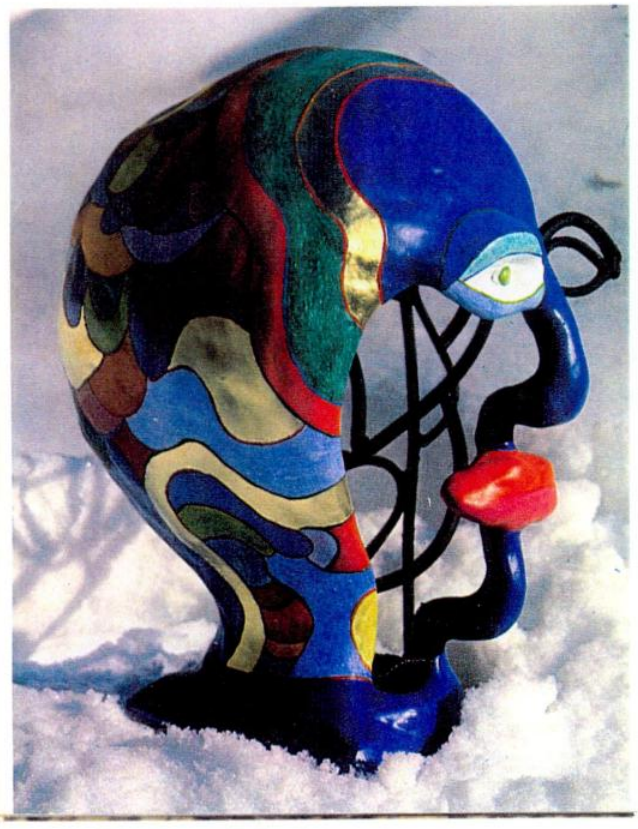
Here she brings anger into her work. She seems almost obsessed with her illness. The snake again representing her fear of her illness.

When De Saint Phalle began mastering these sculptures she was in great pain. She was obsessed by this pain so it is not surprising that it came out in the pieces she made. Curator Jean Yves Mock who organised a retrospective exhibition for her in Paris in 1980 says she is the hardest worker of all the artists he knows. "And the more she works the happier she is" (18). So it seems that the one thing that makes De Saint Phalle at ease and happy with her life is her work, and it is her work which became the destroyer of her health and quality of life. In coming to terms with her health problems she introduces her breath of fresh air (the Skinnys) thus bringing her life experiences once again into her work. Through endurance, foresight, strength and skill she stands a master of all the elements around her. As her work reflects all phases of her life she is in command of keeping it in control by introducing it into

Fig 11:Niki De Saint Phalle,

Half And Half,40 X 30 X 27cms.

1980.



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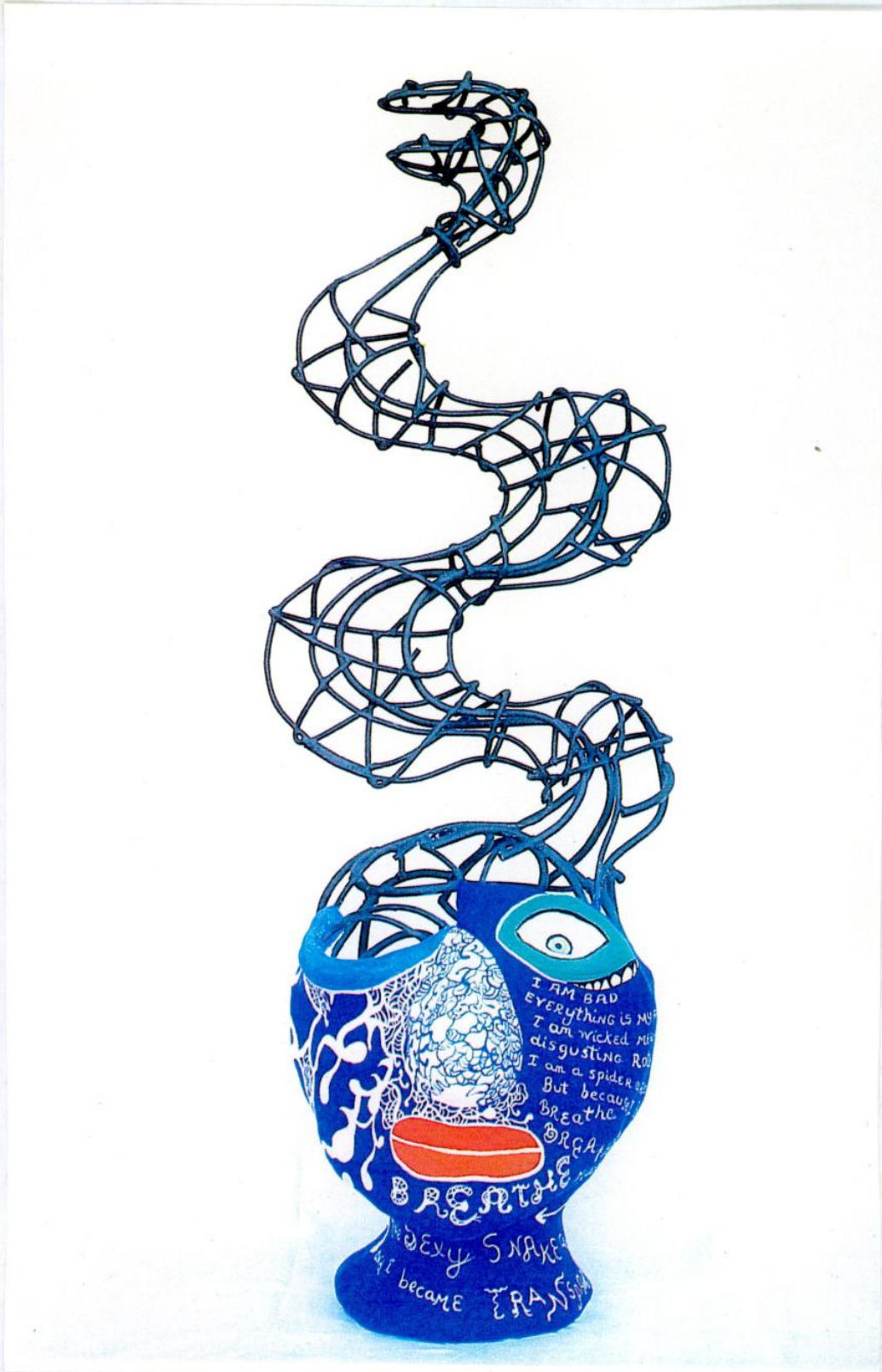

Fig.12:Niki De Saint Phalle,Psycho Portrait, 105 X 38 X 45 cms. 1981.

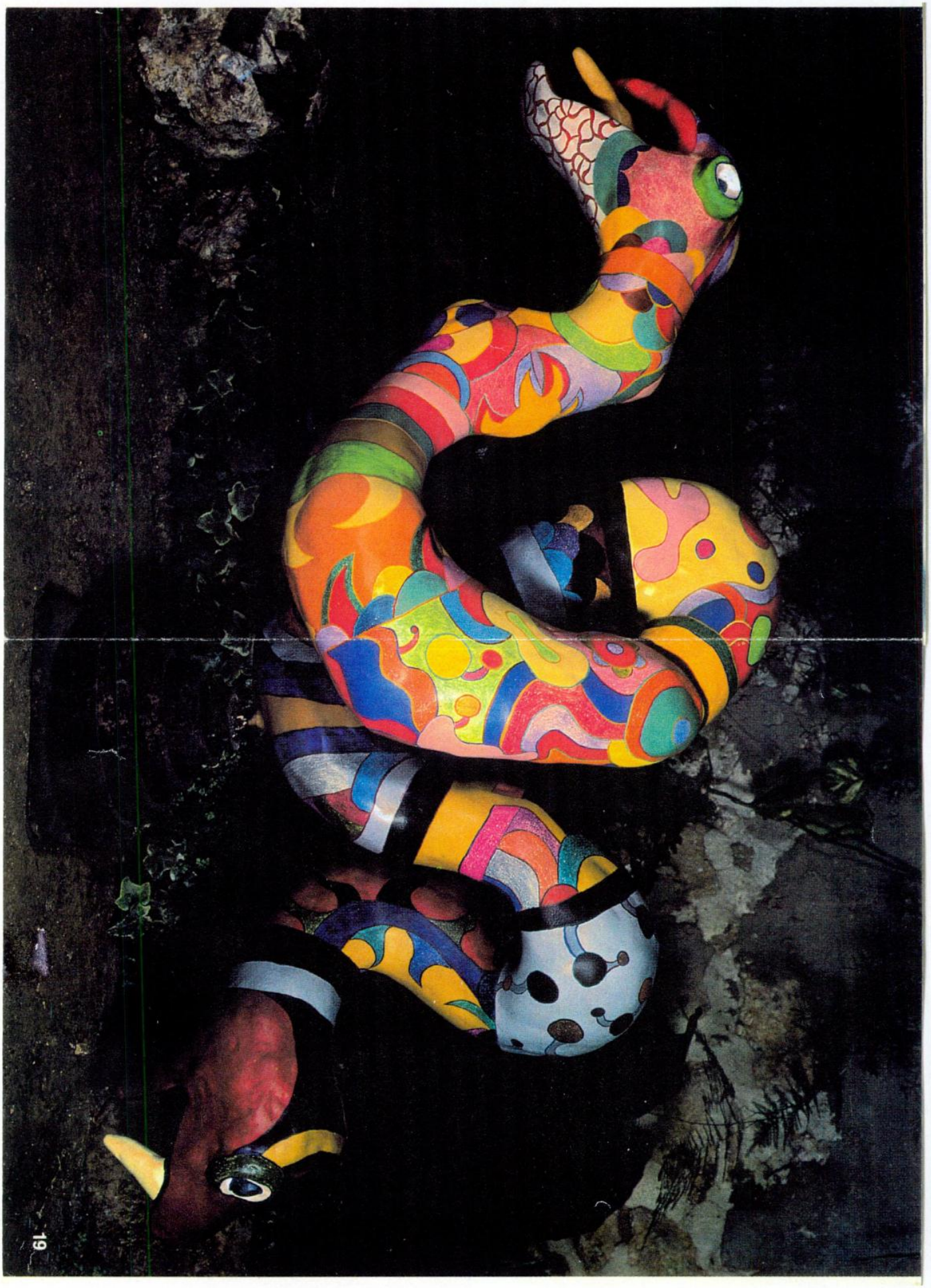

Fig.12·5:Niki De Saint Phalle,Two Headed Serpent,65 X 130 X 42 cms,1982.

her work and through her work she achieves more by getting an even greater insight and understanding of herself, her strengths and emotions.

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CHAPTER TWO: HEALTH & SAFETY IN THE STUDIO

Artists, whether professionals, teachers, hobbyists or children, are often exposed to a wide variety of hazardous materials and chemicals in their art and craft making endeavours. Unfortunately, artists often use chemicals without taking adequate precautions. some artists are unaware that they are exposing themselves and if working at home, as many artists do, they also expose their spouses and children to these hazardous materials.

Monana Rossol, both scientist and artist, spends her life trying to save the lives of artists. She is particularly concerned

> *"Sometimes I think the scientists are showing more concern about art hazards than the artists themselves" (1).*

Rossol is director of the non-profit organisation, The Centre for Occupational Hazards (a spin-off established in 1977 from the Art Hazards Resource Centre of the foundation for the Community of Artists). Rossol's career as an award-winning ceramic artist has been put on hold so that she can devote her time to the work that preoccupies her and a growing cadre of health specialists. They are trying to get the word to artists, teachers of artists, teachers of children, art therapists, manufacturers, law makers, hobbyists, parents and other citizens!

> *"Be aware of the materials you use; avoid those that threaten your life. Know exactly how to use carefully those that are merely dangerous. And remember", Rossol points out "that mainly art materials are dangerous because their toxicity is cumulative - the seeds of carelessness or ignorance may come to harvest in your body in twenty years or so"(2).*

A graduate of the University of Wisconsin with a BS degree in Chemistry, Rossol worked as a research chemist in private industry to earn tuition for both an MS in ceramics and sculpture and an MFA in glassblowing and ceramics. She joined the Wisconsin faculty as a project assistant in the Department of Civil engineering on a National Institute of Health grant for pollution research, while creating art at home.

