new zealand potter vol 18/2 spring 1976

Potter

Work by Brian Gartside
Photograph: George Lelieveld

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New Zealand Potter is a non-profit making magazine published twice annually. Circulation is 4500. The annual subscription is $NZ3.00, for Austalia $A3.50, Canada and the United States, $U.S.4.00, Britain £2.00 postage included.
New Subscriptions should include name and address of subscriber and the issues required. Please mark correspondence "Subscriptions". Receipts will not be sent unless asked for. A renewal form is included in the second issue each year. This should be used without delay. It is the only indication that the magazine is still required.

editor: Margaret Harris
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editorial/subscription/advertising
P.O. Box 12-162 Wellington North, New Zealand
printed by Deslandes Ltd, Wellington

Dutch oven firebox

Barry Brickell

New Zealand was a highly forested land. When the Pakeha became established they systematically felled the timber trees in the native forests, not only to make homes, ships, factories, wharves and furniture, but also money. Vast quantities of fine Kauri, Rimu, Kahikatea, Totara and Matai were exported from the turn of the century for the following 30 years or more, let alone what was used here. The Kauri export industry, in fact began in the 1840s and the poles were highly prized for spars.

After the old craft of pit-sawing there followed the steam-powered sawmill, of which thousands were built right throughout the land, from Kaitaia in the north to Stewart Island in the south. Today there remain working only 3 of the old type to the best of my knowledge, of which one is due to shut down very soon. These mills were driven by huge steam stationary engines, supplied with steam from waste-wood and/or sawdust-fired boilers. In order to burn the wet sawdust with sufficient heat to fire the boilers, specially designed brick fireboxes were employed. These are known as "Dutch ovens". This term was introduced to me as a lad, when during my student days I visited, inspected, photographed and perused every steam sawmill I could find. All the sawmill workers knew the furnaces as Dutch ovens, just as all potters have their terms "grog, wedging, throwing" etc. as natural lingo. Of course none of the sawmillers could tell me the origin of the term, but some did venture forth with the odd, wild hypothesis. A friend of mine recently became infatuated with the zeal to discover the answer. He visited a public library and at length arrived with the following item of deep research:

> "The Dutch ovens of Northern England or the Apple Roasters of Somerset, were made from half a cylindrical pan with a narrow shelf formed round their internal curved walls and handles or knobs applied to their outer curved surfaces".

One is tempted to draw conclusions therefore and in *Fig.* 1 I timorously suggest the following shapes.

As a potter, my own interest in Dutch ovens was stimulated by the desire to have a wood-fired stoneware kiln. Many are the tales of climbing kilns, traditional wood fired kiln folklore and the magic of the process, that I thought many thoughts, often far into the night about how to achieve 1300°C (cone 10) temperatures with wood. I began to recall the steam sawmill fireboxes. I studied Daniel Rhodes and Bernard Leach, as well as a photograph or two, taken by a friend who visited Japan and saw a traditional kiln still at work. All of a sudden, the concept became clear; the technical principle of the Dutch oven unfolded. It is as follows:

When a fire is lit in the tunnel-like firebox of the Dutch oven, some of the heat is absorbed by the bricks of the arch and some passes into the kiln via the throat. After a while the arch begins to reflect a fair amount of heat directly down on the wood of the burning fire. This tends to cook the fresh wood just thrown in, causing it to give up its gas. The gas does not have much chance to burn inside the firebox itself, due to the *parallel* flow of secondary air always entering the front. *(See Figs 2 and 3).* When these streams of air and wood gas reach the throat, they are suddenly forced to change direction and fan outwards behind the bag wall, this being a highly turbulent mixing (carburation) process. This is where the real combustion takes place. The burning gases then pass down through the kiln setting and natural draught from the stack causes the flow. When such a kiln is running at full stoneware temperatures (up to cone 10), the firebox temperature is about 900°C, while at the top of the bagwall it is about 1300-1320°C and on the kiln floor about 1250°C, in a well-designed chamber. When not reducing, there is no flame out of the stack at this stage. Stoking must be fairly continuous at full heat and if too much wood be thrown in suddenly, reduction is immediate, accompanied by a 2 ft flame glow from the stack, and countless flamelets from the various leaks around the top of the arch. We often leave a small, permanently open hole at the top of the wicket, to indicate the reduction state to the fireman. Although one needs to attend to one's kiln throughout the 12-16 hour firing cycle, with increasing regularity of stokage, it is a stimulating activity and jolly fine discipline.

Contrary to what the books tell us, the wood does not have to be bone dry for stoneware firing. I am referring here to pine (p. radiata) waste wood, or mill slabs from the nearest sawmill. We are achieving cone 8 and 10 temperatures easily with wood which has lain in the paddock for a mere 2 months or less, fresh from the mill. In winter, it is necessary to keep the wood dry, but even then, the wind will dry it sufficiently within 2 or 3 months if kept in open-sided sheds. Often less time than this will suffice. Manuka (Tea tree) fuel is abundant throughout the land in most rural areas. It is prized here for the earlier or slower stages of the firing, as it will "keep in" longer and produces lots of glowing charcoal. Above about 900-1000°C, however the far more flairy, gassy, flame-making pine is required to achieve full temperature. Contrary to popular opinion, hardwoods such as manuka are not so much hot-burning as creators of a hot charcoal zone, thus excellent in stoves.

In the Dutch oven-fired kiln, we have seen that the secondary air, drawn in through the permanently open stoke hole, causes the com-

Fig I.

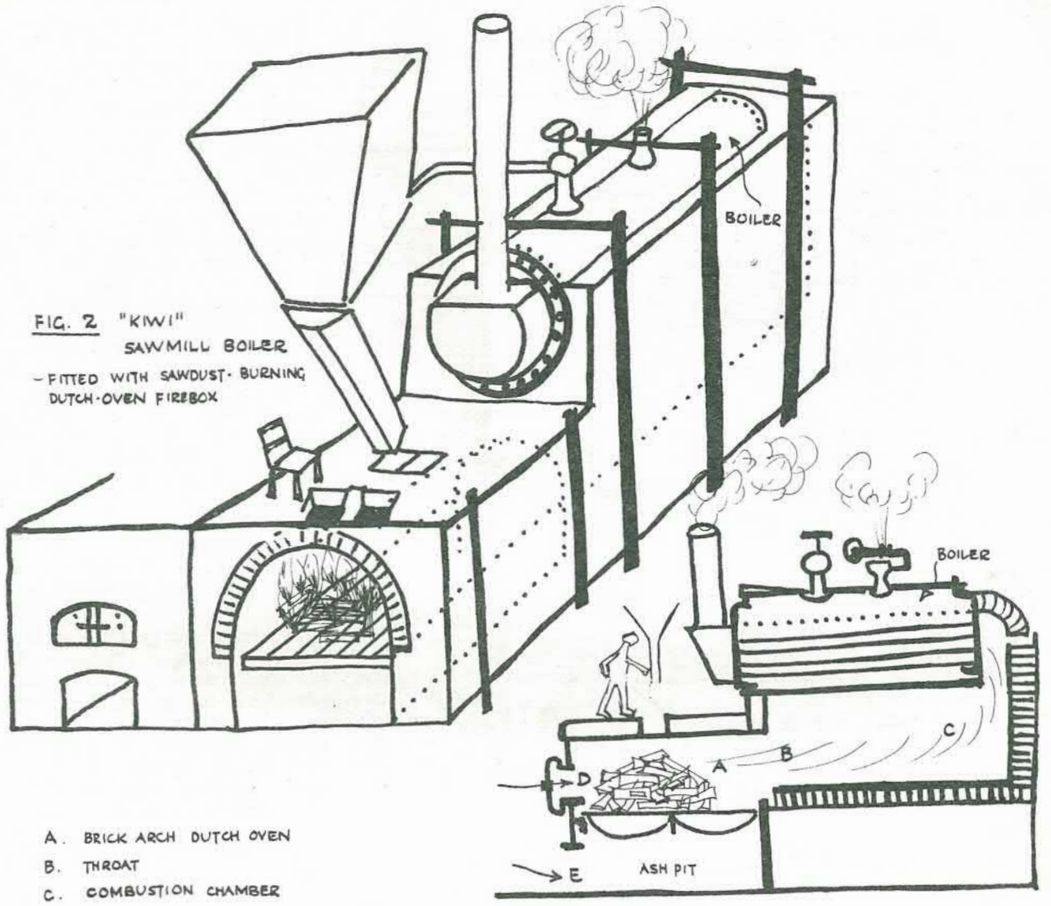


FIG. 2 "KIWI" SAWMILL BOILER
– FITTED WITH SAWDUST-BURNING DUTCH-OVEN FIREBOX

A. BRICK ARCH DUTCH OVEN
B. THROAT
C. COMBUSTION CHAMBER
D. SECONDARY AIR
E. PRIMARY AIR

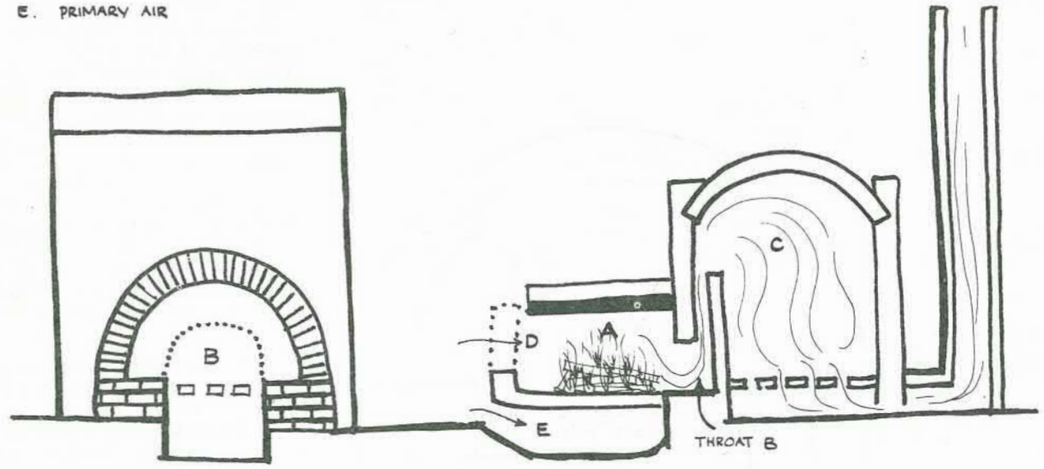


FIG. 3 "KIWI" TYPE STONEWARE KILN.
NOTE: TOTAL CROSSECTIONAL AREAS OF ALL FLUES & PASSAGES MUST NOT BE LESS THAN THAT OF STACK

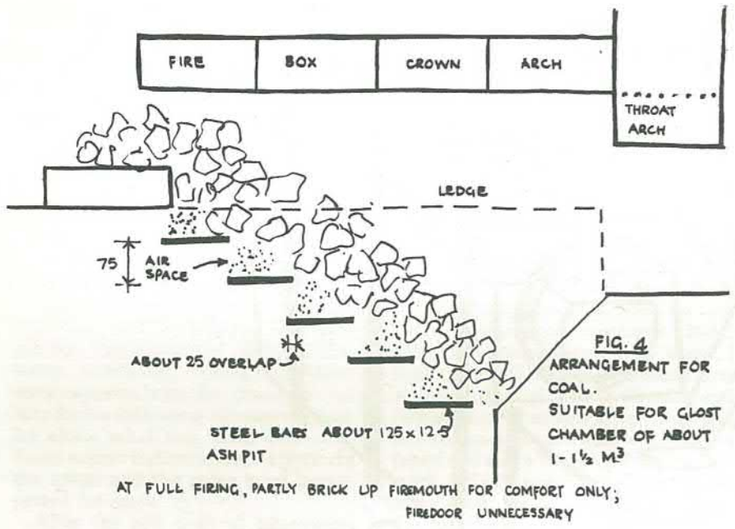
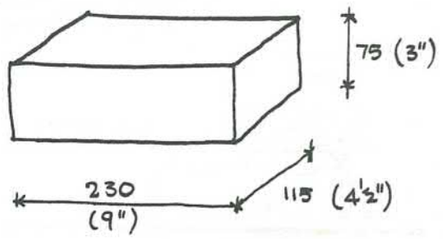
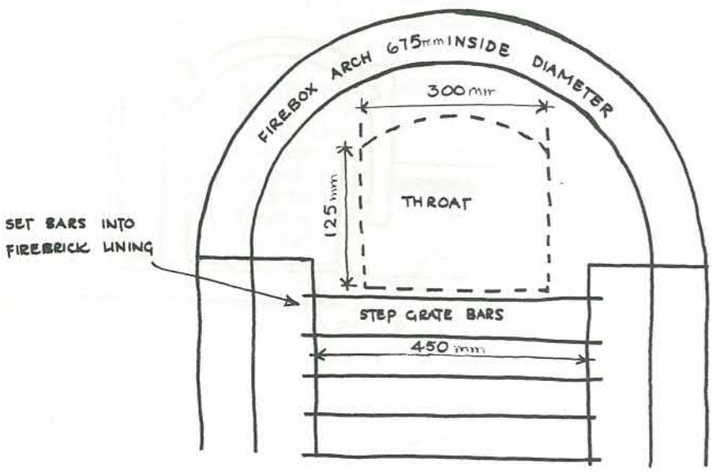


FIG. 4
ARRANGEMENT FOR COAL.
SUITABLE FOR GLOST CHAMBER OF ABOUT 1-1½ M³



NOTE : ALL DRAWINGS BASED ON COMMON BRICK SIZE



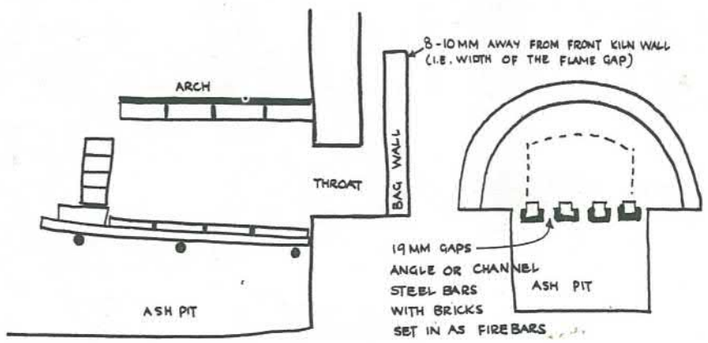
bustion. The sole job of the primary air is merely to keep the charcoal on the grate at an acceptable level. It is not necessary to have more than about ⅝ inch slots in the grate bars in order to control the charcoal level (Fig. 5) Sometimes it is helpful to place a damper over the ashpit, if the fire is running too thin. The step-grate system (Fig. 4) is very suitable if one wishes to burn pine cones, bark or coal as fuel. I have discovered it to be a far superior bar type firebox in that there is less forcing of the fire and therefore less clinker. Again it was the steam sawmill that sparked this off. At Tapanui (Southland) and Waipa (Rotorua) the large modern state mills are run by adjacent power stations. These run off wood chips and sawdust, burning under the huge boilers in step-grate Dutch oven fireboxes. The glaze on the throat brick indicated to me that some goodly temperatures were attained. The step grate also renders easy cleaning of the fires with a straight iron bar or poker.

