

# Comments on clay bodies used by two potters in the Port St Johns region of the Eastern Cape Province, South Africa

## John Steele

Walter Sisulu University, Department: Fine Art, East London, South Africa

E-mail: [jsteele@wsu.ac.za](mailto:jsteele@wsu.ac.za)

## Georges-Ivo Ekosse

Walter Sisulu University, Directorate of Research Development, Mthatha, South Africa.

E-mail: [gekosse@wsu.ac.za](mailto:gekosse@wsu.ac.za)

## Ndze Denis Jumbam

Walter Sisulu University, School of Applied and Environmental Sciences, Mthatha, South Africa

E-mail: [njumbam@wsu.ac.za](mailto:njumbam@wsu.ac.za)

This collaborative study has brought together our various backgrounds in art history, ceramics practice, chemistry, and clay mineralogy, so as to contextualise properties and ideas about the clay bodies used by octogenarian potters Alice Gqa Nongebeza and Debora Nomathamsanqa Ntloya. Nongebeza works from her homestead at Nkonxeni village [31° 37'59.66"S, 29° 23'22.26"E] in the Tombo area, and Ntloya is based at Qhaka village [31°36'34.04"S, 29° 24'34.78"E] in the Chaguba area, these sites being within about 5 kilometres of each other on the R61 road from Mthatha towards Port St Johns. Working separately, these potters have been digging clay from their respective mining sites and making pots for approximately the past sixty years. In this paper notions about why those specific clays were chosen and why their characteristics are desirable are enframed by comparative chemical analyses thereof as well as by a broad overview that places these clays in a wider perspective.

**Key words:** bonfired vessels, ceramic artworks, ceramics praxis, ceramics raw materials, chemical analysis of clay, earthenware, Port St Johns region, pottery, potters, visual arts, zero electricity usage ceramics technology

### **Izimvo ngomsebenzi wodongwe olusetyenziswe ngabaxonkxi ababini kwisithili saseSajonisi kwiphondo leMpuma Kapa eMzantsi Afrika**

Le ntsebenziswano izise ndawonye inkcubaphuchopho ezisuka kwinkalo ezahlukeneyo ngembali yenkcubeko, umsebenzi wezandla, ikhemestri nokombiwa kodongwe ukifumana izizathu nezimvo ngodongwe olusetyenziswe ziinkonde zabaxonkxi u-Alice Gqa Nongebeza no-Debora Nomathamsanqa Ntloya. U-Nongebeza usebenzela emzini wakhe kwilali yaseNkonxeni [31° 37'59.66"S, 29° 23'22.26"E] kwisiphaluka saseThombo. U-Ntloya yena uzinze kwilali yaseQhaka [31°36'34.04"S, 29° 24'34.78"E] kwisiphaluka saseChaguba. Ezindawo zabo zingumgama wekhilomitha ezintlanu ukusuka kwenye kuhola wendlela u-R61 ukusuka eMthatha ukuya eSajonisi. Besebenza ngokwahlukana, ababaxonkxi bebesomba udongwe kwindawo zabo ezahlukeneyo besenza iimbiza zomdongwe isithuba seminyaka engamashumi amathandathu egqithileyo. Kweliphapha izinto ezinjengokuba kutheni udongwe oluthile luye lwasetyenziswa/lwakhethwa nokuba kutheni izinto ezifunyanwa kolidongwe zifuneka ziye zaqanjiswa ngokuthi kwenziwe uhlalutyo olukhethekileyo lwekhemikhali kunye nembono ebanzi ebeka ezintlobo zodongwe kwimo ephangaleleyo.

**Amagama amakaqatshelwe:** ubugcisa obenziwe ngokutshisa emlilweni, ubugcisa beselamiki, ukutshintshatshintsha nokujonga kokusetyenziswa kodongwe, izinto ezikrwada zeselamiki, ucwaningo lodongwe ngekhemikhali, ingqayi, isithili saseSajonisi, umsebenzi wodongwe, abaxonkxi bodongwe, inkcubeko ebonwayo, ukusetyenziswa kombane okungenandleko kobugcisa beselamiki

Potters take carefully selected raw earth, pound and add water if needed for appropriate consistency, then with “skilled and knowing hands” (Dobres 1998: 1) shape ideas, allow air to circulate and dry the works while adding colouring agents and surface texturing if desired, then carefully fire<sup>1</sup>. After this process of heat treatment, which transforms raw clayey materials and facilitates durability by producing a chemically altered state, those artworks become situated in private and public places for use and contemplation. Such ceramic vessels are created by Alice Gqa Nongebeza and Debora Nomathamsanqa Ntloya (Steele 2007, 2009) by means of zero electricity usage technology<sup>2</sup> at their respective homesteads near Port St Johns (figure 1). They dextrously blend materials and processes with practical experience in order to achieve intended functional and visual effects when they make and act on creative technical and aesthetic choices.