> *"My obsession with art hazards began the day I went into the Art department from chemistry"(3). Rossol recalls "I found artists working with the same materials we had used in the chemistry department - but with no ventilation hoods, no danger warnings, no chemical splash goggles. All the precautions we had been taught in chemistry were*

unknown to them. I started then and there to teach my first art hazards course" (3).

Teaching students the additive effects that certain materials have on each other is vitally important. More so, teachers of art students should have full knowledge of the dangers in their departments. I feel that before anyone is qualified to teach in an art department, they should partake in a health and safety course. They must become fully aware of the hazards of the department so that the students entering the course are made aware of the dangers from the beginning, thus giving them no chance of picking up bad habits in handling dangerous substances. Instead health and safety should come as second nature. We could only achieve this level of consciousness if artists are required to learn chemistry. They are working with chemical materials. Our ignorance can costs us our lives or - just as tragic - the quality of our lives. What I mean by quality is the chronic illness that can plague and slowly destroy lungs, limbs, eyes and brain - illnesses that could be avoided if the artist had even elementary knowledge of the effects of what he or she is using, day in and day out. We need to know how to use these materials properly and how to ventilate studios properly, how to determine life-threatening allergies to certain materials. If we don't learn, we are putting our health at an unnecessary risk.

Joy Turner Luke, a painter and colour specialist who serves as Artist Equity Chairman of the materials research committee, has also done missionary work to bring out the truth in labelling artists' materials. Both Luke and Rossol strongly believed that materials would have to be labelled according to certain safety requirements. Luke shared Rossol's conviction that artists should be taught basic chemistry while still in art school. According to Luke, the key to saving lives is education. She also abandoned her career as a painter because of her time-consuming work on behalf of other artist. To support her efforts she taught a state of the art colour class and lectured on the physics and other properties of colour to professional groups around the country. She is a colour consultant not only for paint companies but also for laboratories at Eastman Kodak and the Rochester Institute of Technology among others. Her work with Artists Equity, manufacturers and the Inter Society Colour Council (control standards for the longevity (fastness) of colours) led Luke to question whether manufacturers who had agreed to a colour standard couldn't also agree to a labelling standard for toxicity.

In 1979 manufacturers of pigments and paints agreed to list their ingredients for testing; graduate students at Rensselaer Polytechnic institute analysed 700 different paints for pigment content, which would also relate to both performance and safety.

Initially, manufacturers feared that Congressional hearings, testimonies of cancer-ridden artists and dramatic stories of children dying from inhaling lead in art products would cause economic disaster for their companies, especially the smaller ones. But some industry members leaped at the chance to ensure the safety of their products. The problem was that in large quantities all chemical containers had labels listing ingredients and guidelines for proper use. But, by the time the same chemicals were squeezed into tiny tubes or poured into small bottles there just wasn't enough room for all those words.

> *"But the hazard problem is so very very complicated"(4) says Mark David Gottsegen, a painter assistant professor of art at the University of North Carolina in Greensboro, who now wears a `moon suit' in his studio. "It is not that it is being ignored by the manufacturers but that exposure to the individual ingredients is varied and unstandardized; no two artists work the same way, even when using the same materials. Furthermore, as any toxicologist knows, an individual ingredient may be hazardous in one for but not in another"(5).*

In 1979, hearings took place to demonstrate the possibility of listing ingredients on a small tube of artists paints. Due to the publicity of the hearings manufacturers agreed to begin working with health specialists and artists towards a voluntary standard. The labelling standards for quality performance and toxicity are known as ASTM (The American Society for Testing and Materials) D4236 and represent a scientific and commercial breakthrough that can safeguard the health of the artist using these materials.

The premise of The American Society for Testing & Materials was simple. One standard dealt with the quality of artist paints and accurate labelling for pigment content, and the other concerned labelling for chronic toxicity. But achieving these labelling standards was difficult. In 1977, Joy Turner Luke founded the Coalition for Health Labelling of Art Materials which initially faced industry opposition but she managed to turn them around.

> *"It was a long drawn out effort, hearing and explaining so many technical details" she says "but in the end it has been an enormous victory - a verifiable standard ASTM D4236 has been set. Now we want all the state to write D4236 into legislation" (1).*

We must note that not all manufacturers were in opposition. Verne Clark of the Graphic Chemical and Ink Company of Chicago and Brian Heath, president of Windsor & Newton products were the out front pioneers in their efforts to ensure the safety of their materials. Also, John Callen, a senior representative of 3M (Art Supplies Company) voluntarily teaches how to use different kinds of respirators for different kinds of art.

In January 1985, two separate actions confirmed that Rossol's message, and that of other relentless art advocates, over the last decade was being heard. For the first time hundreds of art materials were labelled according to a standard adopted voluntarily by major manufacturers. At the same time state laws mandating the labelling of art materials went into effect in California and Oregon. It was at this time, product labels marked AP (Approved Product) or CP (Certified Product) for Children under twelve, came into effect. These meant the quality of the material, workmanship and colour met with specific requirements. These labels from a voluntary program developed by the Art and Craft Materials Institute, indicate that the materials have been "*Certified by an authority on toxicology, associated with a leading University to contain no materials in sufficient quantities to be toxic or injurious to the body even if ingested*". These labels reflect great effort by Artists Equity and other Artists representatives, as well as co-operation among toxicologists and other health specialists. The toxicologists alongside chemists, industry representatives and artists worked together for three years to develop labelling standards that gave ingredient information, instructions for safe handling and use, and health and safety warnings. At present the ASTM safety label is on most art products but there is no ingredient breakdown. People need to be aware of what they are using. The ASTM safety standard is not going to be much help if you happen to be terribly allergic to one chemical in the mix. The fact is that 100 per cent of the population have allergies to certain substances, be it organic or chemical (8). Everybody has their own tolerance level. Once you pass the tolerance level of a certain substance an allergy develops. No doubt, some people may develop an allergy to an unlabelled substance in an art products due to lack of labelling.

Having spoken with Mr John Lloyd, technical manager for Daler Rowney, I found that Ireland and Great Britain do not conform to the ASTMD-4236 health label. They are under no obligation to use this health label on their products. Nevertheless, it is printed on most products being exported to America, because he states "*the Americans have become very*

aware of the ingredients in their products and will not buy it unless it conforms to the ASTMD-4236 health label" (9). Is it not time that we followed in the Americans footsteps? We too should start to become more aware of product labelling and health standards. There is a genuine need for correct labelling procedures to be introduced in this country and it is just not acceptable to keep people in the dark about potential health risks any longer.

Glazes - How Safe Are They?

The first pieces of glazed pottery were almost certainly produced by the Egyptians who mixed soluble sodium compounds with the clay from which they fashioned ornaments, beads and sculptural objects which we now refer to as egyptian paste. Eventually, however, the Egyptians were to develop glazes based on powder suspensions which were made, applied and fired much as we do today. A glaze can be described as a thin coating generally containing Silica and Alumina which, after firing, closely resembles a sheet of glass. It is continuous, impervious and almost completely insoluble when correctly formulated, applied and fired. A ceramic glaze might contain any number of the following elements: Aluminium, Antimony, Barium, Boron, Cadmium, Calcium, Cobalt, Colemanite, Copper, Lead, Lithium, Manganese, Magnesium, Potassium, Silicon, Sodium, Strontium, Titanium, Zinc, Zirconium, an indeed many others. It is evident from this list that glaze chemistry can be extremely complex, with additional complications arising from further reactions between the glaze and underlying body during the firing process. Thus, the glaze and how it affects the health and well being of the artist is itself a complex issue.

When talking about health problems arising from the use of glazes and glaze materials we must differentiate between the two main problems: first, handling the glaze materials may cause problems due to the toxic nature of certain materials. Also there is a metal release problem due to the fact that certain glazes on fired pottery may be attacked by acids present in foods types resulting in contamination of food by heavy metals released from the glaze. The most probably source of danger is not direct ingestion of material but the inhalation of fumes or dusts containing toxic material. One obvious example relates to Lead Bisilicate which people assume to be relatively safe, because of all the common lead compounds used for glazing - it is the least affected by the digestive acids - it does however, break down much more easily in the lungs. Some ceramic artists are fuming ware and the process does have considerable dangers

if not carried out in efficient fuming chambers with effective extraction equipment. The fumes released by the salts of silver, tin, titanium, platinum, and zinc all have accumulative dangers. To quote one of these:- "*Silver Chloride - affects skin, eyes, lungs and kidneys, - blue black discoloration of the eyes, kidney change and hypertension*"(10).

When taken into the body, by the mouth or inhalation, most materials can be harmful to some extent. This depends on the particular material, its fineness and the amount taken. While the result may be mild irritation, illness or in extreme cases, death, it follows that all materials should be handled with extreme care to ensure that they are not being introduced into the body in any significant amounts. Ceramic artists should be aware of the materials listed below. When using these materials for use in glazes, particular care must be taken, as all of these can lead to severe health problems. These may only occur after long-term usage of the material because their toxicity is cumulative. Antimony oxide, Barium oxide, Barium carbonate, Borax (Sodium Borate), Boric acids, Calcium borate frit, Colemanite, Cadium Compounds, Chromium oxides, Cobalt oxide, Copper oxide, Copper Carbonate, Fluorspar (Calcium fluoride), Lead Carbonate, Lead oxide (red lead), Lead Sulphide (Galesa), Litharge (Yellow lead), Nickel oxide, Quartz, flint, Cristobalite, Varadium Rentoxide, Zinc Oxide. The list seems endless, as are the health problems which arise from poor handling of the materials.

In general, lead poisoning is nearly always contracted by the inhalation of lead contaminated dust, but it can be obtained by the ingestion of lead compounds and this could be a serious danger to the individual potter who works in a confined area and has his / her own individual methods. Medically a distinction has to be drawn between lead absorption and lead poisoning. Two people may absorb the same amount but only one may have signs of lead poisoning. There is no fixed figure for the amount of lead that will produce the symptoms of lead poisoning (11). Likewise, some people begin to show symptoms after only a few months' exposure, while it may not be evident in others until after a few years. The symptoms of lead poisoning vary from one person to another. The most common complaint is that of tiredness and just a feeling of not being well, due to anaemia. In some cases severe abdominal pain and severe headaches and vomiting can occur. According to Charles Bray of Sunderland Polytechnic,

> *"Toxicity is something which is related to the amounts involved. Many materials, essential to life in small quantities are indeed poisonous in larger amounts. Different people have different metabolisms and this*

results in individual standards of susceptibility. effects can be acute or chronic but it is likely that the greatest danger from most chemicals used in ceramics is not from acute poisoning but from persistent and accumulative effects" (12).

Lead oxide is a valuable component of many glazes and because of its essential usefulness has received wide attention from ceramic researchers since the eighteenth century. Some of the more valuable properties of lead glazes include: its low melting range with strong fluxing action permitting the formulation of durable glazes; its wide softening range, giving glazes of increased fluidity; its low surface tension which assists in the production of glazes free from blisters and pinholes; its good colour response which ensure brighter richer colours than leadless glazes. These are but some of its advantages, its main disadvantage being that it has a high health risk factor.

Extensive world-wide research has taken place over the last fifty years aimed at developing a satisfactory substitute for lead in glazes. Many formulae have been developed by increasing the amount of Sodium, Potassium and boron in the glaze. But it seems that there is no other element that will give the glaze all the desirable properties mentioned obtained from lead. When lead glazes are correctly formulated, applied and fired they are amongst the safest and acid resistant of all. In order to formulate the glaze properly, toxic lead oxides are normally fused with Silica and small amounts of Alumina to produce a very stable lead bisilicate. This fusion process is called `fritting'. Due to the toxic nature of lead compounds it is important to introduce any lead required in a glaze in the form of lead frit. This then is referred to as a low solubility glaze. Small additions of Alumina and Titania reduce the solubility of lead silicate frits, whereas additions of alkalis or borax increase solubility. Some pottery text books list glaze recipes which include the addition of raw lead, but it is possible to use lead in the form of lead bisilicate and therefore bring them into the safe category of the low solubility glaze. But this stable glaze can be destroyed if one is not aware of other influencing factors such as (a) particle size (fineness) of the frit or glaze; (b) effect of additions of colouring oxides. Copper oxide influences the safety of a glaze to a greater extent than any other colouring oxide and therefore should not be used in any lead containing glaze which is likely to come into contact with foodstuffs or beverages. Certain acids found in foodstuffs (such as citric acid (fruit juices) or Acetic Acid (vinegar)) will tend to attack the surface when in contact with glazed pottery. The release of toxic amounts of the heavy metals such as Lead, Cadmium

Zinc, Barium, Copper and Antimony may result. All glazes are soluble in acid to some degree. It is not only the glazes which may contaminate food. Concern about barium glazes was increased when several individuals reported changes in the appearance of some barium glazes after contact with food and one reported symptoms after eating from the ware (13). Dr Woodhall Stoppard, toxicologist at Duke University and the consultant for the Arts and Crafts Materials Institute was asked to analyse barium and its risk factors to the health of the artist and that of the public using barium glazed pots. He concluded from his results that although barium does not accumulate in the body like lead, the damage it does to the body will be cumulative. In addition, the physical damage it may cause to the central nervous system may be attributed to other causes as barium cannot be found in tests (14).

