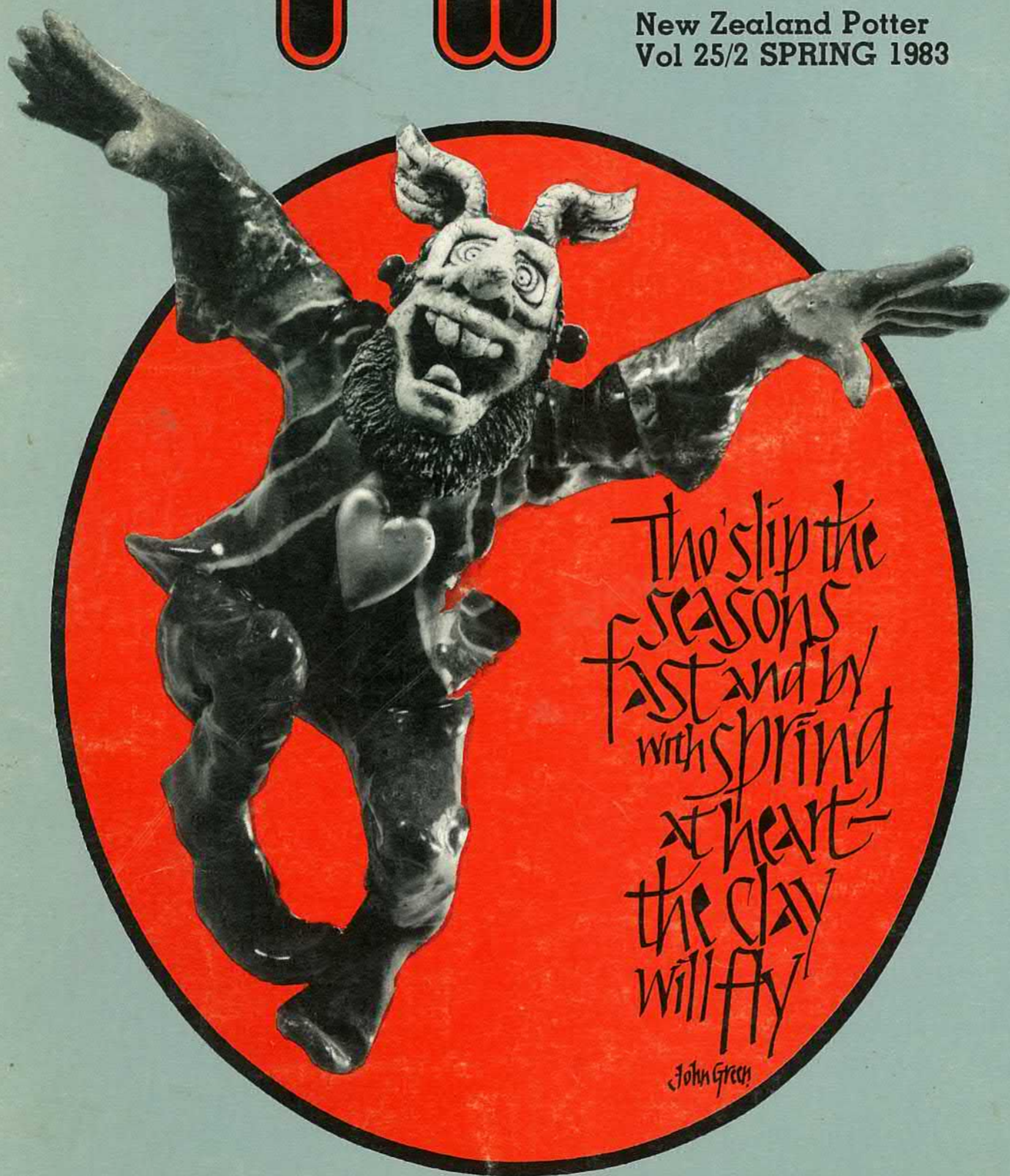


Snussek & Annscouth
170 Weggery Drive West
Dunedin.

Paper

New Zealand Potter
Vol 25/2 SPRING 1983



Tho'slip the
seasons
fast and by
with spring
at heart
the clay
will fly

John Green



New Zealand Potter is grateful for a generous grant from Winstone (Wgtn) Ltd towards publication costs.

Potter

New Zealand Potter
Vol 25/2 SPRING 1983

Cover: Captain Love by John Green. Photograph by Mike Keeling

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HIGH CARBON FIRING

With sawdust

Firing pots in a slow burning material to introduce some carbon into the clay is probably the oldest firing technique there is. In spite of the apparent simplicity, there's a big range of possible effects. This is how Peter Gibbs has been doing it.

After trying a variety of firing systems, I've settled on a very open container for pots and combustibles, and try to fire only on still days. This discourages the intermediate browns and greys associated with wind and heavier reduction and promotes stronger blacks, clearer whites (if using white clays) and more clear cut boundaries between them.

The kiln I use, which is frequently rebuilt to accommodate whatever pots are on hand, consists of a layer of bricks on the ground with walls built up of bricks with about 150 mm gaps. Pots can be stacked on top of each other, but this is really unnecessary, as the kiln can be refired as often as required. My normal procedure is to lay down a thin layer of sawdust (50-70 mm), sometimes with a layer of straw, leaves, seaweed or whatever on top. Pots are then put in, usually on their sides to pick up the marks from the material beneath. Over the pots, I usually place a layer of something to resist complete direct contact with further sawdust. Some salt is usually sprinkled around at this stage, although pieces of seaweed or rags soaked in brine have a similar effect. The pots are then covered over with sawdust so that there is a layer of 75-100 mm covering the pots. Burning is started by lighting a fire on top of the sawdust. When well established this is left to go out and the kiln is covered with a sheet of corrugated iron, and left until all the combustible material has burnt away.

My recent work in this area has concentrated on simple bottle shapes which I have treated as a vehicle for this surface development. This form also has the advantage of prior public acceptance so that you're not confronting the customer with too many distractions.

Generally I've used No. 18 clay which gives good white and black contrast, and can be burnished to a fine smooth surface. Even better are two new clays—a white earthenware EW2 and sieved slab clay—SC80 which are presently being developed by Winstones. Good results can be achieved with practically any clay according to preference. Burnishing is done on the wheel using a stainless steel rib, and a piece of copper pipe

Peter Gibbs, Nelson



around and inside the neck area. If the pot has got a bit hard it can be dampened down with a wet sponge from time to time during the burnishing.

Following the firing, the pots get a quick wash and are then lightly polished with a wax polish to give a good sheen and to enhance the depth of the surface.

As a group activity, the process provides scope for a lot of experimenting with various natural combustibles—moss, seagrass, wet newspaper, bark, you name it. A recent day with the

Motueka Pottery Workshop resulted in a wealth of new material and about 130 pots. To fire all these pots in one kiln and to achieve results between stacking at 9 am and unloading at 4 pm, we constructed a kiln about 300 mm wide, 10 metres long, and generally holding only one layer of pots. A fire was lit along the complete length of this kiln to start combustion. Unloading, while hot work, was possible by late afternoon. The rest of the day was filled in with some throwing demonstrations and raku firing.

Firing in Saggars

Peter Gibbs

Historically, saggars have been used as containers to protect the ware from all the organic combustibles that can go through a kiln during the course of a firing—particularly when firing with fuels like wood and coal. Saggars also double as alternatives to using bag walls and/or kiln shelves. My approach, and that of most contemporary

saggar users, is to keep all that dirty stuff in.

My first attempts, and some of the more successful, were simply to throw cylinders slightly bigger than the pots in question—one saggar per pot. Into the dry, raw cylinder I placed a sprinkling of alumina, the pot itself, then filled the saggar to the top with

crushed charcoal. Occasionally, a small sprinkling of salt, piece of seaweed, or rag soaked in brine would be slipped in somewhere as well. The effect would be a pot, black at the bottom, changing to orange colours on the way up. The various sources of salt would ideally produce slightly softer areas on the clay but at either extreme, volcanic eruptions or nothing at all. This depends not only on the amount of salt, or salt bearing material, but also on how close to the pot the salt source is. Normally the saggars only allowed for one or two millimetres clearance around the pots, so only a small amount of salt is needed. Such a tight fit also means more economy of charcoal (but more mess getting it in.) The charcoal can be crushed in a grit grinder or something similar, or simply by putting a bit in a clay bag and bashing it with a brick—not a pleasant job either way. The best of these pots are nice and subtle and nothing too drastic ever goes wrong. No lids were used on the saggars as this just caused a predominance of grey/black colours.

Alternatives are to use other materials and it's getting these sorted out that starts to cause some problems. My next approach was to save on throwing saggars by throwing some cylindrical vase type pots. These are laid on their sides around the edges of the kiln shelves. The pots to be fired are placed on the shelf, and any gaps between the wall/vases, and the props filled with broken brick, shelf etc. The charcoal, and other combustibles or whatever, are poured over until the pots are all pretty well buried, then the next shelf is just placed on top. If firing in this way, it's easier to do it at the



bottom of the kiln so any overflow of materials either while stacking, or firing doesn't fall on pots below. This is a particularly useful scheme if the bottom of your kiln tends to underfire, as the exact temperature isn't important—provided a suitable inside glaze is used.

Another approach which I have more recently used is to throw planters about 400 mm to 500 mm in height and diameter. Each of these may be used as a mini environment into which may be placed charcoal, sawdust, ash, coal dust, salt, seaweed, straw, leaves, old tins, door knobs, dead pets or whatever, even pots. Some body stains may be successfully applied depending on temperature. These saggars may be fired at any temperature between 900 °C and 1300 °C, although the area I use is 1200°—1300°. Any damage to the inside of the saggar/planter is unimportant, given understanding customers, or alternatively put a plant in

them. Some care needs to be taken when placing several pots in one saggar to avoid fusing them together.

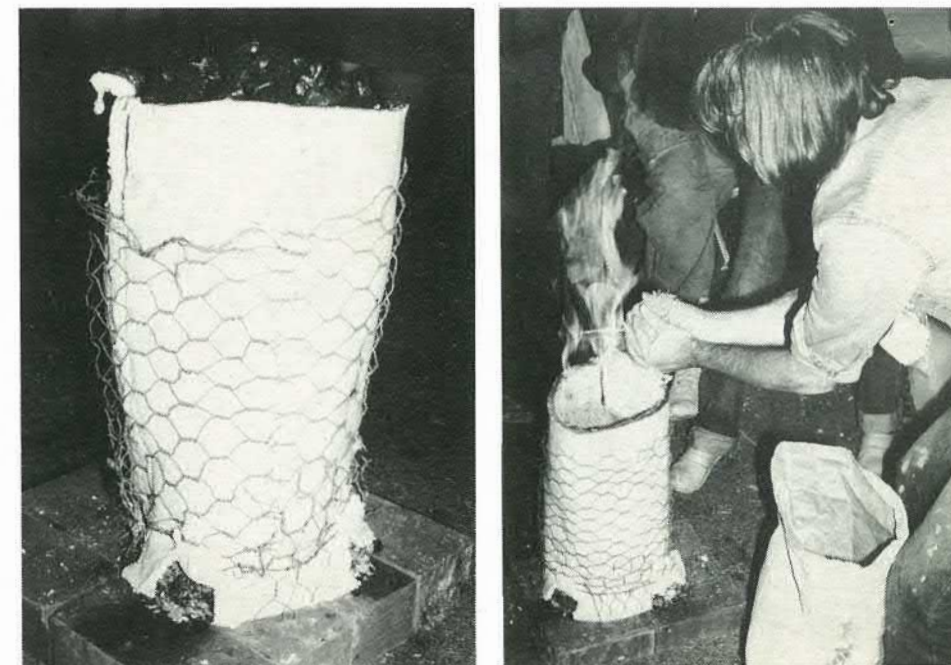
At present I'm leaning towards using fewer materials, sticking to those which I know work well. The results are so unpredictable and varied that more are not necessary. The best clays are white stoneware or porcelain, and can have varied surfaces from dead smooth to pretty rough—as with McPhersons Slab Clay—now made by Winstones. The forms need to be simple—in this case they're really a vehicle for the surface.

A list of more specific articles follows.

References O.S. Rye "Glazing in Saggars" *Pottery in Australia* Vol. 21 No. 1 1982 Chuck Hindes "Saggar Firing" *Studio Potter* Vol. 7 No. 2 1979 Richard Behrens "Vapour Glazing in a Saggar" *Ceramics Monthly* June 1976.

Instant Kiln

This kiln demonstrated by Neil Grant in Nelson is a mere cylinder of ceramic fibre about 1 metre wide supported by netting. The brick base is just to protect the floor and is not essential. The holes at the base let air in and the kiln may be lit here or from the top or both. It will burn charcoal or sawdust and heat could be intensified by some forced air via a vacuum cleaner at the bottom. The outlay is cheap enough to be an interesting kiln to experiment with. One could make a pot in the morning dry it on a gas burner and fire it in the afternoon.



Pit firing

In California in 1980 I saw the technique of pit firing being used at a gathering of potters and students on a beach near San Jose. With the scale of the firings, the size of the pots being stacked with reasonable ease, it became apparent to me that this method of firing would suit my work.

I had been potting for ten years using an electric kiln for stoneware, latterly using a 32 cu ft gas fibre kiln, and had control over my techniques, but I was ready for change and new developments. I had a strong urge to decorate the bigger pots but being basically self taught and with no training in graphic arts, applied decoration did not come easily. Here was a way to resolve the problem of decoration by allowing the flame to do it for me.

The medium offers spontaneous surface decoration and is particularly suited to my basically simple forms. The fire moving freely gives orange, grey/blues, black and cream colours curling and swirling across the surface—sometimes strong, sometimes muted. The finished pieces are rather galactic looking. Each pot usually has quite different "faces" depending on colour and patterning.

To achieve a smooth surface, pots are semi-burnished in the leatherhard state. The long hours spent are worth the effort and the task can be satisfying. Burnishing is not intended to achieve a highly polished surface such as on the slipped black ware and monochrome pots made by North



American Indians and Mexican potters.

Almost all my pots are wheel thrown and worked on later, made from a stoneware body I mix myself, opened up with the addition of grog and coarse fireclay. Different bodies require different treatment and some commercially available clays are quite suitable—to these I add 8% sand, 12% grog, and 20% coarse fireclay. Most clays will withstand the thermal shock of pit firing usual sized pots. The risk of thermal shock fractures increases many times for large pots however, and is more than proportionate to in-

Ray Rogers, Auckland

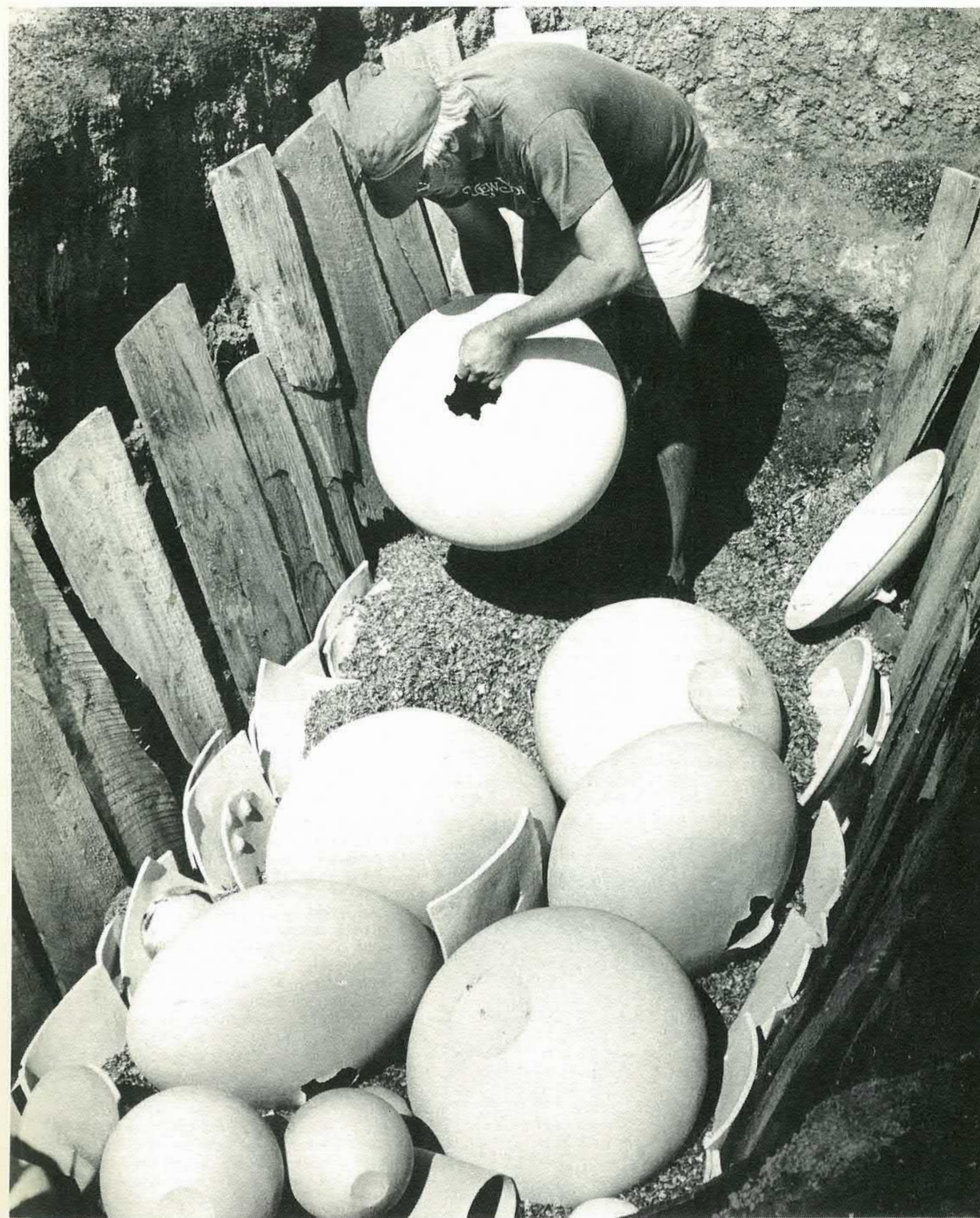
crease in size.

I use the wheel for speed and convenience in pulling up the prepared clay into an approximation of the final shape before the real work begins with finishing and modelling the detail. The pots are then bisque fired in the gas kiln to a rather low temperature of 750°C.

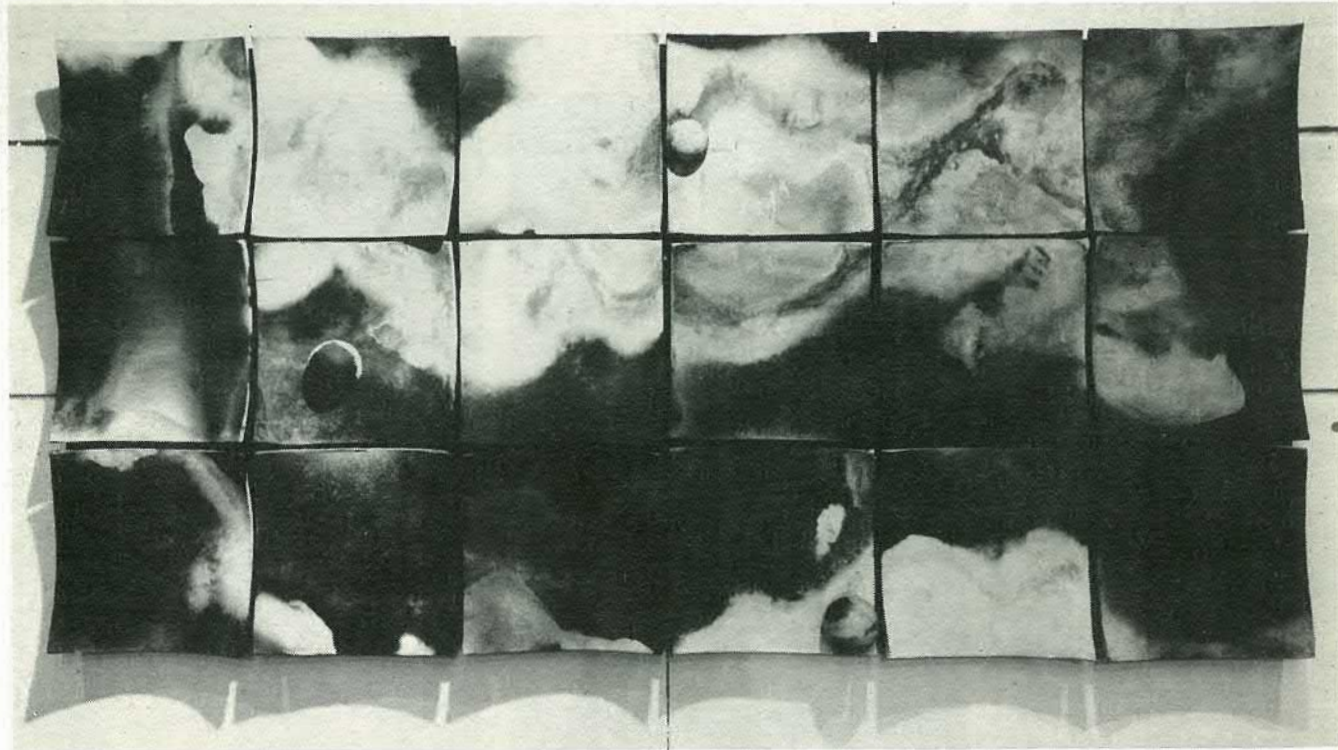
Setting the pit

Having gathered up plenty of sawdust, firewood (just about anything will do so long as it isn't painted or plastic coated), and some corrugated iron sheets, the pit can be dug. The amount of earth removed is considerable as I discovered when digging my first one by hand. Now a back hoe is an essential tool. Dimensions of the trench are approximately 4 to 5 metres long, 1.5 metres wide and 1.5 metres deep. Sawdust is placed on the bottom to a depth of around 20 cm and the pit is lined with boards to prevent soil falling in whilst stacking.