Pottery clays are seldom pure and they differ from region to region. The impurities contained therein are also usually varied. These, together with different mineral constituents of the raw materials, play significant roles in determining main properties during shaping, firing, and subsequent use.



**Figure 1**  
View of Nongebeza and Ntloya homestead sites, just off the R61, near the bridge crossing the Mngazi River (Google Earth, 23 January 2009).



**Figure 2**  
Alice Gqa Nongebeza in 2006, left, and Debora Nomathamsanqa Ntloya in 2008, right, respectively creating vessels by adding coils of clay to a flat base, then upwards towards completion at the rim.

Potters, in most areas of Africa where ceramics are created by means of zero electricity usage technology, come to trust handed down and experienced knowledge as well as their senses of observation, touch, and smell, as means used to ascertain the quality of raw materials needed. Even in contemporary circumstances there is usually no chemical analysis of clays conducted

by such potters. Thus, our chemical analysis and assessments of the clays used by Nongebeza and Ntloya (figure 2) are presented below as a text complementary to and alongside such local knowledge as has already been put into practice by these potters (Steele 2007, 2009).

People experience similar things, such as clay and artworks, and physical environments, such as home or village, in diverging ways. Nigel Thrift (2005: 231, 249, also citing Brown 2003: 162) in quite an extreme example, has called attention to changing perceptions of materiality whereby he quite startlingly suggests materiality of any items, including clay and artworks, as being “no less physical than ... thoughts”, and that “thinking is now bound up with objects to such an extent that everyday life presents us not with phenomenology’s reduction of the world of consciousness”, but everyday life presents participants therein “with consciousness reconceived as something dispersed throughout the material world”.

Likewise, Fred Myers (2005: 88-89) has suggested along a similar vein that “materiality --as a theory of quality of objectness-- is not so much an issue of matter but is constituted, rather, through ideological frameworks”. He went on to observe further that “formulation of materiality (or materialities) is varied and often conflicting around different understandings of subjects and objects”, noting with specific reference to conceptualisations pertaining to artworks, that “nowhere is this more apparent --or palpable-- than in situations in which human beings attempt to secure, stabilise, or even limit the flow of culture, to turn culture into property form”. Visual arts raw materials such as clay and paint, for example, and resulting works of art do, furthermore, “possess different significances at the same time or over time” (Thomas 2001: 139).

Despite that avenues for looking at clay as a visual arts raw material seem thus to have “become ... unmoored” (Vogel 2005: 15) it nonetheless remains true that potters use clay to create their artworks despite that they are likely to conceptualise and interpret their raw materials and practices in diverging ways. Within that context it has been found, for example, that Frank Hamer (1975: 58) provides a useful interpretation of the nature of clay in his observations that

it originates as a pure mineral in decomposed igneous rock. [It is] a ... variable, responsive ... heavy, damp, plastic material that ‘sets’ upon drying and can be changed by heat into something ... hard [and] waterproof. [In its original state] the decomposed rock ... becomes soft which, if exposed, is weathered and washes away. During transportation by river, or by ice or sea, the clay is ground, picks up impurities, loses associated minerals and is finally settled into areas of similar particle size. The result is a clay stratum of progressive variation from fine to coarse with possible change of colour and composition also.

Elaborations on those observations, from Wikipedia, include that

clay is a term used to describe a group of hydrous aluminium phyllosilicates (phyllosilicates being a subgroup of silicate minerals) that are typically less than 2 micrometers in diameter. Clay consists of a variety of phyllosilicate minerals rich in silicon and aluminium oxides and hydroxides which include variable amounts of structural water. Clays are distinguished from other small particles present in soils such as silt by their small size, flake or layered shape, affinity for water and tendency towards high plasticity. ([http://wiki.answers.com/Q/what\\_is\\_clay](http://wiki.answers.com/Q/what_is_clay) 31/3/2010).

The clayey raw materials used by both Nongebeza and Ntloya are from shales (figure 3), weathered shales, and clays of ancient Palaeozoic rock that are part of the Witteberg Group (Jacob *et al*: 2004), and the Bokkeveld Series. Interbedded among the shales are sandstones, flagstones and quartzites, the latter probably being partly the source of high silica content in the shale and clayey materials used by both potters, more of which shortly. Also, when thinking about different types of clay it is helpful to use a chemical analysis yardstick to which other clays can be compared. In that regard Frank Hamer (1975: 60) has suggested that an earthenware<sup>3</sup> type of clay could theoretically be analysed into a formula of components made up of alumina 23%, plus silica 62%, plus iron oxide 1%, plus calcia and magnesia 3%, plus potash and soda



2% (loss on firing 9%). The clay content thereof could then in turn be further analysed to be 50%, plus feldspar 15%, plus free silica 29%, plus iron oxide 1% and limestone 5%, clay content having been based on clay crystal structure with the formula  $Al_2O_3 \cdot 2SiO_2 \cdot 2H_2O$ . This type of clay is kaolin, with the dominant mineral being kaolinite. Variations in these and other components result in clays of different characteristics.