Leaching glazes are glazes which slowly release all their soluble ingredients into food. Since glazes commonly contain many metals we should be similarly concerned about other toxic glaze chemicals. We should be also concerned about toxic metal containing glaze ingredients used in large amounts (15% or more) such as fluxes including compounds of barium, lithium and boron. In addition other metals could be hazardous in much smaller quantities including those which are highly toxic, sensitising or cancer causing such as antimony, chrome, nickel, uranium, and varadium. Until research and standards are set only safe glazes should be used on food contact surfaces. Ingredients considered safe might include dolomite, the feldspars, soda ash, whiting, clays, silice, alumina and magnesium carbonate. Safe colorants for these glazes might include most iron compounds (not chromates), tin oxide, zirconium containing compounds, zinc oxide and small amount of cobalt and copper. Some potters knowingly continue to put their customers at risk for the sake of aesthetics, convenience, old habits, deliberate ignorance or money. Others are unaware of the dangers, ignorant of the hazardous materials they are using perhaps over a long period of time. Through their ignorance they are not only putting their customers' health at risk but their own and they are coming into contact with, perhaps mis-handling these toxic materials in their raw state. It may be years before all the research is done and the problem completely understood by all practising potters. We have it in our power to work in a cautionary manner and stop the suspect practice. Then no matter what the research ultimately shows, there can be no criticism of our techniques.

It is not only the chemicals that are putting artists at risk, but airborne materials. In this case the material is in disguise, you are totally unaware of it being around you. Some airborne

materials you may smell but are you aware that these chemicals in the air around you are directly affecting you through inhalation? Airborne materials can affect the lungs directly or become absorbed into the bloodstream through the lungs. Airborne materials of concern include: solvent vapours from paint, inks and thinners; spray mists from airbrush and aerosol spray cans; gasses and fumes from photographic baths, pottery kilns and welding; metal fumes from soldering, welding and metal-casting; and dusts from dyes, pigments, pottery glazes, woodworking, grinding, not to mention dried airborne clay dusts.

Perhaps one of the less obvious dangers would be that of the pottery kiln. Many schools, colleges and studios have inadequate ventilation systems. It is extremely important that kilns in the workplace have a good ventilation system in order to extract any gases emitted by the kiln. The danger of this system was emphasised a couple of years ago, when a particular delivery of stoneware clay released large quantities of sulphur dioxide at 900 degrees centigrade and 1000 degrees centigrade in the bisque firing. Sulphur dioxide is sufficiently toxic to be dangerous but as it is a pungent gas the area would have cleared fairly quickly as the smell become unbearable (15). What if it had been a different gas? A colourless, odourless gas? The people in the area would have been left unaware of the toxic airborne material and nevertheless there would have been a health risk factor.

A law suit also came about when a teacher claimed to have developed respiratory ailments brought about by classroom exposure to invented electric kiln emissions (16). Monona Rossels' particular goal is to protect children whose organs may not be sufficiently developed to withstand the assault from chemicals innocently used at home or classroom art activities (12). In this case the teach claimed to have developed a debilitating formaldehyde sensitivity from the kiln emissions. The teacher was supported by a State Occupational Safety and Health Administration (OSHA). One part per million (1ppm) of formaldehyde was detected in the air near the kiln and nowhere else in the area, thus ruling out other sources for the substance. OSHA considers 3ppm the Threshold Limit Value (TLV) for the workplace (18). In a classroom however, there should be lower levels of toxic airborne materials. Classrooms are considered to contain `high risk populations' such as children, teachers, children with pre-existing health problems, mainstreamed handicapped retarded children and even pregnant teachers. Therefore industrial exposure levels (3ppm - TLV) should not be applied to these more vulnerable groups.

Formaldehyde is toxic and it is know to be a powerful sensitiser. Some people exhibit symptoms of formaldehyde exposure at tens of parts per billion levels. Kiln emission are usually tested for sulphur dioxide, lead cadmium, carbon monoxide, chlorine, fluorine, nitrogen dioxide and ozone. These are some of the inorganic compounds likely to be produced when inorganic clay and glaze chemicals are heated. But formaldehyde is an organic chemical and it too is released. According to one expert, during the firing, certain organic compounds in commercially prepared slips and glazes decompose to produce formaldehyde. There is no shortage of organic compounds in kilns, these include colouring agents, thickeners (e.g. Gum Arabic), lustre glaze oils, resins, waxes and natural organic impurities found in most clays. There is no shortage of organic compounds in kilns and these compounds decompose with heat. With so many sources of organic compounds in clays and glazes and the range of kiln temperature, a vast number of chemicals could be created. This adds to the number of dangerous airborne materials in the workplace and continues to put the people working in the area at risk.

Formaldehyde is not the only dangerous chemical released by the kiln during firing. Sulphur dioxide mentioned earlier is released from almost all clays during firings and from some glaze chemicals. Sulphur oxides are strong lung irritants because they combine with water (either in the lungs or with water vapour present in the kiln) and form sulphurous and sulphuric acid mist or droplets. Repeated inhalation of this material can cause chronic lung diseases, such as chronic bronchitis or asthma. Carbon monoxide is also produced during the firing due to the organic compounds decomposing. Carbon monoxide enters the bloodstream through the lungs and destroys the oxygen-carrying haemoglobin in the blood. Symptoms of low level carbon monoxide intake include headache and fatigue. These metal fumes are formed when the metal evaporates during the firing. The evaporation takes place well below boiling point. Some metals which are known to evaporate during firing are: Antimony, Cadmium, Chrome, Copper, Lead, Nickel and selenium. As stated, earlier all these metals are toxic. The metal fumes emitted by the kiln are extremely fine particles of metal oxides which escape and settle on the floor as part of the dust. These metals dusts accumulate where kilns are fired regularly. Here they can affect the people working in the area by ingestion, skin contact or by being simply stirred up on air current and made circulate for inhalation.

The respiratory tract becomes very irritated due to fluraine and chlorine released when glazes containing chemicals such a fluorospar, iron chloride and cryolite are fired. The lungs can also be irritated by nitrogen oxides and ozone. Nitrogen containing chemicals when decomposed in clays and glazes also produce nitrogen oxide. These are just some of the chemicals to be found in kiln emissions. These emissions are a threat to the health of the people in the area. Worse again, unpredictable emissions can also occur where highly toxic chemicals can be produced for this reason kiln ventilation plays a large part in reducing health risks in the studio. It is so important to have adequate extraction to prevent these fine particles of metal oxides accumulating and leaving yourself open to disease which may eventually develop into a terminal illness.

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CHAPTER 3: SEVEN STEPS TO RECOVERY. DIANA HOBSON

Toxic materials and kiln emissions are not the only factors which may affect the health of the artist. Stress is also a common factor. According to Lisa Scroepfer, *"Craftspeople have some of the least stressful jobs in the United States"(6)*. But this may not be the case for all artists / craftspeople. Potters as business people have the usual problems involved in running a business - production, marketing, quality control, distribution, sales, administration and the inevitable problems and emergencies in each of these areas. There is the constant collision of business reality with the fantasy, hope and dream of being at one with the process of making unique and useful objects which please themselves and their fellow human beings. Also, as creative individuals, craftspeople struggle with the lonely and often terrifying tasks of coming up again and again with something unique, interesting or beautiful.

Diana Hobson, born in Stoke on Trent, England in 1943, went straight from school to become a trainee ceramic designer for Clarice Cliff. In 1959, she began studying ceramics in Stoke on Trent School of Art. After college, she worked from 1965 to 1971 as a designer for Howard Pottery Limited. It was in 1971, at the age of 28 that she experienced a major trauma in her life.

> *"It was a very big shock. My body weight dropped overnight to 5st 12, I was holding onto the very edge of sanity" (1).*

At this stage in her life Hobson felt that she had to find her identity, to prove that she had some worth. This unexplained shock put her on a different level than she previously was and it was then that she began to "*work like mad"*(2).

Because of this trauma, Hobson turned to her work as if she were looking for some kind of release. *"I chose the very most difficult thing that I could do, which was working with metal"(3)*. She moved to London where her work began with metal and where she hoped to start a new life for herself. She found that working with metal grounded her, that she had a lot of spiritual energy but that her physical body had disappeared. For Hobson, the only thing she felt she could do to survive was to work as hard as she could. It was at this stage that her work took control of her everyday needs. Throughout her life, Hobson has experienced two physical breakdowns.

"As a perfectionist, the nature of the content of my work has led to overstress. There is a point, when the creative drive is not balanced, where it becomes destructive" (4).

Hobson was ambitious for the work. Because of her collective energy her ideas were strong. She felt she had the energy to do the work. But artists who are particularly sensitive to collective energy are very vulnerable. So Hobson began setting herself `super-human' tasks and to actually finish the work she would have to use up all of her energy.

"I kept putting myself in this situation again and again, pushing myself further and further. I've slowly eroded the reservoir of stamina and have been feeling it for a long time"(5).

In 1973, Hobson entered the Royal College of Art, London where she spent the following three years working with metals. Again, her creative energy pushed her deeper and deeper into her work.

"I put a tremendous amount of energy into my work and I empty myself. I'm a perfectionist, I push things to the limit and I take chances, I push my physical body too far"(6).

For three years, Hobson had difficulty sleeping - she spent more time looking after her work than looking after herself. By the time she finished in the Royal College in London she was completely burnt out of energy and had a physical breakdown.

In 1976, Hobson received a British Council Scholarship which enabled her to spend a year in Finland. This was her first step on the road to recovery. Instead of continuing her own work and following through her ideas she spent her time using the materials of the countryside. She spent some time carving wood and generally feeling more at one with nature - trying to strike an even balance between herself and her energetic drive. A year later, Hobson returned to London and set up a jewellery workshop in order to make a living. It was at this stage of her life that she began to work with glass and research the idea of using pate de verre (this involves the use of ground glass mixed with a fluxing medium to help it melt readily. This mixture is put into a mould and fired to fuse the particles of glass).

It was 1980, and Hobsons' energy hadn't fully returned, but she kept going, determined to make herself more stable in the world.

"I did my research and began with pate de verre vessels, I wasn't using my full energy as I was in the Royal College, I was just collecting myself together"(7).

For three years, Hobson worked with the technical process of pate de verre and this helped her to recover more of her spiritual energy.

In order for Hobson to continue her life and work in a less damaging manner, changes had to be made. Letting go of old moded habits collected from childhood onwards and turning them into something positive was one of her main objectives.

"The habits you collect are fear and the response to things. I feel very positive when I've got my teeth into something, but when my energy goes I can become very negative. It's actually seeing the pattern and trying to change things. I have to remember that I can make things happen, that I can make life work for myself and it doesn't have to be very tough, I can do it gently"(8).

Hobson talks of childhood patterns such as `Children should be seen and not heard' and the lack of confidence that comes from that. She looks on her work as a means of survival. *"The work has my life in it"(9).* It seems that Hobson, her life and her work are very much so directly and emotionally intertwined in each other that there would be no means of survival without it.