The pots can be sprayed with small quantities of oxides to help encourage some colours. Salt is cast at random. Placement of the pots calls for some care and depends on the effects required—some pots are stacked on top of others. Where they are lying on sawdust they take up carbon and smoke reduction. To help improve colour movement on the surfaces, oxides are sprinkled with some intentions in mind. When iron oxides are used the addition of salt gives some orange shades. Copper Carbonate mi-



Photos: Ces Thomas

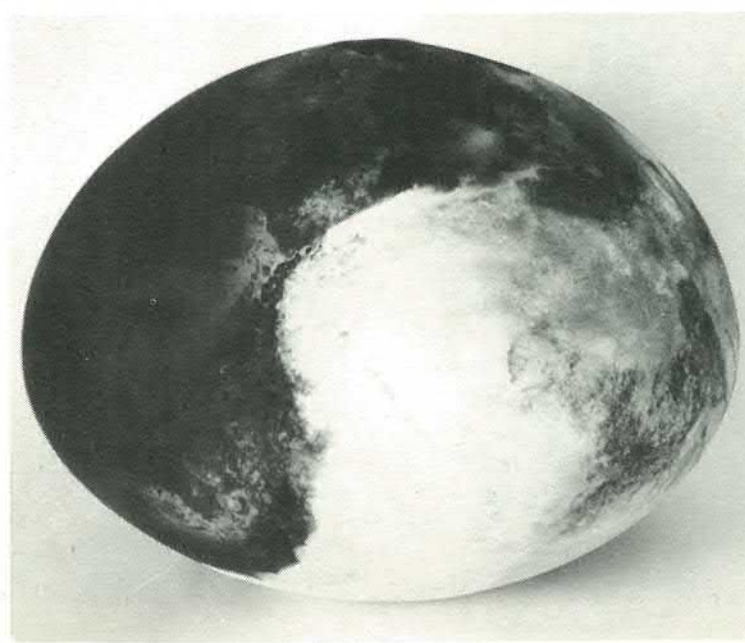


grates and fumes to give some reds, pinks and soft pastel colours. Different clays react according to their iron content so the results vary. Cobalt is predictably blue, and chrome green.

Dry firewood is stacked directly onto the pots to a depth of around 0.5 to 1 metre. Corrugated sheets placed on top enclose the pit and give some measure of control over the fire. Restoking is usually necessary when care must be taken to avoid damaging the pots, particularly if they have become exposed. Firing takes between 4 to 5 hours then the pit is closed up using the corrugated iron sheets, and left until cool enough to remove the pots about 24 hours later. My losses through cracking are now around 20% but I find this failure rate acceptable.

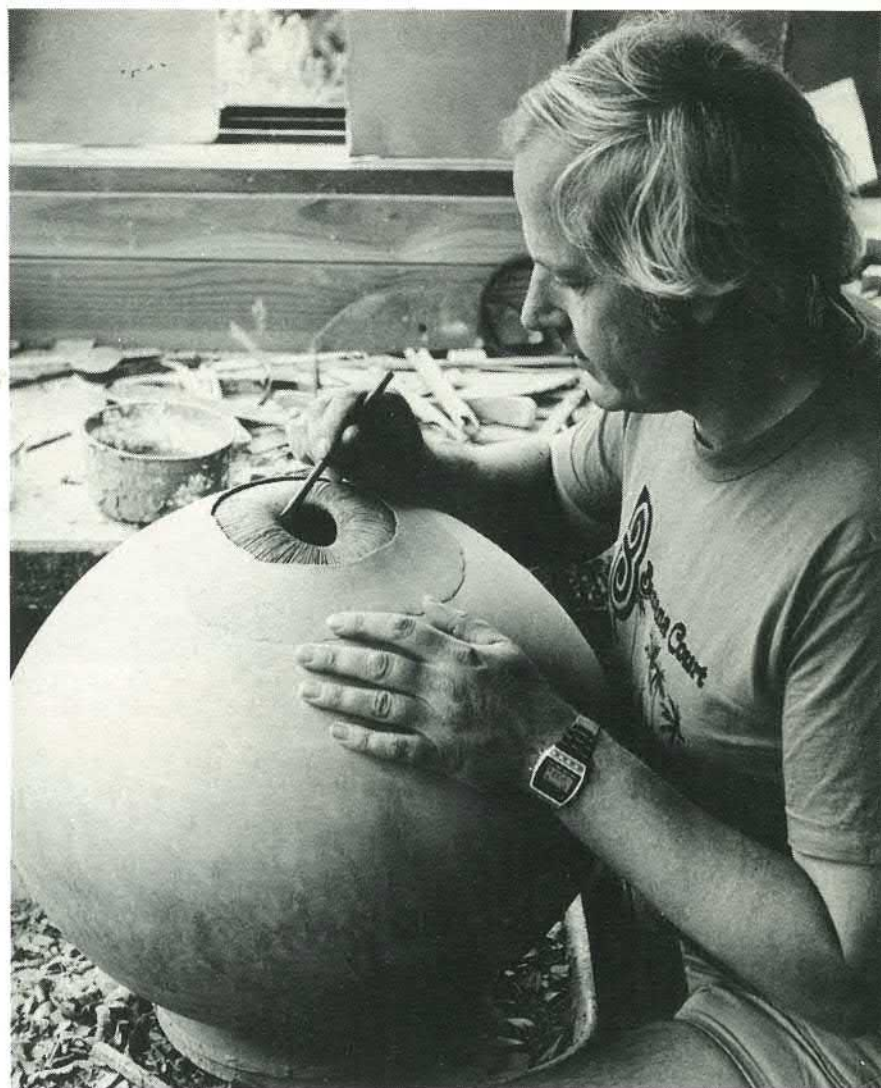
Sometimes I return to stoneware to keep my hand in at glazing, but pit fired non functional pottery continues to absorb most of my energies. I don't know for how long. There is more to explore yet and specialising in this area feels fine. I will continue using organic forms like coral and fungi as basic ideas or maybe try to move clay more freely. I'm also using the pit firing method for tiles. Some large scale pieces are being used by architects.

A few months ago I was in Australia working in Derek Smith's workshop in Sydney for an exhibition at Blackfriars Gallery in Glebe. The clay used was a raku body which I'd been assured could take anything I could give it, but I later discovered that it could not withstand pit firing in large forms. Firing was done at the property of Frederick Chapeaux and I couldn't have managed without the help of Frederick and friends. It was a challenging experience with reasonable results in spite of problems encountered.



Galactic looking forms varying in tones from smokey black, pastel pinks to cream with seams and patches of orange red or green where oxides have taken effect. The photographs show the pit being stacked and Ray working on "Fungoid Form" which won for him this year's Fletcher Brownbuilt Pottery Award.

Photos: Ces Thomas



KILNS

A kiln for pioneers—make your own bricks

Jan Kiesel

An ex-patriate New Zealander, Jan Kiesel has been in correspondence with The Potter over the past 18 months. She sent us this article on her kiln building experience in the hope that other potters in isolated situations in New Zealand or elsewhere might be encouraged by her achievements. Her interesting correspondence follows this article.

After spending approximately two years firing earthenware in a tiny electric kiln I wanted a change and a challenge. But, living in Kaduna Nigeria and being unable to simply buy refractory bricks, ceramic fibre or other parts necessary to build kilns according to designs given in ceramic publications, I was beginning to think that for an amateur, and despite Cardew's descriptive 'Pioneer Pottery' the whole process of kiln building here was too daunting.

However, before completely giving up on the idea of building my own kiln, I visited Michael O'Brien of Amadu Bello University, Ceramics Department, Zaria with my problem—to build a simple, inexpensive kiln which would reach stoneware temperature. His answer to the problem was to be a small but efficient wood-fired kiln, to be made completely of local materials. The kiln was to be built with unfired bricks and I understood that this first kiln would possibly be a temporary kiln, being used to fire more bricks, which in turn would be used in the re-construction of the permanent kiln. Because of the amount of contraction that would take place with these unfired bricks, the risk of the kiln partially or completely collapsing during firing would be great, despite allowances made for this contraction in Michael O'Brien's design.

I hope that this design and description of the kiln building will be of help to others who may find themselves in the position of being able to acquire raw materials, but unable to use imported or factory finished equipment in their kiln construction.

The first task was making some 2000 refractory bricks by hand. With the arrival of 30 sacks of kaolin from Kankara at my house late September 1981, the brickmaking project began—mixing 50/50 kaolin and sawdust together in a not-too-sloppy-mixture and pressing it into a mould of

three bricks—3" x 6" x 2". These were made on the concrete garage floor and left to sun dry. The process took quite some time—approximately four months, and it was not until mid-January when I visited Michael O'Brien again, that the date for the kiln building was set for 6th and 7th February and a list of things to get ready was given.

The kiln was to be encased in a thick 'skin' of laterite built up in the traditional Hausa fashion of laterite/straw cores bound by a slop mixture of the same. We would need about three thousand of these as the skin was to be three cores thick. For this I acquired the services of a traditional house-builder Malam Tanko Gari. He and his labourers, taking both the laterite and the straw from our compound, completed these cores (tubuli) in about a week, each core being about the size of two fists placed on top of each other.

Four rods of 1" reinforcing iron 2ft long and welded together for thickness were donated by a friend in the construction business. These were to form the supports for the wood in the fire-box, but in fact were, in the modifications later done to the kiln, discarded.

By the first weekend in February I was ready with sheets of plastic, an army of buckets and a level, to begin building. Michael O'Brien and four interested students came from Zaria to supervise and help in construction.

I had built a foundation of laterite 18" high, 6ft by 6ft. Directly in front of this, facing the prevailing wind, we started building the two arched tunnels to lead from the fire-box through to the kiln chamber. The arches were formed by packing firm damp laterite into an arch form on a wooden plank, building the arch around it and then gently easing out plank and laterite. For these arches we used bricks with considerably less sawdust in them than the 50/50 mix (I had made 200 of these) to reduce the amount of contraction that would take place at these vital points and so reduce, perhaps, the risk of collapse. Bricks were mortared together with the kaolin sawdust mix, of which we tried to use as little as possible so as to facilitate re-use of the bricks when building the final kiln.

The progress was slow at this stage as I had failed to level out the ground in front of the foundation and it would have been a lot easier to keep the walls

level if I had done so. The tunnels led to a bag wall of refractory bricks the height of the foundation. These bricks were not mortared together.

We then started building up the three walls of the kiln chamber, which went ahead quite quickly. We had to check repeatedly that the walls were reasonably level as irregularities in the hand-made bricks always made this a little difficult. From the back wall of the kiln were 3 flues leading to the chimney.

As the kiln walls were going up, Malam Tanko and his labourers were busy putting up the outside shell of laterite. This provided support for the structure and was added insulation. It was later also to prove to be quite refractory. The laterite was separated by sheets of plastic from the kaolin bricks, once again in order to facilitate the re-use of these bricks which would have been hindered if too much laterite had fused to them.

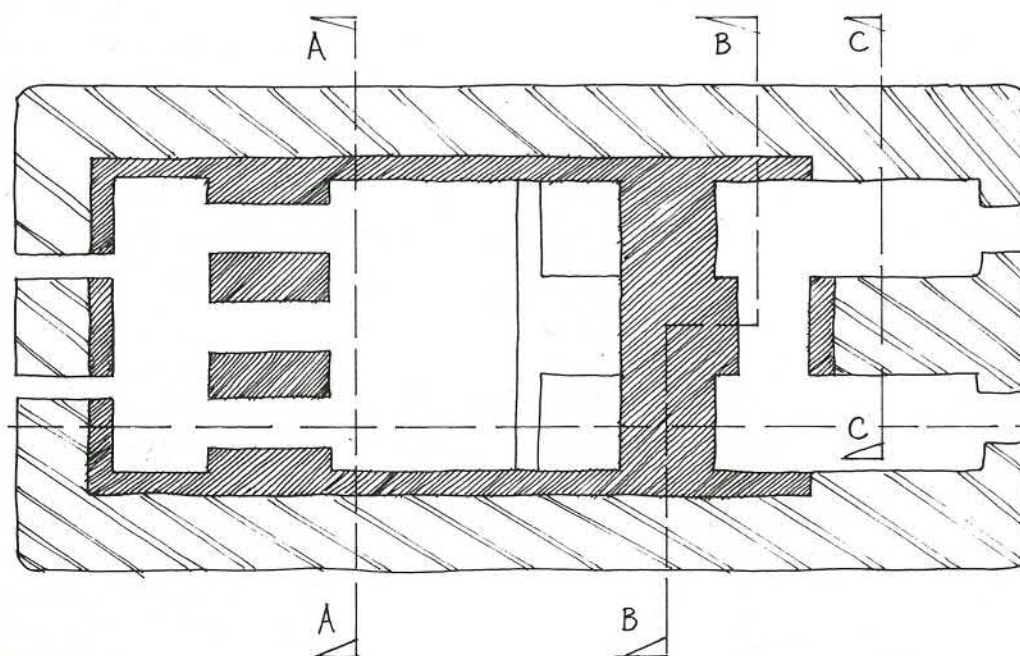
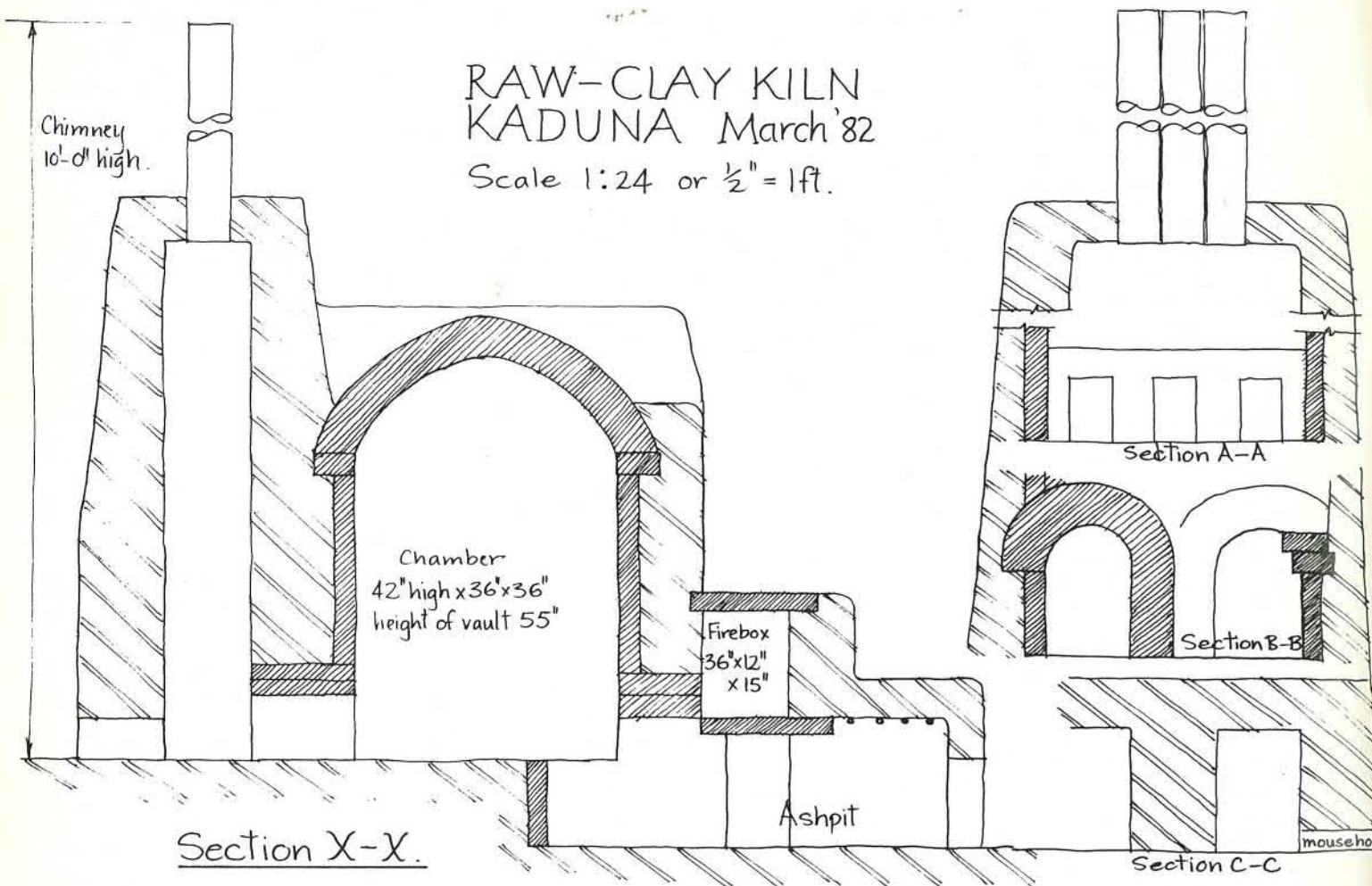
Malam Tanko was also responsible for the building of the fire-box with the four iron rods across it forming a grate, and the ash fire-pit extension with its domed roof, into which we would be able to rake the ashes. This would allow air to pass over them and unite with the air from the fire-box itself.

The main arch was completed the next day. The construction of this was probably a little less than exact, due to the irregularity of the bricks themselves. I had not made any wedge bricks and so we built up the arch by sloping the bricks on the mortar, which was packed up higher at the outside.

The remaining construction was to be mainly Malam Tanko's. Over the next week he and I were to complete the chimney. We wired together three sets of eight powered-milk tins (donated by interested friends) to form three long pipes; bound these together and set them into the approximately six foot high laterite portion of the chimney. They rested on a couple of reinforcing rods set into the laterite and were also bound to two pieces of angle iron which protruded out of the laterite. Two bleed holes were allowed for at the base of this laterite chimney, and further up, at about 'eye' height, were yet two more bleed holes made by inserting two milk tins with their bases cut out but with lids left in place so that we could open and close them at will

RAW-CLAY KILN KADUNA March '82

Scale 1:24 or $\frac{1}{2}$ " = 1ft.



A draught wood
fired kiln 1300°C

Refractory bricks
Traditional Hausa
mud bricks
Chimney milk tins
Design: MDS O'Brien

A X

during firing. We bound a metal strip around the outside of the kiln chamber just under the commencement of the arch, as support. This was set in the laterite. I coated the arch roof with a kaolin/sawdust mixture and the kiln was complete.

Since its completion the kiln has been fired twice, both times being packed with bricks which would be later used in reconstruction. The first firing was twenty hours and cones 7, 8, 9 did not melt as they had been placed amongst the bricks used in building up the door rather than in the kiln proper! However, on unpacking the kiln we could see that the majority of the bricks were medium to highly fired, suggesting temperatures of 1280—1300. There had been no collapse in the structure but we rebuilt the arch with

high-fired bricks. The under-fired bricks from the arch and door were put into the kiln to be refired. The fire-box was modified from one to two fire-boxes to give a more even firing on both sides and the iron-rod grate was discarded for a more conventional hob arrangement to place the wood on. Two mouse-holes were made on the sides of the ash-pit extension.

As in the first firing the kiln was slowly pre-heated overnight and the fire proper started in the ash-pit extension the next morning. By mid-day firing was from the fire-pit itself with a constant juggling of the air-flow from the ash-pit extension and the two side mouse-holes. This firing took 12 hours and it was just beautiful to see cones 7, 8, and 9 all lying flat at the end of it.

The project has been a success. For

me now remains some repairs to the side wall, the building of a level chamber floor and the making of kiln furniture.

There will be another firing to fire this kiln furniture and then I look forward to the challenge and excitement of a wood fired glaze firing. I have enough refractory bricks now to repair or even re-build the entire kiln but, since it has borne up to temperatures above 1300°C, I hope this will not be necessary for a while.

The kiln has been roofed with thatch and so stands protected from the rainy season and its storms. The chimney has been decorated with a traditional relief pattern and I find the whole structure of warm brown laterite extremely beautiful.