**Figure 3**

**Shale seen alongside the road on the way to Nongebeza clay traditional mining site, 2008.**

Chemical composition of clay is one of the main indicators of the properties of that sample (Nsiah 2007: 123), and analysis thereof may well give a fair idea of how a clay will behave even prior to any usage at all. In the case of the clays used by Nongebeza --from Mbutho near Nkonxeni village area-- and that of Ntloya --at Qhaka village area-- spaced within approximately 90 min easy walking distance of each other, it is useful to look at comparisons that respectively echo the sequence used by Frank Hamer (1975: 60) above. In that sequence he listed the silica content which was compared to the proportion of aluminous compounds, as well as to iron oxide, calcia and magnesia, potash and soda, including also alkali earths and other oxides, as well as by making comparisons of loss on ignition.

Tabulation of these aspects show:

Silicon dioxide ( $SiO_2$ ) content wt %

Nongebeza: Mbutho area	54.45
Ntloya: Qhaka area	67.84
Compared to Hamer (1975: 60)	62.00

Presence of free silica, which does not constitute part of the structural composition in clay, reduces its plasticity, its shrinkage on drying and firing upon cooling, its tensile and crushing strengths and in some cases its refractoriness (Searle & Grimshaw 1960). Frank Hamer (1975: 266) has also observed that “60 wt % of the earth’s crust consists of silica”.

Aluminium Oxides content wt %

Nongebeza: Mbutho area	16.79
Ntloya: Qhaka area	15.07
Compared to Hamer (1975: 60)	23.00

Oxides of aluminium, particularly  $Al_2O_3$ , are responsible for the refractoriness and plasticity

of a clay sample (Worrall 1986), its presence acting as an “opener ... cutting down the drying shrinkage on the raw clay and making the body able to withstand a higher temperature during firing” (Hamer 1975: 6).

Iron Oxides content wt %

Nongebeza: Mbutho area	11.31
Ntloya: Qhaka area	7.32
Compared to Hamer (1975: 60)	1.00

Iron has a direct influence on the colours of both raw and fired clays (Ekosse *et al*, 2003: 16). The iron content of any clayey material used in ceramics affects its economic value. Oxides of iron minerals in clay bodies thus contribute to the colour of the clay after firing, being responsible for a “range of colours from yellow through orange and brown to almost black ... the commonest crystal of ferric oxide ( $\text{Fe}_2\text{O}_3$ ) being a red-brown colour” (Hamer 1975: 160). Both haematite ( $\text{Fe}_2\text{O}_3$ ) and goethite ( $\text{FeO}\cdot\text{OH}$ ) are commonly found to be present in kaolinitic clays of the type that are utilised by both Nongebeza and Ntloya. The alkali and/or iron content influence the rate of melting through their fluxing action on Silicon dioxide ( $\text{SiO}_2$ ) and Aluminium oxide ( $\text{Al}_2\text{O}_3$ ).

Calcium Oxide and Magnesium Oxide content wt %

	CaO	MgO
Nongebeza: Mbutho area	7.65	5.89
Ntloya: Qhaka area	2.56	2.15
Compared to Hamer (1975: 60)	3	

These alkali materials generally reduce vitrification temperatures and refractoriness, and Hamer (1975: 42, 188) has observed that they act as catalysts and thus contribute to “fusion” of clay bodies upon firing, have a “high rate of contraction ... [and Calcium oxide helps to] prevent warping”.

Potassium Oxide ( $\text{K}_2\text{O}$ ) and Sodium Oxide ( $\text{Na}_2\text{O}$ ) content wt %

	$\text{K}_2\text{O}$	$\text{Na}_2\text{O}$
Nongebeza: Mbutho area	0.61	1.19
Ntloya: Qhaka area	2.05	2.01
Compared to Hamer (1975: 60)	2	

These are also alkali materials that generally reduce temperatures required for vitrification and refractoriness. In this regard Hamer (1975: 231, 279) has noted that Potassium oxide “provides a non-plastic ... fusible content which gives hardness to the finished product”. He has also commented that it is a “flux which instigates the interactions which give the denser ware” and that Sodium “is very reactive and quickly combines with adjacent elements to form compounds”. By way of an initial further observation on these results it is interesting to note that all chemical components predicted to be present by Hamer (1975: 60) in his theoretical earthenware clay body are indeed there in both clays in use respectively by Nongebeza and Ntloya. This can be shown more clearly as follows:

Core components of the three earthenware bodies in wt %; and Loss on Ignition, LoI %