The principle of the step-grate is very simple. It holds up the fire without blocking off the primary air. In order to allow this, the overlap and vertical spacing must be correct. I have recently experimented, using Ohai (Southland) sub-bituminous coal, trying each of three firings with different spacings. The best results are shown in Fig. 4. If the bars are too close vertically, or too overlapping, the fine ash formed on them will block the spaces. If too far apart, the fire will tend to fall through. Occasional fine ash removal with a bent rod is advisable when working up to full temperature. This arrangement is suitable for coking (West Coast) coals and so far by my results, sub-bituminous coals of the screened type. It is also suitable for pine bark and short lengths of wood, including wood chips, but I have not yet tried sawdust. At the latter stages of firing "little and often" is the rule for stokers; keep the firebox throat filled with flame. Due to its large size and slow combustion this is a beautiful type of firebox to handle, and, as with all solid fuels, very quiet.

In Bernard Leach's Potter's Book, we see the oriental concept of a dutch oven — the hemispherical firebox arch. The principle is just the same; a heat reflector. The Dutch oven, now with us, is still crude, very enjoyable to operate, moderately efficient, requires constant stoking, but who will be the technologist to make automatic self-feeding in these days of dwindling oil and pollution consciousness? Fools.

Sawmill Dutch oven boiler fireboxes in stages of demolition after 35 years of use. Note the forced draught duct and the wood-ash-glazed bricks at the back of the uptake throat
photo: Ron Cooke

FIG. 5 FIREBOX FOR PINE SLAB WOOD



NOTE : SIZE OF THROAT IS APPROX. EQUAL TO HALF CROSSECTIONAL AREA OF FIREBOX

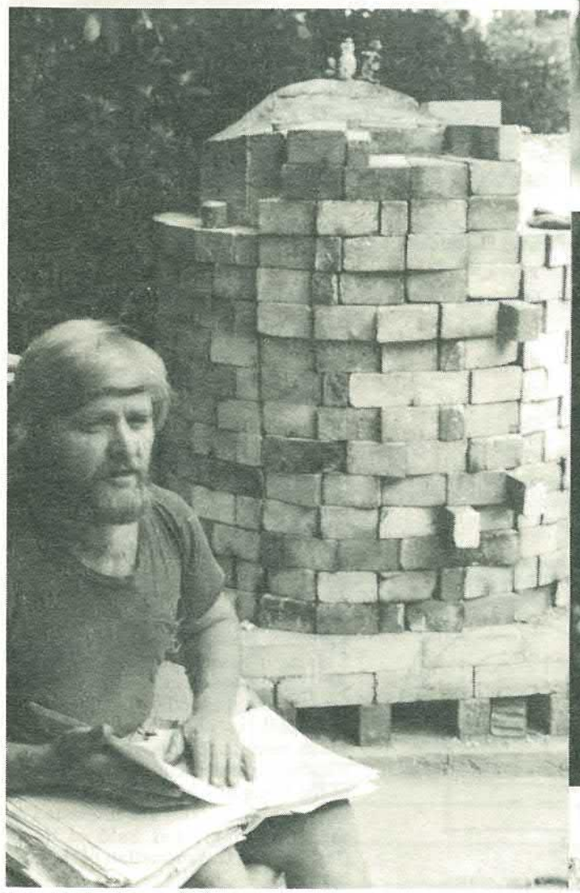
Footnote

In the last issue (Vol 18/1 Autumn 76) on page 3 is an excellent view of the firebox of the Shino kiln of Toyozo Arakawa in the notes provided by Len Castle. One could call it a sort of Dutch oven, at least in principle, the throat being replaced with a row of rectangular flues. For some interesting first-hand descriptions and illustrations of traditional wood fired kilns, one could do no better than obtain "The Kiln Book" by Frederick L. Olsen. (pub. Kordmos Books, Bassett, California.) This is a recent publication by an American who worked in Kyoto and was associated with the late John Chappell, to whom he refers with much respect. The book is profusely illustrated and includes descriptions of the firing of kilns such as the Bizen type, for those who are interested in the much neglected field of flame flashing and the animation of the clay by fire.

3 POTTERS 2 KILNS

Muriel Moody has two kilns at Day's Bay which she generously shares with friends. Additional to the 2 chambered Cowan type kiln is a new cylindrical up draught kiln with a flame introduced via a jet burner tangentially to the circle at the bottom. The construction is of 9" brickwork laid without mortar surmounted by a castable top. Muriel reserves this kiln for salt glazing

photos: N Harris



Left: George Kojis trained as a potter at a university in the States. He now lives in Eastbourne and is teaching in the art department of Wellington Teacher's College. These are examples of his work.

Muriel and Willoughby. The salt glazed duck and the sculptures over the page are from a one man exhibition of her work held at the Dowse Art Gallery

photos: Terence Taylor

Group of pots by Jo Weissberg

Martin Beck

The month of May was saddened by the sudden death of Martin (Case) Beck, one of the grass roots potters of New Zealand.

With his wife Nancy he started potting in 1951, and was an original member of a small group which founded The North Shore Society of Potters which was the first organised group of potters in New Zealand, and inspired the formation of the Auckland Studio Potters with Martin Beck as its first president.

He was also among the first movers for a New Zealand Society, of which both he and Nancy were foundation members.

Case and Nancy potted together, developing complementary, yet distinctive styles. His pots have an architectural or sculptural quality, at the same time reflecting his warmth and depth of character. Each pot was made with superb craftsmanship. They will be found in private collections, government departments and museums including the International Museum of Ceramics, Faenza, Italy. Fellow potters will miss his wisdom, sincerity and friendship and remember with utmost respect his guiding influence. We extend our deepest sympathy to his wife and family.

Ian Firth

Alan Reed

Canterbury potters learned with regret of the death recently of Alan Reed. A lifelong connoisseur of art and collector of pots, his comments were always sound, helpful and encouraging to potters. He chaired the inaugural meeting of the Canterbury Potters' Association in 1963 and drafted its constitution. His good advice was always freely available to the association.

Wyn and he were responsible for initiating the collection of pottery in the Canterbury Museum and when overseas brought back pieces for the collection.

Potters from all over New Zealand will recall the generous hospitality of Alan and his passing will be regretted by all who had the privilege of knowing him.

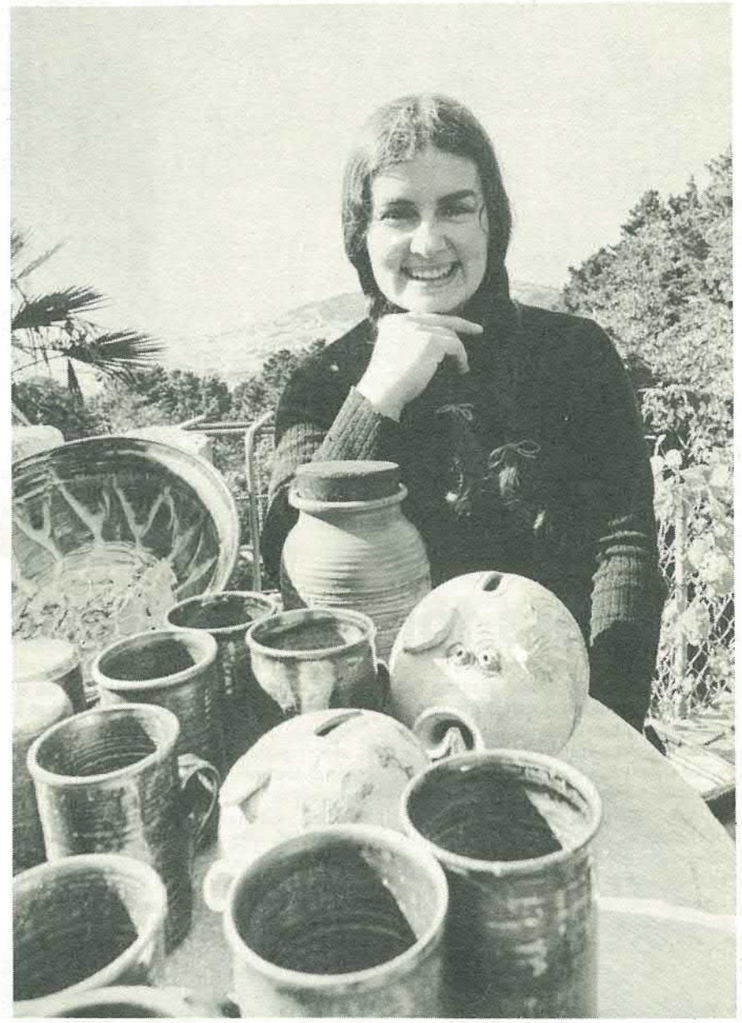
Nola Barron

Honouring Bernard Leach

The Victoria and Albert Museum are planning a substantial exhibition in the museum between 3 March and 8 May 1977 to honour the 90th birthday of Bernard Leach. They are publishing a booklet for the ocassion based on our own New Zealand Potter Collection of essays published in 1960, which the editor says would be difficult to beat.

In defence of the town potter

Jenny Shearer



After five years as a potter I see advantages in having a studio and a kiln ten minutes from the Wellington central post office.

Early feelings of envy towards my country counterparts have been put aside. I like teaching pottery and there is scope for this in town. An interesting cross section of people attends the classes and helping them is a change from making my own pots. Besides, I like to be able to go to concerts and the cinema. Now I'm established I wouldn't swop being a town potter for a country potter.

When I decided to take up potting seriously, I wanted to be sure I was competent and committed. I'd seen the working backgrounds of many of our potters pictured in the pages of the Potter so I knew what sort of rural environment I should be looking for, but my position seemed hopeless. We did not have several beautiful acres, a farmhouse or buildings to accommodate kilns and wheels. Our suburban house could barely hold our family of four young children and two cats, furthermore the section sloped impossibly with access down a steep path. But David's work could only be done in town so moving was out.

Apart from the question of where to have a pottery was the question of how to become a potter in New Zealand. Five years ago there were no courses or apprenticeships available in Wellington. While in Britain I'd attended Gloucestershire School of Art for a year handbuilding and doing sculpture, but I'd already been introduced to the wheel in New Zealand and I knew I wanted to make domestic ware. Back in Wellington I found the hobby classes could teach only the rudiments — there was no way I could carry on the training I had left. It was suggested that it would be fun and simpler to take up Ikebana, continental cookery or cake icing.

There was only one way. Take the plunge. Buy a wheel. Build a kiln and get on with the business of learning to make and fire pots. Forget about the unsuitability of the site and make the most of the advantages.

We town potters can get together for selling. With two friends from nearby we have held Open Days. Three of us contributing gives variety and more stock and a share in the work involved. For our first Open Day we put a small advertisement in the evening paper. An hour before opening time we displayed the pots in the garden and on the terrace. We were amazed at the number of people who saw that small advertisement. They came mostly in the morning but continued coming until closing time at 5 p.m. We've had four more Open Days at different houses and the number of visitors and pots has increased enormously. There is obviously a great interest in buying craft work in this way.

We've noticed that local residents seem pleased to find that they have potters in their midst. (Yes our kilns are clean burning.) The pot buyers like to see the potters and vice versa. Our only complaint about Open Days is that they've become too hectic and we would like to scale them down.

Our advice to city people dithering about the expense of a pottery set-up is do it — take the plunge.

Jenny and David Shearer are currently building a new house in Wellington incorporating a studio and kiln room. David also makes pottery and they have interesting plans for the future.

photos: John Patience

Pointers for new potters

Here are some tips about glazing for the inexperienced potter about to make the change from earthenware to stoneware temperatures.

- The transition should not prove too difficult. Glazing earthenware pots is an exacting task. Careless handling of the pot while dipping shows, and there is no saving grace of extra heat to merge body and glaze. The discipline already learnt should be applied in the new medium. If you are firing in a new kiln with oil or wood you may be pleased when you get an interesting flash glaze effect.
- Equip yourself with two good reference books on glazes. They will help to give you confidence even if you cannot work out molecular formulas. I suggest: "Stoneware and porcelain" by Daniel Rhodes and "Glazes for the craft potter" by Harry Frazer.
- When looking through a catalogue for the first time don't be daunted by the bewildering lists of glazes and colours. Ignore the page on body and slip stains and decide on an off-white or colourless base glaze.
  If you are making domestic ware many of the advertised matt glazes are unsuitable. If you've ever heard the sound of a spoon scraping on a matt glazed bowl you'll know what I mean. Satin and glossy surfaces don't get stained with food so readily and are generally considered more hygienic.
- Use your base glaze to mix or brush on different oxides as you would with earthenware but remember that the clay body is more likely to affect the glaze colour than it would at lower temperatures. Its the combination of clay, glaze and kiln atmosphere that gives the final result. Commercially made glazes are not to be sniffed at. Several are most attractive and turn out much the same whether fired under oxidation or reduction. They will be more expensive than mixing your own, but they can be a good starting point and give predictable results. Generally speaking they should be applied thinly (no more than the thickness of a razor blade when dry.) When applied thicker they tend to develop sharp edged pinholes and craters. The wet mixture should be the consistency of thin cream.
- If the idea of using wood ash appeals to you and you have a ready supply, don't be put off if you are using an electric kiln. Woodash glazes are generally subdued, earthy colours and should be applied more thickly. Reduction tends to bring out their more subtle qualities. In my experience they tend to go glassy over 1260° Centigrade.
- Its a mistake to play around with too many different glazes in the early stages. Concentrate on two or three good bases and work on those. Hans Coper has used only one glaze on all his pots — with variations, and the results are never boring.
- If you do come up with some good formulas don't be reluctant to pass them on. An identical recipe will often look different on someone else's pot and fired in another kiln. Its in our potting tradition to give and share alike.