Out of necessity and a survival instinct she began to do yoga which helped her to learn about the physical world (10). For a long time she kept herself enclosed within her work and during the first period of her breakdown she was no longer interested in looking around her/she was following her own deeper self. Only recently has she begun to take an active interest in reading and learning. she has opened up, widened her vision and experienced more outside herself. Gone are the inhibitions and concentrations which forced her to look in on herself and as a result, major changes have occurred. *"I've had to go out and ask for help, it's necessary"(11).* With the help of a homeopath, Hobson learned to balance her energy formula and direct things in the right way.

"Your body really reflects everything that's going on. I've learned to direct my energy through my hands and with my hands, heal myself and other people.(12)

Hobsons small sculptural objects cross the boundary from "craft" into "art". They move conceptually away from certain "craft" expectations and limits. Hobson has found (through her illness) that she needs to tolerate her work (herself) from the preoccupation with techniques and materials that can absorb the attention of both the producers and the consumers of craft objects. Hobson's level of technical knowledge is of a very high standard, having worked with ceramics, metals and glass for a considerable number of years. The work she is doing now is concerned with the metaphysical world. Through her work she communicates what she experiences.

> *"It has put me in touch with different levels of experience, but leaves me open to external forces" (13).*

Her most recent work, entitled "Seven Steps" (February 1991) is a series of seven pieces. This series of work began as an image in her mind of a red sandstone boulder, followed by finding this exact stone in the English river Dane. This was near the place where her ancestors live from the 12th to the 19th Century. Hobson recalls

> *"I began to walk around the stone, each revolution faster than the next, creating an enormous force pulling me into its centre. From this experience the whole series of work evolved"(14).*

In these pieces, Hobson uses quite a range of materials - glass, sandstone, feathers, bronze, slate, limestone, animal hair and pink granite. The first piece of the series entitled Circling, 1991, (fig 14) is made from pâte de verre, sandstone and feathers. Here Hobson states that the piece

> *"represents the transition from the void into the first stage of life. I carved onto a hollow already in the stone to fit the shape of the glass `embryo'. The bronzed feathers continue the movement and receive life giving energy from our universe"(15).*

Perhaps for Hobson this is her beginning in life, that she is the embryo slowly emerging from the stone but quite comfortable in this position. The feathers could indicate her having energy from birth, that her strong energetic forces have been with her from the beginning. The form is simple and strong. There is a powerful sense of comfort surrounding this piece. Perhaps it is the comfort and energy she received that day when circling the red sandstone boulder. The feathers lie comfortably next to the stone making the piece look relaxed - at ease, with the contrast of the three materials working as one. This same embryo formed now in bronze continues in the second piece of the series entitled Presence of Bronze , 1991, (fig 15). Here

Fig.14:Diana Hobson,Circling,
Pâte de Verre/Sandstone/
Feathers.1991.

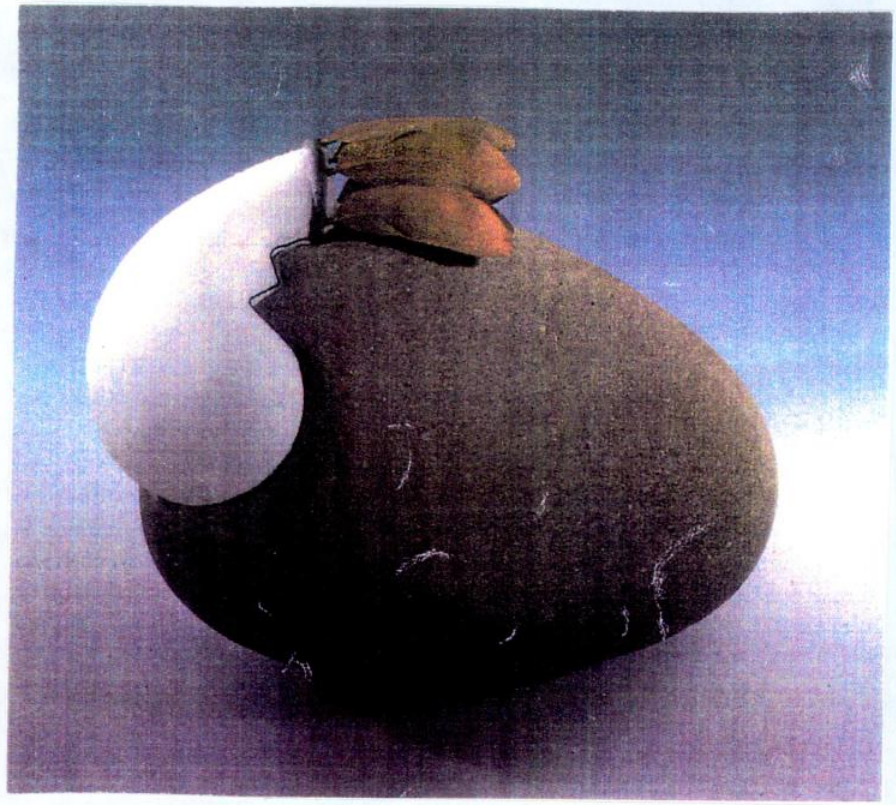
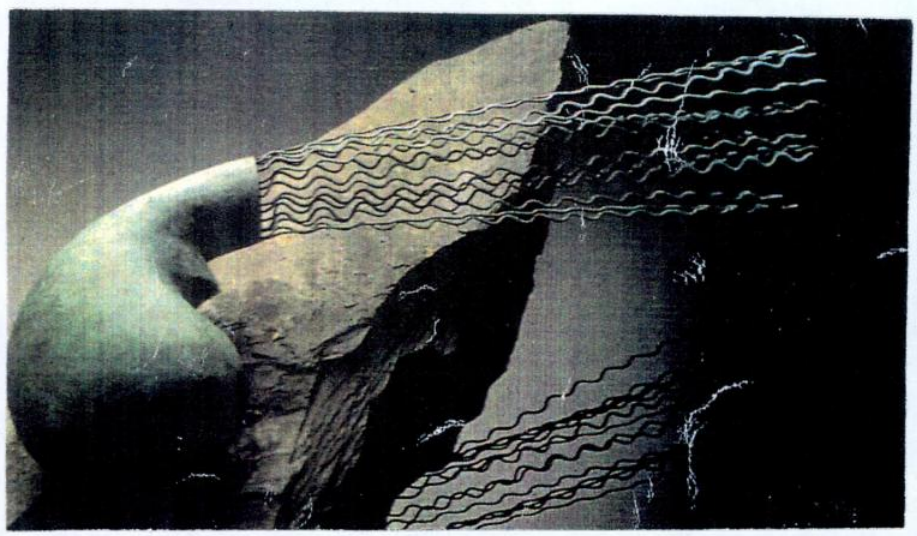


Fig.15:Diana Hobson,Presence Of Bronze,
Patinated Bronze/Slate,1991.



the piece (life) become more earthbound. As it evolves it retains its contact with nature and the void. Her patinated bronze depicts the embryo; it lies flat on its side on the slate. The feathers are replaced by curled wire which stretches out in a horizontal way. This wire creates a huge energetic force in the piece, there is almost an electricity emanating from it. The embryo is given greater prominence than that in the previous work "Circling". It has moved away from being comfortably attached to the sandstone boulder to lying quite awkwardly on the granite. The movement of energy becomes stronger as does the creative force tugging at the embryo. In her third piece Benu Bird, 1991, (fig 16) the embryo changed its appearance. It has begun it own movement of form. It now contains coloured pigment but has gone back to the original pâte de verre state. It sits quite comfortably, quite alert, reaching upwards from a plain of limestone.

> *"One surface of the limestone is the original imprint of an ancient sea. The piece is connected to Ancient Egypt. Benu Bird was a sacred mythological bird with the body of a golden hawk and the head of a heron. It represents the incarnation of the sun at dawn as it appeared alighting on the Berber stone at the temple of Heliopolis" (16).*

The energy is depicted with blue animal hair jutting from the top of the embryo. The embryo in this case has both a visible inside and outside; the inside being dark and quiet and the outside being colourful and bright, lively and energetic. The animal hair continues the movement and flow of energy that surrounds the piece.

The series continues with step four, entitled Fragment of a Circle, 1991, (fig 17). Here the fragments of stone and bronze begin to describe a very large circle. The glass bubble, which is poised on the stone fragment, is a container for light or spirit. The embryo here has evolved quite a lot, its colours and energetic appearance is gone. It remains perched on the sandstone but now the sandstone is fragmented. The energy that had come from steps 1, 2 and 3 is now gone, wasted, used up. There is quite a lot of play between light and dark. The whiteness and pureness of the light container compared to that of the shadow it creates underneath on the sandstone. Perhaps this could be a period of illness, of wasted energy.

The 5th step Rainbow Jester, 1991, (fig 18) changes dramatically. Here Hobson returns to a form for the embryo similar to the embryo in Benu Bird (fig 16). Here colours line the edges of the pâte de verre vessel, energy is reintroduced which flows up into the feathers which are not as static as those used before. Instead they droop gently downwards. The embryo no

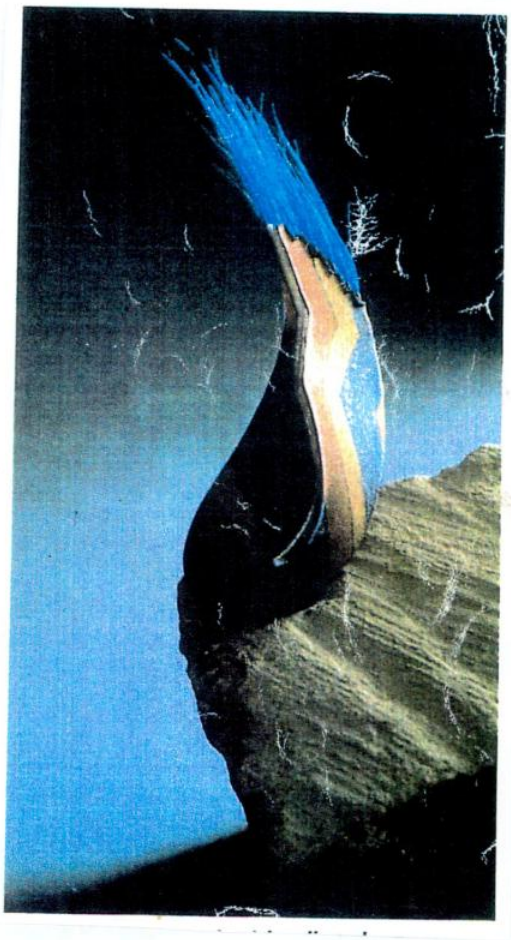


Fig.16:Diana Hobson,
Benu Bird,
Pâte de Verre,limestone,
Animal hair.
1991.

Fig.17:diana Hobson,
Fragment of a Circle,
Sandstone/Bronze/Pâte
de Verre.1991.

longer sits on stone but patinated bronze is introduced once again. Could we relate this to Hobson's recovery, beginning to get well after the initial breakdown?

In Section of a Circle, 1991, (fig 19) pink granite and patinated bronze is used. Here the granite represents a slice through the centre of a three-dimensional circle. The movement of the bronze is lizard like and remains very much within the slice. This piece is to do with integration as is the seventh piece Centering (fig 20). Using pink granite and pâte de verre, the duality of the stone represents the opposites - negative and positive, male and female, north and south, without which there would be no life. The pâte de verre form (the embryo?) in finding itself in the centre is neither negative nor positive and processes both energies into a balanced entity. Here Hobson has found her ideal. She has controlled her energy and found the correct balance. The positive and negative forces which tormented her through her use of energy have struck an even balance. The pâte de verre vessel wears a crown of feathers. These feathers are not to be compared to those used before. They have neither an electric nor a static feel to them, they are evenly balanced and slant in the same direction in a comfortable way. The embryo now sits triumphantly with its crown of feathers.

I feel Hobson has brought us through the stages of her life. These are the steps she had to take - her emotions, her strengths, her illness and her health. These pieces are imaginative encounters that have a personal and intense kind of poetry, a mystique that is at the same time cosmic and earthy. The rough and natural forms are like fragments lifted from nature. These crafted forms belong to human fantasy and these forms were created by Hobson in order to explain and make everything real for herself. Through these steps I feel she has even helped herself more in learning how to strike an even balance. Her work is her life as her life is her work. In a letter dated October 1993, she writes

> *"I see creativity and destruction as opposite sides of the same force. As I have indicated, the dark side - shadow, destruction, illness etc. needs to be transmuted into the light - creative, flowing, healthy, energy. The secret is, not to see the darkness, illness etc. as bad, but to see it as necessary to the process. Without darkness you don't see the light" (17).*

Here, Hobson is talking about Fragment of a Circle (fig 17). This was the point where her illness had taken over. The sandstone at this point is fragmented, broken - she has to see the light.