Material	SiO <sub>2</sub>	Al <sub>2</sub> O <sub>3</sub>	Fe <sub>2</sub> O <sub>3</sub>	CaO	MgO	K <sub>2</sub> O	Na <sub>2</sub> O	LoI
Nongebeza: Mbutho area	54.45	16.79	11.31	7.65	5.89	0.61	1.19	9.15
Ntloya: Qhaka area	67.84	15.07	7.32	2.56	2.15	2.05	2.01	6.29
Hamer (1975)	62.00	23.00	1.00	3.00		2.00		9.00

[Key: SiO<sub>2</sub> - Silicon dioxide; Al<sub>2</sub>O<sub>3</sub> - Aluminium oxide; Fe<sub>2</sub>O<sub>3</sub> -Iron oxide; CaO - Calcium oxide; MgO - Magnesium oxide; K<sub>2</sub>O - Potassium oxide; Na<sub>2</sub>O - Sodium oxide].

There are also four other metallic oxides and phosphorus pentoxide (P<sub>2</sub>O<sub>5</sub>) present in small quantities in the clays from Mbutho and Qhaka areas that are not listed as part of Frank Hamer's (1975: 60) theoretical earthenware clay body. These include:

	Manganese oxide	Titanium dioxide	Phosphorus pentoxide	Chromium oxide	Nickel oxide
Nongebeza: Mbutho area	0.17	0.99	0.12	0.054	0.011
Ntloya: Qhaka area	0.08	0.88	0.08	0.02	0.00

Before going on to take a deeper look at ways in which the various core clay components and extra metallic oxides interact with each other and some ways in which each particular combination has special advantages and disadvantages, as well as at how these are manipulated by Nongebeza and Ntloya to maximise advantages, it is necessary to contextualise by taking a brief look at aspects of these potter's respective ceramics praxis<sup>4</sup> and *chaîne opératoire* so as to clarify several main characteristics.

The idea of investigating respective ceramics *chaîne opératoire* in this context enables use of a conceptual tool for reflection upon a mix of influences and procedures arising from knowledge of earlier ceramics praxis and present day clayworking practices, usually centred around quite specific clayworking phases. Such stages of technical acts can loosely be identified as:

- consideration of artworks to be created;
- decisions about what clay to use;
- clay mining/acquisition;
- clay preparation;
- clay fashioning;
- artwork surface manipulations such as adding engravings or colour;
- drying processes;
- pre-firing finalisation of artwork surface treatments;
- preparation of combustible pyre;
- firing techniques;
- post-firing surface treatments; and
- artwork disposal practices.

Olivier Gosselain (2000: 190) has observed that “most technical options” of this *chaîne opératoire* “are functionally equivalent”, meaning that “similar goals” can be achieved utilising different technological procedures, and “that a choice made at one level does not automatically condition the choices made at other levels”, as well as that “substantial flexibility” is possible in what raw materials are chosen and how they are utilised. Even though these comments may initially seem quite startling such perplexity only arises because how one does things is swayed

by perceptions and preferences which are at least partly influenced by background and other factors contributing to a sense of individuality and identity.

Thus, as suggested by Olivier Gosselain (2000: 188, 190), just as identity can be viewed as a “process rather than an entity”<sup>5</sup>, one can also conceptualise technical acts as being open to change, such behaviours offering “room for manipulation, or choice”. Furthermore, *chaîne opératoire* choices, as much as final products, are also considered to be “full stylistic phenomena”, with differing styles facilitating and articulating variations in “orchestration of significance” (Preziosi 1989: 169).



**Figure 4**  
Clay quarry at the Hausa village of Tasmakke in Niger (Gosselain & Livingstone Smith 2005: 35).



**Figure 5**  
Left: Nesiwe Nongbeza, granddaughter of Alice Gqa, at Nongbeza clay mining site, 2008.  
Right: Siziwe Sotewu, foreground, with Ntloya “tasting the clay” at her clay mining site, 2008.

Nongbeza’s clay mining and manipulation practices can thus be seen as individual acts of partnering with particular types of a widely available raw material in order to achieve specific creative outcomes that include transformation of that raw material by means of fire into utilityware in the form of vessels and other household items. With regard to clay collection, unlike some massive extraction sites elsewhere in Africa (figure 4, above) worked by many potters engaged in zero electricity usage technology, both Nongbeza and Ntloya dig clay from small local sites that have been used for decades (figure 5, above).

A major difference, however, is that Ntloya’s clay and subhunge --a sandy shale temper inclusion often found near clay sites that is used as an additive to clay so as to strengthen the body-- collection sites are located on a grassy slope within an easy 200metre stroll of her homestead, while the site used by Nongbeza is relatively distant and difficult to access. That site is located in the adjoining Mbutho area, approximately 7.6 kilometres by road or 5.2 kilometres by foot in the general direction of the Mngazi River, towards the sea. The site can only be accessed after leaving a very narrow and winding gravel roadway to follow an extremely steeply descending purpose made pathway that weaves through dense indigenous forest and undergrowth for approximately 40 metres. All clay dug must be carried up this steep slope, usually by several children and other helpers in many smallish quantities, before it is hauled back to the studio prior to usage and transformation into ceramic artworks.