Base glaze recipe

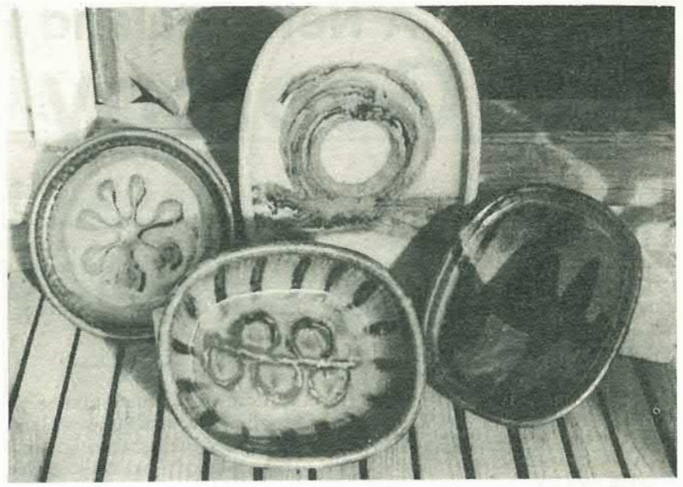
Semi-hard clear stoneware. 1250-1300C

Feldspar	70	
Whiting	12.5	semi-matt surface
China clay	13	
Flint	4.5	

For a pleasant whitish glaze add 5% tin oxide.

Jenny Shearer teaches at Wellington High School

Paul Wotherspoon



Paul is a full-time potter supporting a family from the output of a 60 cubic foot 2 chambered oil fired kiln situated on a Wellington suburban hillside even closer than two miles from the central post office. Despite being in the city the outlook is surprisingly rural with green leaves and hills and one solitary rooftop in sight. There is no city feeling about this place and Paul has no desire to return to live in the country.

As a potter he is unusual in that he makes entirely flatware by press moulding from eleven basic shapes fired to 1400°c. He has confined himself to this ware to satisfy an insatiable demand. People like the chance of buying plates and they are attracted by the brightness of the colours and the decoration. There are three basic shapes of plates to choose from. He makes some dinner sets of six or nine settings comprising dinner plates, side plates, a steep sided baker and serving platters.

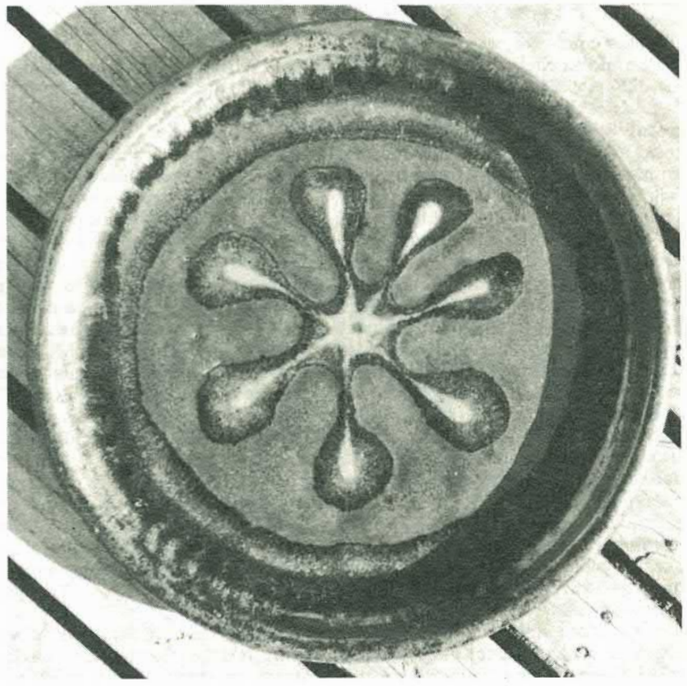
For interest the plates depend on decoration. Paul uses four glazes in different combinations. Sometimes the decoration is a pattern. Sometimes its from the chance results of the running glaze and he doesn't go to great lengths to prevent some of the shelves from sloping gently. A difficulty to be overcome in the making of this ware is the problem of warping. There is also a big outlay in kiln furniture since Paul does not use stilts.

Frank Light was the originator of this pottery. He made the moulds and built the first kiln. Paul took over the house and equipment from Frank Light four years ago and learnt the ropes from him too.

Meanwhile Frank Light has taken to the country near Masterton. He is making flatware again at present, but as a means of getting money to develop his property rather than as a production potter.

Tip from Paul Wotherspoon

For those who use a jet burner and find that the pipe burns away, a protective covering of Maniseal normally used for sealing up cracks in car exhausts, greatly extends its life. Its also useful for sealing up cracks between bricks which occur inside the kiln after successive high reduction firings. (Comes in a tube like toothpaste, messy stuff to work with but worth it.)



A New Zealand Potter's
Geology pt. 2

Barry Brickell

In Part I (Vol 18/1) of these notes, we merely touched upon the surface of the unfathomed depths of the subject — weathering. We went on to summarise some of the important clay and potters mineral deposits, which are a product of this phenomenon. It is the weathering of the feldspathic rocks which concerns potters. The geological map can help us find where these rocks occur, and also tell us their approximate age and composition.

The stoneware potter is not only interested in clay, but also in suitable grogs and glaze materials, and refractories for his kiln and colouring minerals for his glazes.

Table I is my attempt to correlate the accepted geologists age classifications with our geological map and the local New Zealand scene. To know roughly the age of the rocks is a useful indicator of the stage of weathering, and thus the likely clay content or ease of crushing. By using the colour key at the side of the map, the innocent potter can avoid having to learn all the scientific terms by heart!

Basic Guide for Age and Types of Rock from the N.Z. Geological Survey Map.

(Use the colour key at side of map)

The oldest rocks, coloured purple, are of Palaeozoic age and are confined to parts of the South Island. They are mainly schists. Overlying these are the rocks of our major mountain ranges of both islands, e.g. the Southern Alps, and all major North Island ranges. These are the greywackes of Mesozoic age, and consist of fractured and rather crumbly, compressed sediments containing feldspar. Overlaying these are the rocks of the Tertiary period (light green, fawn, orange) which consist mainly of softer sandstones, mudstones and some areas of limestone. The most recent rocks, coloured yellow, of Quaternary age are the silts, sands, gravels and secondary clays, deposited in low-lying areas, and no doubt derived from the weathering of the various older rocks.

However, as with life on this earth, nothing is so simple. Throughout each of these main periods, volcanoes and underground upwellings of molten rock have spattered over the map with patches of red and pink, volcanic and plutonic rocks respectively. To my mind these are our most interesting potters' rocks, as they all contain feldspar, more or less weathered into various grades of china clays. (For an excellent example, refer to p.216-217 *Economic Geology of N.Z.* by G.J. Williams, for the Nelson granites).

Feldspathic Rocks

These are of greatest interest to potters; the fresh rock for glazes (and body fluxes) and the weathering products as grogs and body materials. In New Zealand the range of them seems to me a little limited, for instance we seem to have none of those gorgeous nepheline syenites, sodalites and feldspar deposits of the purity which are obtainable overseas (Sweden, U.S.A., Africa and Australia). However, we are rich in andesites, basalts, rhyolites and in the South soda-rich rocks which can yield some good glazes. So, all igneous and volcanic rocks, the greywackes and schists and some of the sandstones are feldspar-bearing, and are of at least potential interest to potters. See Table II.

New Zealand Weathering Sequences

(ref. Williams, *Economic Geology of N.Z.*, Ch.20)

As already outlined, the older the rocks, the greater the weathering and the more are the feldspars converted into china clays. Thus the hard rocks slowly soften and become lighter in colour as the iron-bearing minerals are also weathered and the iron oxide is leached out. This can, in certain specific areas give rise to very pure deposits of primary china clays (e.g. Matauri Bay, Northland, Tairua, Coromandel Peninsula, Mt Somers, Canterbury) where the sole impurity may be coarse particles of quartz. This mineral suffers little weathering compared with all others, and tends to persist to the bitter end. It is the potters' chief enemy as it has nasty expansion-contraction characteristics in the kiln and can cause dunting. I note in my various researches that this problem becomes more apparent in the northern clay types. (See Williams, p. 357-358).

During the long dark ages of weathering, it is the climate which has just as strong or even stronger effect on the end results as the nature of the parent rock. It seems that in New Zealand the older clays are best, due to their greater kaolin/halloysite ratio. (See *Clay Minerals* section). Clays deposited before the mid-Tertiary (pre ice-age) thus tend to be of better quality than those derived from the weathering of later igneous rocks. Such clay deposits of commercial size occur at Waikato, Kamo, Mt Somers and Benhar in the form of greyish "fireclays", often associated with coal measures and known as "fossil clays". Clays derived from the weathering of Tertiary sandstones and volcanics tend to be more halloysitic and thus susceptible to stresses in drying and firing. Some contain the clay mineral montmorillonite to which belong the bentonites, as found in large deposits in North Canterbury. In the Auckland, Northland, Coromandel areas, these Tertiary clays are often suspect in that they contain much fine silica which is difficult to separate out (recall dunting problem). A high alumina content is always welcome to counteract the silica. Theoretically pure Kaolin contains 47% silica and 39% alumina (the rest water). If you have access to analyses of clays, those containing over about 60% silica should be well tested for biscuit dunting before contemplating them for "bread and butter" living. In New Zealand an alumina content of over about 20% is considered favourable; indeed one of the few Tertiary type clays containing high alumina (up to 35%) occurs at Kamo, Northland.

Primary and secondary clays

Fig III shows a hillside of weathering rock (containing *primary* clay) being eroded by natural forces. The resulting silts, sands and clays when transported by water and re-deposited are termed *secondary*. The clays, being finest, settle last or furthest away or in the least turbulent areas. Thus most, if not all, the impurities are separated out leaving a very pure clay. The fireclays described above are of this type, as indeed are most deposits, large and small, of fine-grained plastic clays. Some of the primary clays are great fun for the more "animated" approach to stoneware bodies. They are likely to contain particles of the parent rock as natural grog, a good example being the

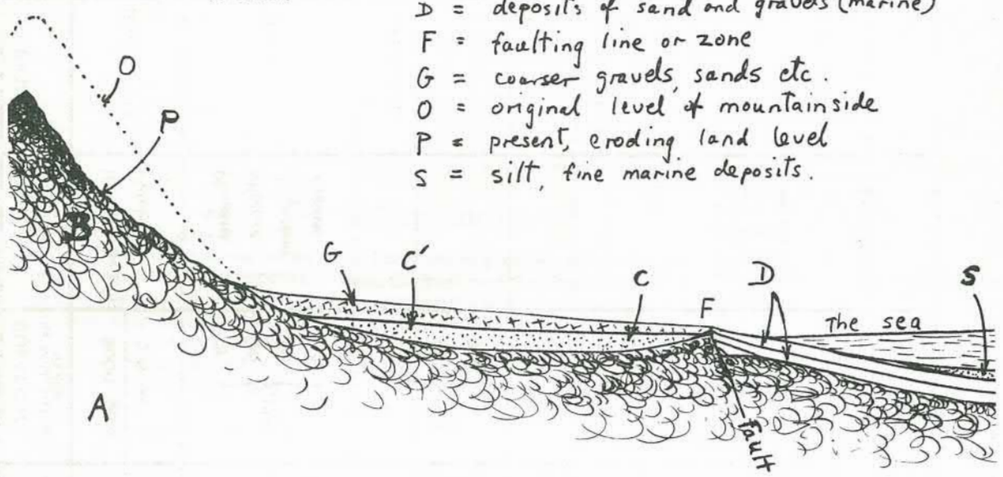
TABLE I THE WORLD GEOLOGICAL TIME SCALE (adjusted from various texts)

ERA	PERIOD	EPOCH	DURATION IN MILLIONS OF YEARS	TIME AGO IN MILLIONS OF YEARS	TIME SCALE RELATIVE DURATION	MAP COLOUR SEE GEOL. MAP	LOCATIONS OF VARIOUS AGE GROUPS OF ROCKS IN N.Z.
	Quaternary	Holocene (recent) Pleistocene	5000 years 2.5 m	1/200 < 3		light yellow (q)	river deposits, dunes, recent volcanism, mud flats, swamps. Auckland - basalt. Rotorua - pumice
COENOZOIC						bright yellow (p) & M	alluvial plains of gravels + sand stones, some crude clays eg Napier, main N.I. volcanoes
	Tertiary	Pliocene	7			orange, pale yellow (m to n) & K	sand & mud stones, "papas" Waikato fireclay/coals bulk of Taranaki blue papa (terracottas) limestones of King Country, andesites of Coromandel & Waitakere, Dunedin
		Miocene	26				
		Oligocene	38		125		
		Eocene	54			olive green (j) F	certain hard sandstones overlying Greywake in Northland, E. Cape. Mt. Sunners volcanics
MEZOZOIC	Cretaceous		71				
	Jurassic		54		160	blue (g,h,i)	main backbone ranges of both Islands, the Greywakes (eg Wellington)
	Triassic		35	288			
PALAEOZOIC	Permian		55				
	Carboniferous		65			grey (c & d) purple (4,5,6,9) orange (1,2)	certain shales, argillites, quartz sandstones N.W. Nelson, Marlborough. Volcanics of Nelson, mineral belt & schisty patches in Otago/Southland, schists, granites of Fiordland, Westland & N.W. Nelson (granites) including Stewart Island.
	Devonian		50		345		
	Silurian		35				
	Ordovician		70				
	Cambrian		70	633			
ARCHAEOZOIC	Precambrian						ancient, hard gneisses, granites, argillites in patches in Fiordland & N. Westland.
FORMATION OF THE EARTH'S CRUST 4000 - 5000 MILLION YEARS AGO							

N.B. It is pointless for the potter to try & learn these scientific names. The table is offered as a help to the interpretation of the Geological Survey Map. It gives a rough sense of proportion to the time/age thing.

Fig III
Weathering and erosion

A = fresh, parent rock
B = primarily weathered parent rock.
C = finest secondary clays
C' = coarser secondary clays
D = deposits of sand and gravels (marine)
F = faulting line or zone
G = coarser gravels, sands etc.
O = original level of mountainside
P = present, eroding land level
S = silt, fine marine deposits.



"rotten granite" in roadside cuttings near Kaiteretere, Nelson. A little ball clay added to this coarse material renders it throwable, and on firing can resemble "Shigaraki" in its beautifully grotty texture. (See Table II as a summary of the weathering products of feldspathic rocks).