Fig.18:Diana Hobson,Rainbow Jester,Patinated bronze/Pâte de Verre/feather (Cree Hackle),1991.

Fig.19:Diana Hobson Section of a Circle,pink granite and patinated bronze,1991.
Fig.20:Diana Hobson Centreing,Pâte de Verr and pink granite,1991.

In the series "Seven Steps" each embryo or pate de verre vessel rests on a large piece of stone or bronze. They develop from being a solid oval boulder to flat slate to broken sandstone to curved bronze and finally to a slice of a three dimensional circle. Here it seems that Hobson has gone back, back to the solid oval to become part of that comfort again and in this case finds her way into its centre, being neither positive nor negative, finds the correct balance and her energies flow evenly once again.

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CHAPTER 4: MANGANESE POISONING, JANE LANYON

Jane Lanyon, born in 1948, is the daughter of a well know British painter - the later Peter Lanyon. She was strongly influenced by his love and understanding of the Cornish landscape and by the artists of the St Ives school. It was from these sources and from her associations with the famous Leach potters that she gained her perceptions of the landscape. She trained in secretarial studies in the UK and has been extensively involved in the fields of public relations, advertising and art gallery administration. From 1968 to 1977 she travelled overland from Sydney in Australia to Perth, then on through Malaysia, India, Pakistan, Iran, Turkey and finally to Europe. In 1977, Lanyon returned to Perth. Influenced by the colours of North Western Australia she took up pottery again and studied it part time. Before taking it up full time she taught pottery for the Shire of Wanneroo for up to five years and she travelled to the UK visiting potteries where she got further inspiration and practical encouragement from Janet Leech and the Leech pottery. She also became the administrator for the Wanneroo arts council, setting up office, arranging grants and encompassing all facets of the arts.

Between 1986 and 1989, Lanyon finally began working full time from her own small studio exhibiting in galleries in Western Australia. In 1990, she exhibited alongside works by Bernard Leach, David, John and Janet Leech, Lucie Rie, Hans Coper, Michael and Seth Cardew. Jane Lanyon is an `artist' potter who, because of her intense feelings about the Australian landscape and total confidence in her technique is able to create in each piece the very spirit of the landscape which inspires her. In 1989, she travelled to the Northwest of Western Australia. This is an area of great beauty with extremes of vivid colour and temperature created by the ever changing light. The images left a lasting impression that has influenced her work since.

> *"My forms are about places, feelings, colours and the light, especially the light and the characteristic shapes one sees about you"(1).*

Using a local stoneware clay to depict the colour of the earth, surface decoration is achieved through the application of coloured slips at the leather hard stage. All forms are fired to 1250 degrees Celsius. Lanyon's vessels stand in a world of their own. The sensuality and dramatic effect of the vessels is largely due to her strong sense of form and her application of the coloured slips. Through the use of coloured slips Lanyon does not create a conventional

landscape, they are not photographic representations of landscapes but more about feelings of places and being at one with nature (2). The clay and slips immerse together like solids and fluids of the landscape, creating an illusion of the Universe in harmony with nature. Earth, water, fire and air are brought together in tranquillity producing a stillness within each piece. To look at this work, the calmness and peacefulness that surrounds it one would not think that it caused the artist to become seriously ill.

In December 1992, Jane Lanyon was diagnosed with Parkinson's disease, related to manganese poisoning. This may be due to the fact that she is a potter for seventeen years who has worked with manganese and also lived in areas where manganese was mined. On the basis of her use of only 2% manganese which was used for colouring a clay slip, Lanyon's health has been severely damaged.

> *"Manganese poisoning refers to the chronic neurological disorder caused by manganese, also as a chronic disorder of the central nervous system (CNS) resembling Parkinsonism"(3).*

Chronic poisoning with manganese occurs most often in miners. Lanyon lived in St Ives, Cornwall where manganese was mined, and worked for several years in Port Hedland, Western Australia near a stockpile of manganese ore.

Manganese ores are mined by both open pit and underground mining. Before the ores are ready for industrial use, they must go through a series of refinements. The are crushed and roasted before shipment and afterwards they are crushed to a smaller ore and ground. This grinding process has been responsible for a great number of cases of manganese poisoning. During the grinding process the manganese metal dust becomes airborne. Manganese poisoning can occur due to inhalation or ingestion of this dust. Manganese poisoning is a cumulative disease and it may take many years before it is realised. The disease is treacherous as it works secretly and slowly, leaving the person exposed, unaware of the damage being done. Early symptoms are: fatigue, apathy, weakness in the legs, tremors of the hands, muscular spasms and leg cramps, loss of co-ordination with symptoms resembling Parkinson disease(4). Treatment includes the administration of a substance called Levodopa. This has a remarkable beneficial effect in relieving the rigidity, but it is less effective for the tremor.

Iron deficiency is said to leave the person more open to manganese poisoning, as it increase manganese absorption. According to Lanyon

> *"My own long family history of iron deficiency anaemia was treated with iron and tonics which I now find have added manganese compounds. Iron deficiency anaemia has been advanced as an important factor in worker susceptibility to manganism. Since there are atomic similarities between iron and manganese an iron deficient body may absorb manganese more readily than one with an adequate iron supply". (5)*

In the ceramic industry, manganese is used in the mixing up of glazes or coloured slips. Manganese give colours varying from a bright red purple to a dark purplish brown that can almost be black. As discussed earlier, metal fumes can be released during firing from the glazes. If manganese oxides are present in the glaze the fumes emitted can cause metal fume fever and manganese poisoning.

After a diagnosis on December 24th 1992, Lanyons' future prospects affected her more than the symptoms. Lanyon continued her work as her symptoms were not bad and in February 1993 she held a ceramic exhibition with the Craftsman Potters Association at the David Canter Gallery in London. Three weeks later, her diagnosis was verified and she stopped working with clay. *"I decided to steer clear of pottery for a while to see if my symptoms would subside"(6).* One of Lanyon's symptoms included the swing in her left arm lessening. The most characteristic symptoms of Parkinson disease are tremor and rigidity. Parkinson tremor is a fairly rhythmic tremor of resting muscles. Rigidity is more widespread than tremor; and if the spine or neck is affected, it causes a stooped posture. If the facial muscles are affected it causes a mask like expression. Associated movements such as swinging the arm while walking may be absent casing the hurried gait. If the rigidity is not treated, the muscles will stiffen and become useless. Because of the weakness on Lanyon's left side, her pots tended to end up slightly off to one side. Getting someone to throw the bases for her helped keep her on track. For Lanyon, this was a difficult time -

> *"To be honest, I am not fully at peace with myself and I guess this affects my feeling towards my pots. They just don't ring true at the moment"(7).*

However, Jane Lanyon is still deeply involved in her ceramic work, in her piece Storm Approaching, 1991, (fig 21), the swelling colours of the clay and slips emerge as one, creating a dramatic feeling of upheaval and of turbulence. The form itself adds to the intense feeling of the piece. It seems that in one clear swoop it rises up, bellying out to an extent where you

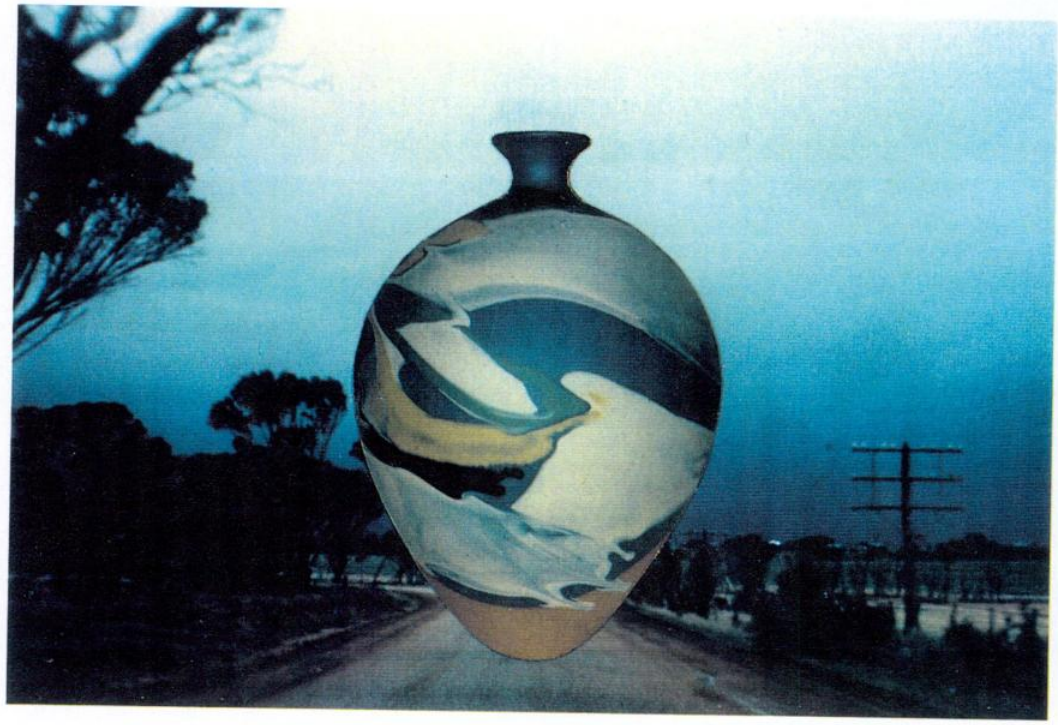

Fig.21,Jane Lanyon,Storm Approaching,Bullfinch,Western Australia, 1991.

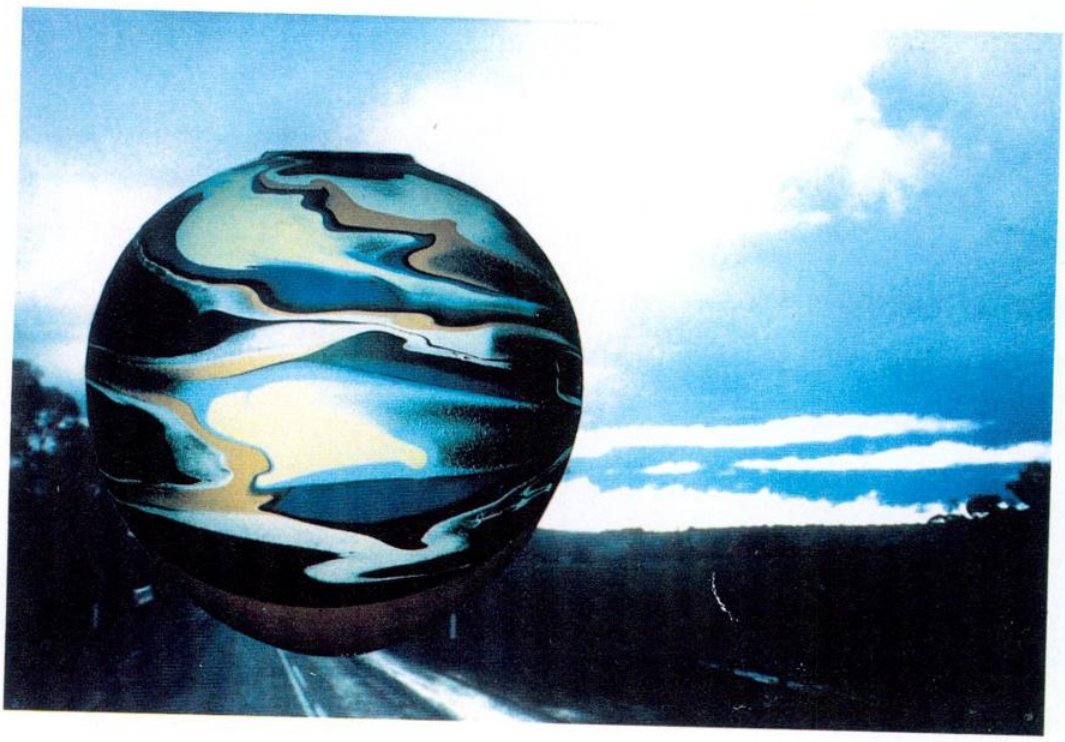

Fig.22:Jane Lanyon,Rain Clouds,Western Australia,1991.

may almost feel that it may burst. This uncomplicated form enhances her fluid interpretation of the storm. In another piece entitled Rain Clouds 1991 (fig 22) her interpretation of the sky, its movement and its colours is vividly expressed. One may almost feel the darkness approaching, the extremes of heavy clouds and open sky. The movement of the colours is so dramatically interpreted that one can easily see how important the feeling, colours and light of the landscape is to Jane. She has involved herself with her work and her thoughts one hundred per cent, to an extent where you feel the intensity of here feelings ebbing its way through her work.