Despite constraints imposed by distance, and difficulty of access, Nongbeza has expressed that she really likes her clay because it is strong and fit for purpose, and also because both components of clay and subhunge temper are available as layers at the single mining site, sometimes already perfectly mixed. These pleasing attributes have led her to gratefully pronounce it the “clay that God has mixed” (Interview 007 of 28<sup>th</sup> April 2006: 2, as well as Interview 008 of 12<sup>th</sup> May 2006: 20), allowing elements of belief and appreciation to play



within and as part of what is actually also very precise implementation of technical knowledge required for optimal raw clay and sabhunge temper selection actions.



**Figure 6**

**Alice Gqa Nongbeza and coiled vessel in progress, made in one sitting (photo: John Costello, 2008).**



**Figure 7**

**Alice Gqa Nongbeza vessels, in her studio, used for brewing beer, 2006.**

Furthermore, the clay is indeed robust (figure 6, above) and well suited to her coiling style of construction technique whereby a vessel shape is built up upon a flattened base of clay by means of application and joining up of successive rolled out sausages of clay. Her clay is sufficiently plastic to allow easy shaping of forms, as can be predicted from the chemical composition of 54.45% of free silica which is not high enough to substantially inhibit plasticity. The other elements which directly influence ease of workability and shaping capacity are the aluminium compounds, present in a pleasing proportion of 16.79%, while the free silica and the aluminium compounds in combination with all the other raw materials contribute to remarkable stand-up-strength that allows for relatively large vessels to be created in a single sitting, with an even wall thickness that does not need to be thinned later.

As can be seen in the table below (values in wt %) which shows core components of the Mbutho area and Qhaka area clays, there is a dramatic difference in chemical composition between them, despite that they are located within a few kilometres of each other.

	SiO <sub>2</sub>	Al <sub>2</sub> O <sub>3</sub>	Fe <sub>2</sub> O <sub>3</sub>	CaO	MgO	K <sub>2</sub> O	Na <sub>2</sub> O	LoI
Nongbeza: Mbutho area	54.45	16.79	11.31	7.65	5.89	0.61	1.19	9.15
Ntloya: Qhaka area	67.84	15.07	7.32	2.56	2.15	2.05	2.01	6.29

[Key: SiO<sub>2</sub> - Silicon dioxide; Al<sub>2</sub>O<sub>3</sub> - Aluminium oxide; Fe<sub>2</sub>O<sub>3</sub> - Iron oxide; CaO - Calcium oxide; MgO - Magnesium oxide; K<sub>2</sub>O - Potassium oxide; Na<sub>2</sub>O - Sodium oxide].

This chemical difference between the clays is also directly reflected in performance characteristics, including that both bodies fire satisfactorily without too much warping, blistering, or cracking, and that vitrification is sufficiently adequate for basic liquid containment (figure 7, above). Furthermore, it can be observed that the Qhaka clay is higher than the Mbutho clay in silica but lower in aluminium compounds, resulting in a clay with a low workability factor because of being much less plastic, generally being easily breakable and having very little stand-up-strength. Consequently, vessels made using the coil technique by Ntloya are usually small (figure 8) --less than a handspan in height and/or width, compared to those of Nongbeza which frequently exceed 500mm in height and/or width-- and are made thicker than finally desired in order to avoid collapse. Thus her construction technique optimises qualities of the raw material



available by building relatively small and thick, the item then being scraped thinner upon partial hardening the following day, thereby allowing for careful finalising refinements of shape once the vessel can easily be handled.



**Figure 8**

**Debora Nomathamsanqa Ntloya vessel in progress, then being scraped down and thinned the following day, 2008.**

It is also probable that varying clay preparation practices influence clay performance characteristics. For example, the clay used by Nongebeza is relatively coarse and granular because the raw materials are pounded with heavy tools on a stone with only sprinkles of water being added occasionally until the desired consistency is reached, at which stage work on shaping desired artworks is begun. This practice is in contrast to the approach used by Ntloya who carefully grinds her raw materials which are then sieved to remove impurities before exactly measuring out desired proportions of clay and sabhunge, then gradually mixing sufficient water into the prepared mix, which would be wrapped in plastic prior to use the next day or thereafter. Thus the Mbutho and Qhaka clays receive differing preparation treatments, with the clay of Ntloya being much more refined, and in that process having lost much of its toothy grittiness, thereby probably also contributing to its tendency to slump because of relative lack in stand-up-strength.

Even though the clay of Nongebeza has a generally higher proportion of alkali Potassium oxide and Sodium oxide, as well as alkali earth bearing chemicals such as Calcium oxide and Magnesium oxide, there is sufficient in both bodies to have fluxed the respective vessels created with those clays for them to ring sweetly when struck firmly on the rim, and for them to be adequately strong and vitrified to be fit for purposes of containment for events such as beer brewing and so on.