Here is a rough sketch indicating the gradations between fresh parent rock up through the resultant primary clays in areas of deep weathering. (e.g. greywacke and igneous areas).

Principle to remember:

The characteristics of any clay sample depend *more* on the kind of weathering history than the type of parent rock, from which it has been derived.

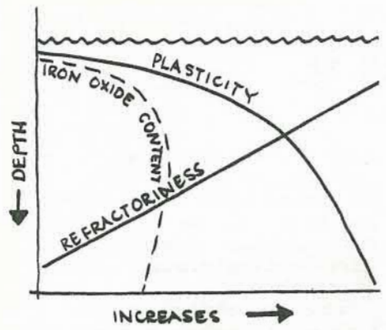
The clay minerals

(reference: M. Cardew — *"Pioneer Pottery"*)

Kaolin is not the only clay mineral. There are at least two other major classes, the *montmorillonites* (includes bentonite) and the *illites* (the micaceous clays). Briefly, their characteristics are as follows:

Table II Products of weathering - summary, potters minerals only.

Original Parent Rock	Products of Primary weathering (1°)	Products of Secondary (2°) weathering	Final clay type products of Secondary weathering
pure feldspar	China clay Soluble alkalie salts → To sea.		ball and pipe clays (white)
Feldspathic Sandstones, Argillites, also most Igneous rocks, schists and greywakes	Quartz, (silica) Clay minerals Residual feldspars Iron oxides		Silica sand Plastic basic clays (kaolinites, halloysites ± some bentonites) Colour varies as iron carried over or not. Some residual feldspar still possible also.
	Calcium carbonate Soluble alkalie salts → leached out to sea.		
	Heavy metallic minerals		→ Ore deposits



Kaolinite (china clay) $Al_2O_3.2SiO_2.2H_2O$ Crystallised in plates (sub-microscopic size), has good shrinkage and drying properties and is the most sought after mineral. Its formation in New Zealand seems to be favoured by greater age (pre mid-Tertiary) and more neutral weathering conditions (absence of vegetable acids from soils of warmer climates).

Halloysite. This clay mineral belongs to the kaolin group, and one must be wary in researching the scientific literature that an author means strictly one or the other. Its theoretical composition is: $Al_2O_3 2SiO_2) 4H_2O$ ( ) — greater than) crystallised in rolled "tublets" (sub microscopic size). It has rather excessive or uneven shrinkage during drying and firing, but apart from this, offers no other problems. It is not possible to distinguish between these two minerals except with sophisticated scientific equipment. Halloysite formation seems favoured by more acid weathering conditions (hotter climates) and more recent rocks.

Montmorillonite. $Al_2O_3 4SiO_2.H_2O$ — x H_2O. Fe_2O_3 etc. includes both the swelling and non-swelling bentonites (e.g. the huge deposits of North Canterbury). These are often super-plastic, iron oxide-contaminated limey or lime free clays. When fired, a considerable proportion of "free active silica" is released (note high silica content) which is the main cause of dunting and shattering. However in small proportions in stoneware bodies it is a strong and harmless plasticiser. Its geological formation seems to be encouraged by more alkaline (Na, Ca, Mg) conditions of weathering, such as provided by some of the Tertiary glauconitic sandstones, of Canterbury and Hawkes Bay.

Illite $(n — 2Al_2O_3 \left(\begin{matrix} 8\text{-}n\ SiO_2 \\ n\ K_2O \end{matrix} \right) 2H_2O$

(This is an approximate formula only)

Sometimes known as the hydrated or hydro-micas, they are good stoneware body clays, but their occurrence throughout New Zealand seems to be very patchy. More research could well be done on this mineral. I once found a very small seam of illite clay at Henderson, Auckland, and it is noteworthy that unlike the siliceous plastic clays around it, this sample vitrified on its own in the glost firing.

Feldspathic Sands not indicated by the Map.

Around the east coast of Northland, one researcher (Schofield) found that feldspar/quartz ratio varied considerably with latitude. The feldspar content reaches a maximum of 70% south of Marsden Point. Note that at Parengarenga Harbour, in the far north, the beach sands are almost pure quartz (silica) used in glassmaking.

This more or less concludes Part II of these notes, and in Part III I should like to present a detailed description of our igneous rocks and their behaviour as body and glaze materials. Meanwhile for those interested in analyses of igneous rocks throughout New Zealand I suggest obtaining the soft-covered book *"Chemical Analyses of N.Z. Rocks and Minerals* (with C.I.P.W. norms and petrographic descriptions 1917-1957 Part I. Igneous and Pyroclastic rocks) By Challis and Newman, from the Government Printing Offices. Good reading and good luck with clay prospecting!

A Potter's Dictionary of Materials and Techniques

by Frank Hamer

Pitman Publishing London 1975 $26.30

This publication is a remarkable achievement on the part of the author. It contains detailed yet lucid descriptions of all the materials and processes that are of concern to the potter as well as some of the most absorbing historical material. To call it a dictionary is almost misleading, it contains so much more than simple definitions. For example the reader wanting to know why his last firing yielded a split pot will become wiser and less sad after reading twelve or so pages on cracks and dunts.

Beginners as well as unscientifically minded potters need not be put off by the volume of the material contained. It is so clearly written and so thoroughly indexed with cross references that it is a simple matter to obtain the information needed. I'm not qualified to discuss the validity of the complex scientific material but I can say it is presented in a way that a non-scientist is encouraged to approach glaze formulations from a sounder basis than most of us seem to use. For those of us with a scientific bent, the methods of dealing with the formulae and the related appendix of tables are given in detail.

There are about 600 photographs and line drawings supporting the text. Some of the photographs are too soft and grey to be fully effective, and the absence of colour plates is a noticeable omission. Even Frank Hamer's fluent writing cannot by itself give adequate descriptions of colour, and texture in glazes, clays or minerals. However there are some delightful surprises that sparkle from the text giving fresh meanings to everyday words. If you think you know the meaning of butterfly, clobber, dogears, kissing and funk, you are in for a surprise.

This book's greatest strength is its handling of potters' materials and the way they behave and comprehensive though it is it could not cover the entire field fully. For example, while it gives detail about thixotrophy in slips and glazes, it is thin on thixotropy in clays which is of concern to New Zealand potters caught with loads of "surface treated" and hence thixotropic clays that dunted and bloated during firing.

Potters who collect glaze recipes like wekas collect spoons could be disappointed with Mr Hamer. The examples of glazes he gives are simple, basic representatives of each type embedded in the relevant text. This is a good approach because it encourages independent research and testing, which is the most ultimately rewarding way of discovering a glaze. New Zealand potters will be surprised to find few examples in the range above 1250°c. How will the receipe collectors meet this challenge? By intelligent modifying of the glazes using the information in the text as a guide?

Frank Hamer's book is the most extensive single up-to-date source of information available to potters and further it is exceptionally readable.

Stan Jenkins

Greek pottery

Margaret Harlow

I was first in Greece for one year as an apprentice potter in Amaroussion near Athens in the mid 60's. Naturally I led a rather Spartan life, but I enjoyed island tripping whenever possible as the potters of Crete, Rhodes and Skyros are such interesting individuals, and also one is drawn to the marvellous examples of old pottery in scattered museums.

It was business first with the Greek master-potter. He explained that as I would learn from him as I worked, he would receive 60 percent of anything I sold over the counter – typically Greek, as under the counter was not mentioned.

Shapes and decorations in contemporary Greek pottery suggest links with the distant past. The simple folklore ceramics from the island of Siphnos for example, are not much different from surviving examples of Middle Bronze Age pottery found throughout the Cycladic group.

Perhaps most noticeable are the relatively free and open marine influenced designs of Minoan pottery reflected in today's pots made on the island of Aegina. As well, there are traces of the early geometric patterns in contemporary pots although they lack the intricate and formal compression of the works of ancient Greek decorators. In the animal shaped pottery of Mytilini (or Lesbos) today, it is not difficult to see the influence of the so-called Orientializing period of seventh century pottery characterised by the reintroduction of motifs taken from nature. The "wild goat" can clearly be traced in the deer patterns found in contemporary Rhodian pottery.

It is worth noting that the high classical styles from Corinthian and Attic ware — both red and black figures — survive only in replica, adding little to present day craftsmanship. Later Byzantine floral designs can be seen in some of the rustic ware throughout several of the Greek islands where distinctly local attitudes prevail, particularly on the island of Skyros. Today Greek pottery is mainly faience, which was introduced to Europe by the Moors via Spain.

There are small communities and families of potters at work on the Greek islands producing their local variations of traditional motifs and themes, but it is Athens which has become the commercial centre of Greek pottery and the most interesting in terms of craftsmanship. Eventually most of the island pottery finds its way to Athens anyway. And so do a good many potters.

The village of Maroussi just outside Athens emerges as the dominant force in modern Greek pottery. With its plentiful supply of water and red clay and attractive village like atmosphere, Maroussi began attracting potters from the islands, particularly Siphnos after Greece won its independence last century. Water was a precious commodity, often in short supply to the Athenian, so the potters of Maroussi made

earthenware pitchers for carrying water by carrier to the fast-growing capital. The concentration of potters eventually led to the development of more sophisticated and finely decorated pots until finally students from the Athens School of Arts moved out and joined the Maroussi community of potters. In 1958 artists and craftsmen founded an association, and assisted by the Maroussi municipality, organised the first Panhellenic ceramic exhibition. A co-operative was formed with the aim of establishing a clay production unit, a school for potters and a permanent showroom where the work of folkloric-art potters from all over Greece could be shown.

At this display one can see pots from Crete, the Rhodian ware with the deer design, plates from Skyros, the tsikali for cooking beans, the foufou barbecue braziers and the kapnistiri or melisokomos terra cotta watering cans for smoking out bees, from Siphnos, and the giovetsi casseroles and terra cotta water jugs, all produced from private workshops working within the co-operative.

In these days of mass production it is a pleasure to use handmade pottery. How much nicer to have salt, sugar, nuts and olives stored in beautiful crocks. How good the food tastes when cooked in earthenware casseroles. How cool the water when kept in jugs of terra cotta. These traditions are still part of everyday living in Greece.

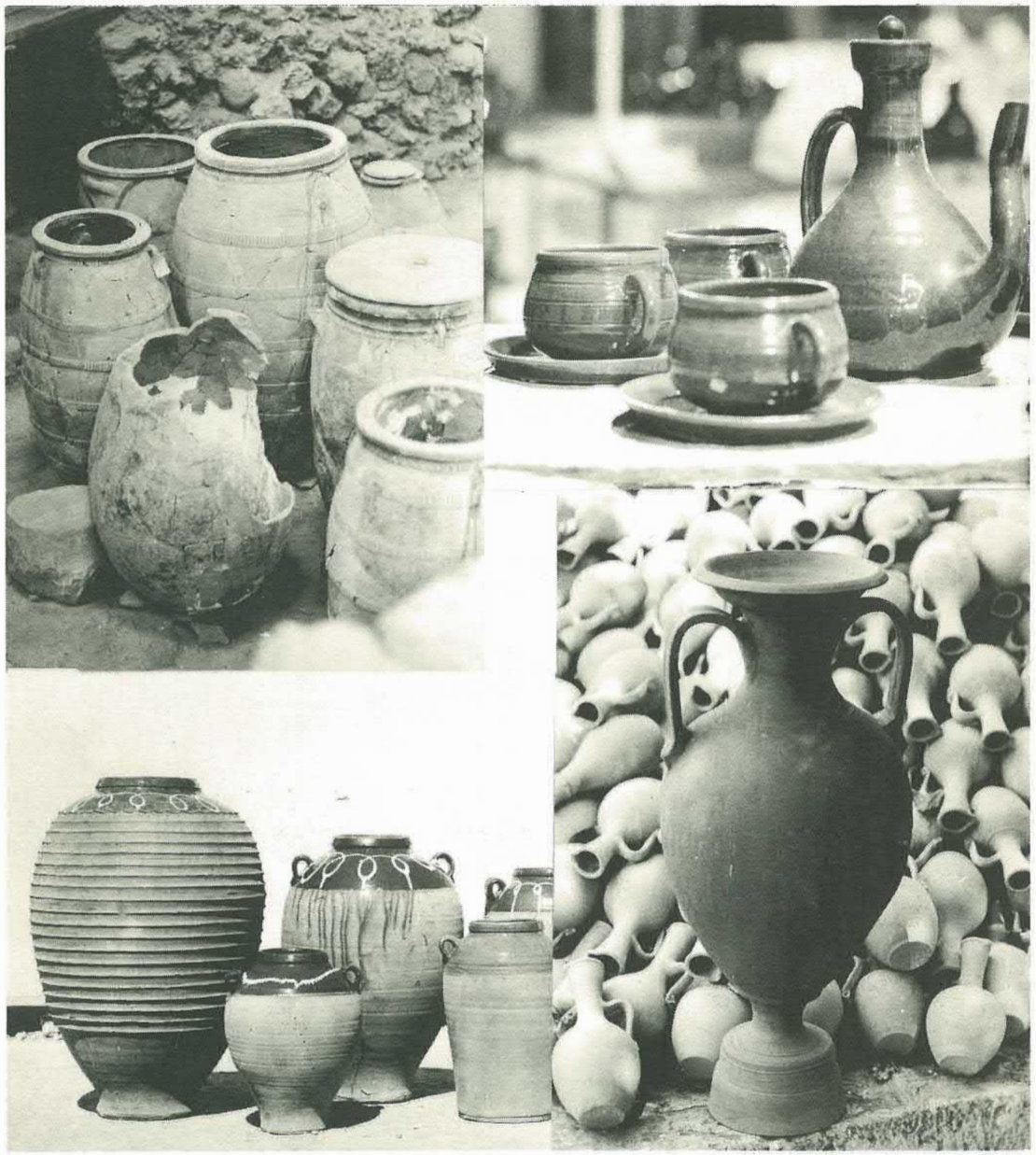
Forms are made in various ways. By coiling, banding, throwing on the wheel, free form modelling pinching and casting.