Letters from Africa

June

Dear Editor,

I often read NZ Potter in the hope of finding information relative to me in my isolated situation. Cardew was helpful but his brick making more complicated and his kiln too large. The whole point I feel of my project is that a kiln can be built of unfired, sundried bricks without collapsing—a step on from Cardew who pre-fired his bricks for the Abuja and Jos potteries. It was interesting to see in NZ

Potter, Autumn 82 the quotation by Fin-dhorn Garden "The bridge to heaven is built with bricks you make yourself" Having now made over 2000 I find "the nearer your destination the more you're slip-sliding away". (Simon and Garfunkel). I'm grateful for many back numbers of NZ Potter. I read and re-read them in an attempt to feel part of your extended family. That's one thing here—often feeling on your own. The little I know about pottery I learnt from Kofi, the Ghanaean pupil of Michael Cardew, who set up the Jos pottery (similar to, but less known

than the Abuja pottery). My ability to speak Hausa does bring me into reasonable contact with the craftsmen potters in Northern Nigeria and also with the famous and unspoilt Ladi Kwali. But these potters are unable to help me with the technical knowledge I require in learning to produce glazed stoneware. Michael O'Brien has all this knowledge but has so little time. I am grateful for the amount of time he has donated to my project already."

continued on page 12

New Zealand Ceramics Now, Suter Art Gallery, Nelson

photos: Lynne Griffith



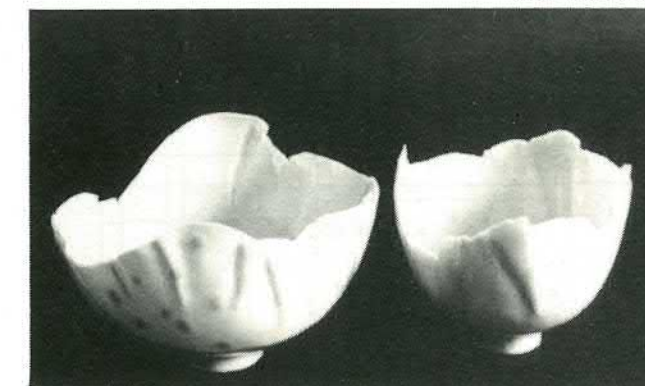
Penny Walker



Gail Weissberg



Scott Hockenull

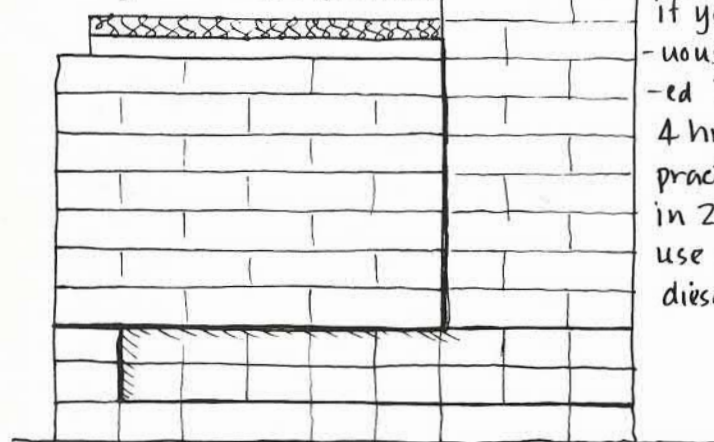


Barbara Hockenull

QUICK FIRE SALT KILN.

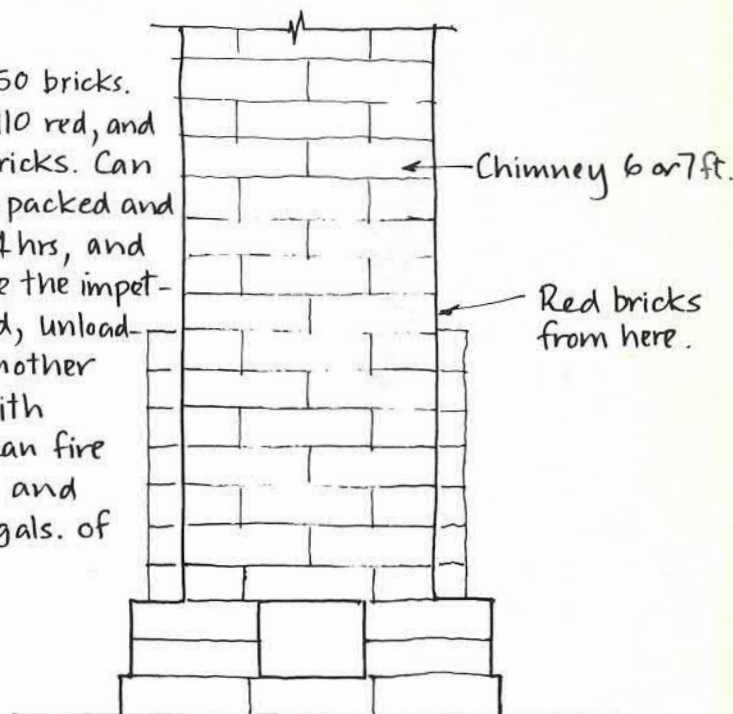
Continued from last issue.

Contributed by Madeleine Findley, The Oaks, 1RD Darfield. Madeleine and 2 Darfield potters had pots from this kiln, accepted for salt glaze exhibition, Koblenz.

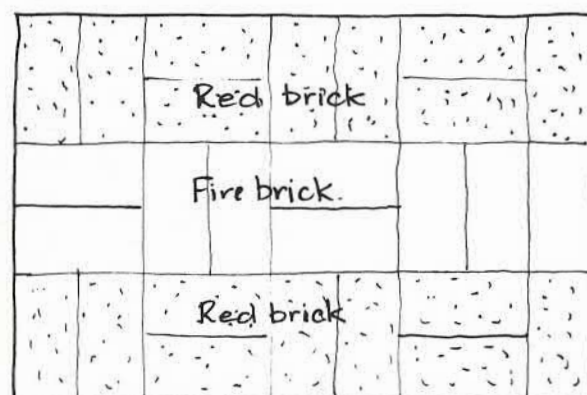


Side elevation

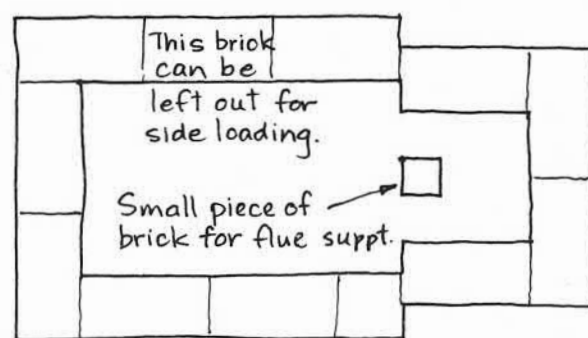
Need 250 bricks. Could be 110 red, and 140 fire bricks. Can be built, packed and fired in 4 hrs, and if you are the impetuous kind, unloaded in another 4 hrs. With practise can fire in 2 hrs. and use 2-3 gals. of diesel.



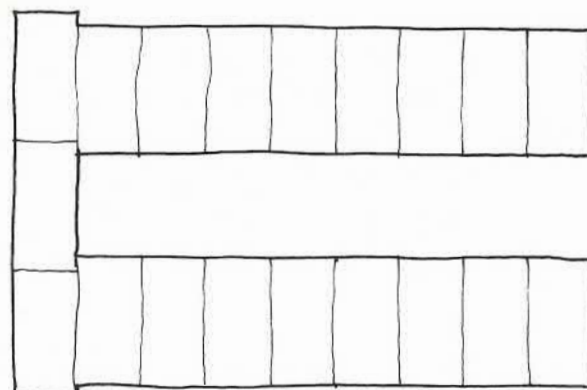
End elevation.



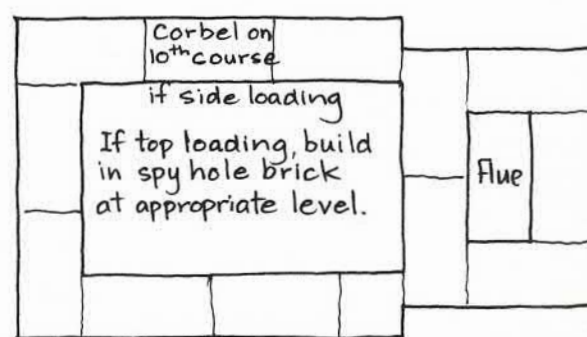
1ST Course



5TH and 6TH



2ND and 3RD

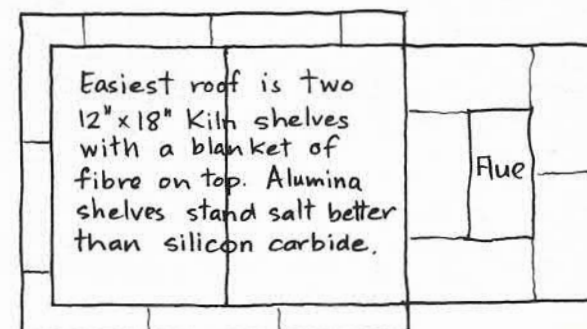


7TH to 10TH



4TH

Coat shelves well with high alumina wash, and put clay bats, alumina dipped, under pots.

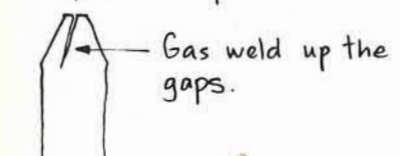


JET BURNER - How to build one, plus vague theories on why it works.

USE: Car/truck exhaust pipe 450-600mm long, 35-50 dia. Copper pipe, new or old, 300-500 mm long, 3-5mm inside dia. TOOLS: Hacksaw, hammer, long bolt, vice, drill, oxy-acetylene gas welding outfit, screw driver. MATERIALS: 2 pot resin glue/filler, 3 bolts or self tappers.

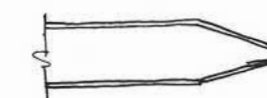
CONSTRUCTION:

Cut four long V's out of one end. (two at a time) Using the bolt in the vice as an anvil, bend and shape the end.



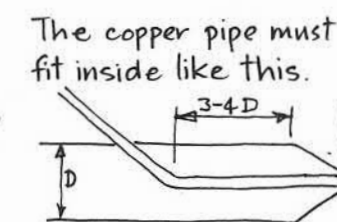
The end must be perfectly circular. The judicious insertion (hammer it) of a

tapered round thing will achieve this. File the end, square to the length of the tube. You now have a cross section like this,



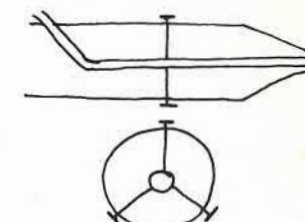
First vague theory. The little hole should be $\frac{1}{3}$ - $\frac{1}{4}$ tube diameter. The air must be severely constricted to achieve the increase in velocity needed to atomise the fuel well. Straighten the copper and hammer one end in to close it symmetrically.

File the end square. Drill it out $\frac{1}{2}$ to 1mm.



The straight piece before the tip should be about 3-4 tube diameters long.

Second vague theory. Burners have to be air-flow shaped to work well. So, nice shapes, symmetry and time for the flow to settle down after being disturbed, are needed. A slopingly drilled hole in the side will let the carefully bent copper pipe through. Centre the pipe with three screws or bolts. Fill round the side hole with epoxy.

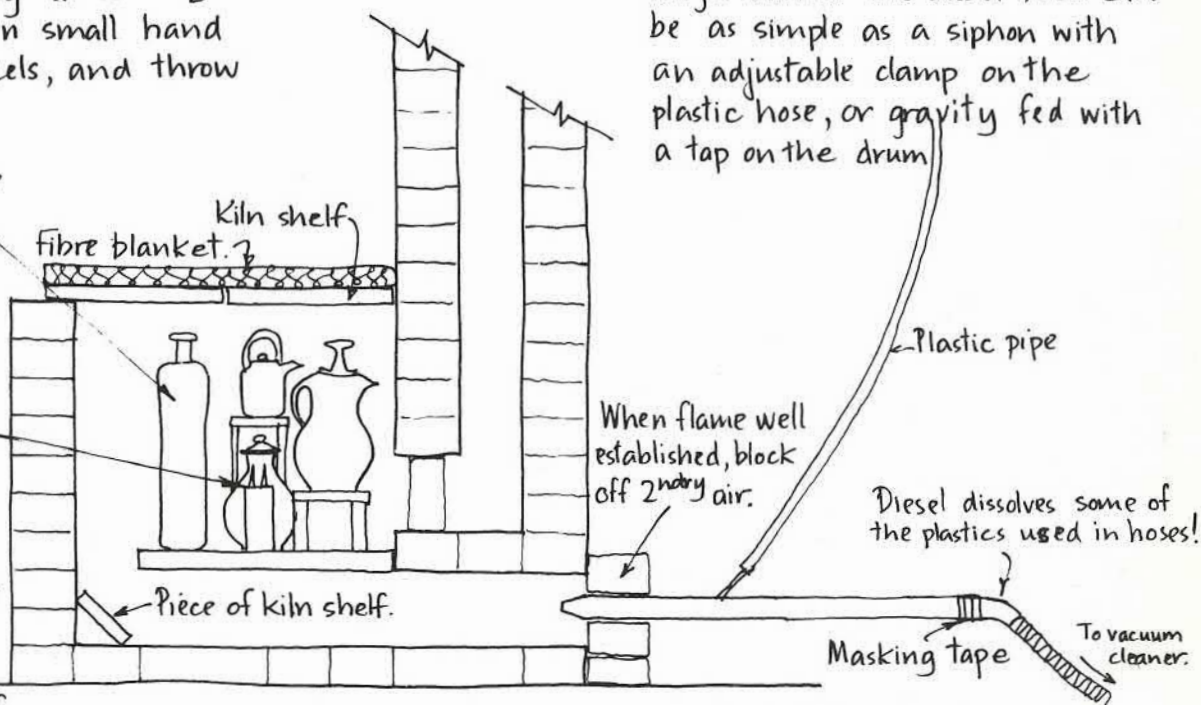


You are now the proud owner of a Mk.1 jet burner (you improve with practice). You will need a strong air supply at the big end. A good vacuum cleaner (a British Vacuum Cleaner Model I is what we use) will do. Paddle wheel blowers have not got enough head. You must have a very high back pressure. If symmetry and internal air flow is good the burner will throw an atomised cone of fuel 450-600mm before it explodes in the fire box. The burner keeps cool.

Salting can start at cone 8 or 9, depending on your clay's maturing point. For the first firing at least $\frac{1}{2}$ a 2L bucket. Wrap in small hand grenade size parcels, and throw into fire box.

Pre bisqued pots because of fast speed to cone 9.

Have 2 or 3 test rings at spy hole level. They can be hooked out with No. 8 wire hook. Start fire on wood for at least $\frac{1}{2}$ hr. Turn on diesel and continue to feed occasional wood until diesel self ignites on back piece of shelf.



Because of the venturi effect of the jet burner the diesel feed can be as simple as a siphon with an adjustable clamp on the plastic hose, or gravity fed with a tap on the drum.

When flame well established, block off 2nd air.

Diesel dissolves some of the plastics used in hoses!

Reconstruction of an old kiln with fibre

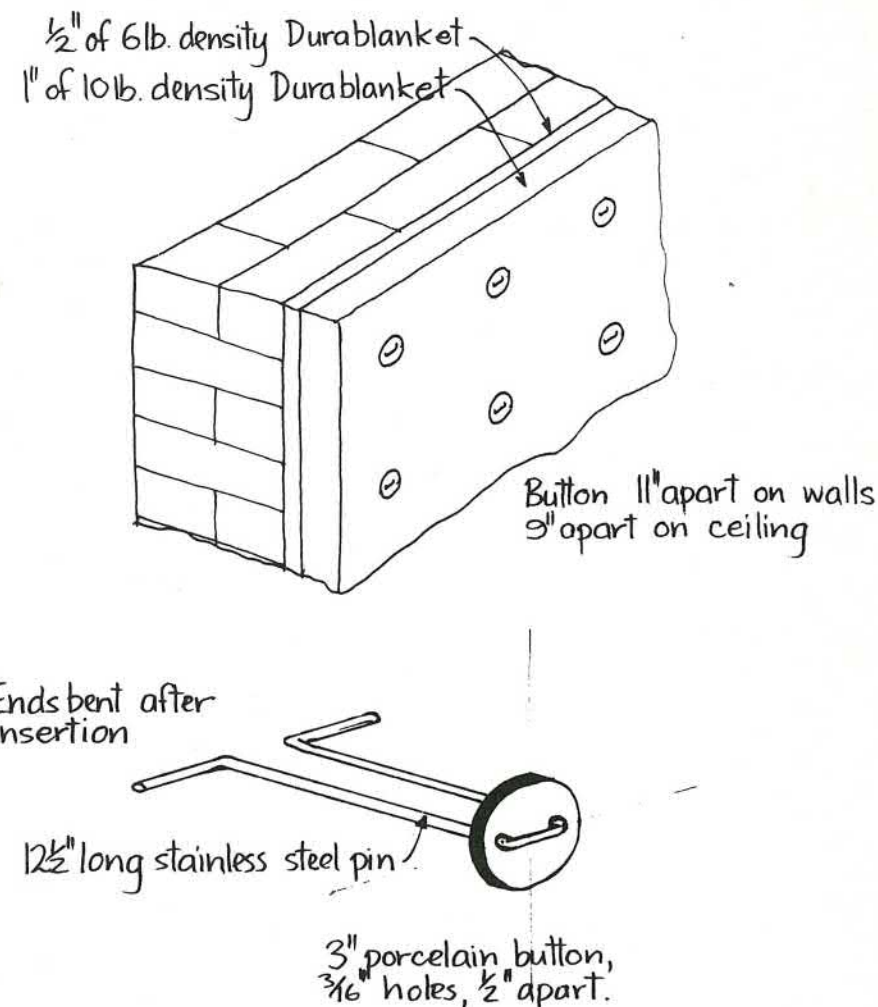
Elizabeth Woodfield, Hamilton

Recently I rebuilt the glost chamber of my kiln to more than double its capacity. It was 25 cubic foot and used approximately 20 gallons of diesel to cone 10. Now at 60 cubic feet it uses 20 gallons firing in about ten hours. Any shorter firing time shows a temperature gradient top to bottom that is too great.

The kiln is built of brick and lined with ceramic fibre. Installation of the fibre was agreeably easy. The fibre was pinned to the brickwork by means of stainless steel pins which are threaded through ceramic buttons, the ceramic fibre and through the brick wall, then are bent back securing all. See diagram.

After carefully measuring up and marking where the fibre blanket is to be anchored, drill through the brick joints with a DB (double brick) masonry drill bit which fits on an ordinary $\frac{1}{2}$ " chuck electric drill. In some places I had to drill through 9" of brick. This was not difficult, but at very regular intervals I withdrew the drill and dipped the bit into soluble cutting oil to cool. Stainless steel $\frac{1}{8}$ " type 304 rod was cut into 26 2" lengths and bent into hairpins. To make the pins, drill $\frac{1}{8}$ " holes with centres $\frac{1}{2}$ " apart in a piece of hardboard and using vice grips bend till the legs of the pins can just pass through the holes with no pressure. The pins cannot be forced through the ceramic buttons as the buttons would break. The buttons were porcelain clay 3" diameter, the holes being $\frac{3}{16}$ " to allow for shrinkage, the centres being $\frac{1}{2}$ " apart. Next time round though I'll use ceramic element casings as they give more support at 10" in length.

To put it all together, a friend inserted a wire from the outside of the kiln, through the drilled hole, impaling the fibre blanket which I pressed against the brick wall and the protruding pin ends were bent back on the



outside of the kiln. The door is steel, lined with fibre attached in the same manner.

The exposed bit of the pins inside the kiln must be protected from the flame and direct heat, so buttons of fibre were glued in place with sodium silicate. Some of these protectors have come off where I've knocked them so I have made repairs by applying fire-cement over the exposed wire and

stuck scraps of fibre over them.

I still get small carbon buildups directly above some of the four burners. As these cannot be chipped away from the fibre without damaging some of the blanket, it is best to remove the carbon as you observe its growth then the precious fibre is not damaged.

Although ceramic fibre is expensive, the fuel savings well and truly justify it.

difficult project so Kofi has kindly agreed to make a set of saggers for me. Kofi stayed with me for a week giving me more throwing lessons and boosting my confidence. I'll write after Christmas with facts about the firing but feel sure it will be o.k. The second brick firing did get up to 1320°C in 12 hours.

March

Dear Margaret,

Here as promised are the results of my first glaze firing ie the third cone 9+ firing in this kiln. Cone 9 was reached and laid

flat within 12 hours. The firing began at 6.15 am and was finished with its final stoke at 4.25 pm. I was using Kofi's (ie Cardews) V2 glaze and AA glaze (mentioned in Pioneer Pottery) and two Tenmoku glazes and two ash glaze tests of my own. All reached maturity—the best being the AA glaze over red slip and Kofi's Tenmoku—ie V2 with iron shavings. V2 alone was very milky and dull as were my own tests. The kiln shows no sign of strain and I'm planning my next firing.

Jan Kiesel
PO Box 153 TIG Dornier
Kaduna, Nigeria

continued from page 9

November

Dear Margaret,

Thank you for your letter telling me you are interested in my article. The saga of the kiln goes on—fighting the white ants (eating the laterite shell) rainy season (swamping it and filling it with frogs) high winds (bringing the thatched roof to the ground) and so on and so on. However now that the rains have finally stopped I've ordered a mammy lorry full of wood for a glaze firing. I have tried to make kiln shelves and found it a really

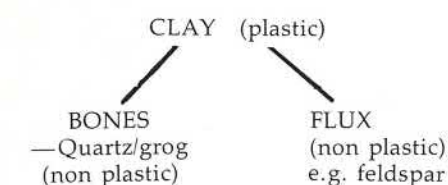
CLAY

How we find it, make it and fire it.

John Carlson

A geologist whose M.Sc thesis was on clay mineralogy, John Carlson is manager of Winstone's Clay Division.

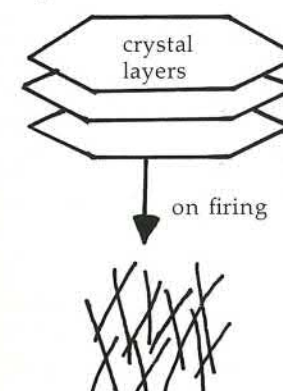
CLAY BODIES Pottery clay bodies are not just a bagged up lump of mud, but a complex mineral assemblage that is very sensitive to even slight changes in physical environment. They are essentially a 3 component mix.