On the other hand, firing of completed artworks presents another clutch of challenges to both potters, each having developed a unique procedure that optimises clay characteristics and intended outcomes (figure 9). Upon perusal of the table, above, showing proportions of core components of the Mbutho area and Qhaka area clays, it can be seen at a glance that the Mbutho clay is higher in all chemicals apart from Silicon dioxide and Magnesium oxide, those characteristics facilitating dramatically differing firing strategies.

Nongebeza's firing technique involves placing ware onto an already blazing wood bonfire, with removal of works out of hot coals occurring soon after redness of the items being fired has been observed. In contrast, the pots created by Ntloya must be absolutely bone dry prior to firing and are thus subject to a preheating phase before being fired to full temperature in a metal basin with dry cow dung being used for fuel (figure 9). Furthermore, items are only removed by her once the fire has died down completely.



**Figure 9**  
**Alice Gqa Nongebeza, left, places a large pot directly onto an existing fire (Photo: John Costello, 2008). Above: Debora Nomathamsanqa Ntloya places her works within a basin filled with dried cow dung prior to lighting the fire, 2008.**

It is difficult to pinpoint which materials contribute substantially to the capacity for Nongebeza’s clay from Mbutho area to respond optimally to being placed directly onto a raging bonfire. It is remarkable that this clay is able to so well withstand the sudden thermal shock that it is subjected to with such extreme temperature change when it is being fired. In this regard it is noteworthy that Nongebeza is the only potter practicing zero electricity usage technology that we know of who utilises that approach<sup>6</sup>. Interestingly, a clue might reside in the relatively high Calcium oxide content of 7.65% of the Mbutho area clay because of the capacity of that material to impart stability and “prevent warping” (Hamer 1975: 188) although in fact many of her vessels do warp, but not to such an extent that they break.

Another clue emerged while chatting with local East London potter and clay supplier Jeremy Dubber (25<sup>th</sup> June 2010) recently. He enquired about the raw clay consistency and when told that the clay used by Nongebeza is relatively coarse and granular he commented that firing of clay was usually done quite slowly because of trapped water needing to find a slow way out between the platelets of clay particles to the surface to escape as steam, or else the work being fired would explode. He suggested that perhaps steam could make its way out much easier than usual from the Mbutho clay because it was full of small stony particles that pierced and intersected the platelet structure of clay particles.



**Figure 10**  
**Approximately average size, shape, and colouring of fired vessels by Alice Gqa Nongebeza, left: 306mmh x 268mmw; and by Debora Nomathamsanqa Ntloya, right: 102mmh x 137mmw (photo: 2010).**

Other factors such as the presence of metal and phosphorus oxides as shown below are not

likely to contribute to thermal shock resistance in the proportions that they are present in these clay bodies, their roles being limited more towards fired colour: namely deep blue/blackish to purples and deep browns for the Mbutho area clay, and lighter browns for the Qhaka clay (figure 10, above).

	Iron oxide	Manganese oxide	Titanium dioxide	Phosphorus pentoxide	Chromium oxide	Nickel oxide
Nongebeza: Mbutho		0.17	0.99	0.12	0.054	0.011
Ntloya: Qhaka		0.08	0.88	0.08	0.02	0.00

Thus, from the foregoing it can be seen that both a geological contextualisation as well as a chemical analysis of clays used contribute in some ways towards greater understanding and appreciation of both the works created by potters such as Nongebeza and Ntloya, and awareness of some of the local knowledge and know-how that both potters utilise when creating their artworks. It also seems likely that as other clays and raw materials made use of by potters elsewhere in southern Africa --and indeed the continent at large-- are contextualised and analysed that a much more coherent and extensive picture will emerge of raw material preferences and practices of potters who engage with zero electricity usage technology.

In conclusion, then, it seems to be appropriate to return to an earlier topic pertaining to ideas about clay and to take cognisance of some observations made by Lyall Watson (1992: 23), who characterises clay as “the fabric of earth itself”, being composed of crystals<sup>7</sup> that “replicate themselves in a stable manner”. Furthermore, he has suggested that crystals in clay are “lifelike, arranging themselves into complex layered structures which have the capacity to evolve ... their crystals are tiny ‘naked genes’ which are being churned out constantly by the earth ... and sorted into arrays with very different functions” (1992: 23-24). This conceptualisation of clay suggests that those lifelike qualities referred to may be transformed without being nullified in a potter’s hands. Then, as a final thought --for now-- it seems fitting to comment that it is enjoyment of the wonderfully responsive and sensually tactile visual arts medium of clay that links many potters worldwide, past and present. Thereby we also salute the achievements and artworks created by our largely as yet unrecognised local Eastern Cape potters such as Nongebeza and Ntloya.