The clay is formed from decomposition and erosion of feldspathic rocks. The breaking down process frees the alkaline kaolin which can withstand high temperatures in the firing process and yet retain its ability to hold colour. Traditionally the side kick wheel, and now its modern motorised version is used in Greece. Over the centuries the basic equipment has remained the same — a rib for shaping and paring away excess clay, a sponge for smoothing sides and edges, a steel wire to cut the finished pot from the wheelhead. Mechanised modern aids such as the pugmill are used all over. Motorised wheels are the rule. Many potters use the electric kiln, but some produce good earthenware from kilns fired with nut shells, olive pits or wood shavings. Most have a thorough knowledge of the clay. Village potters normally use a series of water gardens to purify and clean the materials before obtaining a suitable plastic clay.

The difference between Greek and New Zealand pottery is that Greek pots are produced to type as a commercial venture, while New Zealand pottery is individually crafted with differences in clay bodies, glazes and textures making for variety, and most of these pots are attractive to look at as well as having a use.

After 14 years as a working, travelling modern-girl-gypsy I feel now I must settle down and collect and make some pots here at the foot of the hills near the sea.

Margaret Harlow
Four Peaks, Geraldine,
South Canterbury



Top left: Storage pots for wine and food have not been removed from their positions where they were shattered by volcanic erruption 3,500 years ago
Top right: Turkish style coffee or tea set, an example of modern Greek pottery
Bottom left: Collection of simple olive containers
Bottom right: Grecian urn, copy of an old water carrier

photos: Rory McGuire

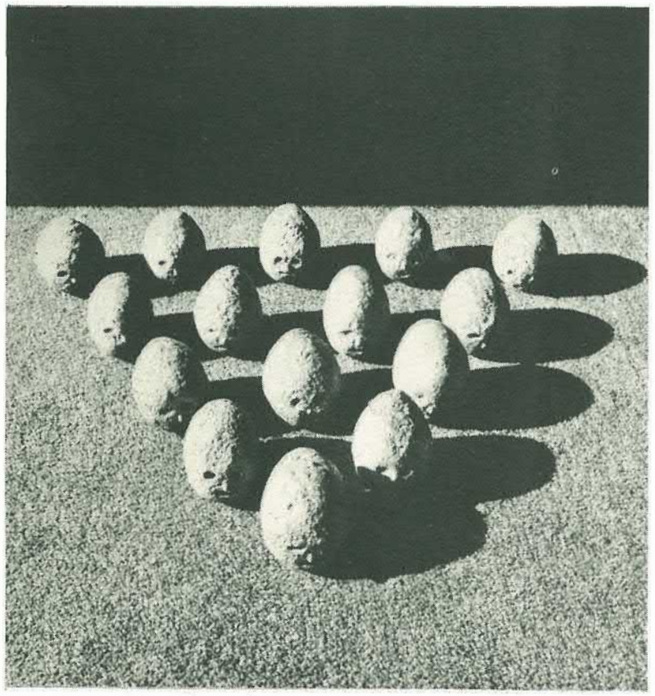
RECENT EXHIBITIONS

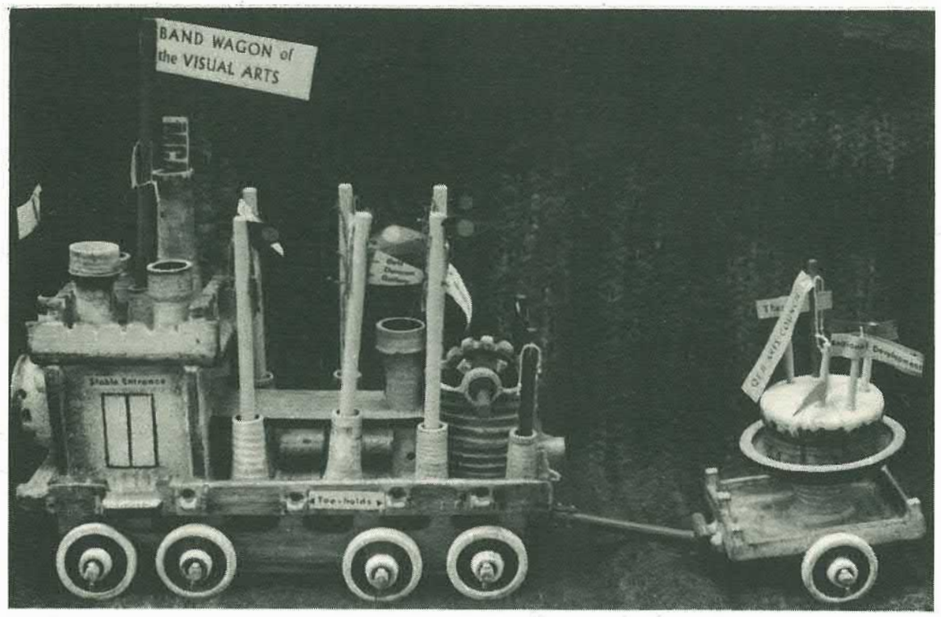
Right: Fissured terrace pot unglazed stoneware, Margaret Milne from the Manawatu Art Gallery's Contemporary Ceramics 1976 Exhibition in Palmerston North

Below right: Raku form copper glaze under reduction by Denys Hadfield from the same exhibition

photos: Stan Jenkins

Below: Formation, David Brokenshire stoneware 700 x 700 mm shown in Wellington at the NZ Academy of Arts Pots 76 exhibition





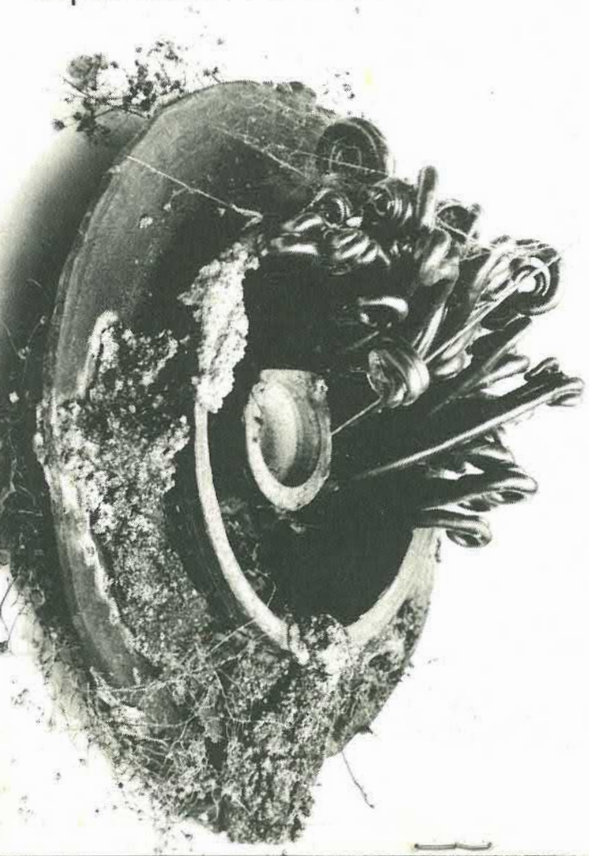
Juliet Peter makes a comment at Wellington Settlement's Gallery

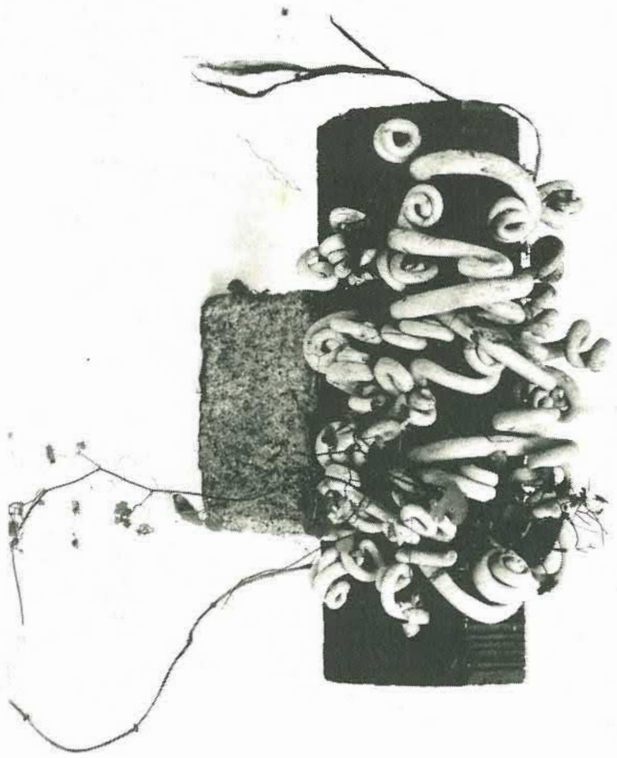
Right: Group of candles by Sally Vinson porcelain and stoneware some with turned wooden bases in matt white, matt black and ink blue electric fired to 1280°, from an exhibition of Alicat Gallery Auckland

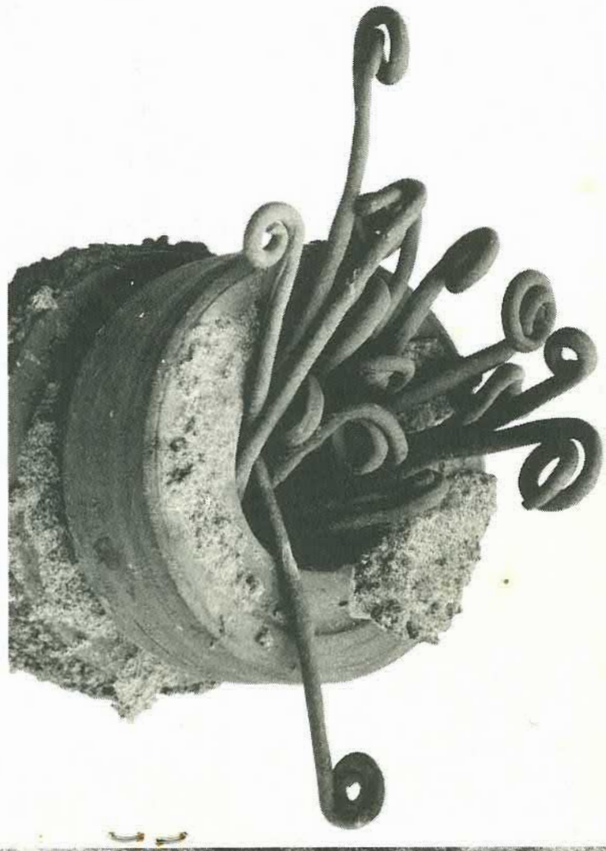
Below: Teaset by Lawrence Ewing from a wide range of domestic ware shown at the Connoisseur Gallery, Dunedin

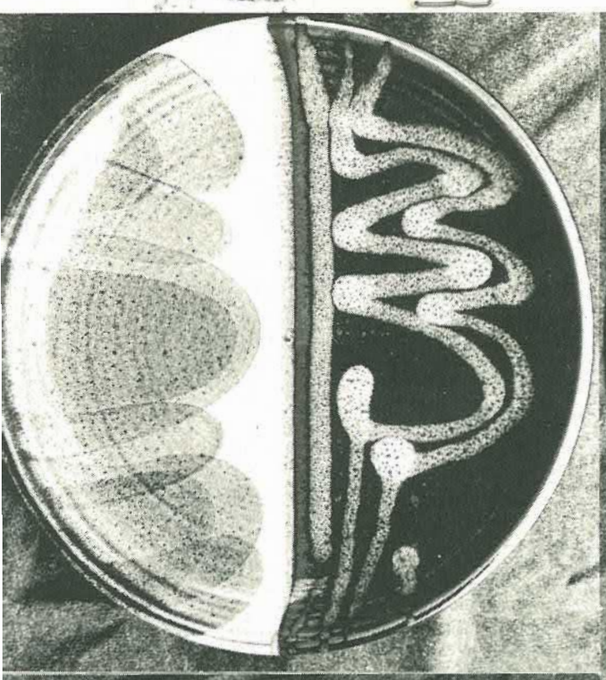
Primarily a painter or 2D. designer spends time dealing with the illusion of space • Sculptors use the element of space itself
In the 20th sculpture has been freed from the pedestal, from the restrictions of traditional materials and how they "should" be used and from the human figure and other such literal content • The meaning can now become inherent in the way the object describes its own arrangement and existence in space, light and time. —— Time and movement are fascinating elements closely relating to sculpture – changing light and the passage of shadows over the surface and its surroundings make the object live!
* People nearly always see "things" in my sculptures and say that they are "fun". Neither of these are my intention. If I could clarify my intention in words I wouldn't need to make the objects — the source of the idea can possibly be traced to one or several visual experiences but the associated feelings and resulting creation of forms would have no tangible source • I always work in series — developing forms based on the previous one.