The quartz skeleton maintains a rigid body on throwing and controls the firing shrinkage of the clay. Free quartz is also essential to glaze fit.

The clay provides the strong muscle to the body, allowing flexibility in working, but also giving high green strength. Neither pure china clay nor quartz will melt till over 1500°C so a flux is necessary to lower the fusion temperature to the potters range.

CLAY MINERALOGY There are four main clay types important to pottery. (i) **Kaolinite** $Al_2O_3 \cdot 2SiO_2 \cdot 2H_2O$ generally found as hexagonal crystal sheets that slide over one another giving plasticity.



Mullite scales and needles of high fired strength for stoneware pottery (ii) **Halloysite** $Al_2O_3 \cdot 2SiO_2 \cdot 4H_2O$ occurs as tubes, thus reducing plasticity. The higher water content can cause problems with shrinkage and crack-



ing, but otherwise it fires the same as Kaolinite converting to strong Mullite.

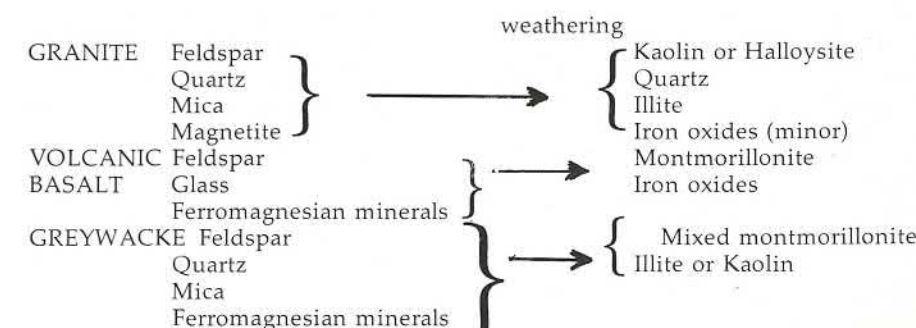
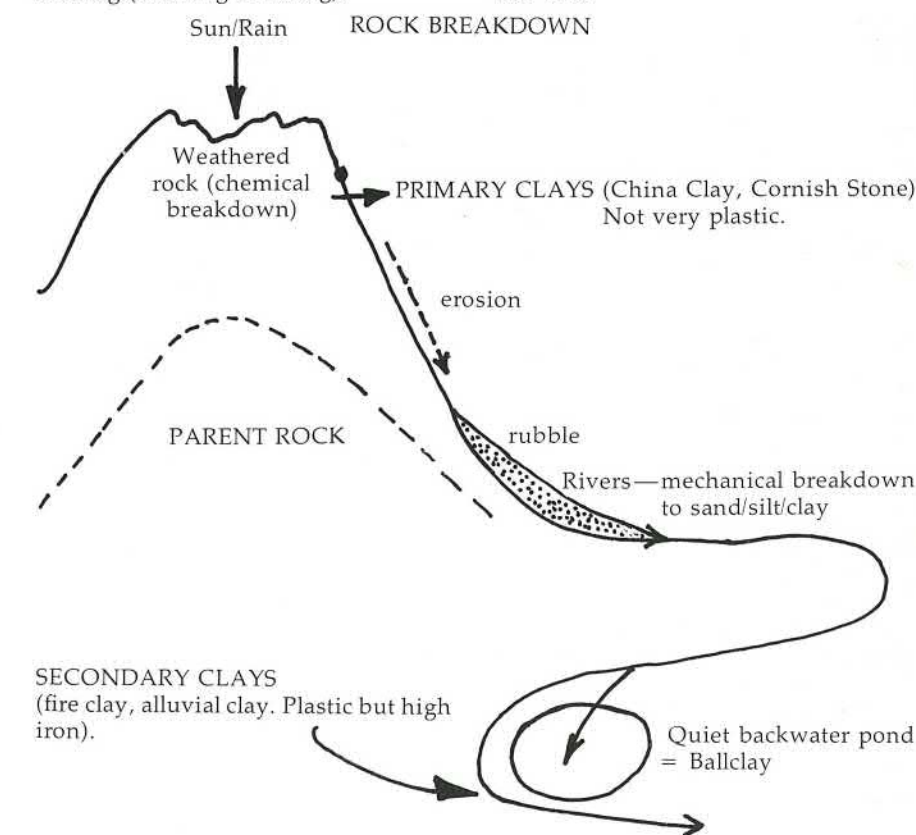
(iii) **Montmorillonite** Also occurs as crystal sheets, but with a very high interlayer water content that can cause crystals to swell up to 16 times their original volume. Although very plastic for pottery, too much montmorillonite leads to drying and cracking problems and high shrinkage on firing as the water is driven out.

Another problem is that on firing it tends to form siliceous glass rather than Mullite. This gives brittle stoneware with high shrinkage on cooling that can cause peeling of glazes and dunting (cracking on firing).

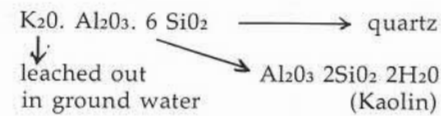
(iv) **Illite (mica)** A bit like montmorillonite, this clay has some excess water that can cause cracking. However, it is rich in potassium and forms an excellent auxiliary flux if used in small amounts.

From the above we conclude that quality Kaolin is preferable as an essential base to good throwing clay bodies, giving adequate plasticity yet high fired strength.

GEOLOGY OF CLAY All clays are essentially broken down rocks. Therefore the original rock type has a profound influence on clay minerals formed. The breakdown process (e.g. weathering) then also alters this and determines clay size. The process looks like this:



Primary Clays Kaolin derived from in situ alteration, if white, is called "china clay". The important change is from feldspar



If the alteration is not complete the resultant mixture of feldspar and Kaolin and quartz is called "cornish stone" and is excellent in pottery as a self-fluxing ceramic. During the acid leaching iron is often removed and the Kaolin is pure and well crystallised. These crystals are often large and need

additions of fine secondary clays to obtain the plasticity necessary for pottery.

Nelson district is particularly well endowed with china clays and cornish stone derived from weathering of the widespread occurrences of granite. Other primary deposits exist in Westland (weathered schist), Northland (altered rhyolite-halloysite type) and Coromandel.

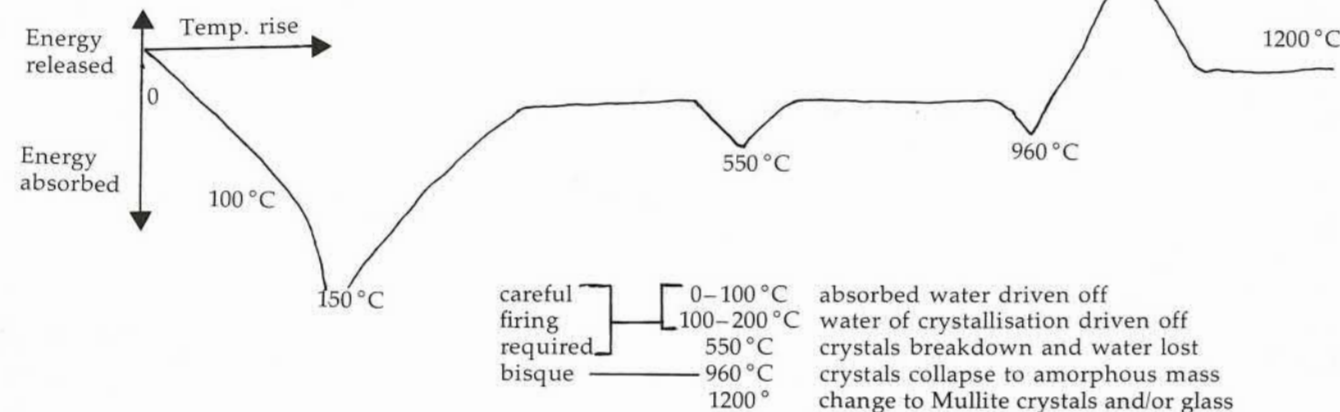
Secondary Clays These are the "fireclays" and "ballclays" essentially deposited from rivers washing them out from the primary clay alteration zone. In transport the clay crystals are knocked about and reduced in size. Ballclays produced from this are ex-

tremely plastic, but can only be used in smaller amounts due to their high shrinkage in firing.

A further problem is that in breaking, the clay gets unbalanced atomic charges left on the crystal edges that attract other impurities, especially iron. Natural ballclays often therefore fire buff or brown in colour.

Fireclay just describes any clay capable of being fired to a high temperature but traditionally such clay is usually associated with coal measures.

Blending of fireclay, ballclay, and/or china clay is usually necessary to balance the plasticity of the throwing body against shrinkage and to ensure a uniform distribution of particle size.



Fireclays are common in New Zealand, e.g. Huntly, Nelson, West Coast, but the very plastic ballclays are not so. Hyde ballclay occurs in Otago and small deposits are used from Westland and Nelson.

THROWING PROPERTIES Plasticity or workability is the ease with which clay can be worked on the wheel. Plasticity comes from the minute clay crystals that slide over one another when lubricated by a film of water and is best developed with flat plates, e.g. Kaolinite.

However, if the body were all fine plastic clay, it would be weak in throwing (no bones) would split and having high moisture, would give high shrinkage and a tendency to crack on drying.

If the body is propped up with coarser particles they must be carefully graded to ensure dense packing with a minimum of air gaps. Air in these gaps must also be extracted with a high vacuum pugmill. Potters repugging prepared clay should also ensure that their pugmills pull at least 27 inches of mercury vacuum.

Too much silt causes "flabby" clay likely to "squat" on throwing.

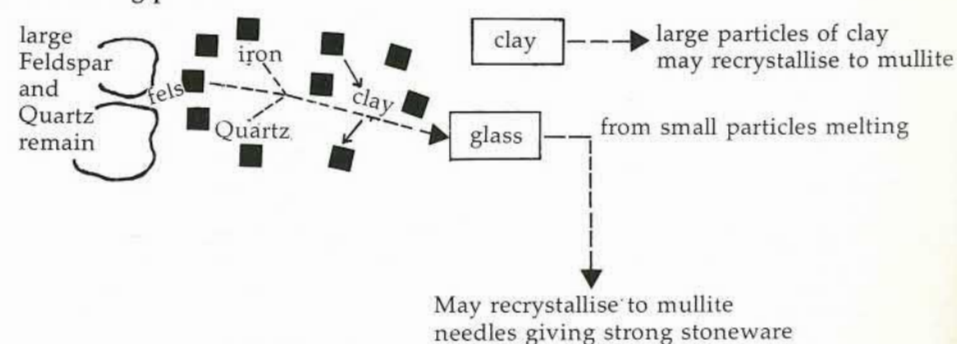
FIRING Above is an idealised thermal analysis curve for Kaolinite

Normal pottery practice is to bisque fire to about 960°C giving maximum strength of the resultant pot whilst retaining sufficient porosity for glaze absorption. Different temperatures will give different porosity and the potters themselves will determine this to some degree.

Bisque firing should preferably be in oxidising conditions to ensure burn out of any carbon in the clay that could otherwise be trapped to later bubble out through a glaze. Also, formation of oxidised (ferric) iron in the clay bodies diminishes bloating and bleeding of iron compounds during later glaze firing.

When the body matures or vitrifies it welds (not melts) together with glass. The nature of this glass is most important.

The maturing process



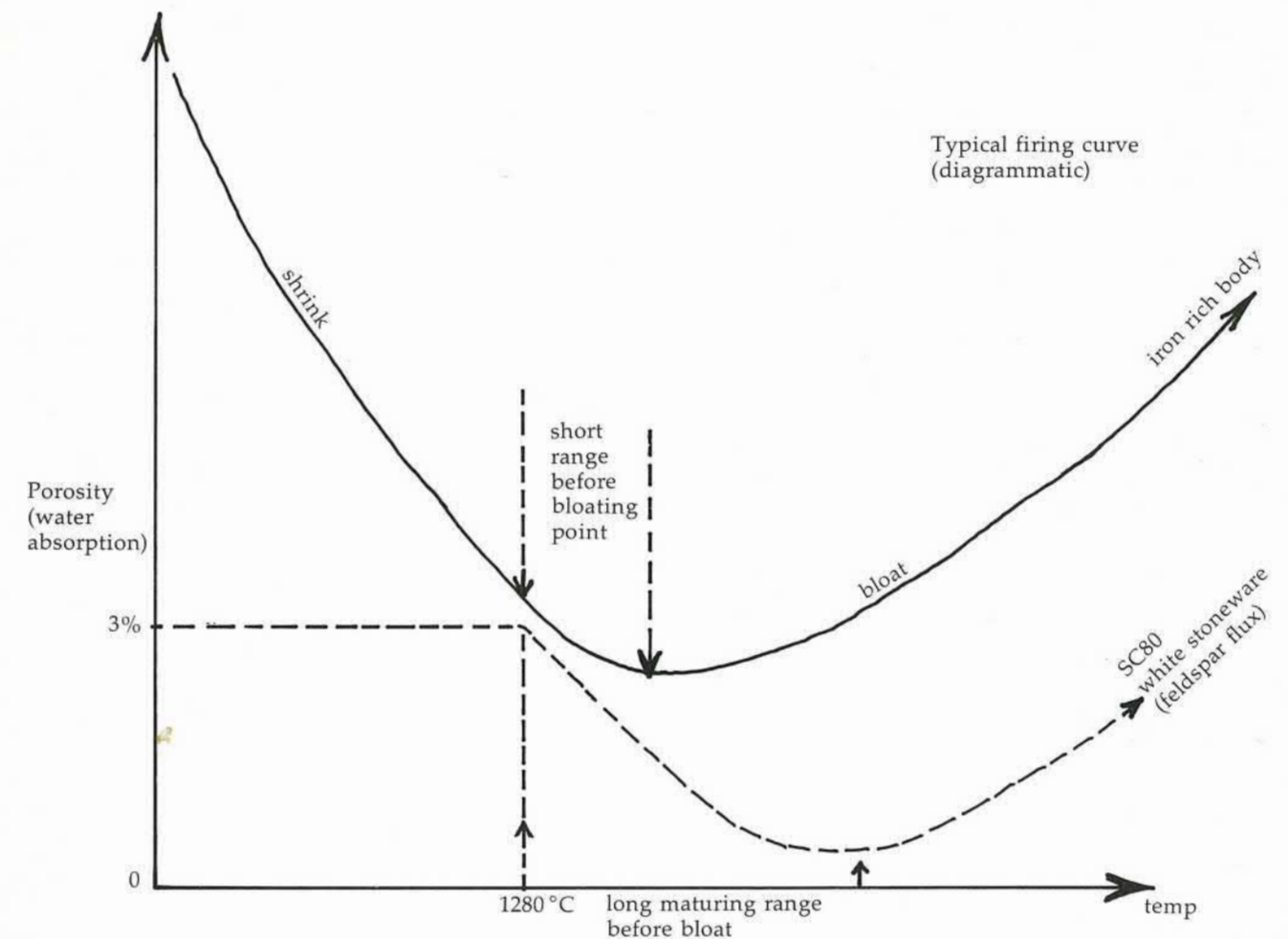
The large feldspar and quartz generally remain to maintain the pot framework without it running into glass globs. This point of minimum

porosity (stoneware) is at a delicate balance.

Excess silica from Montmorillonite, illite and quartz silt inhibits mullite

and may promote cristobalite in the glass. Sudden shrinkage of 3% at 200-250°C can then yield dunting cracks. This demands high Kaolin in the body.

Specifications



Potters will be aware that most Winstone clay brochures specify 2-3% water absorption at say cone 9 reduction as a maturing point. Maturing does not mean fully vitrified. Maturity is normally 1/2-3% water absorption at which point the clay has become "stonelike". It is not a guarantee against leakage. Thus cone 10 for GB2 is really a minimum, although perfectly adequate, maturity. To rely on sealing pots, higher temperatures are necessary, but this is entirely at the potter's discretion. High firing iron clays such as RMK II and GB2 must be checked under the potter's own conditions since in some cases completely vitreous clay is never achieved as vitrification is preceded by bloating due to iron melt. It is much safer to fire to 3% w.a. at cone 10 and seal off the pot inside with a glossy well fitting glaze. Alternatively white stonewares can be used where water absorptions

can safely be reduced by 1/2-0%.

Cones "Clay" is a mixture of quartz clay and flux. Cones are made very similarly. When the cone matures the designed clay body matures and this is entirely a function of the work/heat done on it and is not reliant on a specific temperature. For instance 3% water absorption can be achieved at 1250° by soaking X-stoneware for some hours. Alternatively rapid firing can only get 3% w.a. at 1280°C or higher. The rate of temperature increase is important to any reliance on thermocouples and even then calibration of temperature against cones along with recording firing curves for each firing is essential to understanding what is happening to the clay. A typical "cone 9" firing is shown in the photograph. It does not mean the cone melted to an unrecognisable blob.

In conclusion remember that clay is sensitive. Furthermore, it also has a



"memory" and if stressed unevenly in throwing, it may warp or crack in firing. Clay demands respect, but with good handling it turns to a very creative medium.

HOOKED ON PORCELAIN

Hand building

David Brokenshire describes his method at a workshop in Wellington.

"There is the constant challenge of working with a difficult material that can create something incredibly beautiful. Frequently the result can be ugly—a disaster, but when it comes off it moves the heart and is worth the effort and strife.

The sea has always been part of my environment, Thornton's Bay, Thames Coast as a child and Clifton Hill Sumner in my working years as an architect and now as a potter. The influence of the sea is there I guess in some of the curving wavelike forms and impressionistic decoration in colour. I enjoy creating a small world held inside a bowl that requires looking into and reflection on, as one would look into a rock pool.

Translucent porcelain is particularly suitable for this kind of expression. At its best it has an air of incredible fragility and can sustain quiet delicacy of colour. The silky finish given by the reduction firing adds to the tactile appeal.