As in Sea Spray 1992 (fig 23) a magical sensation engulfs this vessel creating a sense of mystery and peacefulness, its volume swelling out and tapering up as the sea would swell and eventually explode releasing its waters in mists of spray. The magic and mystery of the sea portrayed in her application of slips - so delicately done, a sensitive movement of colours from the darkness of the sea to its pureness and whiteness of its spray. The forms Lanyon used for her vessels depict the landscape she is interpreting. As in The Gap, 1991, (fig 24) this form rises up in a triumphant way. It is tall and quite slender compared to her other forms. In this piece it seems that the sea has victory over the landscape. The deep oranges perhaps depict the cliff edges on either side with the blues, blacks and whites of the sea rushing through the `gap' it has eroded for itself. The form tapers out at the top of the vessel perhaps indicating the opening to the sea. This triumphant scene is also suggested in her piece titled Foam, 1992, (fig 25) here the whiteness and pureness of the foam seems to have victory over the rest. The browns, oranges and black depicting the rocks and boulders of the river. The blues of the water gently suggested but overpowered by its turbulence, causing the whiteness of the foam to swell above and between the rocks and landscape.

Lanyon's forms are strong and with the application of slips they make powerful and intense statements. Again, magic and mystery surrounds her piece entitled The Floating Goddess 1991 (fig 26). Perhaps this is about the ever changing light in the Australian landscape - the gradual change in light, from the darkness of the night to the brightness of day; the shapes, and their characteristics that one may see with the ever-changing light; how light has the power to make things look and feel different; how it has the ability to make you feel different. Perhaps the `Floating Goddess' is the light, that she is in control . Is the `Floating Goddess' controller of light, the very spirit of the landscape which inspires her? Lanyon creates feelings

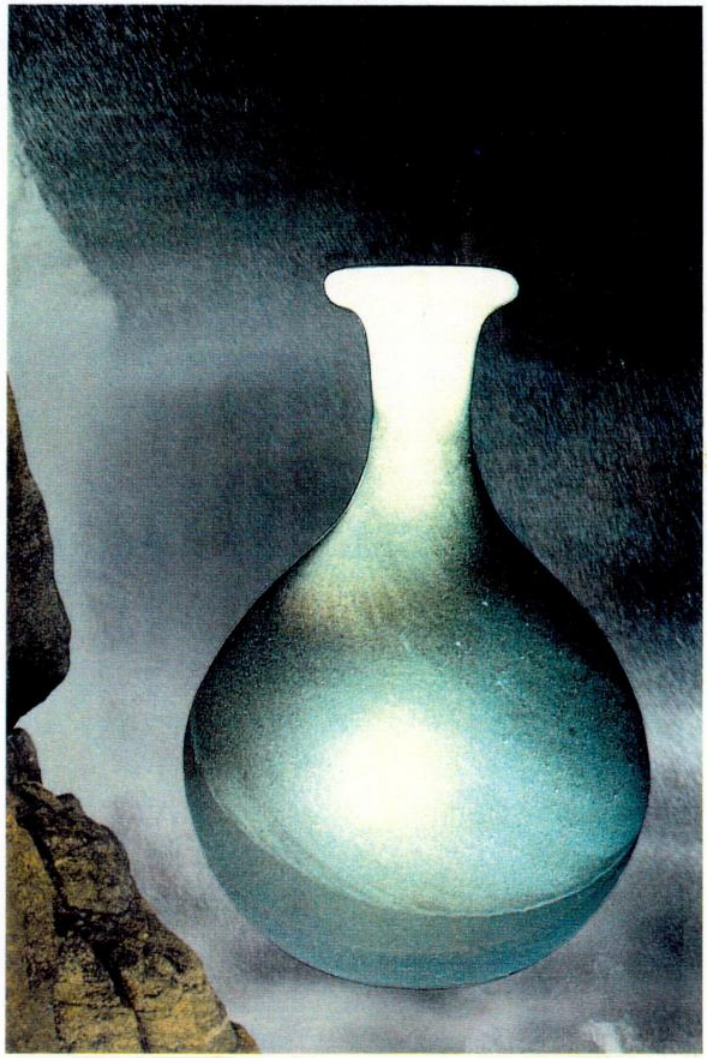

Fig.23:Jane Lanyon, Sea Spray,Albany, Western Australia, 1992.

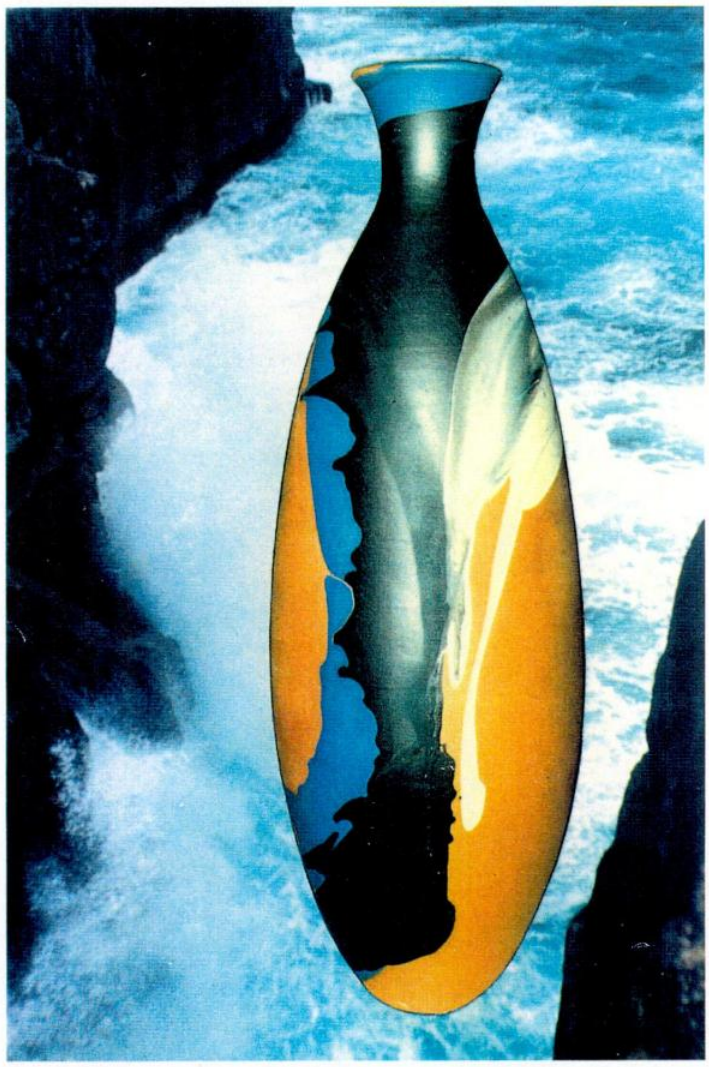

Fig.24:jane lanyon, The Gap,Albany, Western Australia, 1991.

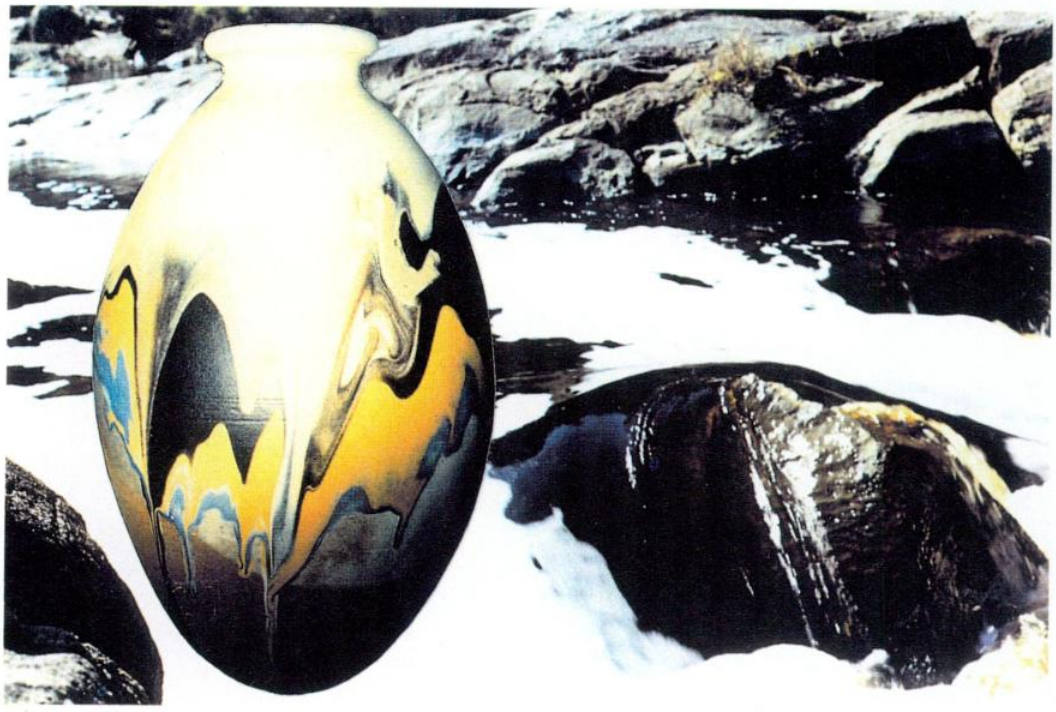

Fig.25:Jane Lanyon, Foam,Frankland River,Western Australia,1992.

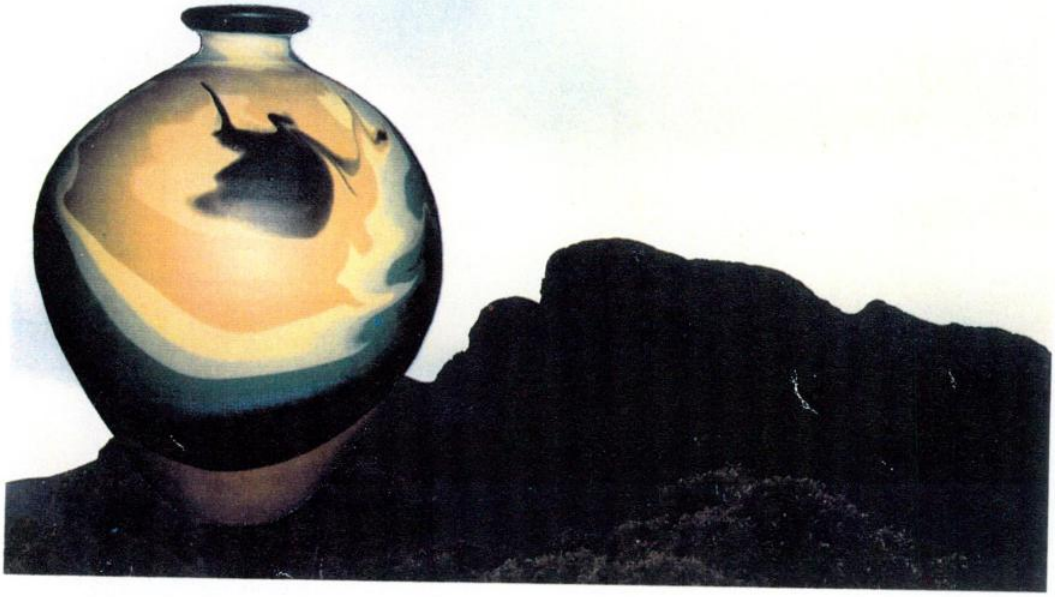

Fig 26:Jane Lanyon,The Floating Goddess,Bluff-Knoll,Western Australia,1991.

within her pieces. You cannot just look and walk away. It is a matter of becoming part of her landscapes, her emotions, a matter of imagining her landscapes, her storms and rain clouds. This is not a difficult task as Lanyon's work is brilliantly done. The sensitivity and calmness of the landscapes portrayed is overwhelming. But it was through the application of the slips along with other factors mentioned earlier which resulted in this brilliant artist falling ill.