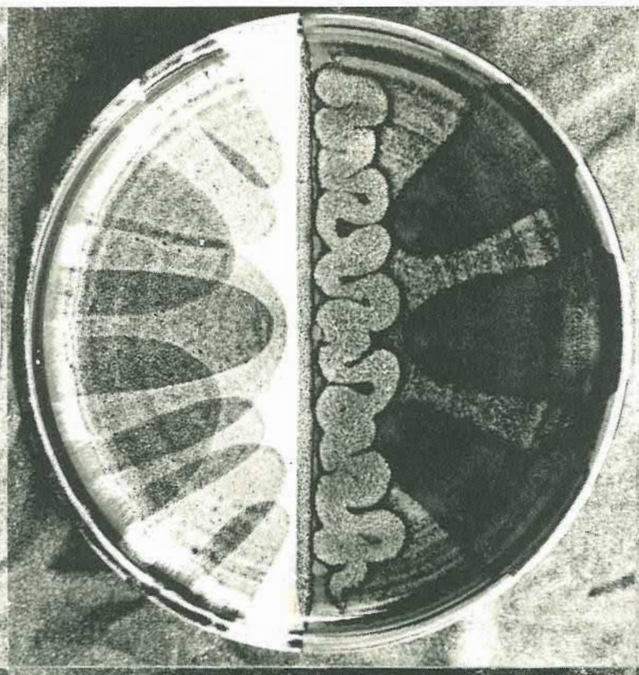
The sculptural forms here are composite structures using ceramic materials such as terracotta, porcelain, firebricks, red bricks, glaze, cement and sand. Some parts pre-fired and re-assembled for second firing – all fired in diesel kiln with reducing atmosphere • The plates are about 400mm diameter – thrown – decorated with NZ or Aust. glaze materials – one fired in reduced atmosphere the others oxydised to 1260° – 1300°C

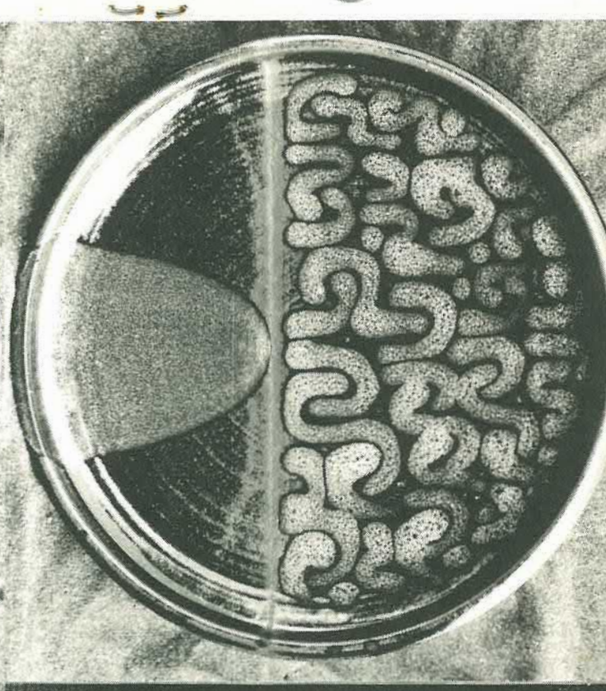


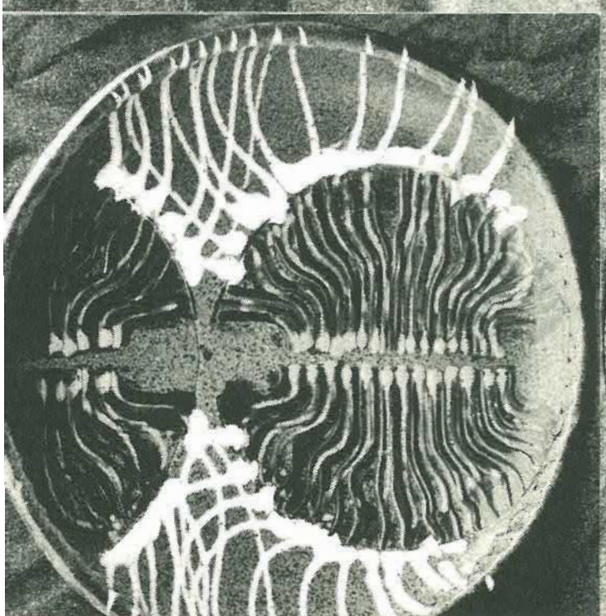


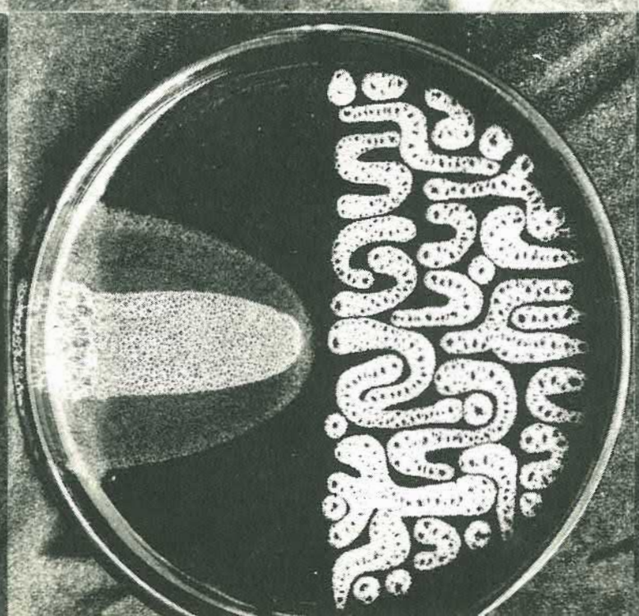


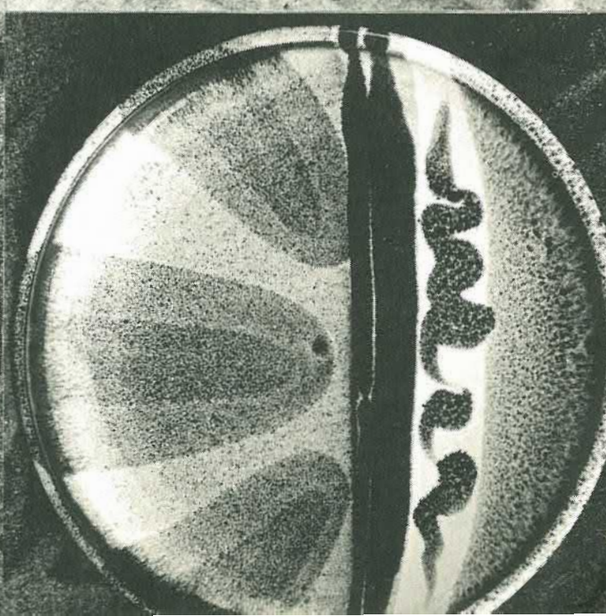












PORCELAIN

John Reeve

The following is the first part of a paper prepared by John Reeve on the subject of porcelain. The author is well known throughout North America as a craftsman and philosopher who has spent years working as an integral part of the Leach Pottery in St Ives before returning to live and work in British Columbia.

We wish to thank the author and "Tactile", the magazine of the Canadian Guild of Potters for permission to reprint this article.

When we were very young, porcelain was little used by studio potters. Bernard Leach made porcelain, Lucie Rie made pinch bowls here and there and accepted, as the impressionable do, that porcelain was something rare and exotic, too difficult for us, an arcane and mysterious secret of the potter's craft.

It is different now, and nearly every potter admits to making some porcelain. Art schools do it. Podmores sell porcelain clay pre-packaged like margarine. Craft Horizons shows the latest funk-porcelain. The mystique is gone.

In principle I approve, for I understand mystique to mean the perpetuation of artificial mystery, as in a Dracula film we find not only terror but are comforted by the certain knowledge that the blood and the wooden stake will soon be replaced by a bland girl selling popcorn. Until we can see beyond the mystique we cannot begin to apprehend the mystery and the miracle of reality.

In practise, unfortunately, the mystique is not always replaced by the reality, but too often by the popularization of a new definition with broader, more popular, easier connotations — and this has certainly happened with porcelain. From what we see in the galleries we could almost believe that any clay-body which is not actually coloured and not actually earthenware is porcelain.

Do we or should we all agree as to what porcelain is? Of course not. In an absolute sense there is no such thing as common reality. What is real to us is only that which we realize (make real) for ourselves. As soon as the *idea* that we can't tell Stork from butter becomes more real than the difference between them, we can no longer tell the difference. And so with cheese, or raku, or porcelain.

I can no more tell you what my reality is than you can tell me how much it hurts. But I can try, and I have an obsession, among others, to persist in a search for the root of things, the underlying principles behind all the rubbish I believe, read, hear, and am taught. I maintain the naive attitude that beneath it all is something clear, simple and true. It is a fool's game, but I persist.

There are those who maintain that the potter can remain simple, innocent (and therefore more pure) by refusing information, by rejecting all knowledge of chemistry, calculation and technology, by working purely on "gut-feeling". Like the old-timers, they say who were ignorant of all this modern nonsense and yet made better pots than we do. It is a fool's dream. In truth, the old-timers were not ignorant because they shut their eyes to the phenomena of their world. The old-timers used the resources they had to the best of their ability, and that seems to me a course worthy of emulation. The change from pit-firing to glazed translucent porcelain, no matter how long it took, was not accomplished by closed minds. That their pots were better than ours is the result of our disintegration. We are the ignorant ones, for we have forced culture and science to such a pace that we just cannot keep up.

The road to simplicity is not the road of assumed ignorance. It is a far more tortuous path which has led me into the thickets of technical knowledge, "through a dark wood, a grim-pen, menaced by monsters, fancy lights, risking enchantment".

This article is about porcelain and is an attempt to pass on some information and some experience about what porcelain is and about making pots with porcelain. Because I think that the only sound definition of porcelain defines it as necessarily translucent, let me say before I begin that many of the pots which I consider to be the finest pots in the world are made of white clay, called porcelain, and have little if any translucency. I think particularly of Ri Dynasty Korean pots, for it is a period of superlative magic for me and its strong white forms are an endless and ever-increasing source of wonder, fill me with joy and awe, and remind me just how feeble and pretentious are my own works. That they are not translucent, and therefore not porcelain, matters not a damn. Their inherent reality is quite beyond any description or definition which can be laid on them. Descriptions and definitions are only tools that we use, by which we may expand our own consciousness and understanding. They should not be walls by which we limited our reality.

Porcelain is dense, vitreous, translucent stoneware.

It is white, or nearly so, and neither it nor its glazed surface can be scratched by steel. There is another definition based entirely on low porosity, but by that definition any highly-vitrified ware such as blue basalt ware or bone china, or even over-fired earthenware might qualify as porcelain. In fact, the only characteristic which distinguishes porcelain from stoneware is TRANSLUCENCY. Both are vitrified clay-bodies, the former opaque and the latter translucent.

Translucent means "transmitting light" — that light will pass through. It does not necessarily mean that we SEE through — that is a quality of transparency. When I was much younger than I am now, we used to say that it wasn't porcelain unless you could read a newspaper through it, and I have made and used porcelain bodies that you COULD read a newspaper through, as long as the pot was very thin, the light very bright, and the reading confined to the large black type. As a literary experience there wasn't much to recommend it, but I can remember being absurdly pleased with myself at the time.

When a clay-body is translucent, the light passes through it even if you can't see the shadow of your fingers against the light. Passing through, the light gives the pot a luminous quality which is unique to porcelain and quite different from any opaque ware however white or bright it's colour or surface. This is the quality of porcelain which has enchanted both potter and pot-user for many centuries.

Porcelain first came to Europe from China along the Marco Polo route. Accustomed as we are to the elegance and refinement of our civilization, it is difficult for us to appreciate what a shock it must have been for Europeans to see these pots for the first time — thin, light, white, translucent, quite unlike glass or stone or metal or pots made from common clay.

Having seen them, Europeans wanted the technique for themselves, and enormous energy was expanded in trying to duplicate this magical material from the mysterious Orient.

Many ways were tried, but only two solutions prevailed in Europe for the manufacture of porcelain on a large scale. On the continent, Sevres, Rosenthal et al simplified the problem by raising the firing-temperature to about 1460c. At this temperature, relatively simple compositions of clay, feldspar and flint will produce translucent wares which at 1300c would be quite under-fired, the product having a low thermal expansion and a good resistance to heat-shock. It is a good solution in terms of the ware produced, but the additional temperature places a much greater demand on kilns and refractories, making the ware much more expensive and a thing apart from stoneware potting. Even today many people think that porcelain is synonymous with extremely high temperature, in spite of thousands of years of Chinese porcelain firing at or below 1300c.

In England, the solution was a compromise. English Bone China, as the material came to be called, is very white and very translucent, and has a world-wide reputation as "quality-ware". But as a thing-in-itself, bone china is not a porcelain, but an imitation porcelain with approximately the same relationship to porcelain as Mother's Pride to bread.

The translucency, as well as the name of bone china, is the result of using BONE ASH as the principal body-flux in the recipe. Bone ash is CALCIUM PHOSPHATE, and the result of its use as a body-flux is vitrification and translucency at a lower temperature than is possible with porcelain, at the expense of accepting the sudden-flux nature of the calcium which makes body-distortion extreme, and a softending of the glass by using the phosphorous as a supplementary glass-former. The firing-distortion is so extreme that the ware cannot be fired in the normal way with a high-temperature glaze. Instead, the unglazed ware is high-fired, and being unglazed can be propped and supported, packed in sand so that the shape cannot alter in firing. After firing, the marks of the propping are ground off and vitrified, translucent biscuit is glazed and re-fired. Because the second firing must not be so high as to reach softening temperature again, the glaze must be one which will fire at a lower temperature. The finished product: fine, white and translucent, has a soft-glaze surface in no way superior to that of cheap earthenware. Thus, the steak-knife soon cuts through the glaze and the floral-pattern, the marks caused by stacking the plates begin to show, and mother puts away the bone china in the glass-fronted cupboard and uses it only on special occasions.

There seems to have been no third alternative which appealed to the ceramic industry in Europe, except on a small scale, and there is little commercial porcelain fired in the region of 1250c. In spite of this, the studio potter has common materials at his disposal with which he can make good-quality, white, translucent porcelain which will fire at these temperatures. It will not throw as easily as a good plastic stoneware, and it will be much more likely to distort in the firing, but it can be real porcelain — dense, vitreous and translucent.

THE SILICA TRINITY

Unlike that in a glaze, the silica-content in a clay-body cannot be accurately represented by a *SUM*, because it is dissolved into the *SILICA GLASS*, the vitrified part of the body. The remainder is *FREE SILICA*. Part of this free silica converts to CRISTOBALITE, the remainder is QUARTZ CRYSTALS. The proportion of SILICA GLASS determines the vitrification and the translucency: the CRISTOBALITE and the QUARTZ (left over, "cemented" into the glassy matrix) determine the thermal expansion (and contraction) of the body, controlling strength, crazing, shivering, etc. The exact way in which these forms reach equilibrium in the firing is quite complex, and incomprehensible to me, for CRISTOBALITE forms from both QUARTZ and CRISTOBALITE. It must be rather an orgy, and difficult to know who is doing what to whom.

SILICA GLASS: *The maximum* SILICA GLASS which can be present in a clay-body (or a glaze) is determined by the balance of Silica/Alumina/Fluxes in the recipe. A ceramic material can only form as much glass as there are fluxes to *COMBINE* with the silica. Neither FLUXES nor SILICA will make glass at kiln temperatures, but only fluxes *AND*-silica.

The *minimum* SILICA GLASS which can be present in a clay-body is determined by another factor, *TIME*: by how much of the silica present has been able to dissolve into the glass in the time allowed.

CRISTOBALITE: Seeking its own stability, hot quartz will convert into CRISTOBALITE, beginning about 1100c. It will not change back into QUARTZ as it cools. The conversion is a slow process and happens only gradually.

CRISTOBALITE as it cools has a shrinkage of 3 p.c. between 300°C and 200°C. This is a drastic shrinkage, and a potentially shattering experience for the pot.

FREE QUARTZ: All that silica put into a clay-body which has neither converted to SILICA GLASS nor CRISTOBALITE remains as FREE QUARTZ. It has a sudden expansion on heating and contraction on cooling of just over 1 p.c., smaller than that of cristobalite, but occurring suddenly at 573°c. This, too, is a potentially shattering experience if the contraction is too much for the strength of the body to withstand.