Although I have made up my own porcelain body, for preference I use

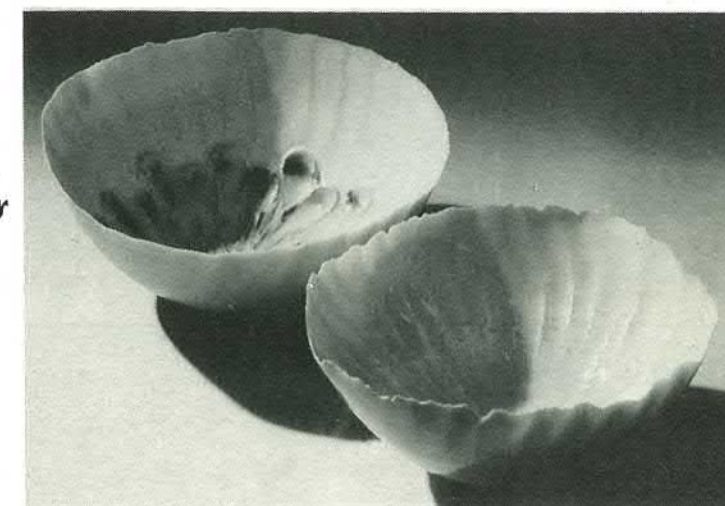
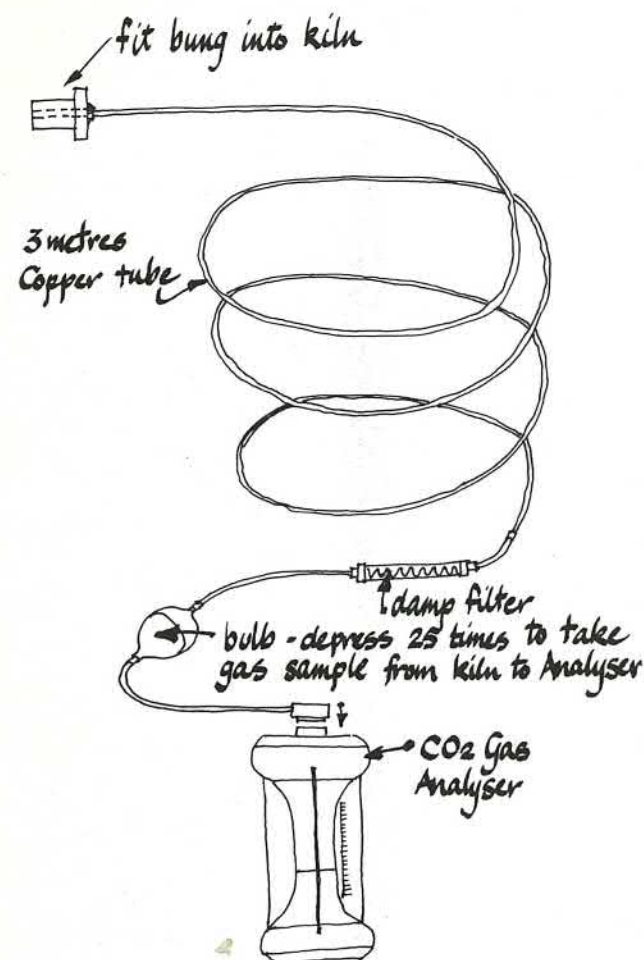
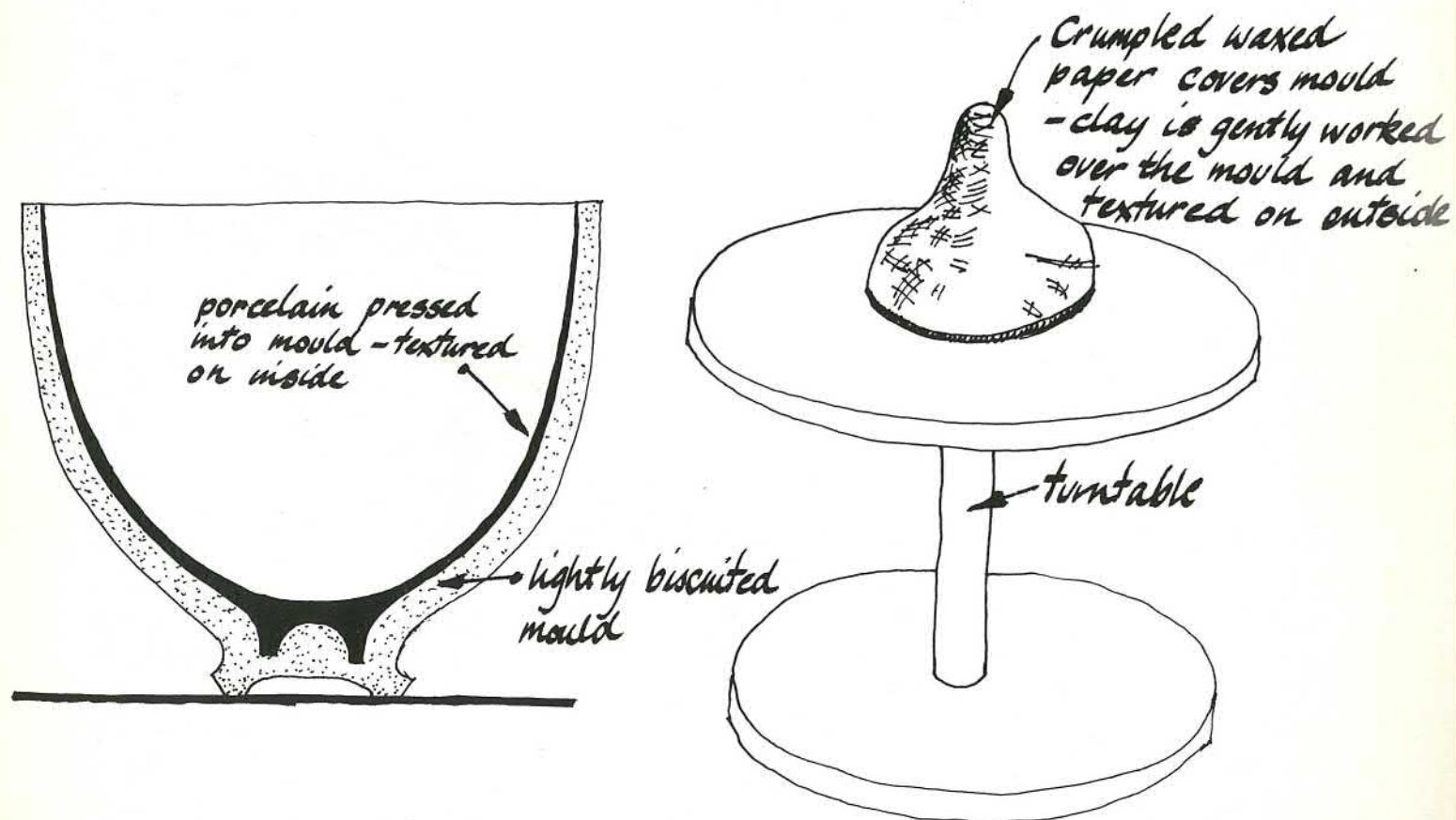
Podmore's David Leach body fired to cone 10 right down in an LPG fired ceramic fibre insulated down draught kiln. For my flower forms I have thrown many moulds in stoneware clay. I prefer the clay moulds to plaster ones which are susceptible to scratching or dropping pieces of plaster into the clay with shattering results later. The lightly biscuited moulds (to 800°C) can be used about 50 times if you are lucky, so that all the pieces from the mould can be seen as one of a limited edition rather like prints. I note on the bottom of each mould the amount of clay required and I weigh out that amount each time—it ranges from 50 gm-800 gm.

I have two approaches to forms using moulds depending on whether I want texture inside or outside on the piece. The moulds are cleaned with a plastic knife which does not wear or scratch the biscuited surface. For obtaining outside texture the interior mould is first wrapped in waxed greaseproof paper and placed up side down on the turntable. The clay is gently worked over the form and the wanted texture worked into the outside surface of the clay. I leave the

paper in place and this burns away in the biscuit firing.

The clay is left to harden for a short time then lifted free of the mould. For inside texture bowls the clay is worked directly into the mould sitting right way up on the turntable. The clay is gently worked up the inside of the mould progressively thinning out towards the top edge. The piece is left in the mould for about half an hour when it can be freed from the mould and set aside to dry. The texturing of the piece is done while the clay is still in the mould.

In firing I use a CO₂ gas analyser. LPG is an expensive fuel so I use the analyser both in the oxidation climb and particularly during the reduction period. The use of the CO₂ analyser is reported in NZ Potter Vols 22/1 and 22/2. One point only needs emphasising that the gas sample being measured needs to be at outside air temperature. I manage this by using 3 metres of copper tube attached to a bung which fits into the top spyhole at one end and onto the feed to the analyser at the other end. See the attached sketch.



Glaze colouring using soluble salts

David Brokenshire

I have been experimenting with soluble salts for colouring since George Kojis introduced me to them three years ago. I have used them extensively on fine porcelain.

If they are applied by brush to the bisque the colour soaks right through the piece and stains the glaze both inside and out. The colour effect is soft like watercolour applied to damp paper.

After the solutions have been applied the pieces must be completely dried before applying the glaze. The solutions can also be applied over the glaze which gives a more precise outline to the brush stroke.

So far iron sulphate, copper sulphate, (both obtainable from plant shops) and cobalt sulphate have been used.

The following proportions are offered as a start for experimenting.

2 gms cobalt sulphate dissolved in 100 ml of water gives a pale blue.

50 gms of iron sulphate dissolved in 100 ml of hot water in a reduction firing gives a green.

40 gms iron sulphate + 4 gms of cobalt sulphate dissolved in 100 ml of water gives a muted blue-green.

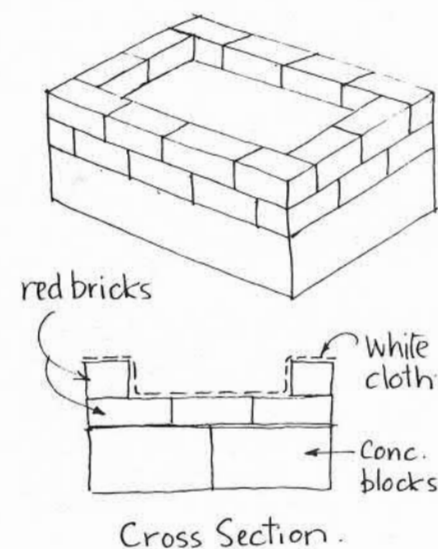


40 gms iron sulphate + 6 gms of cobalt sulphate dissolved in 100 ml of water gives a stronger blue.

10 gms copper sulphate dissolved in 100 ml of water in a reduction fire will give a red.

Vegetable food colouring dyes can be put in each solution eg cochineal or

red food grade colour can be put into the copper solution which shows you where you have applied the colour. These vegetable dyes burn out and leave no trace in the firing. The solutions can also be sprayed over the pieces before or after glazing which can give finely graded colour changes.



Recipe for porcelain

4.5 China clay—NZ Ultra Fine or English Croleg
2.5 quarts
2.5 Potash Feldspar
0.5 Bentonite—White English

Slake the china clay by scattering it into water with which there is a cup of vinegar for every 10 lbs of China clay. Use a mask. Dry mix the other 3 ingredients and seive through a 20 mesh seive. Sprinkle into water in a separate bucket to the China clay. Soak 24 hours. Using a 60 mesh seive, seive the Quartz, Feldspar and Bentonite and then seive the China clay into that. Drying: Don't use plaster as this decreases the plasticity of this clay. Recommended methods are either hanging it up in the cloth tied at the top like a pudding, or make a trough from the most porous red bricks you can

find. On the bricks put a white cloth. Slop in the clay and cover it with another cloth. When it is sufficiently dried out wedge and put into plastic, to age for six weeks.

Glaze recipes:

David Leach Cone 9 Jade Green, reduction

25 Cornish stone
25 China clay
25 Whiting
25 Quartz
2% Red Iron or 6%-8% Yellow Ochre

Waxy White Cone 9 oxidation or reduction

16.68 Talc
27.5 Potash Feldspar
12.37 Whiting
13.74 China clay
29.7 Flint
good with cobalt but not iron.

Alan Kestle

Auckland

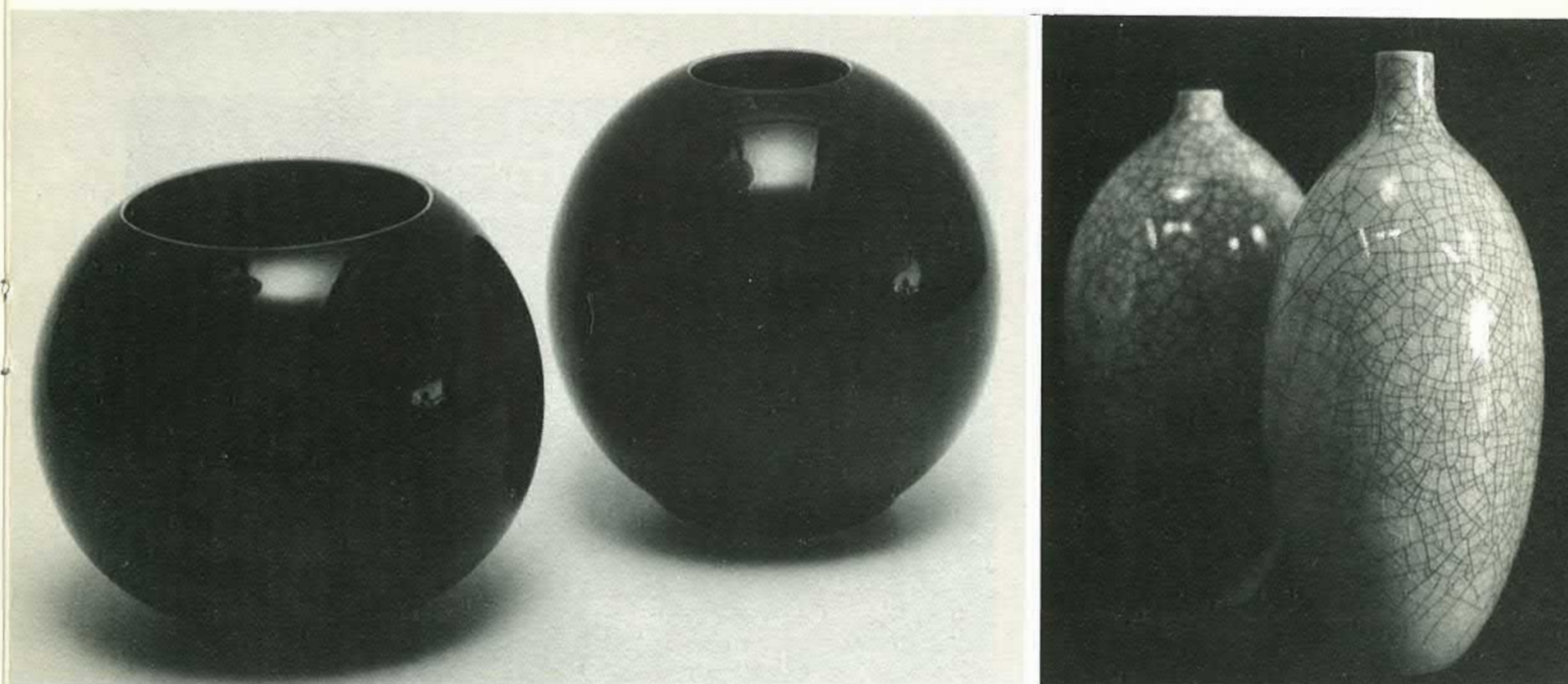
Porcelain is the only clay I have worked with seriously. Its clean, fine texture feels right to me. My pieces are carefully turned and finished to give smooth surfaces which I consider the clay deserves.

I began working with clay in 1976 at an Auckland Studio Potter's Centre class where John Parker taught me the technique of throwing porcelain. I now work as a ceramist fulltime. My clay is Podmore's. I fire in an electric kiln to 1240°C. My three and a half cubic foot kiln tends to limit the size of my current work, but I'm keen to throw bigger forms.

I like geometrically precise forms such as cylinders, spheres and ellipses finished in a high gloss glaze often black or unglazed with lines inlaid into a burnished surface. Turning and paring is a major operation of the finishing process. I find metal kidneys ideal for this purpose. They cut, turn, burnish and are flexible and cheap. Raw pots are often returned to the wheel for "fine tuning" many times before they look and feel just right. Fired pots have unglazed surfaces lightly sanded to give a finish that is silky smooth to the touch.

I have experimented with other clays recently thinking that the change would do me good. Perhaps it has—I'm still working with porcelain!

Alan Kestle is a member of the 12 Potters Co-operative, Remuera Road, Auckland.



Alan Kestle's work exhibited at Media Gallery, Wellington.

photos: Ans Westra



Dianne White Auckland

I like geometric shapes. Cones, spheres, cylinders and clean sharp lines are what I concentrate on when forming and trimming my pots. In the past three years I have extended these shapes exclusively to form boxes—usually thrown from Podmores porcelain clay or from RKF fired in an electric kiln to cone 8 (Orton) or cone 7 (Orton).

I throw the box shape as close to the shape of the finished article as I can. When the pot is leather hard I cut the footring, trim the outside, and cut and form the galleries of the box. I find the precise fit of the lids a challenge and will concentrate on this aspect until this is achieved.

The boxes made from porcelain are usually decorated with a coloured porcelain slip applied in spaced lines. Stoneware boxes have a reactive slip applied in bands. This may be further decorated by cutting through the reactive slip to the body below. Both slips are applied with suitable brushes, with the pot returned to the wheel and centred.

The following are my slip recipes:

PORCELAIN SLIP

Crushed dried porcelain clay	65
Nepheline syenite	20
Calcite	13
Borax	2
Water 75 cc per 100 grams dry	
COLOURS: Yellow stain	15
Sky blue stain	15
Coral stain	15
Black/grey	8

REACTIVE SLIP

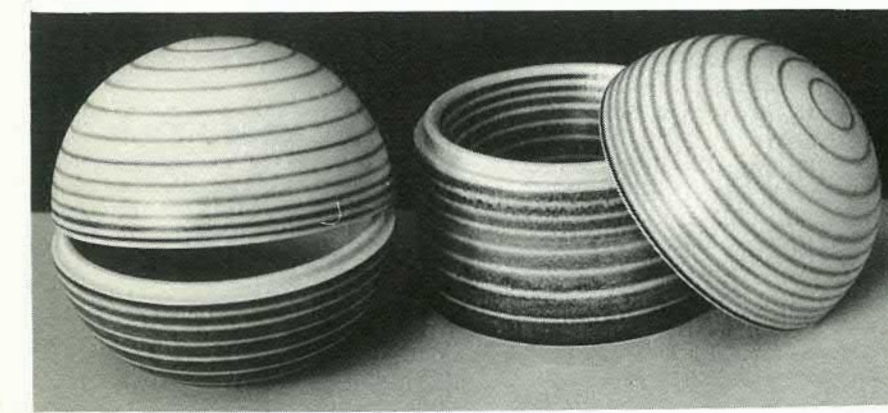
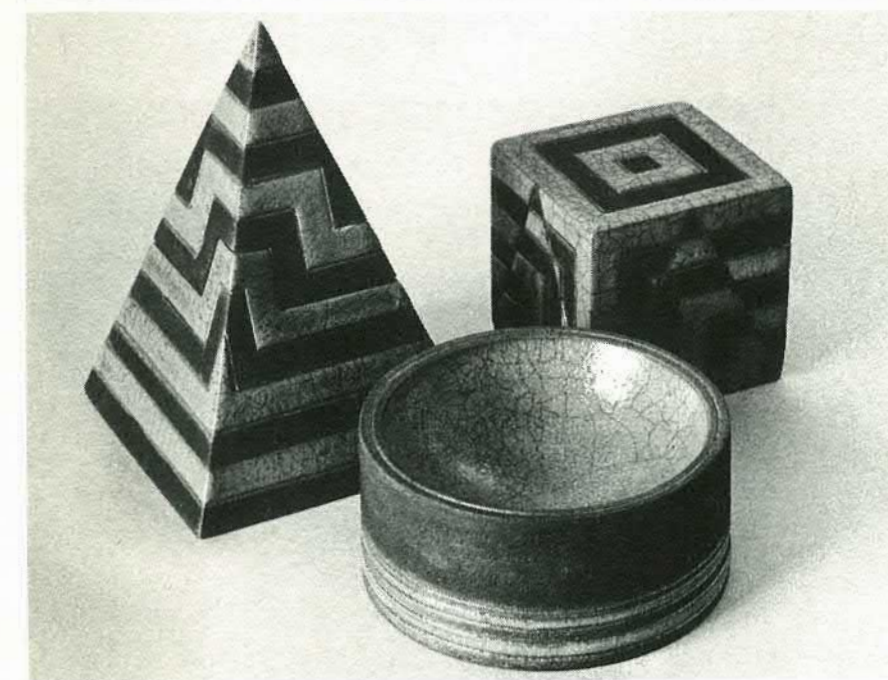
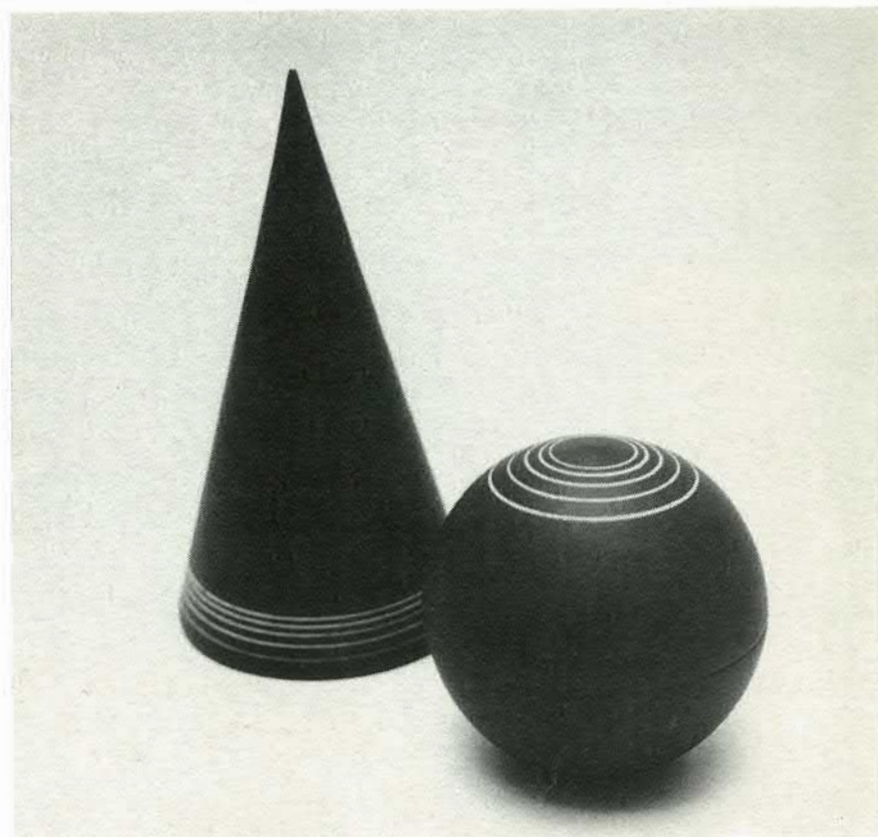
E2 or red earthenware clay dried	75
Wollastonite	25
Ball clay	3
Silicon carbide (400 mesh)	2
Borax	2
Water 75 cc per dry weight given.	
COLOURS:	
Off white	As mixed
Soft yellow	5 Red iron oxide
Blue	1 Cobalt oxide
Green	2 Nickel oxide
Black/brown	5 Manganese oxide
	4 Copper oxide

These slips were developed by my husband Trevor. He has always been interested in the technical side of pottery and has been responsible for many experiments which have resulted in the slips I use now.

After biscuiting the boxes are glazed by spraying. The glaze I use is universal, i.e. it can be used over the porcelain slip and gives a smooth satin



Bottles, coral and blue slips above, below and right, black porcelain boxes with inlaid white lines, and boxes with banded slip and reactive slip. The geometric forms above right, bigger than the boxes are raku fired and in brilliant cadmium yellow, orange and green.



translucent effect, or it can be used over the reactive slip and produces a bubbly soft volcanic effect.

UNIVERSAL GLAZE WHITE MATT

Australian Feldspar	314
Calcite	200
Talc	104
China clay	292
Zinc oxide	100
Silica	131
Standard borax fritt (From CGG)	33
Titanium oxide	11

I like my firing to be controlled. The stoneware pots I fire at a regular 100° per hour to Orton cone 7. Porcelain is a different matter; I fire this at 100° per hour for 10 hours, then change to 50° per hour till Orton cone 8. This way the top and bottom of the porcelain boxes do not fuse together, the glaze has time to mature, and the porcelain will be translucent when finely made.