In 1993 through frustration at her diagnosis, Lanyon took up painting

> *"With my father's recognition and my brothers too, I'd always felt inadequate about my painting. With the shock of my diagnoses and my husband's confidence in me I put all my inhibitions and apprehensive feelings aside"(8).*

Lanyon's paintings are quite similar to the decoration used on her pots. Using a similar method of control she achieves aerial images of the earth. Using a household acrylic paint and gloss, the colours are generally made up using natural oxides in a clay slip, which acts as a thickener. Through painting Lanyon seems to find a release from her disease. She becomes preoccupied and excited with her new work and she finds her possibilities limitless. In her paintings the Coast, 1993,(fig 27) and the Beach, 1993, (fig 28) the colours are delicately used to an extent where you are drawn into the painting. The paintings hold an element of mystery or hidden secrets. As in her ceramic work Lanyon once again captures the true spirit of nature. Although they seem closely related to her pots, they create a different impact, tell a different story. Lanyon's images tend to draw you closer and it is then you begin to see the tiny details, which, at first glance, were invisible. Again, in Rocks, 1993, (fig 29), and Sea Spray, 1993, (fig 30), the energy of movement which is so evident in her pots, comes through in these paintings. In Bushfire, 1993, (fig 31) and Floodplains, 1993, (fig 32) the vibrant colours used in contrast with each other show vividly the conflicts of nature. Although Lanyon has brought her love of western Australia into her paintings, she finds her method of working has changed.

> *"My painting technique is not exactly the same as working on a sphere which creates its own obstacles. A flat surface is definitely easier and one can work at areas over and over again until the right image emerges"(9).*

After a 9 month break, Lanyon has returned to her pots, but she cannot work as she previously had done. *"I now make smaller pots and my work is much slower"*(10) (fig 33). When asked whether she would produce work - ceramic or otherwise about her illness she says *"No I feel*

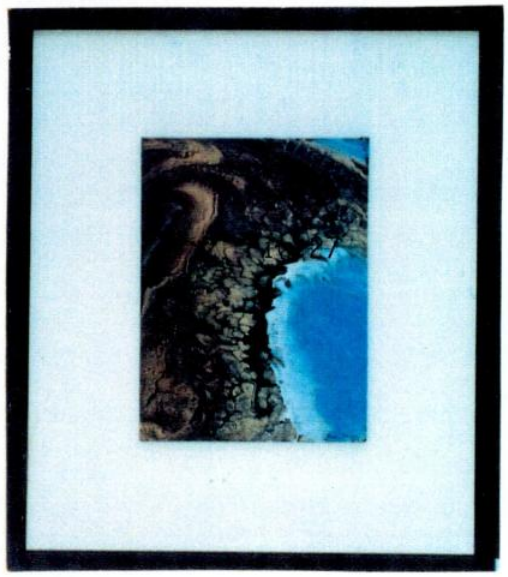

Fig.27:Jane Lanyon,The Coast,
14"X12",Western Australia,
1993.

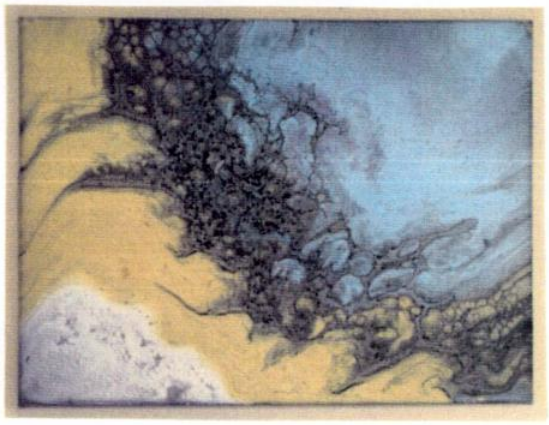

Fig.28:Jane Lanyon,The Beach,
14"X12",Western Australia,
1993.

Fig.29:Jane Lanyon,Rocks,
16"X13",Western Australia,
1993.

Fig.30:Jane Lanyon,Sea spray,22"X15",Western Australia, 1993.

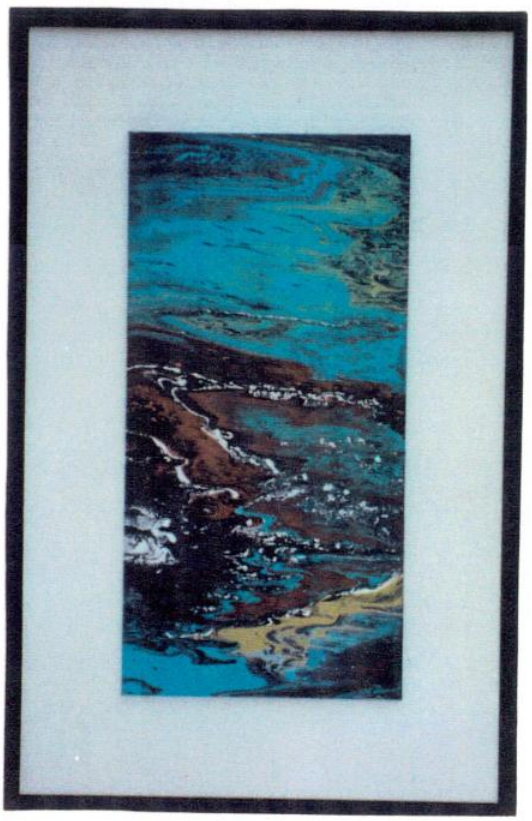

Fig.31:Jane Lanyon,Floodplains, 23"X15",Western Australia,1993.

Fig.31:Jane Lanyon,Bushfire, 16"X14",Western Australia,1993.

Figs.33:Jane Lanyon,Smaller pots made after diagnosis, 1993.

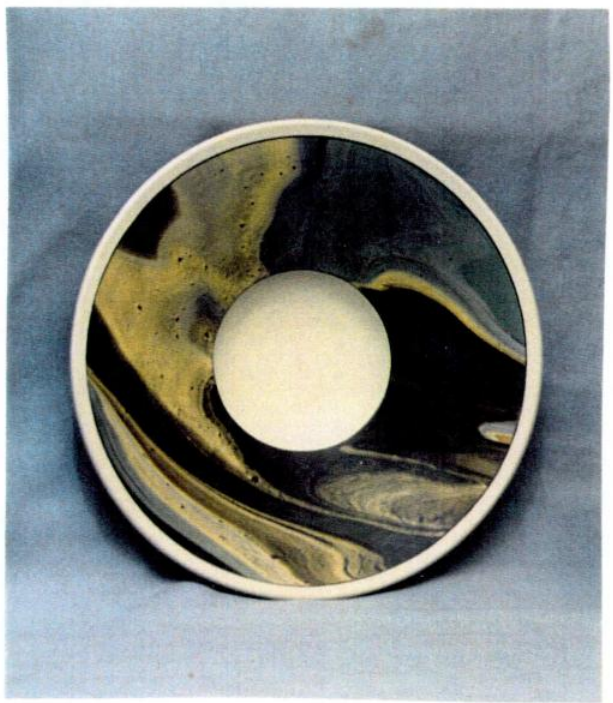

Fig.33.

the need to be positive and not pulled back by the downside of the disease". Instead, Lanyon has devoted her time and energy into researching her disease and its connections with manganese. She has been in contact with Monona Rossol from the Arts & Crafts & Theatre Society (ARTS) who has been very helpful and who has printed an article for Lanyon on manganese poisoning in the American Arts newsletter.

> *"Somehow, we have to get the message across to backyard potters and artists" says Lanyon, "at home we are not only endangering ourselves but our children by exposing them to these materials. This is my main concern" (11).*

Lanyon has talked to many potters who laugh it off as if it'll never happen to them.

> *"I want to convince tunnel vision potters that they must look very carefully at how they achieve that end result, a littler more thought and time could save years of agony later on" (6).*

After being diagnosed, Lanyon has become aware of four potters in western Australia, with Parkinson's; one who has packed and bagged manganese; others have cancer and one has M.S. and she spent years mixing manganese into her clay. It is too late at this stage to hear about other people with similar diseases. One must become aware of the dangers of manganese and the dangers of all other materials that are being used. We must make others aware. It's just a matter of reassessing how we work and what we use. By making a few necessary adjustments you may be saving your health from being at risk. The time to start changing is now. Don't wait for something to happen before doing so. If you risk your health for your art, it may result that in years to come you are no longer able to do the one thing that you love.

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CHAPTER 5: THE THERAPEUTIC VALUES OF CLAY

Working as a craftsperson, you may come across hazardous materials and stressful situations which may affect your health. On the other side of this situation artistic creation has the power to heal. "*Through the malleable medium of clay a person can reclaim his/her identity and dignity, thus making new contact with the outside world*"(1). To the potter, clay is the raw material for functional ware and artistic forms. But to the emotionally stressed person, clay can be the raw material for their feelings to mould and change, or to pound and destroy. The clay can also be used as an important building block for a positive self image. Through the ceramic process, feelings can be explored and transformed into manageable emotions. These experiences with clay include physical involvement, solving problems in a creative sense and making a statement which may be personal to the patient. All of these processes have beneficial qualities in a sense of being therapeutic or evaluative. This results in the clay being a very natural medium for healing.

You may be familiar with working with clay - the natural pounding and wedging process in order to transform it into a manageable medium. To the psychiatric patient, this process too can be very important, but in a very different way. Such physical work allows feelings to surface, helps rid the patient of hidden emotions or stress. This physical process is necessary in the early stages in the treatment of the clay and the patient. Once the feelings (anger, hate, love / loss) of the patient surface, they can be treated and discussed with the therapist. The next step to be taken is to create a pot. By using a simple handbuilding technique the patient is allowed to explore the medium of working with clay. This experience not only provides helpful information concerning the patient's problem but it can provide helpful information for the therapist concerning the patient's problem. Low esteem often daunts psychiatric patients and the ability to create a pinch pot can be a new beginning of self appreciation and a more positive self image and outlook. When the patient is self reluctant and doubts his/her ability to create even a basic pinch pot, Nancy Bolon (therapist residing in Chugiak, Alaska) tells them that children and their approach to clay *"never doubt their powers of creation, attacking the clay with refreshing enthusiasm" (2).*

However, adult hesitation is typical as these are unfamiliar situations and they feel expected to produce something worthwhile. According to Nancy Bolon

"Adults, mentally distressed or healthy, tend at times, to suppress growth, rather than to nurture the novice, the child within us" (3).

Also, by the time we become adults we have developed a pre-conceived idea of what something should look like (for example, how a well made pot should look). Support and encouragement are commonly used to accompany basic hand-building instruction during therapy. These adults, aware of how the pot should look, suffer from feelings of failure when their first attempts of building a pot look awkward or silly. Thus their self esteem drops lower.

As patients work through pinch, coil and slab pots, much can be learned about their problems. The approach taken by the individual is also informative. Patience or lack of patience with clay, tools, the therapist and the environment can reflect how that person deals with other daily activities. Low frustration for tolerance often surfaces here. The size of the projects can indicate how patients feel about their ability to control the clay. Their confidence in controlling themselves and their environment can also be reflected. Attention or interest deficiency can be suggested by the amount of time invested in producing a pot.

The challenge of working on a potters' wheel can have therapeutic value in the sense of supplying the individual with an additional risk-taking adventure. Wheel work can also be an indication of talent or ability to succeed. On the adverse side of the issue, an occasional deflated ego, punctured by the demands of the wheel can provide a more realistic view of a persons' ability and limitations. Placing ill-suited patients at the wheel and expecting preciseness and patience from them can rain some self confidence. If they are not able to perform to their own set standards, whether due to lack of talent or low tolerance for frustration, a devastating setback can occur.