Thus, a good porcelain body will have:

1. Enough FLUXES to combine with the silica.
2. Enough TIME to convert the silica into glass
3. Little FREE QUARTZ and/or CRISTOBALITE left over.

LITTLE free quartz, not *NONE*. The FREE QUARTZ and/or CHRISTOBALITE, doing their final shrinkages with the body in a condition of slight compression (squeezed) which prevents crazing and gives the body its' greatest strength. Too little FQC and the glaze may craze. Too much, and the body will be diminished in vitrification and translucency. Much too much and the body may shiver, spiral-crack, or shatter.

NOTE: although it is important to understand the direction from which these three bogey-men (the shiver, the spiral-crack, the shatter) may threaten, they are far less likely to appear in porcelain than in stoneware. A porcelain body which suffered them could hardly even *approach* translucency.

EARLY DAYS AND A DIGRESSION ON GLAZES

When I first began to make porcelain, I used this recipe:

56 China clay (Grolleg)
28 Felspar
14 Quartz
2 Bentonite

It worked very well. My kiln at Hennock had an extremely long soaking period above cone 8, and this porcelain fired to cone 10 produced very good qualities — the pots were white, translucent, had a good glaze-fit with no crazing, and a degree of distortion which I found more pleasant than alarming.

Joining the dance

Bronwynne Cornish

For a handbuilder, treading lightly into the area of reflective clay imagery porcelain offers a wide palate.

Not being a technically minded person, I find using David Leach, prepacked porcelain most satisfactory. Most of the work evolves from paper-thin sheets cut directly with linen thread from the block. These are combined with press moulded objects such as feathers, dolls' faces shells or leaves.

Down in my workshop, the clay and I sit facing each other ready to begin our daily duet. We play many tunes from slow waltzes to frantic rock and though it doesn't take too unkindly to the way I push, pull and tear it, at times rebellion is seen in the cracks that appear on drying. It seems that a long, slow drying is necessary for porcelain. Although I have had some success fast drying thin objects on top of the electric kiln, this cannot be recommended for flat objects.

The survivors of this rough treatment are bisque fired in the electric kiln to 1000°C. I like to keep the glazing fairly simple letting the beauty of the porcelain speak for itself.

The folded fat pieces, such as shoes and highly decorated pieces such as wedding cakes look their best lightly dressed in a handsome celadon, or clear porcelain glaze. Tenmoku too looks well on the breaks on edges and the juicy rolls on the bottoms. Delicate, more detailed pieces featuring feathers and faces are given a wash of cobalt, copper and manganese mixed, left naked outside and lined with lustrous bone ash if well treated in the kiln yields an amazing range of subtle colours ranging from mauve, pinks through to pale apple green and dark green according to the reducing or oxidising atmospheric conditions.

These are all fired in a natural draught drip feed oil fired kiln to cone 10. In my first five years working in earthenware I fired in an electric kiln. Although at the time this was a convenient way of obtaining results, somehow an element was missing. Fire!

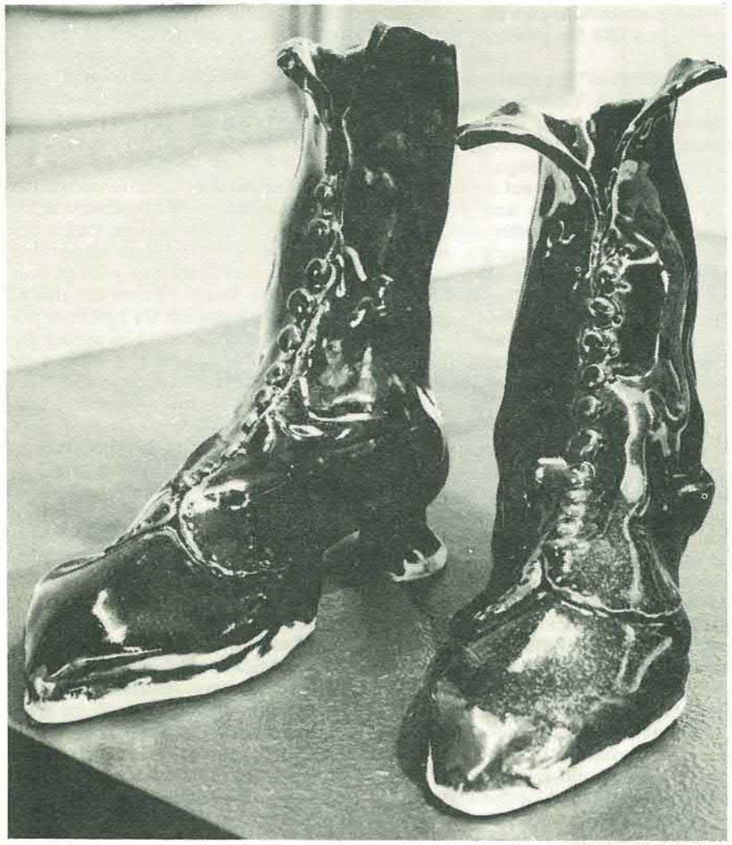
Learning to operate and master my present kiln has been a most expansive experience for me. I suppose its the ever-present element of surprise on opening the kiln which is so satisfying. The feeling of the fire participating in the dance. Even the appearance of my kiln pleases me. It is constructed from a single layer of fire bricks, heaped over with a three foot layer of clay, the final look being of a large loaf of bread.

Wedding cake 225 mm (9"), celadon glaze, lustred shoe

I like to think that the clay and fire and I work together to produce objects of a strange and unusual beauty which is a mirrored reflection from within of what I see.

This year I have been fortunate to have the support of the QU II in the form of a grant to enable me to work for a year exploring clay form with no concern about the saleability of the object.

Bronwynne says "I have been up at Bethells for a month working with Paul Tobin and Warren Tippett using their delightful wood fired kiln. Some lovely objects were produced. I'm especially pleased with the barium glazes".

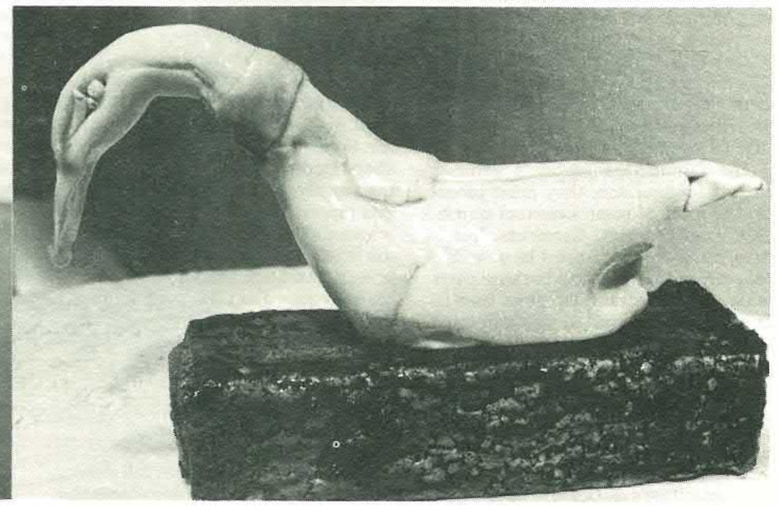


Left: Ladies town shoes

Below left: Feathered vessel

Shown at the Manawatu Art Gallery contemporary Ceramics Exhibition
photos: Stan Jenkins

Below right: Khaki Campbell duck bone ash glaze on greeny blue salt glaze base



Weavers get quality mark

Dorothea Turner

In the four years that the New Zealand Spinning, Weaving and Woolcrafts Society has been assessing for its Quality Mark, 458 members have submitted work and of these 274 have been awarded the right to affix the QM label to part of their output, even to all of it in some cases. This is not yet a high proportion of our membership which is now more than 4,000; but the Quality Mark is not easy to win, nor is it everyone's goal.

The Society was concerned about the poor craftsmanship in much of the work offered for sale. We had at the time a prospect of a national shop in a Rotorua tourist complex and could see that if we were to maintain a reputable standard here, and elsewhere, we must have some formal screening. For the most part the bad work was being produced innocently and in good faith; we were almost wholly without opportunity for basic instruction, even in the larger centres. Simply by alerting members to standards and pitfalls, we expected the QM to have an effect on others besides those who applied, and so it has proved.

We appointed a Christchurch-based committee of four who defined requirements and invited submissions. Within each category of craft, applicants must submit five articles, covering the types of work on which they hope to use the QM label. These are the categories, and in brackets the number of passes since April 1972: Weaving (75), Crochet (3), Knitting (142), Handspun wool (25), Kiwicraft (2). The knitting and crochet are wholly based on handspun yarn, but it is possible to qualify also as a spinner only. Weavers may apply for a QM to cover all articles in this broad field, or they may apply for one special aspect of it, e.g. floor rugs or apparel textiles.

The committee inspects articles closely for function; they must promise the kind of wear a normal purchaser would expect. Garments, handbags, cushions, etc., must be sensibly proportioned and strong in those parts which take the strain. Textures, both in knitting, crochet and in weaving must be appropriate to the kind of washing and wearing they will meet in ordinary use. Fringes, seams and other finishings, inside or outside, must conform to the understood disciplines. Aesthetic judgments, being personal and conjectural, are by general consent outside the committee's duties and over to the customer. Wall-hangings and mobiles are left to make their own conventions; there is no QM for purely decorative articles.

"Handcrafted" is a vital word on the Society's label. Various speeding up processes often seen on more commercially produced articles, as for example the machined edging on handwoven placemats, are not accepted for the QM. Neither is any form of machine knitting, a matter which was decided by the Society's whole membership after sharp (and not yet defunct) controversy. The QM label must thus be distinguished from the international Woolmark which is not dependant on handcrafting, though the handcraftsman can be granted its use.

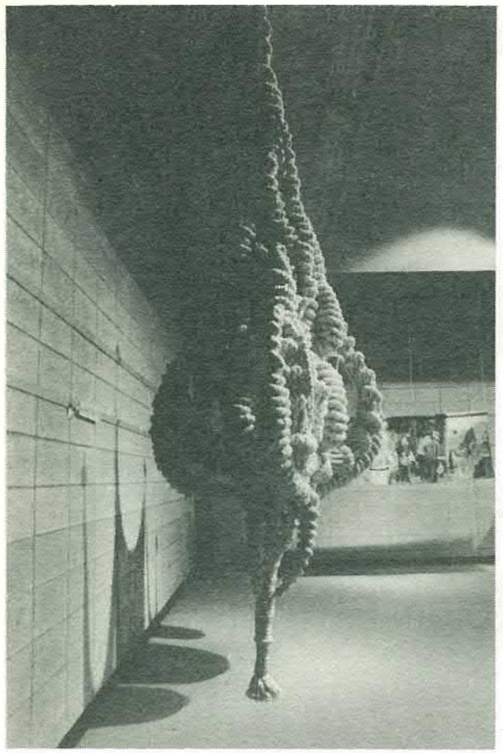
Articles the committee considers not up to standard are returned with a brief note indicating where the defect lies. Where only one or two of the five articles have failed, the maker knows that in re-submission only these have to be replaced. Many of our members, particularly the non-weaving majority, make nothing for sale; it is all absorbed domestically. These are labour-intensive crafts and a marketable surplus is less easily produced than in pottery. We have found that the QM is in great demand with our non-marketing members who value it as a personal goal; and in our still grave lack of tuition and criticism, the verdicts and comments of the QM committee are of great moment to our more isolated members.

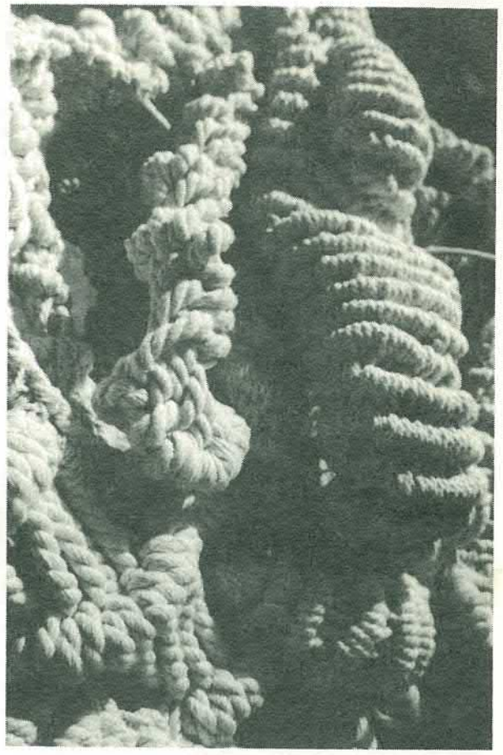
Therefore we have far fewer than 274 spinners and weavers producing QM articles for sale, and we have many without the QM offering work to the public, some of it up to a high standard, some of it definitely not. At first the Society hoped to persuade, craft shops to stock only QM articles, but as the supply did not equal the demand this proved futile. In the main centres, where exhibitions have set a standard, the leading craft shops usually choose wisely. But there are many craft shops casually run, and craft corners in general shops and these, on the tourist bus routes, can do good trade though they offer actual rejects from exhibitions and work well below QM standard. We can do nothing about this but persevere until a greater volume of work corrects the situation. In the meantime it would be fair to say that the right to use the QM carries more prestige within the Society than in the world outside (which is a healthier situation than the reverse would be), and it could be another 5 years before shops catering mainly for tourists will carry the sign "quality mark goods only".

Supervising the use of the QM label is, of course, one of the trickiest aspects of all this. We have the machinery for complaints, for investigation and for a year or so's "unfrocking" if necessary. We now require that in our annual festival exhibition all entitled to use the QM label must affix it, thus enabling us to get an over-all idea of performance, though the presence of a QM label is no factor in awarding the prizes for the competitive classes on which this exhibition is based. Last year for the first time, we restricted the festival shop to QM goods; it was not overstocked. One major difficulty of supervision is that some craftsmen, moving on to a new form or technique, use on it the QM label which they have not earned in that field. This can happen quite innocently, where the transference is within such widely ranging crafts as knitting or weaving. Often those who learn weaving through rugs cushions and handbags make an unsuitably weft-loaded article when they move into apparel textiles; and weavers who learn mainly through the latter usually make a limp rug. We are now therefore changing the requirements for QM weaving, asking for each submission to include a piece of warp-faced (braid) weaving, a piece of weft-faced and a good area of plain balanced textile weave, besides two of the weaver's own choice; in this way we can perhaps make sure that each applicant has covered the basic training which would be faced in the first few weeks at any overseas school. And this will be supported by the syllabus for basic weaving recently prepared by our standing committee for education, information and research.