Recently I have been making slab pots with thrown bowl shapes inserted inside the assembled square and rectangular shapes. The outside flat surfaces give me a large area on which to rule geometric designs when the pots are leather hard. After biscuiting I hand paint the glaze on where it is required. The pots are then Raku fired and smoked. The finished effect is a brilliant coloured pattern area with the matt black surface as a contrast. The glazes I used for this technique are commercial cadmium orange, yellow and green. The firing temperature was given as 1050° so the following combination was found effective to bring the temperature down to about 950°.

RAKU GLAZE

Commercial glaze	50
Gertsley borate	40
Nepheline syenite	10

795 New North Road
Mt Albert, Auckland.



photos: Ans Westra

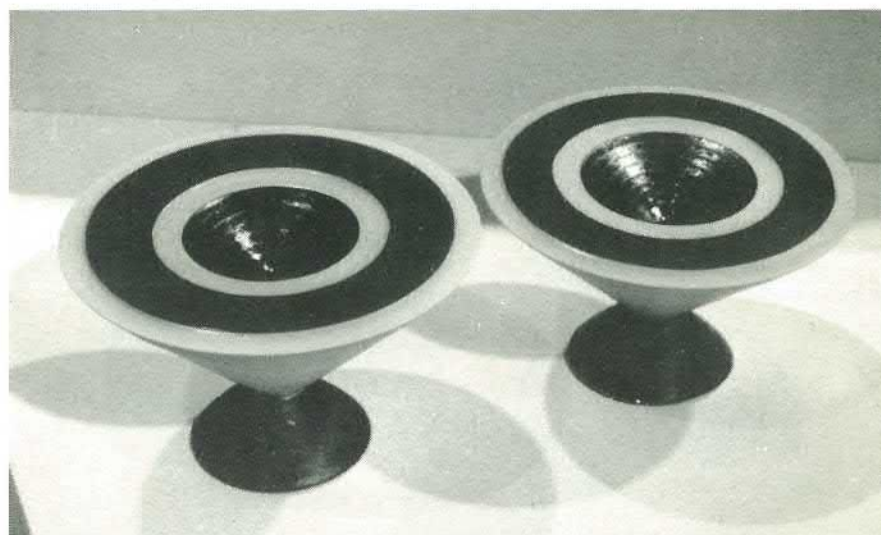
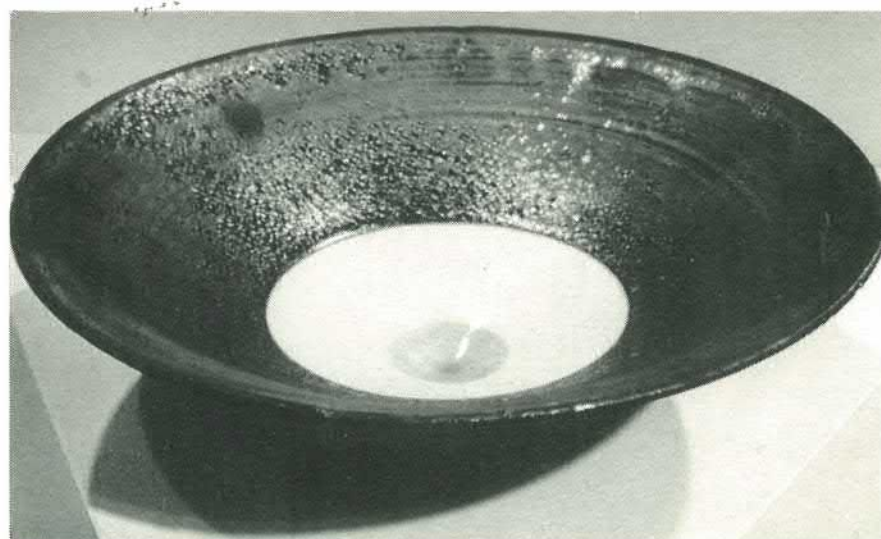
Melanie Cooper Wellington

Melanie Cooper has returned to New Zealand after spending three years in Adelaide where she took a Bachelor of Design (Ceramics), at the South Australian College of Advanced Education. Although a four year course, she was able to enter at the third year because she had already attended Teachers College, completed the diploma course in ceramics at the Otago Polytechnic and had three years throwing experience. Nevertheless she was required to submit an extensive work record with photographs before entry. "I undertook advanced study because I considered I did not have the skills at my disposal for a career as a professional potter especially in the field of glaze chemistry, than the one year course had provided."

I'm working entirely with porcelain clay fired in oxidation to 1280 °C. I've chosen an ivory coloured porcelain body because the unglazed areas blend with the decorated areas of colour contrasted with metallic black on my hard edged geometric forms. Achieving translucency is not my objective.

Because I have been particularly interested in developing colour at stoneware temperatures I chose as a challenge the elusive pinks for my glaze research project. The culmination of a year's research and experiment has now given me a variety of glaze stains ranging from pale to strawberry pink obtained by adding different percentages of chrome to a base glaze formulated to suit the stain. I wanted dense colour with total coverage which meant firing in reduction. If the glaze is perfectly formulated and meticulously applied an oxidising firing will permit total firing control with one hundred percent reliability. There are no chance firing bonuses, in fact oxidation seems to accentuate every fault, so each piece must be correct in every detail before committing to the kiln for the predictable results you can expect.

The colourful work evident in contemporary Australian work is the result of increasing understanding of glaze technology being developed in the various art schools and colleges. Those without knowledge of glaze chemistry can buy from extensive ranges of commercial glazes not available to New Zealand potters, who traditionally have relied on basic oxides for colour. Courses such as the one I undertook in Australia are offered in all states, some of the students coming straight from school, some from shorter certificate courses, some previously hobby potters desiring fulltime instruction. Thousands of



students are graduating from these courses resulting in the wide range of sound work, displaying skill and understanding whatever the style.

Young talented Australian potters can earn recognition and support from pottery guilds, craft councils and workshops like The Jam Factory in Adelaide who will help establish them in various ways such as by providing workshop space, staging exhibitions and developing markets—very necessary in many cases for the big step forward from college to independent craftsman. Only the best are taken on, standards having been met all the way, so those who graduate are considered competent. In Australia there is an obvious line between professional potters and hobby people, each just as relevant, but not to be confused.

Although the potting scene in Australia is lively Melanie has returned to Wellington where she is in the throes of establishing herself. Ideally she would like to work with other professional craftspeople in the type of urban workshops now a feature in other countries.

SUMMER SCHOOL 84 "Throwing & Design"

Royce McGlashen
Cob Cottage Pottery
126 Ellis Street,
Brightwater, Nelson.

January 23rd-28th incl.
Please send SAE for details.



Slip decorated earthenware—wood fired

Steve Scholfield, Manawatu

I started pottery work with Christopher Vine in the Teal Valley, Nelson where I learnt to make both earthenware and stoneware. After this I had a brief spell at Nelson Pipe Works and later was privileged to help Harry and May Davis with their project at Izuchaca in Peru. From there I travelled to England to work for Peter Dick at the Coxwold Pottery.

It was Peter's work that attracted me to slip decorated earthenware. For the past three years I have been making slipware, once fired in a wood burning kiln.

Both low fired and high fired earthenware is produced. The low fired pots are mainly planters and ovenware, plus platters and large mixing bowls. The clay which comes from Plimmerton, when fired to 1060 °C is extremely tough and due to its high percentage of coarse particles, makes very durable oven pots.

For finer ware I use Potters Clay RKF, which I've found to be the most suitable earthenware clay for raw

glazing, and fired to 1160 °C is practically vitrified. Most of the pots are wheel thrown and while leather hard they are slipped and returned to leather hardness and then decorated by either slip trailing or sgraffito, and finally glazed with a lead bisilicate fluxed glaze. The quality I like in these low firing glazes is warmth and strength of colour with a good gloss and a clear distinction between background colour and decoration. During the final three hours of firing the effects of fly ash play a vital role in creating the colour effects. These effects can only happen if the ash is stirred whilst long flames are licking through the pots near their highest temperature.

The kiln, an enlarged version of the Coxwold Potteries' first chamber a downdraft with two Bourry fire boxes, has a total capacity of 190 cu ft and burns roughly a bit over a cord of demolition wood, or preferably pine, per firing. The main advantages of two opposed Bourry boxes, is the even heating at low temperatures, plus good

control over the atmosphere of the flame. Lead glazes are prone to blister with a reducing atmosphere.

From the three basic slips, the colour range is from black via a sequence of browns to orange often enhanced by dark to bright red fire flashing, and a sequence of yellows down to the pales—but in addition to the range of original slip colours, all of them are liable to transmutation by kiln atmosphere to different parts of the pot.

My slip recipes are:

Black slip:
30 litres of red body clay slip
plus 500 gms red iron oxide
500 gms manganese dioxide

Middle yellow slip: Clay dug at Pahiatua

Bright yellow slip: China clay or white earthenware slip

I am strongly in favour of testing for the safety of lead glazes and the two following have been found to be safe.

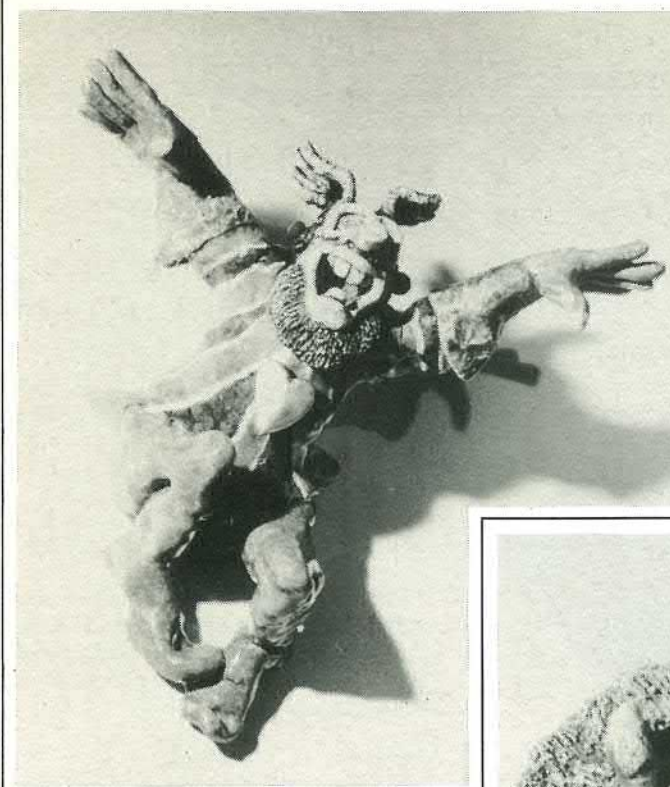


THE EMPTY HAT



The Wizards Return

of their
grazing
peens



Captain Love
'Tis the joy of life itself
that gives the fool
his final lift.

Faerie Earth



Tom
the Unicorn
(Rocking Horse)

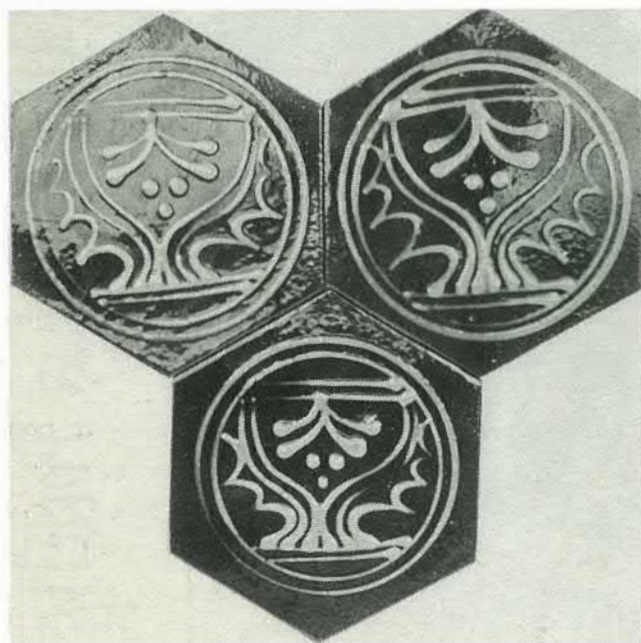
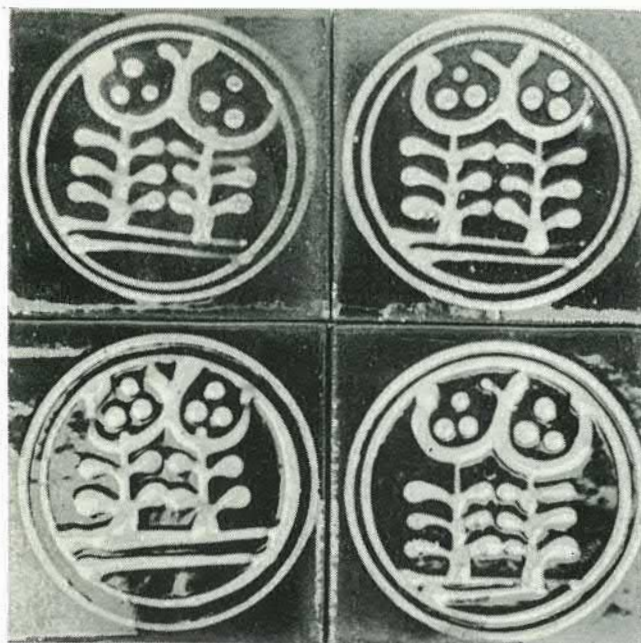
She was 31
& He was 17
(Tub)



An Exhibition of Fantasy by John Green at the Albany Village Pottery



photos:
Peter Butler



1060 °C	
Lead bisilicate	70
Body clay	10
Feldspar	4
Whiting	2
Ball clay	5
Bentonite	1
plus iron oxide	2.5

1160 °C	
Lead bisilicate	56.7
Feldspar	30.6
Whiting	5.5
Ball clay	7.1
Bentonite	6
plus red iron oxide	5
manganese dioxide	3.3

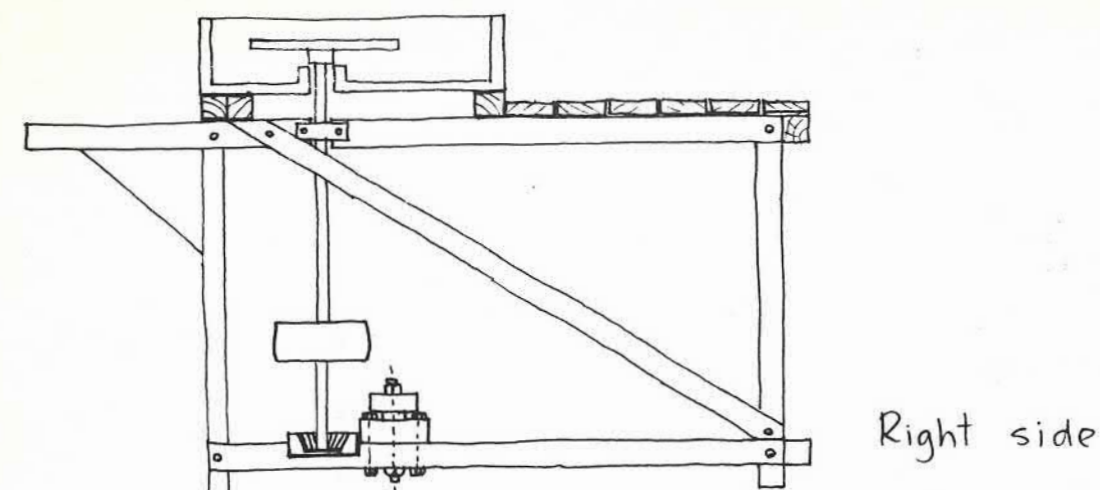
These are applied when the pots are leather hard and have been made suitable for raw glazing by the addition of Bentonite, omit if they are to go over bisected ware.

Postscript

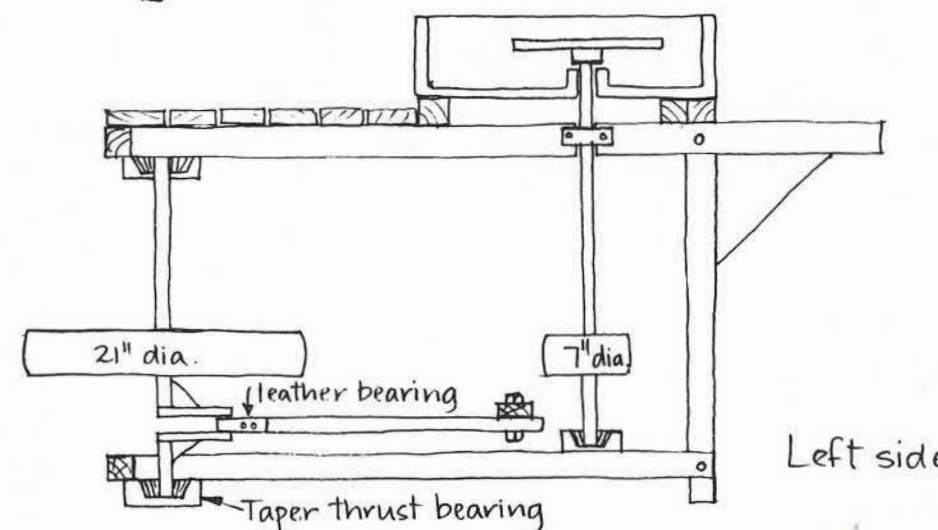
Since writing this article, I am digging and processing Pahiatua clay for the 1160 °C body. Various combinations of this very plastic stoneware clay and the Plimmerton clay, ground greywacke, and pumice have been tried. The results have been quite good but more testing is required. The method of processing used to date involves putting the dried Pahiatua clay through a hammer mill with cyclone attached, producing air floated clay. The greywacke comes from a local crushing plant and is sufficiently fine to be added as is. The pumice from Wanganui, requires ball milling. My ball mill is a plastic drum containing plastic balls and it rotates on rollers. The drums (ex penicillin containers from the Glaxo factory), do wear out in time but are very cheap. The mixing is done in a ribbon blender.

After doing a series of reduction firings the schedule now consists of taking the kiln up to 600 °C on demolition wood, followed to full temperature stoking with pine. The demolition wood (mainly Rimu and Matai) appears to create a reducing atmosphere without any sign of smoke, whereas pine is much cleaner burning. The longer flames make for a more even firing; and a cone difference—the hottest zone at the centre of the kiln. The more fusible pink ash is also superior to that from demolition wood.

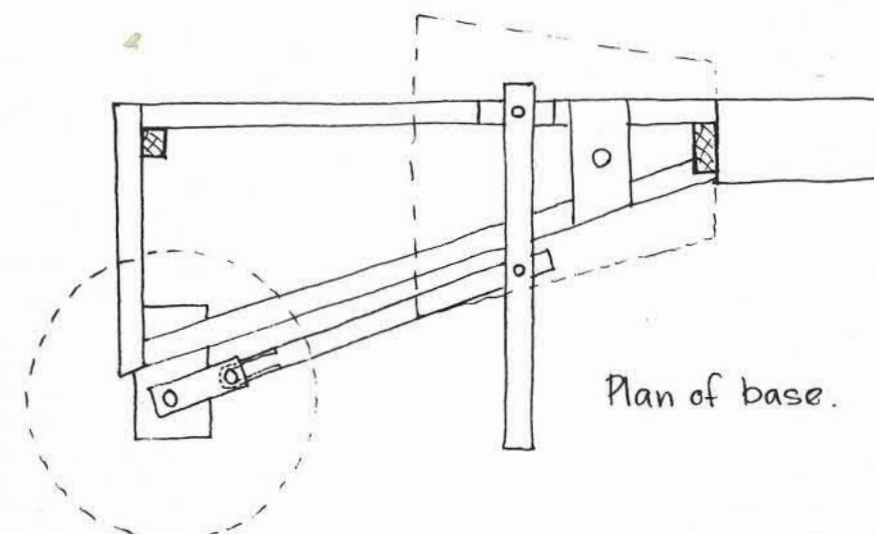
Rocket Pottery
Jackytown Road
RD 7 Palmerston North



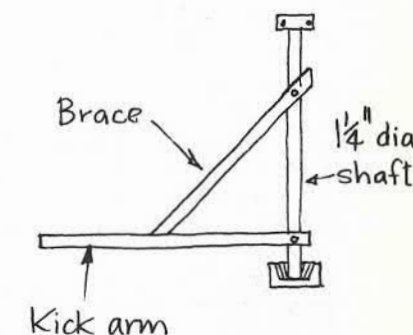
Right side



Left side



Plan of base.



IZCUCHACA STYLE, GEARED KICK WHEEL (3:1).

Comments: A fast kick wheel, easy on your leg, and suitable for centring clay up to 20 lbs. without too much effort.

Construction: All hardwood timber framing bolted together and bearings set tightly into wooden blocks. Both shafts are 1 1/4" ϕ and have shoulders turned on the bottom end to take thrust or alternatively a shaft collar can be used. The braces on the crank (5 1/2" centre to centre throw) are needed to carry the weight of the concrete filled fly wheel/primary pulley. The 2 pulleys are connected with a flat belt. An alternative to hanging the kick arm on a chain, is to attach a third shaft with bearings top and bottom, securing this to the left side of the frame, vertically. The kick arm is bolted to the bottom end and a diagonal holds this securely horizontal (refer to diagram.). I have found this smooth and quiet.