An entirely different potential is introduced with the sculpting of clay. This is when the beauty of clay as therapy is at its best. In this case projects don't have to be accepted or rejected by the therapist, but by the kiln. If the work survives the firing, it has been accepted. The survival depends on the quality of the work. The process of modelling the clay can carry strong expressions of feeling. The patient is allowed to create the wildest fantasy possible or impossible. The result can even be physically destroyed, demonstrating the power achieved by the creator. Part of being an art therapist working with clay is knowing when its time to

discuss the work with the patient, to dig deeper into the patients thoughts and feelings. As the expression of a feeling, the acknowledgement of a feeling, is the beginning of psychiatric recovery. Readiness to explore on the patients' part is essential, and again the therapist must be sensitive to this timing.

The natural qualities of clay allow it to be a therapeutic medium in which destruction and creation can both occur. It is a tearing down process - of defences, of destructive thoughts or actions and of useless harmful feelings. This destruction is followed by a rebuilding of new, healthier coping skills, of more positive action, of tolerance and understanding. Debbie Hull, who spent four and a half months at the Bethlem Royal Hospital, London, was helped enormously from suffering depression, through the medium of clay therapy.

> *"When I felt very depressed, it didn't matter how many people were around me, or how much comfort was offered, I felt frightened and very alone, all of my thoughts revolved around stopping the inner pain that this was causing" (4).*

Hull was prescribed distraction from these thoughts and was introduced to her first taste of Occupational Therapy - (the pottery workshop at Bethlem Royal Hospital, London). Having never worked with clay before, Hull fell in love with the look, feel and overall magic of the material. Just the act of rolling the clay between her fingers gave comfort. The clay needed her undivided attention and she couldn't help but be distracted by it. The first phase of her recovery slowly came into focus.

> *"I found it amazing to realise, that amidst my feelings of failure, rejection and self repulsion, I could create a simple, but totally natural object of beauty"(5).*

Hull, fascinated by her new work and achievements slowly began recovering - her self-image improved and her confidence began to strengthen.

> *"I thought pottery was wonderful. I'd arrive feeling like death warmed up, determined that nothing could ever make me feel better and before I knew where I was, the clay was crying out for my attention. I'd take a wedge of red clay, soft and pliable in my hands and begin on the unconscious process of mental mending, that I was so much in need of"(6).*

The framework provided by the clay helped Hull from either overdoing things, or giving up on them. The clay also taught her to relax, take her time. When it was too wet to handle she had

to learn to become patient, to wait for the clay to dry. Hull found that the clay needed her undivided attention, she wanted to see what the finished piece would be like and so she found she no longer had time to dwell on her own feelings. She would push them out of her mind and get on with her work. From being totally preoccupied with her illness, she became more concerned about her pottery. This provided a welcome relief from the pain and her inner self began to strengthen and mend. One of the biggest attractions the clay held for Hull was that you could always begin again. If the pot was cracked and dried out, she could soften it down and recycle it to be used again.

> *"Clay seemed to me, as a cat with nine lives. What a lovely quality to have the ability to survive, no matter what"(7).*

Pottery rewarded Hull by giving her a sense of joy, of bringing back childhood memories of playing in the garden feeling uninhibited, relaxed and happy. When the pottery brought back these feelings Hull couldn't but feel better. As her friendship with her therapist grew, her self respect and confidence also began to grow and she began to flourish discovering the life that she'd only been aware of through her pots. After her discharge from the hospital, Hull relied heavily on her pottery as her mental support. She spent a further three months as a day patient in the Bethlem but gradually left, by continuing her pottery in the outside world. Even now, fully recovered Hull admits that the pottery plays a major part in her life and health, that the clay remains a constant source of strength and support. Health authorities all over the country are becoming more aware of the therapeutic values of craft in hospital environments. Proof of this growth is evident in the setting up of centres such as Arts for Health established in April 1988 at Manchester Polytechnic, whose director Peter Senior believes that "*more artists and craftspeople are now involved in hospital projects than in any other sphere of public art*"(8).

Pottery, as therapy, is a way of getting in touch with one's inner feelings - anger, fear, maybe resentment is brought out in their pieces and eventually they can bring these feelings out in themselves and therefore deal with them. Through this medium people can learn to be more relaxed and confident about themselves. They, in turn, learn how to lead a normal life once again.

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CONCLUSION

In June 1948, the editors of `Studio Potter' sent a questionnaire to readers which brought responses from over a thousand individuals. Forty one per cent of the respondents reported a work related health problem and about half of these listed two or more conditions (1).

Most of the materials used in the ceramic field are potentially dangerous. We must become aware of these dangerous materials and take every precaution to avoid damaging our health. It is a serious mistake to conclude that the risk of using these materials is too great for the goal. Working in ceramics will always be a viable profession if common sense is used in dealing with the problem. We can remove the risk factor by using surrogate materials instead of toxic ones, using proper ventilation and by cleaning up our act in the studio. It is up to us to make ourselves well informed about the dangers so that we, in turn, can inform others. It should become mandatory that every student studying in ceramics is educated about the potential hazards of working with materials so that the use of a respirator will come as second nature when mixing glazes and working with dry clays.

Many doctors are also unaware of the hazards involved in ceramics, as few receive little or any training in occupational medicine. When faced with a particular pattern of signs and symptoms they don't often know to ask about possible environmental exposures and consequently they are forced toward attributing the trouble to a non-work related cause. In this case you should point out that you are exposed to the same silica hazards as granite workers, who are required by law to have periodic x-rays and function tests because the risk of lung disease is so great (2). Some doctors will identify that the problem is work related and will recommend that you stop ceramics altogether. This may be sound advice but it may also be a reaction due to lack of knowledge of methods to reduce your exposure. Again, you can use substitute materials and keep a healthy environment in your studio.

There are many associations which help the artist. California Artists' Human Services (CAHS) is a non-profit organisation established in 1981 and it offers its members a variety of services. Psychological counselling is available and CAHS also provide artists with access to individual group therapy. In addition, it organises workshops on topics such as stress management and Art therapy. A very different kind of health related service for artists in New

York is `Doctors for Artists'. This was formed in 1984 by Dr Warren Neidich (3). Again, it is a non-profit doctor referral service for performing and visual artists. Artists referred through the programme receive a 20 per cent discount on medical services, including office visits and surgery. Doctors for Artists has members in specialities including: internal medicine, gynaecology, ophthalmology, dermatology and psychiatry. It is very important that fear does not traumatise education.

We can no longer afford the luxury of sheltering ignorance. We must learn and teach others how to use materials properly. We know what our materials can do for us; it is time we learnt what they can do to us. More importantly we know that it is the inappropriate use of chemicals that renders them potentially toxic.

The way now is clear. It is time to stop and think of our working methods and how we can change them. Saint Phalle, Hobson and Lanyon are only some of the many artists with serious work related illnesses. We must become aware of the dangers: it is our only hope of continuing our work as artists, our only hope of being able to retire due to old age and not self-destruction.

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APPENDICES

Non-Toxic Materials

Silicosis - long recognised as one of the occupational diseases associated with the potter and other dust producing industries. Silicosis is rarely fatal but those with silicosis are more susceptible to other pulmonary disease and are less likely to survive fatal diseases such as pneumonia due to their already weakened condition. The pathological evidences are modulation and fibrosis in the lungs. The external symptoms are shortness of breath, chronic cough, pain in the chest and decreased ability to perform work requiring physical exertion.

Alumina - produces a disease know as aluminosis. The chief symptoms being shortness of breath, cough, chronic bronchitis, decreased ability to perform work.

Asbestos fibre is a double threat in that it can cause skin irritation and "asbestos warts" if it punctures the skin. It also causes fibrosis of the lungs if inhaled. There is no cure and treatment can only hope to relieve the symptoms.

Feldspar of any sort leads to a condition known as pleumo oniosis. It is not critical in itself, but weakens the body in resisting other more dangerous diseases.

Fibreglass produces effects very similar to asbestos fibre.

Gum Arabic - has been associated with asthmas and may produce asthmatic conditions. It may also cause eye lylammation, called conjunctivitis. Anyone already suffering a pulmonary disease should avoid contact.

Iron Oxide - produces a disease called siderosis which refers to the mineral siderite or iron carbonate. It is less serious than silicosis and may have no permanent effects.

Iron Chromate - a suspected carcinogen.

Kaolin and China Clays cause kaolinosis if inhaled. The symptoms are similar to silicosis except that it may also lead directing to emphysema and tuberculosis. The disease comes in stages beginning with minor nodulation of the lungs and progressing to sever fibrosis. The disability may be permanent.

Nickel Oxide in glaze formulation is an irritant to the skin. It is also found to be carcinogenic in lab animals.

Mica including muscovite, vermiculite and lipiclolite all lead to lung irritation but are less dangerous than silica.

Ochre causes pneumoconiosis.

Talc inhalation leads to a disease common enough to have been named talcosis. It holds symptoms similar to silicosis. It may lead directly to emphysema.

Tin Oxide - causes a white pigmentation of the lungs and some nodulation but rarely goes beyond that. Symptoms are a slight cough and some shortness of breath.

TOXIC MATERIALS

Lead is classed as an accumulative poison and may be stored for years in the bone structure. Inhaled lead is relatively more dangerous than ingested lead and the symptoms appear more rapidly. Acute poisoning from inhalation has been known to cause death after only two days of exposure. Symptoms are characteristic of many other forms of poisoning; abdominal pains, vomiting, diarrhoea, retention of urine, collapse and in terminal cases, coma.

Arsenic trioxide is the commonest form of arsenic used in ceramics and is one of the most dangerous materials ever found in a ceramic workshop. Symptoms of acute poisoning from inhaled arsenic begin with headaches and chest pains (particularly around the heart). When taken internally, there is usually a 3-4 hour delay before any symptoms are noticed. After that period, vomiting, severe diarrhoea and nausea begin leading to eventually collapse, coma and often death. If inhaled these are accompanied by a severe foamy cough.

Chronic poisoning produces serious and lasting effects which include anaemia, cirrhosis of the liver and kidney damage. Patients who survive as long as one week usually recover after a period of six or more months.

Antimony trioxide - produces symptoms and results similar to arsenic in most ways. Although fatalities are rare, 1.5 to 3 grams may be fatal. As with arsenic recovery is slow.

Barium Carbonate is the usual source of BA in ceramic usage, it along with barium chloride and barium hydroxide is partially soluble and may be a deadly poison if completely absorbed into the system, as little as 1 gram can be fatal. The first symptoms are tremors followed by convulsions, and in terminal cases death due to cardiac and/or respiratory failures.

Beryllium compounds can be taken into the body by ingestion, inhalation or through cuts. Cuts coming in contact with Beryllium compounds may become ulcerated and require months to heal. Beryllium is a strong sensitizer and the dust may cause dermatitis similar to first and second degree burns.

Cadium oxide can be taken into the system by inhalation or ingestion. The latter may produce symptoms in as short a time as thirty minutes. The most usual form of absorption is through inhalation which causes pulmonary lesions leading to emphysema. Damage to the liver, the kidneys and bone marrow are also prone by-products of calcium poisoning.

Cobalt is an important trace mineral in the human system, but over-doses can cause an unbalance leading to irritations and allergies.

Copper is rarely involved in poisoning and only copper sulphate and verdigris are considered dangerous.

Copper sulphate can cause death in a matter of hours in surprisingly small doses. It causes partial destruction of some vital organs.

Ferric chloride is not fatal but can cause gastric upset. It can also cause permanent discoloration if in contact with abraded skin.

Ferrous sulphate on the other hand, can be fatal and should be avoided.

Iron Chromate through inhalation may lead to acute pneumonia and has been associated with some forms of lung cancer.

Lithium carbonate is partially soluble and when ingested may cause severe lesions in the bone marrow and symptoms similar to pernicious anaemia and leukaemia.

Manganese Dioxide is more dangerous than commonly thought. It can be absorbed through either inhalation or ingestion. It is an irritant and may cause an over-growth of the connective tissues in the brain. It affects the central nervous system. Manganese dioxide give rise to a variety of difficulties including stammering speech, muscular disco-ordination, headaches, weightlessness, Parkinson like palsy and spastic gait. All may be permanent. Three months to two years exposure is sufficient to cause any or all of these.

Varadium Pentoxide is absorbed by inhalation. The human body shows very low tolerance and as little as one microgram per gram of tissue can cause serious disturbances. It has been connected to emphysema and severe irritations of the nasal and bronchial passages, leading to a chronic cough.

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