The other knotty problem will always be the appointment of the quality mark committee. We have been fortunate so far. At the outset it was clear where we should centre the work. When the two leading weavers of our first committee found they could no longer continue, we were jolted into realising the precariousness of the situation. We have a limited number of weavers whose judgment, over so wide a range, would be nationally acceptable; and it is gruelling work to ask of anyone. We have been fortunate in our two replacements and in the help now given by the Wool Board who nowadays handle the QM parcels and put rooms at the committee's disposal in Wool House for its two or three annual assessments. Only one of the committee lives in the Wellington area; the others come from Marlborough, Christchurch and Hamilton, their expenses subsidised by the small fee charged for each QM submission. The stability and standing of the committee's personnel and the consistency of its judgments must always be one of the two vital supports of the system; the other is the individual craftsman's integrity and readiness to accept technical guidance.

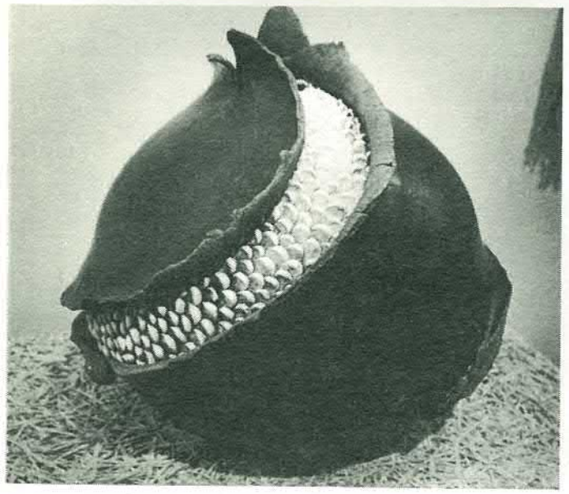
Dorothea Turner is president of NZSWWS.





Margaret Thomson of Eastbourne won the first national weaving award sponsored by the Dowse Art Gallery, Lower Hutt. There were two awards of equal importance – one for traditional weaving and one for an off loom piece. The "tear" is in heavy white cotton woven in macrame and wrapping techniques

photo: Dowse Gallery



Torn sphere by Patti Meads exhibited at the Wellington Potters annual exhibition was bought by Foreign Affairs. Height 500mm width 450mm (20 x 18"), matt black glaze outside, white manganese washed clay inside. High fired earthenware

photo: Evening Post

Win for us

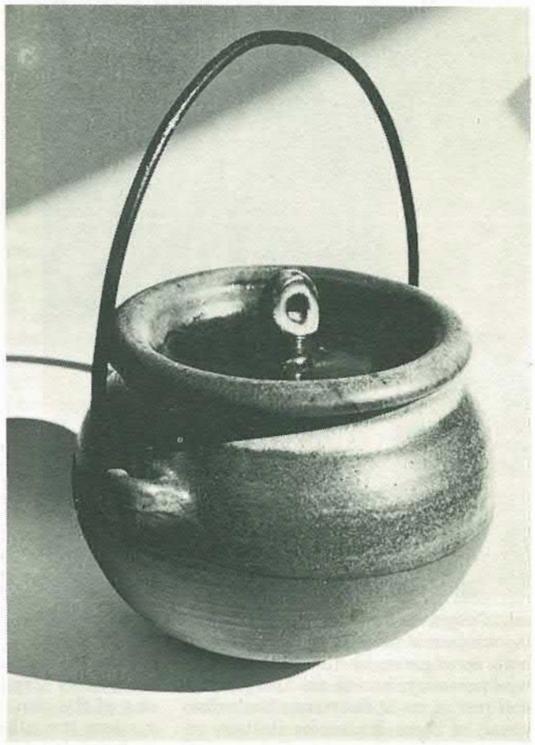
The Potter has won an award in the first National Graphic Design contest. Barry Ellis who gave us the new look in Volume 17/2 won an award in the typography section for the cover and title page design for the Potter.

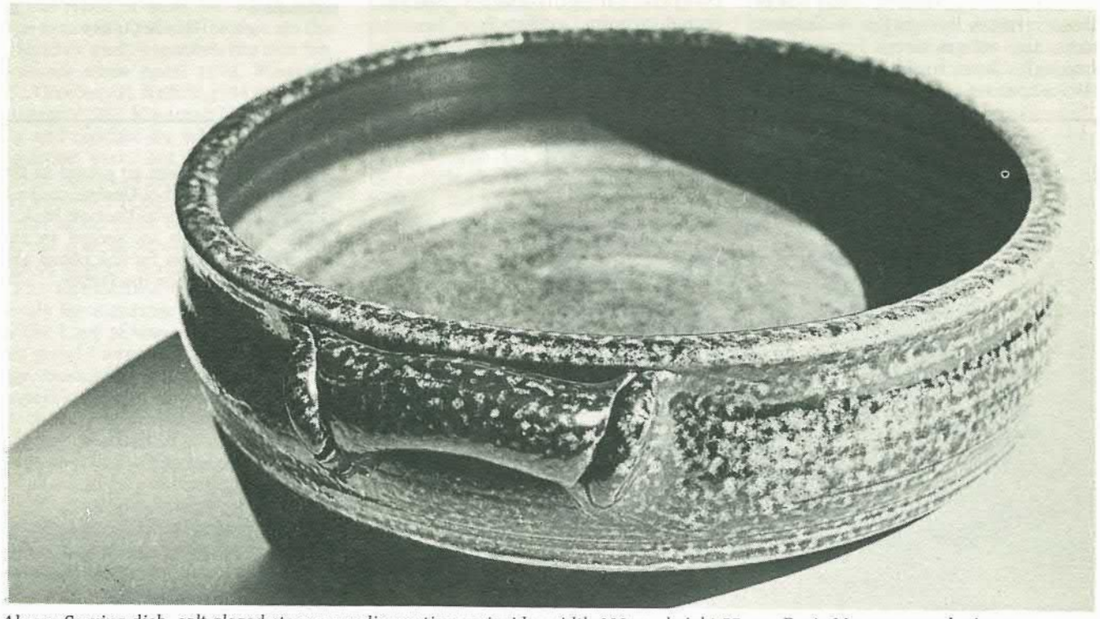
PAKARANGA FESTIVAL POTTERY AWARD

For the festival Scamper Vans a division of Eurkay Engineering Ltd offered two pottery awards of $250 each for a cooking or serving vessel and a vase. Len Castle, selected the pots for exhibition and made the awards

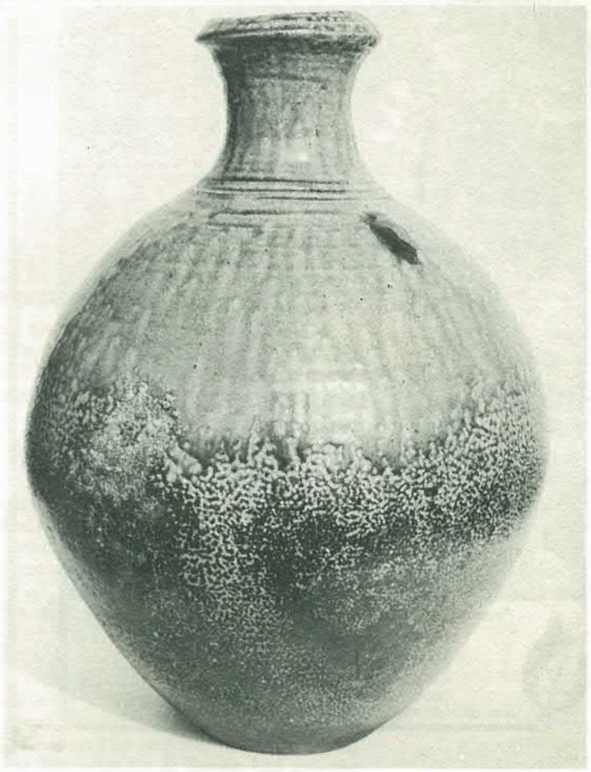
Below: Salt glazed stoneware vase, by Rosie Murray, Auckland

Camp oven 160mm x 190mm, by Tui Morse, Auckland





Above: Serving dish, salt glazed stoneware slip coating on inside, width 230mm height 57mm, Rosie Murray, award winner



left: Vase 350mm high 130mm wide, by Ted Kindleysides
right: Salt and wood ash glazed stoneware vase, 520mm high by Chester Nealie, award winner

photos: Tere Batham

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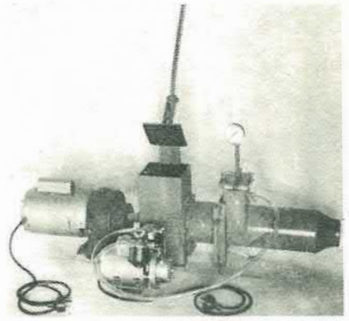

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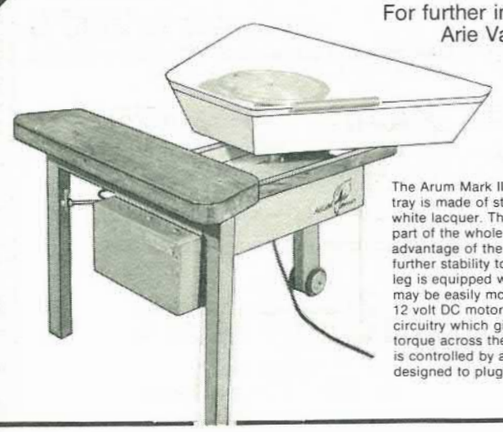
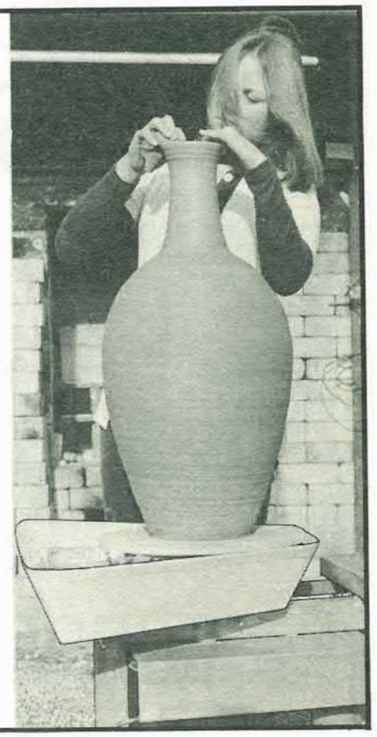


The Arum Mark II pottery wheel frame and tray is made of steel finished in orange and white lacquer. The seat which is an integral part of the whole unit is situated to take advantage of the potter's weight and add further stability to the wheel. The single front leg is equipped with wheels so that the unit may be easily moved. Power is supplied by a 12 volt DC motor energised by special circuitry which gives adequate and constant torque across the whole speed range. Speed is controlled by a knee lever. The unit is designed to plug into 230v AC.



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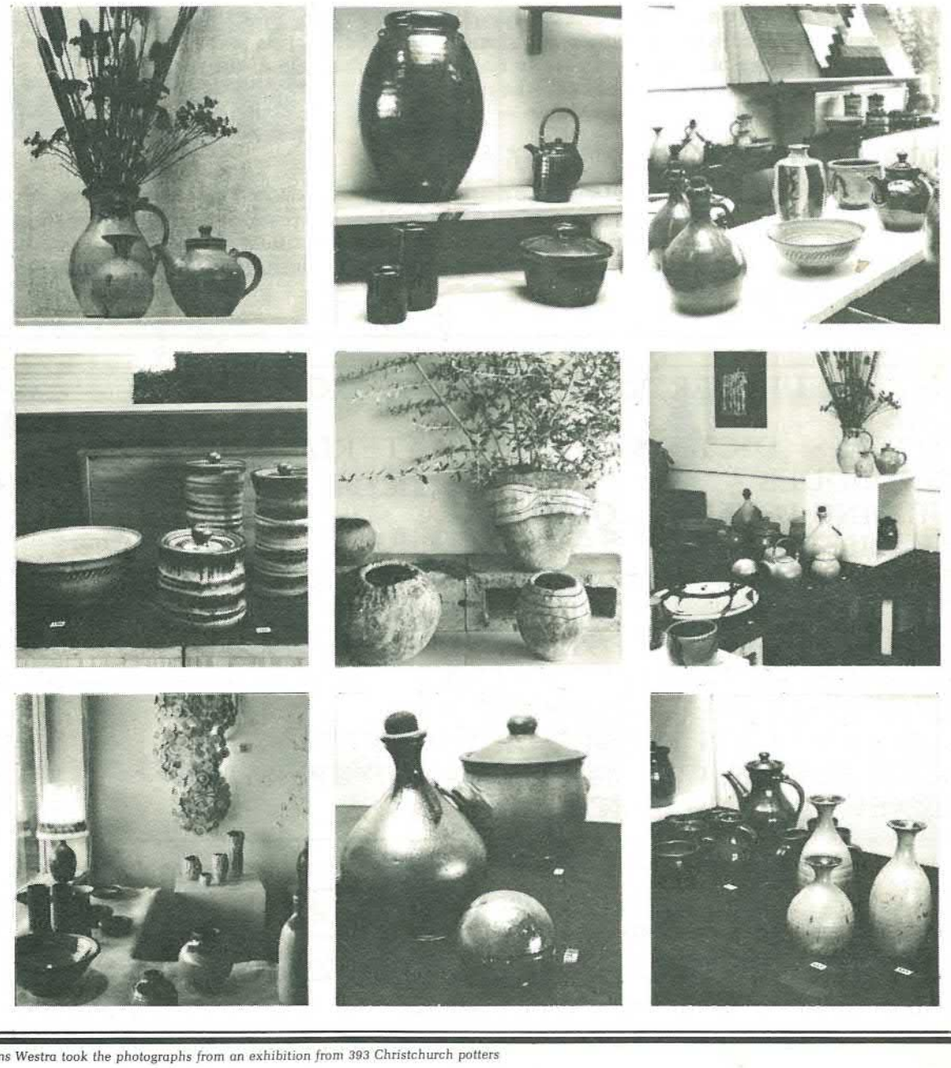

Ans Westra took the photographs from an exhibition from 393 Christchurch potters

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