## Acknowledgements

We are grateful to Alice Gqa Nongebeza and Debora Nomathamsanqa Ntloya for welcoming us to their homesteads and ceramics studios, and for sharing their knowledge so freely, and thank Siziwe Sotewu for help with interpretations of events and translation of discussions. The financial assistance of Walter Sisulu University is also acknowledged. All views expressed are our own.

## Notes

1. Fired clay is clay that has usually been heated to an excess of 600°C (Fournier 1977: 83), also variously called “ceramic, pottery, earthenware, or terracotta” (Berns 1989: 32; and also with reference to Rhodes 1976; Searle & Grimshaw 1960; and Singer & Singer 1963).  
because, among various factors, other terms that have previously been used such as open-fired, bonfired, handbuilt, rural pots, earthenware, or traditional ceramics, have potential for partial accuracy, yet each refers to only an aspect or element of an entire process and *oeuvre*, and are thus inadequate. We also did not want to set up a dichotomy between urban and rural ceramics
2. Selection of the rather laborious phrase “zero electricity usage ceramics technology” has arisen



- praxis, and anyway, alternative technologies to those driven by electricity are correctly coming under ever increasingly more favourable scrutiny. Reasons for that include that electricity in South Africa is becoming prohibitively expensive where it is unreliably supplied by ESCOM which uses “coal-fired technology to produce more than 90% of its output, which has contributed to the fact that South Africa is ranked among the top 15 greenhouse gas carbon dioxide emitters in the world” (personal communication 24th June 2010 from Melita Steele, Climate and Energy Campaigner for Greenpeace in Africa).
3. Earthenware ceramics are “those with a porous body which may or may not be covered with glaze” (Fournier 1977: 70).
  4. We use the term ceramics “praxis” in the sense of “accepted practice, custom, action” (Shorter Oxford English Dictionary 1972) with regard to thinkings about and creation of ceramic artworks, irrespective of rural/urban settings or extent of electricity-usage ceramics technology.
  5. In arriving at this position of acknowledging “the interactive, heterogeneous, and dynamic processes” through which identity is constructed Gosselain (2000: 188-189) referred to Blinkhorn 1997; Eriksen 1992; Hall 1996; Matthews 1995; Meadows 1997; and Pellegram 1998. Gosselain (2000: 188) also referred to significant studies contesting an invariably self-conscious process of identity communication to include those of Howes 1998; Miller 1995, 1998.
  6. It is more a common practice, both elsewhere in South Africa as well as in Africa at large, to lay a floor of combustible material then place items for firing and fuel so as to create a pyre that is lit once all fuel and works are in place, as documented by, for example, Armstrong 1998; Forni 2007; Frank 2007; Goldner 2007; and Perrill 2008.
  7. Crystals act as transducers, transforming and transmuted energy from one form to another” (Watson 1992: 37).

## Works cited

- Armstrong, Juliet. 1998. The Magwaza family, in *Ubumba: Aspects of Indigenous Ceramics in KwaZulu-Natal*, edited by B Bell and I Calder, pp. 41-46. Pietermaritzburg: Tatham Art Gallery.
- Berns, Marla C. 1989. Ceramic arts in Africa. *African Arts*. 22(2): 32-37, 101-102.
- Blinkhorn, Paul W. 1997. Habitus, social identity and Anglo-Saxon pottery, in *Not so Much a Pot, More a Way of Life: Current Approaches to Artefact Analysis in Archaeology*, edited by CC Cumberpatch & PW Blinkhorn. Oxford: Oxbow.
- Brown, Bill. 2003. *The Sense of Things: the Object Matter of American Literature*. Chicago: University of Chicago Press.
- Dobres, Marcia-Ann. 1998. Meaning in the making: embodying the experience of Upper Palaeolithic technology and art. Working paper prepared for Amarind Advanced Seminar “The Anthropology of Technology”, University of California, Berkeley, USA.
- Ekosse, Georges; Mulaba, Antoine & Nkoma, John. 2003. Effect of firing on colour of clayey materials applied to traditional ceramics. *Botswana Journal of Technology* 12 (1): 13–8.
- Eriksen, Thomas Hylland. 1992. *Us and Them in Modern Societies. Ethnicity and Nationalism in Mauritius, Trinidad, and Beyond*. London: Scandinavian University Press.
- Forni, Silvia. 2007. Containers of life: pottery and social relations in the Grassfields (Cameroon). *African Arts*. 40(1): 42-53.
- Fournier, Robert. 1977. *Illustrated Dictionary of Practical Pottery*. New York: Van Nostrand Reinhold.
- Frank, Barbara E. 2007. Marks of identity: Potters of the Folona (Mali) and their ‘mothers’. *African Arts*. 40(1): 30-41.
- Goldner, Janet. 2007. The women of Kalabougou (Mali). *African Arts*. 40(1): 74-79.
- Gosselain, Olivier P. 2000. Materialising identities: an African perspective.