(Drawing provided by Steve Scholfield)

Handbuilding possibilities

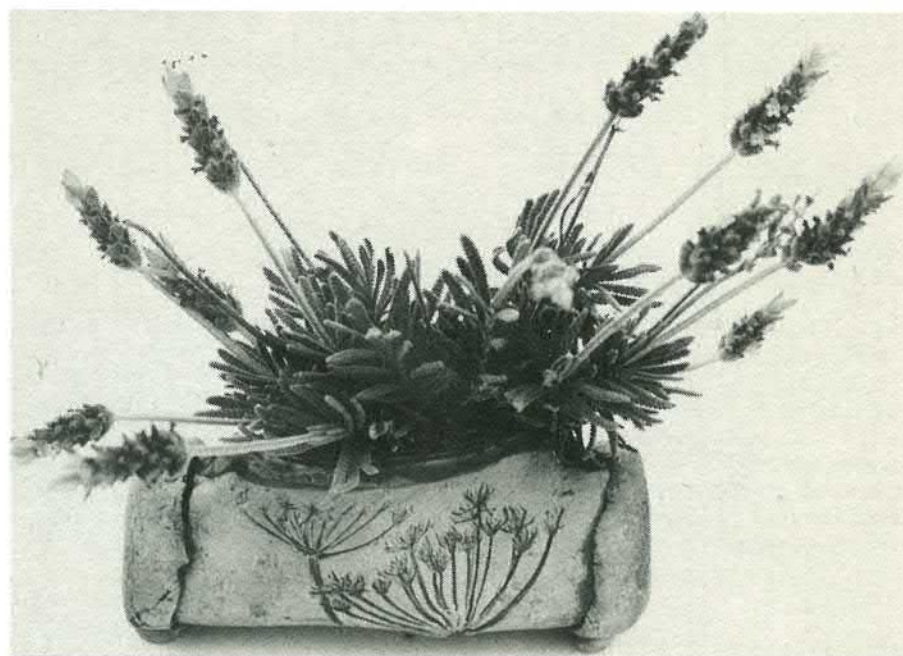
Judith White, Wellington

The house in which I was born looks out over Wellington's folded hills. I see the twisting outline of gums in Central Park, the city with its changing textures and forms, the harbour and its outlines, and I look beyond to a backdrop of mountains. All this must subconsciously influence the way I pot.

I have been potting seriously for five years now, after making a sideways arabesque in the arts, exchanging teaching music, for life as a potter. When I threw away my job, I also threw away my potting wheel and began working alongside George Kojis, with whom I discovered the freedoms and possibilities of using clay differently, observing what it is saying, seeing how it presents its own textures when flung, taking the cues the clay offers. At this point I became pre-occupied with outer surface textures.

What really set me alight is the deeply affecting flow of creativity I experience through the medium of clay. This creativity I had not previously experienced myself though I understood it and cherished it in others — those children and students who expressed themselves creatively in music in my classes. (I believe now that formal teaching too early, stifles creativity.) Clay certainly proved to be the medium for me and its creative freedoms stimulated me as had no other art form.

I especially enjoy making all kinds of hanging and standing garden pots, bells, chimes, as well as hand-built functional pottery. My equipment is very 'Heath Robinson' — tins of all sizes, plastic and cardboard tubes and bisque fired moulds. These bisque



Flower trough, coffee set, bell and wind song.

photos: Penny Pruden



moulds are very absorbent and practical and they enable me to banish Plaster of Paris which is such an unsympathetic substance.

For decoration I use mainly seed heads, leaves and light sprigs. Dried fennel is my favourite. I impress into the clay, and when I fling the clay, the pattern transforms itself into trees, making the step from reality to artistic expression.

It follows that my three glazes are used almost entirely for the interiors of pots. My favourite glaze is Papa — 80 percent Papa clay, 20 percent whiting, but if the Papa needs it, I add a small amount of iron oxide. A black matt and a white matt glaze with the Papa glaze are all stable and congenial and provide me with appropriate combinations. Burnt Umber gives the oxide colour I seek — a warm glowing tan —

fired in an electric kiln to 1260 degrees plus a soaking of one hour.

A particular interest of mine is Music Therapy. All the arts are potent forces in therapeutic fields and I have used clay successfully with both children and adults as a simple and happy way to de-fuse tensions. I know there is no limit to the positive and creative values of clay.

Judith White

Brightly decorated earthenware

Christine Bell-Pearson, Nelson

Christine Bell-Pearson operated her own pottery in London before moving to New Zealand. During a time when she was living in Paris she was accepted as a member of the *Chambre Syndicale des Ceramistes et Ateliers d'Art de France* and she is at present getting together the pieces for an exhibition in the French capital. She has also had work accepted for exhibition at Faenza and has exhibited in London and New Zealand.

I first came into contact with colourful earthenware in the South of France when attending an art course and was introduced first-hand to the pottery of Picasso as well as other local potters. I was at that time studying painting at an English art school but made pots as a craft subject. Pottery gradually took over during the five-year course and although still painting I was mostly occupied with stoneware and porcelain pottery with a leaning towards sculpture and rough surfaces.

Then came a period of glaze research undertaken at the Royal College of Art in London and I became less interested

in accidental effects and was looking for a more European mode of expression. Colour became more assertive in my work when I joined a group of potters working in Chelsea. We used overlays of glazes and in-glaze colours in earthenware, mostly on flat decorative plates. The technique I now use derives from that period but I have had to adapt it, of course, to suit a wide range of different shapes.

Sometimes it requires several firings and the procedure is complicated since it means using glazes from all sources. Commercial glazes sometimes form a useful basis for modification as they contain rare materials not readily available in New Zealand.

Stepping into this field, however, is a procedure that needs a great deal of carefully documented and measured experimentation. When the finished product is of such a nature that there is no room for any accidental effects — and if there are any it is usually disastrous — it is clearly necessary to have precise control of the firing cycle

and the only acceptable method is the electric kiln where the atmosphere is strictly neutral. The firing cycle and temperature are critical if the glazes are to remain where they are put and if they are to fit the clay. This was at one time my biggest problem, now, happily, pretty well under control, so that my pots no longer need to be purely decorative but are taking me into more domestic type of ware such as casseroles and table ware. The decoration the pot will bear is by no means random: I have it in mind when I throw the pot so that the finished work is an integrated whole.

Although I have become known in New Zealand for this type of highly decorated work, it is not my only interest. I find it necessary to have a contrast and a change and currently I am engaged on a variation using a more austere basis of black with lustres and more restrained colour. The main limitation of my type of work is that it is so essentially personal.

71 Tosswill Road, Nelson.

Bright gold, brown and greens in glaze overlays create a "cottage" ware appearance.

photo: Richard Hendry



Ceramics then and now by Brian Brake, an old China hand

Once you are in China—the rest of the world does not exist. China is a pattern; there the pattern belongs to its country more intimately than in any other land I know. I have seen the laced water of paddy fields in many places in the East; but in China, perhaps because of the trees, or because of the flat silk look of it, or the misty light, the impression it makes is manifestly Chinese.

What is it, this ingrained Chinese-ness? Perhaps it is the way that the long civilization and the astronomical millions of people have profoundly modified their country. Three or four thousand years of intensive, detailed gardening—that is what I feel they have done throughout China. Slowly they have made the land their own. Now it is special to them, like their faces, their language, their painting, their ceramics, their boats and even their toys. This quality seems to have passed down through Chinese time without radical alteration, absorbing and redefining everything that comes from without. It is the undivided Chinese-ness of the manner of thought that strikes a visitor like myself.

My first visits to China were in the spring and summer of 1957 and the autumn of 1959. It was on this journey that I met Rewi Alley and probably through him I began to understand a little of China and the Chinese. But it was not my first knowledge of the New Zealander who had lived in China for most of his life. At Boys' High School in Christchurch, the headmaster would read Rewi's letters to the school at morning assembly and there would be a collection of donations for his school of war-orphan at San-tan in central China. So, in Peking we met as Old Boys of the same school in New Zealand. We talked of China, its history and changing way of life but more importantly its people and their way of thought. Being my first major photographic coverage in the East, the initial reaction was studded with so many questions and many of these were answered during visits to Rewi's home. And it was there I saw on the walls wonderful Ming scrolls of trees floating in mountain mists—paintings of the like I had seen in the West and believed the creative imagination of the painter only to discover he was really only painting what he actually

saw. And it was in Rewi's rooms that I first came in direct contact with Chinese ceramics. On his tables and shelves were fine examples of Sung celadons and to my intense interest, selections of shards from the kiln sites he had visited. And as we talked into the late hours of many nights Rewi suggested that I go to the Sam Men Gorge on the Yellow River to photograph the beginning of a huge dam to be built. It was there I saw my first archaeological dig.

The Ministry of Culture in Peking and the Academia Sinica had launched a vast programme to survey and record the archaeological treasures of the area to be flooded. Photographing their activities, besides being of interest to Western magazines, was one of the most exciting times of my life. To watch centuries old pieces being recovered from the earth, was to watch time being unearthed. One finely engraved bronze vessel of the Western Chou, roughly 700 BC, I photographed with Dr Ling the Deputy Director of the dig—it was equally exciting to see this discovery again, in the National Museum in Peking twenty-one years later.

One of my most recent projects has been to photograph a wonderful collection of Chinese ceramics in the Köln Museum of Far Eastern Art (West Germany)—with a different approach. It is a collection I had photographed when it was first exhibited and became part of the permanent collection. At that time, the collector H.W. Siegel, who had lived in China for fifty years, and I had discussed the fact that many people who looked at ceramics did not really "see" the controlled glazing, the many subtle changes in the monochromes and so on. In fact I have heard him say to would-be-collectors, "If you can't see the beauty in this early T'ang bowl—give up ceramics and collect stamps." We are now working together on a book that will show these details and together with texts may give weight to research theories relating to the unintentional becoming the intentional. That wonderful Chun glaze splash was not an accident in the kiln after all. This project on the Siegel collection has been as exciting as the early work in China and has increased my awareness of the importance of "how we look" at this incredible world of Chinese ceramics.



Dr Ling holds a bronze vessel from the western Chou period. He inspects earth samples that could indicate a possible tomb area to be excavated. Restorers at work. Photos: Brian Brake.

Right: detail from the inside of a Chin-yao bowl.
Far right: detail from the inside of a T'ang bowl.
Photos: Brian Brake



Book review, *China; Ancient Kilns and Modern Ceramics*. Wanda Garnsey and Rewi Alley Australian National University Press. Reviewed by Brian Brake.

China—Ancient kilns and modern ceramics by Wanda Garnsey and Rewi Alley gives the interested reader on China as well as the practising potter a wealth of information to digest. In fact I felt at times one needed more pages to expand the many and fascinating details. Sixteen of China's twenty-six provinces are described giving information of local historical traditions and their survival to the present day. The method of approach will create a little difficulty in obtaining an overview of a particular dynastic period but this is not what the book is really about nor does it pretend to give a critical appraisal of the ancient or modern production. It is a statement and valid for this reason. The reader must form opinions. I personally do not appreciate the later periods of ceramic history in China—from the late Ming onwards and the high points to me are certainly the T'ang and Sung. Towards the end of the Ming, complex and ornate designs evolved with the demands of the ruling courts creating "fashions". Today one can see the amazing effects of the changes and what resulted, but however wonderful the controlled technique Chinese craftsmen had and still have, the simple purity of approach of the early potters has been lost.

Recently when looking through vast quantities of export ceramics from the mainland in their Hong Kong department stores, I discovered the simple, traditionally shaped rice bowls of Chekiang, in fact they were from the

Lung-ch'uan kilns and with a wonderful Sung celadon glaze. And I couldn't believe the price tag—50 cents a bowl. I asked the attendant how much it would cost to send a set to New Zealand. His answer was it would cost far too much for "that cheap ware" and why didn't I buy the hand painted sets! It reminded me of a visit to production potteries in Kwangtung and to see the great climbing kilns of ancient times still being used, but sadly to see the over-decorated and over-sculptured work taking priority. I know full well it will take time to reflect and reappraise traditions as well as adjust markets that rely on the export production of China today. Perhaps it is happening—look at the wonderful simple porcelain dish from Feng-feng in Hopeh on page 46, the set of four dishes of modern blue and white from Ching-te-chen on page 113 and the domestic ware from Shih-wan on page 129.

The book has many interesting photographs and very good maps. Personally I would have preferred larger photographs where the interest is so important—the I'hsing pottery on page 84 and the P'eng-ch'eng kilns of Hopeh on page 41. Once again there is so much of importance in the visual material in this book I would have liked additional pages thus giving the layout a little more space to breathe. I was also a little concerned with the colour backgrounds in some photographs but perhaps it was not possible to have them changed. I have always felt strongly that any object looks its

best on a plain background of black, grey or white. One usage I found a little difficult to understand—that of Wade-Giles as against Pingyin, the present-day accepted system for the transcription of Chinese names and terms.

Apart from minor critical thoughts, I do recommend the book to New Zealand potters, especially those who intend to visit China, as it would be a wonderful reference and guide. And for those who are going to China, the great archaeological discovery of the century near Sian—the pottery army of the Emperor Ch'in Shih Huang Ti should not be left out of any itinerary to kiln sites, potteries and museums. This book will give the reader more than a glimpse into the wealth of Chinese ceramic history and as the authors say in the preface, "... the respect and care the Chinese people have for the achievements of their past, as they are for us an inspiration...". I hope that these achievements will not only inspire our potters but also give the modern Chinese craftsmen cause to reflect on the truly great periods of ceramic development in China, and the even greater number of unnamed masters of their art.

Brian Brake, photographer, who lives in Auckland, first won international recognition as a member of the Magnum Group from Paris when his photographic assignments were published widely in such journals as *National Geographic* and *Paris Match*.

Co-operatives in Wellington

Creative Workshops, Eastbourne

Four Wellington artists are following a New Zealand trend for artists to work together in a cooperative where facilities and energy may be shared. Dorothy Pascoe, Julia van Helden, Jean McKinnon and Penny Walker work together in two converted shops in Muritai Road, in the harbourside suburb of Eastbourne.

The workshops were set up by Dorothy Pascoe, Julia van Helden and George Kojis in 1980 as an incorporated society under the Charitable Trusts Act, with the hope that it would meet their individual needs as well as become a place for sharing and stimulating their ideas. With funds from a Sport and Recreation Grant, a fibre kiln was built, and shops converted into flexible, though cramped studios. Later another room was acquired to use as a display space called Workshops Gallery.

Creative Workshops is a cooperative in both a formal and informal sense. Members share all running costs and meet regularly to decide and assign administrative tasks that are seen as time consuming but necessary. The workshop is also available to the community through Julia's regular drawing and painting classes and occasional visiting artist's weekend schools. Sometimes compatible and self motivated people needing a place to work for a period can be accommodated.

Members have had to learn to maintain a balance between independence and sharing. Dorothy, the only person not working with clay, uses painting and batik techniques with coloured dye on silk. Her work, however, is not done in isolation from the others, who find the drawing, painting and colour exploration done in the "clean" room provides stimulating feedback to the work done in clay.

Penny joined the workshop in 1982 after completing the one year ceramics course in Dunedin. "I was relieved to find space in an existing workshop. The shared studio has been a good place in which to start. Having someone accept my earlier work and share in the changes with excitement has helped me to believe in the validity of my own ideas. That security has allowed me to feel free to explore them. I work with slabs of soft clay so they are like fabric or paper. I love the puckering and the folds. I want my pots to have a look of just being made."

Jean joined in 1981 after returning from overseas and very much in need of contact with other artists. "I see mostly benefits from working with



others, solving technical problems being an obvious advantage. Acceptance is important, but so is criticism. I am working with porcelain, using pinching, carving and soft slab techniques. The sources of my work are inherent in the clay itself. I respond to the fluidity, to the marks left by the forming process and to the 'watery' translucence when fired."

Julia combines drawing and painting, working with clay and teaching, interrelating the stimuli where possible. "I like to set up situations where the unpredictable may happen—to be open to change. I allow myself to be influenced by the behaviour of the clay. My forms spring from ideas about unfolding and changing, about new forms growing on and out of old forms, or from discoveries of past patterning on eroded surfaces or rock strata."

Roxburgh 5

Three years ago Gloria Young and Gill Kersey opened Earth and Fire Gallery in Roxburgh Street in mid city Wellington. After completing the ceramics course at Otago Polytechnic both were needing somewhere to work and fire their pots as well as to provide a sales outlet for their limited production. Two adjoining shops in the regenerating hotel and restaurant area of town, have attracted customers, and the partnership has worked well from a personal point of view, but because they were under capitalised it has proved difficult to get ahead financially.

The answer seemed to be to expand, and because they had received so many inquiries from craftspeople wanting to share their space they confidently extended the workshop into a house across the road with room for 7 other craftspeople. In this new cooperative there is a weaver, two leadlight workers, a silk quilt maker, a creative knitter, a painter and an illustrator besides the two potters. They all work independently, though they gather for lunch each day, share equipment and exhibit in the gallery singly or collectively. All enjoy having other creative people about them and the opportunity provided for exploring mixed media techniques.

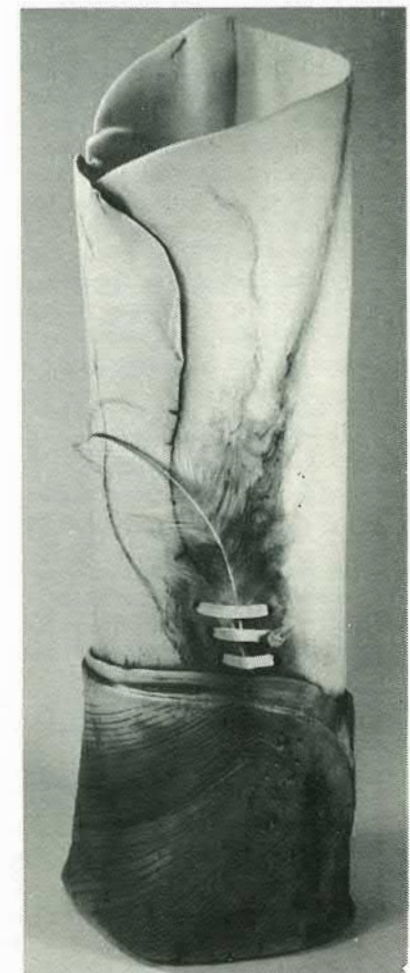
Cooperatives satisfy a need for the participants and help to make our cities more interesting places. It's nice to look in the front window at Roxburgh Street and see a weaver at work.

The Potters' Shop

The latest Wellington cooperative, following the trend for potters to develop their own sales outlets, has opened for business in a former



bakehouse at 324 Tinakori Road in historically interesting Thorndon. Like many others, it is a selling cooperative and not a workshop. Murray Clayton, Mary Smith, Gwyn Bright, Isobel Martin, Paul Winspear, Jenny Shearer, Flora Christeller, Craig Hall, Margaret Beckett, Beryl Buchanan, Julie Palmer, Maureen Hunter Raeburn Laird and Judith White will present a range of work in a pleasant ambience of elegance and style.



Left: Penny Walker, mob of teapots, saggar fired in charcoal, porcelain 7-8 ins. Above: Julia Van Helden eroding emerging forms porcelain fired to 1280°C, oxides, soluble salt underglaze pencil and celadon 13 x 15 cms. Right: Jean McKinnon porcelain vessel with feather, grey, pink, rust, 14 ins.

COUNTRY POTTERIES



In 1977 Anthony and Susan Morris sold Green Farm Pottery in Suffolk and moved to New Zealand. Their intentions were to make big pots and hand-made tiles in a country pottery on its own source of clay. Come December 1977, Morris and James Pottery and Tileworks is established in Tongue Farm Road, Matakana, Northland. All fairly straightforward so far...

Convinced that major changes can only be achieved by making dramatic moves we decided to come to New Zealand. Originally we intended to settle in Gisborne, Anthony's home territory, but rejected the idea on two counts: the clay was too montmorillonitic and transport to our likely main market (Auckland) was too expensive. We made a clay exploration in consultation with some claymen and geologists from Ngaruawahia to Whangarei. We came to Warkworth during a festival; the streets were closed to traffic and it looked a delightful little town. We found 30 acres of excellent alluvial clay on the Matakana river and dug the first hole for our workshop on December first 1977. From that date two phrases have dominated our thinking: *cash flow* and *the learning curve*.

Anthony is very good at setting things up. Inevitably nothing is quite what you expect it to be and the art is to assess the problem, reject the now obvious mistakes and move on to the next stage. We have done this several times and what we use today in terms of equipment and buildings are quite different from the carefully laid plans of five and a half years ago.

We planned to build a courtyard with four buildings, each 20 metres long and 8 metres wide; one for tile making, one for pot making, one for storage and general workshop space, and one for a lovely big house. It was the biggest pottery workshop that we could envisage needing. Firing was to be a one thousand cubic foot wood-fired kiln with two chambers for tiles and one for big pots stacked peasant like one on top of the other and a bonus chamber at the end of the kiln.

We built the first two thousand square feet of workshop and the big wood-fired kiln, then the final payment of our English property was delayed so 450 square feet of workshop was quickly turned into living accommodation. Although we added a further 240 square feet when Patrick was born, we still live in the end of the workshop and have come to appreciate

the certain charms of number eight wire holding the trusses up! Meanwhile the 1000 cubic foot kiln proved to be a disaster. A Rolls Royce to fire we had superb control, but dreadful results.