- Journal of Archaeological Method and Theory*. 7(3): 187-217.
- Gosselain, Olivier P & Livingstone Smith, Alexandre. 2005. The source: clay selection and processing practices in Sub-Saharan Africa, in *Pottery Manufacturing Processes: Reconstruction and Interpretation*, edited by A Livingstone Smith; D Bosquet & R Martineau. BAR Int. Series 1349. Oxford: Archaeopress: 33-47
- Hall, Stuart. 1996. Who needs identity? in *Questions of Cultural Identity*, edited by S Hall & P du Gay. London: Sage: 1-17
- Hamer, Frank. 1975. *The Potter's Dictionary of Materials and Techniques*. New York: Watson-Guption.
- [http://wiki.answers.com/Q/what\\_is\\_clay](http://wiki.answers.com/Q/what_is_clay) accessed on 31/3/2010.
- Howes, David. 1998. *Cross-cultural Consumptions*. London: Routledge.
- Jacobs, RE., Mitha, VR & MacPherson, D. 2004. The kaolinitic deposits on Beaconsfield, north of Grahamstown. *South African Journal of Science*. 100: 560-564.
- Matthews, Keith J. 1995. Archaeological data, subculture and social dynamics. *Antiquity*. 69: 586-594.
- Meadows, Karen I. 1997. Much ado about nothing: the social context of eating and drinking in early Roman Britain, in *Not so Much a Pot, More a Way of Life: Current Approaches to Artefact Analysis in Archaeology*, edited by CC Cumberpatch & PW Blinkhorn. Oxford: Oxbow.
- Miller, Daniel. 1995. *Material culture and Mass Consumption*. Oxford: Blackwell.
- Miller, Daniel (ed). 1998. *Material Cultures: Why Some Things Matter*. Chicago: Chicago University Press.
- Myers, Fred R. 2005. Some properties of art and culture: ontologies of the image and economies of exchange, in *Materiality*, edited by D Miller. Durham: Duke University Press: 88-117.
- Nsiah, JK. 2007. A study of Mfensi clay in the Ashanti region of Ghana. *Ghana Journal of Science* 47: 123-129.
- Pellegram, Andrea. 1998. The message in paper, in *Material Cultures: Why Some Things Matter*, edited by D Miller, pp. 103-120. Chicago: Chicago University Press.
- Perrill, Elizabeth. 2008. *Ukucwebezela: To Shine – Contemporary Zulu Ceramics*. Bloomington: Indiana University Art Museum.
- Preziosi, Donald. 1989. *Rethinking Art History. Meditations on a coy Science*. London: Yale University Press.
- Rhodes, Daniel. 1976. *Pottery Form*. Radnor: Chilton.
- Searle, Alfred B & Grimshaw, Rex W. 1960. *The Chemistry and Physics of Clays*. London: Ernest Benn.
- Singer, Felix & Singer, Sonja S. 1963. *Industrial Ceramics*. London: Chapman and Hall.
- Steele, John. 2007. Rural potters in the Eastern Cape, South Africa: what next? *South African Journal of Art History*. 22(2): 79-97.
- Steele, John. 2009. Tackling art/craft nomenclature, again, with particular reference to octogenarian potter Alice Gqa Nongebeza, of Eastern Cape, South Africa. *South African Journal of Art History* 24(1): 181-192.
- Thomas, Nicholas. 2001. Appropriation/ Appreciation: settler modernism in Australia and New Zealand, in *The Empire of Things: Regimes of Value and Material Culture*, edited by FR Myers, pp. 139-163. Santa Fe: SAR Press.
- Thrift, Nigel. 2005. Beyond mediation: three new material registers and their consequences, in *Materiality*, edited by

- D Miller. Durham: Durham University Press: 231-55.
- Vogel, Susan Mullin. 2005. Whither African art? Emerging scholarship at the end of an age. *African Arts*. 38(4): 12-91.
- Watson, Lyall. 1992. *The Nature of Things: the Secret Life of Inanimate Objects*. Rochester: Destiny.
- Worrall, WE. 1986. Clay and ceramic raw materials. *Elsevier Science, N.Y.* 14-24; 27-46.

**John Steele** has been a potter all his adult life, working both as a production thrower and then as a pottery manager prior to taking up a lecturing post at Walter Sisulu University where his focus is on Art Theory and Ceramics Practice.

**Georges-Ivo Ekosse** is an applied chemist, environmental and environmental health scientist, extraction metallurgist, geologist and applied clay mineralogist. He is a National Research Foundation rated researcher with a very extensive publications record. Georges-Ivo is currently part of university senior management handling the research development portfolio.

**Ndze Denis Jumbam** is a herbalist, chemist and environmental engineer. He has been teaching at tertiary level in Southern Africa for more than fifteen years. He is now focused on research and university administration.