We were exhausted after 36 hours of continuous stoking and because we did not have tiles at this stage we had to fill the whole chamber with pots. We had only a limited percentage of first class pots, many were quite beautiful but warped. At the same time we found that the emotional satisfaction we had expected from working hard for a month towards one major firing was not there—too much was at stake. We cut our losses, pulled down the wood kiln and built a hundred cubic foot gas fired fibre kiln. At last our cash flow began to turn upwards. We now have an additional one hundred cubic foot top hat fibre kiln, which we use with the original kiln for tiles and a 375 cubic foot fibre kiln for the pots. All these can be fired every day if necessary. Poor firings which happen rarely now can be quickly replaced. We feel much happier this way. The buildings too have expanded to cover 3000 square feet.

Understanding clay has provided another learning curve, both in body formulation and in preparation. Despite all that we had read beforehand and all the clayworks we had visited in Europe, it proved to be no simple matter to dig and prepare our own clay. The basic raw material is excellent, but the body we now use is fairly complex with the addition of various materials and the small addition of other local clays to provide a robust body which for us means one that is open, fast drying, has high green strength and an ability to be fast fired. A tall order.



In terms of clay preparation we started with a pit where we soaked the clay for a week. The strongest of us (Anthony) shovelled it from the pit into an old mixer we had brought from a flower pot factory in England. After the first mix the clay was left to sour, then remixed and left to sour once more. A fine throwing clay was produced but the process was laborious. The next stage was to try a pan mill. This was satisfactory but did not mix well enough for the big pots Anthony was making at this stage.

Our final answer to clay preparation has been to blunge and filter press the throwing clay. We made the filter press ourselves, another learning curve... Meanwhile the hand made tiles had their own specific clay requirements. For these we use two different bodies to provide our range of colours from light buff to terra cotta red. We have recently built a large double shaft mixer with de-airing chamber (air bubbles are a problem with hand moulded tiles). This is a complicated machine needing four motors to drive it, however it serves its purpose well.

Setting up has taken time, lots of money and almost constant thought but we think we are satisfied with our buildings, clay preparation, kilns and our product.

We are very concerned about achieving and maintaining a high technical quality. Architects and other specifiers must be assured that our tiles will not crack and wear and that our pots will not split and disgorge their contents into smart entrance foyers.

To help us achieve and maintain this high technical quality we are now employing a ceramist who comes from Britain. Having spent several years running a one man show, Anthony is increasingly interested in gathering a team of people who can pool knowledge and resources and work together as a group. We mainly employ local people who are learning with us to be good journeymen/craftsmen, rather than people who already have aspirations to be potters with all the expectations that idea may hold.

We are not an industry in the generally accepted sense of the word. We run a workshop with craftsmen, and not a factory with workers. We are in the gap between industry and the studio potter where the traditional country crafts were. When it comes to understanding clay, kilns and the technical approach there is a great amount to be learnt from industry and we do not reject that.

Over each stage of our development our vision has expanded. We are a long way now from the dough mixer and 2" pugmill of the domestic ware days

when throwing 40 breadcrocks meant taking a week's holiday because the workshop was too small to hold more pots and the weather (in England) too bad to put them outside.

In all of this Anthony is the driving force. He is the one who enthuses the team, provides much of the creativity and sets the aesthetic standards. Until recently he has thrown all the pots that have been produced here, but is now training an assistant. The big pots like

the small are made in one piece—no joints.

We are not salesmen by nature, but while increasing our capacity we realised that since we were producing up-market products to discerning buyers, we had to adopt suitable marketing methods. We needed to sell to produce, rather than produce to sell. Advertising has been important in bringing our products before architects, designers, home gardeners.

Sue James

Anthony Morris born in Gisborne, attended Lincoln College and the University of Witwatersrand where he studied anthropology. After travelling he settled in England, there working with Robin Welch before setting up his own pottery in an old forge in a Suffolk village. An elected member of the British Craftsmen Potters Association, producing salt glazed domestic ware. His wife and partner Susan James with a background in building design and planning in general, looks after the production side of the enterprise.

Toby Stafford, Fern Flat, Kaitia, Northland

Like dozens of younger potters, Toby Stafford is a potter living the country lifestyle—wood burning, making domestic wares, some of which will be sold from the workshop, but the majority going to craftshops hundreds of miles away. An introduction to potting while at Teachers' College has been a common starting point for many of these potters whose roadside signs are displayed up and down both islands.

My kiln is a 200 cu.ft double Bourry box wood-fired kiln based on Ray Finch's design from Winchcombe Pottery, England. Currently it is single chambered but I have plans to build additional chambers to gain greater efficiency in firing and possibly to salt glaze. Firing takes between 20–24 hours using off-cuts from local mills.

My mate Murray comes at dusk to help fire through the night at the higher temperatures. It is strenuous and intense work but the pots often warrant the effort.

My clay body is basically Peter Stichbury's mix but I'm starting to experiment with local materials. The "brew" is mixed, half a ton at a time, in a neighbouring potter's dough mixer from an old bakery. I have found a kitchen liquidiser invaluable when doing series tests for glazes as I can mix a small amount of base glaze, then add increasing amounts of say, an oxide, a small percentage at a time.

My pots are all raw glazed. I add gum arabic to the glaze to stop crawling and flaking of the glaze. Spraying of bigger pots allows successive coats of glaze to be built up, as I've found dipping pots in their raw state can be hazardous.



Above: faceted vase, tenmoku glaze. Left: Ane glazed lidded jar. Below: Emma tries glazed planters for size.



Phoenix Pottery, Otane, Hawkes Bay

Phoenix Pottery, a partnership between Bob Huck and Peter Pharazyn, formed with a handshake in 1975, continues a Hawkes Bay potting tradition for making large garden pots from local earthenware clay. Generations of the Fulford family made bricks and pipes in their Havelock North pottery and were later known for their plant pots before plastics undermined the market and made the pottery unprofitable. Bob Huck on arrival from England worked at Fulford Pottery and he has brought much of their tradition to the Phoenix partnership.

"We aimed for a country pottery serving mainly the district market, although with the fashion trend towards bricks and earthenware again we are selling from Auckland to Timaru.

"In 1979 we were burned out so we made the decision to move here to Otane and build a workshop which would eliminate some of the awkward features of our previous step-up. We now have a spacious 3400 sq.ft workshop built around a courtyard where we display our pots. In Havelock we had a 180 cu.ft downdraft kiln fired with pot burners using diesel. We now needed a bigger kiln to handle an anticipated increase in production, so we designed a 360 cu.ft throughdraft kiln fired with six burners using waste fuel. If you can stand the smell in the kiln room the advantages of firing with waste oil are many. With a flash point



around 600° it's the next safest fuel to wood, it burns very cleanly complying with the Clean Air Act and the requirements of our local body. At 15 cents a litre delivered to our 1000 gallon tank, it is a cheap fuel. The kiln takes 12 hours pre-firing, 18–20 hours firing and two days cooling. We dig pure

earthenware clay from nearby Omakere and truck it to Otane.

We are not a pottery studio. We regard ourselves as artisans running a rural industry—in our case a pottery."

Peter Pharazyn, Bob Huck
Millers Rd, Otane.



Bob Huck and Peter Pharazyn rearrange stock in the courtyard at Phoenix Pottery. Photos: Country People.

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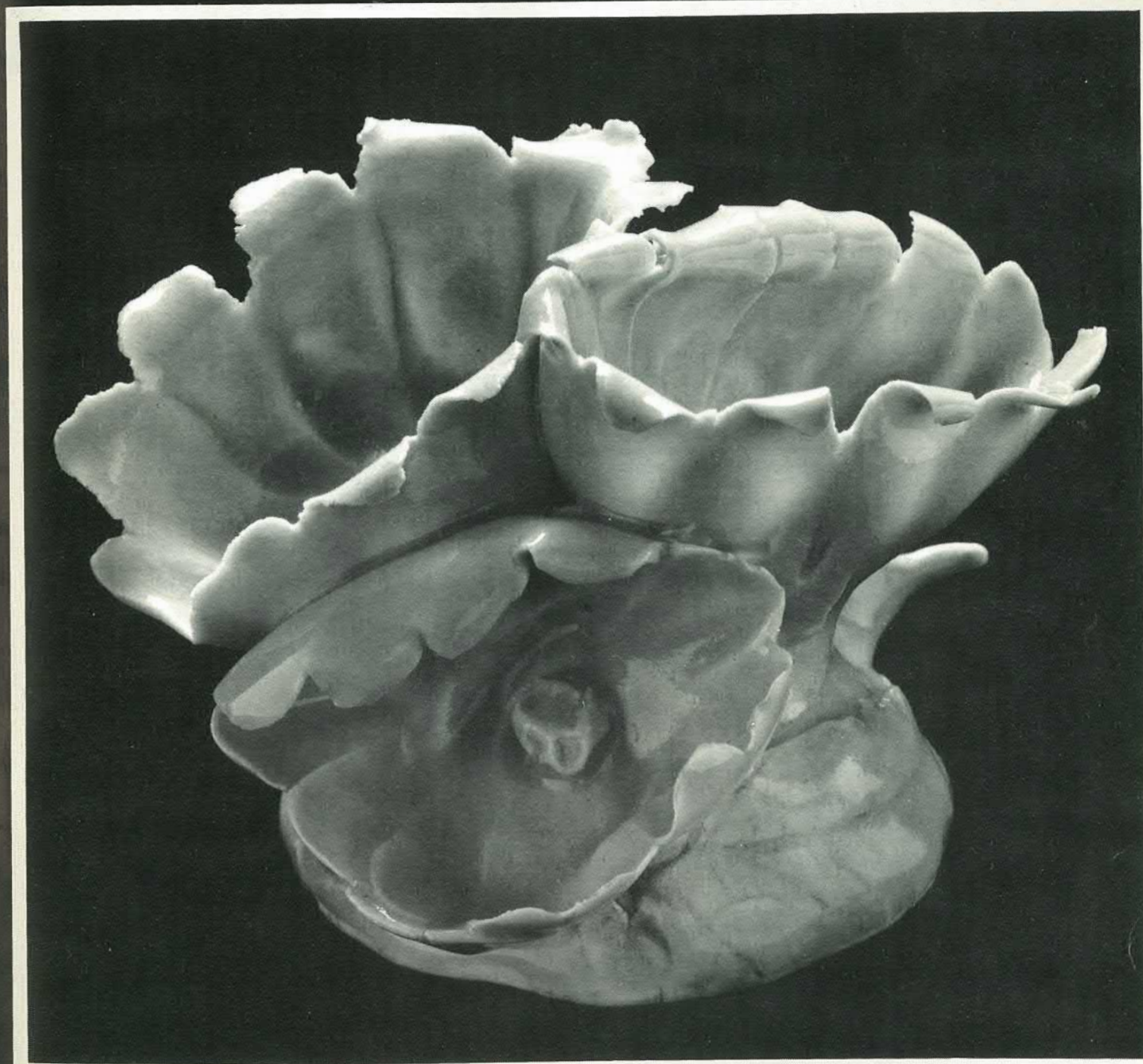
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Rosemarie Brittain

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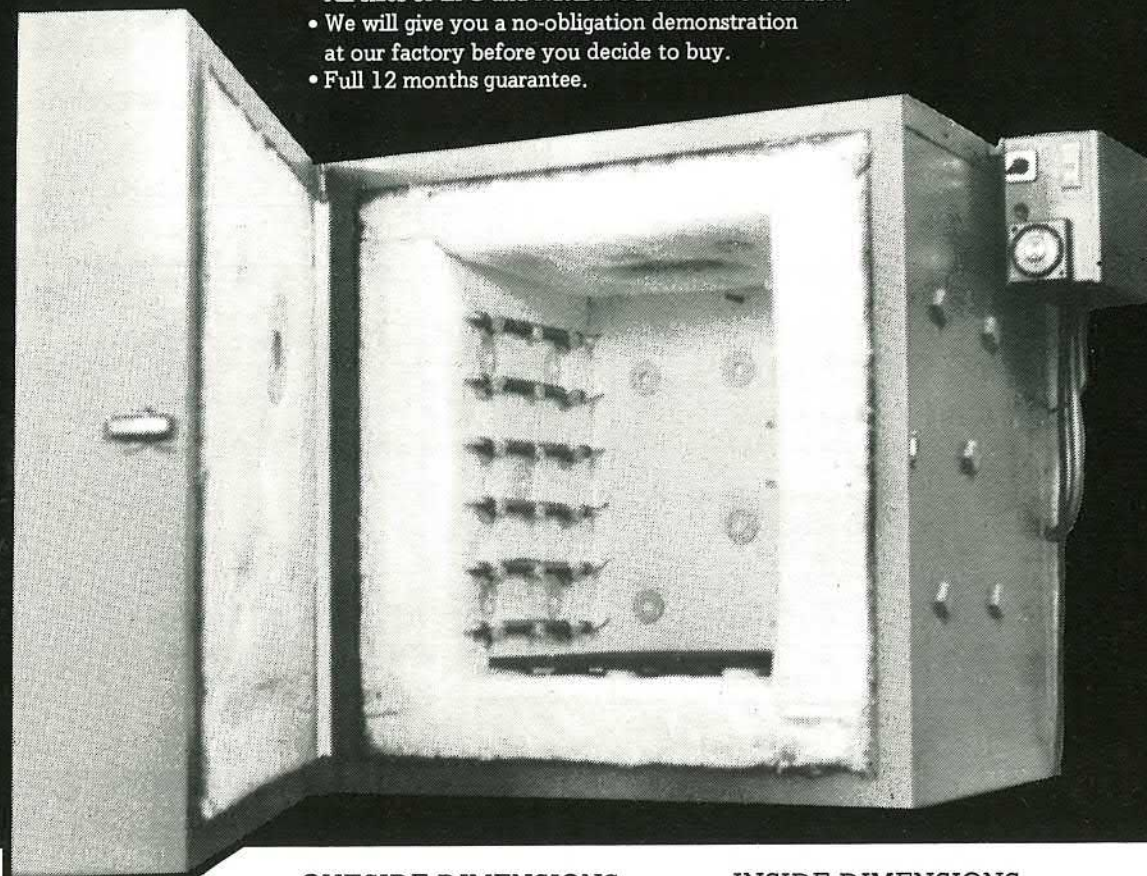
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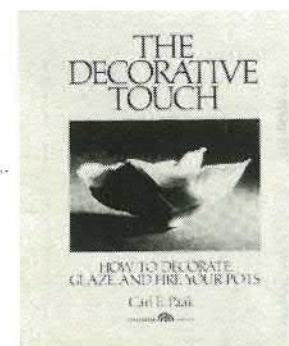
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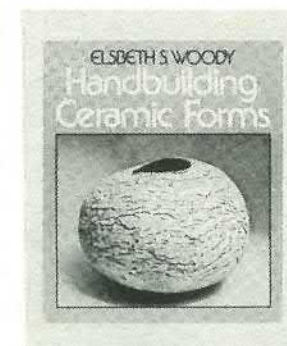
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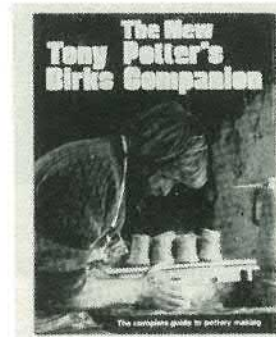
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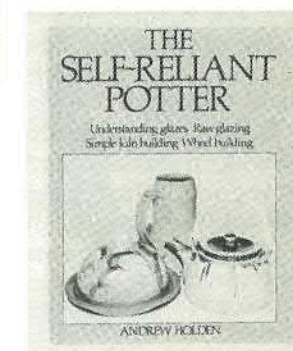
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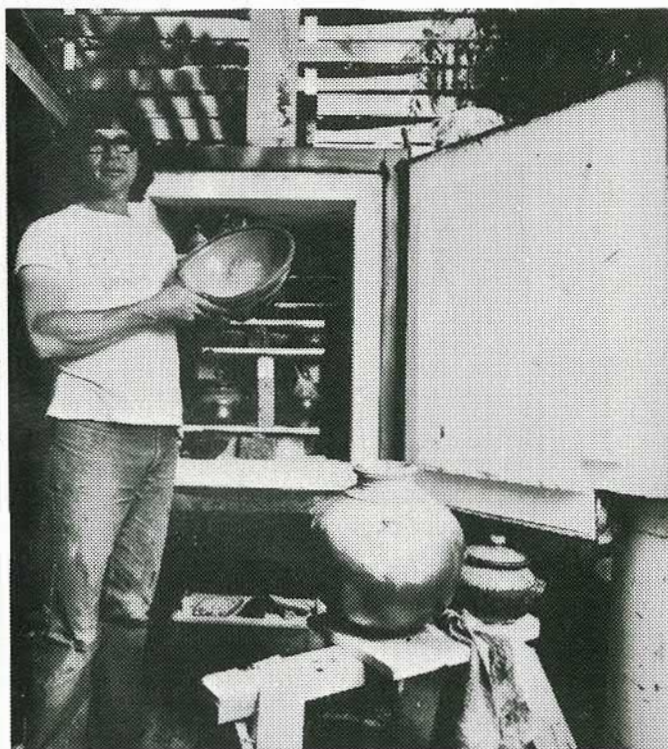
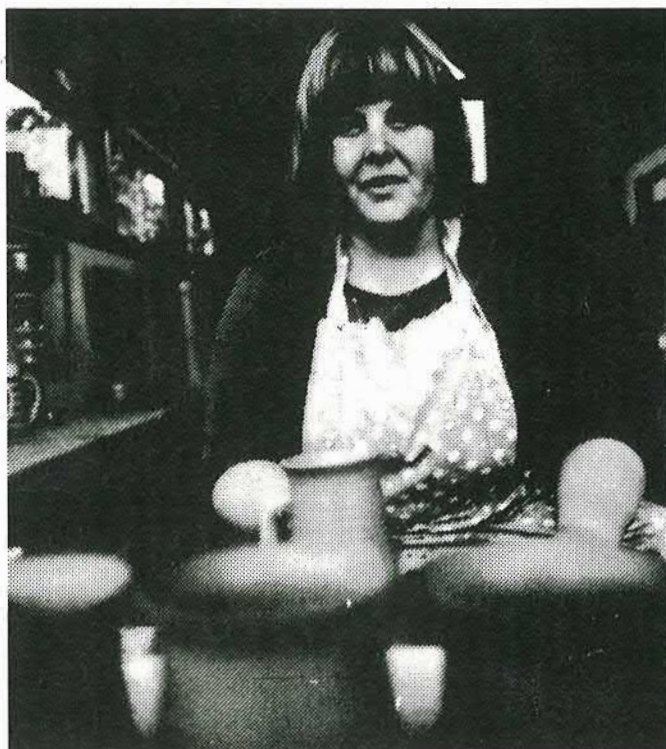
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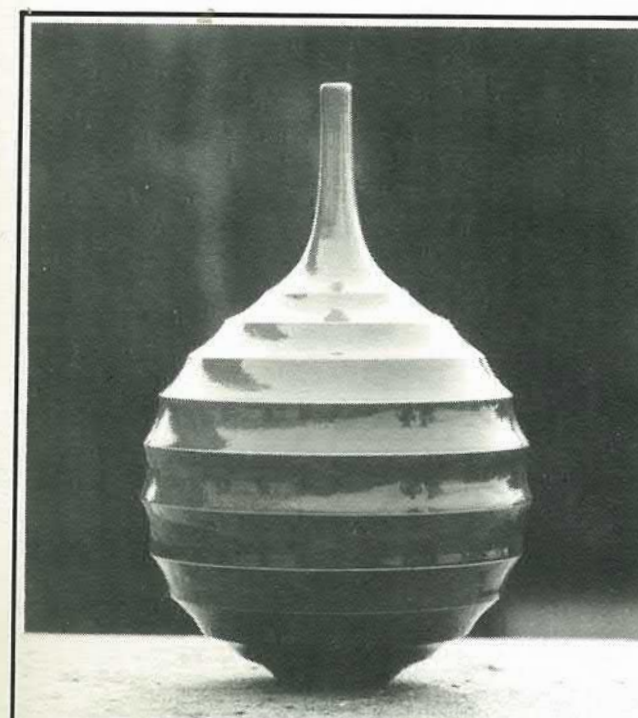
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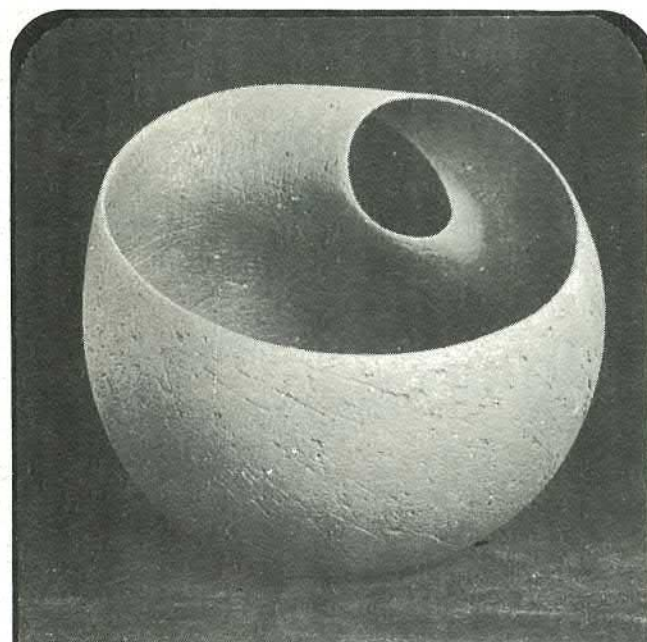
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