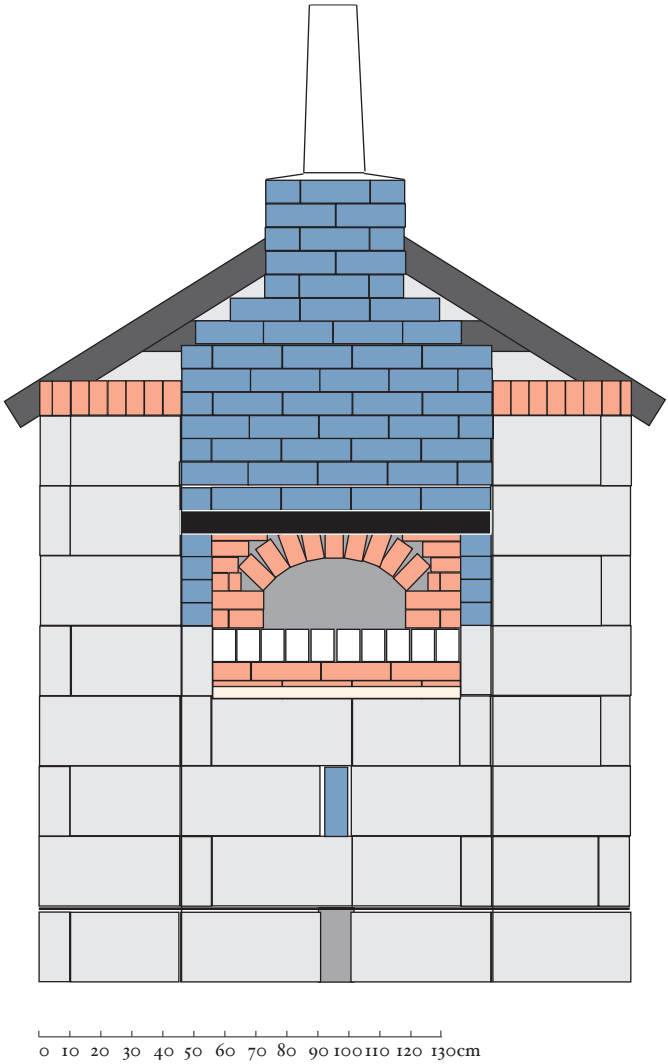
BUILDING A WOOD-FIRED OVEN FOR BREAD AND PIZZA



THE ENGLISH KITCHEN

BUILDING A WOOD-FIRED OVEN FOR BREAD AND PIZZA

TOM JAINE

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Illustration of Bulgarian oven on page 11, © Maria Kaneva Johnson

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Figure 1: a beehive oven, here depicted on a wooden stand, housed in a barnlike structure to give shelter. In the foreground, a trough where the dough is kneaded and left to rise.

ACKNOWLEDGEMENTS

I would like to record my debt to many people who have offered advice, help and encouragement to baking at Allaleigh. Ann and the late Don Barnes, Ed Behr, Roger Berrett, Peter Brears, the late Alan Davidson, the late Gwenda Hill, Andras Kaldor, Nigel Marriage, Janet Mills, Jim Moore, Polly Morrow, Adam Nicholson, the late Alan Scott, Brian Stoddart, Rolf Peter Weichold, and Andrew Whitley.

This new edition is not so much a reworking or revision as a reformatting to fit the series 'The English Kitchen'. In the twenty or more years since its first construction, the oven has continued to give good service. I should stress that the design here described is but one alternative among a multitude. The best recourse for readers anxious to explore other models of ovens (and loaves to cook in them) is the book by Daniel Wing and the late Alan Scott, *The Bread Builders* (Chelsea Green, 1999). I am also grateful to the oven builders Freddie Dudbridge, Gideon Hollis and David Parker who have allowed me to print photographs of their versions of the oven described in the following pages. Their sterling work may give encouragement to those unsure of the wisdom of proceeding.

My family suffered many evenings, and days, of intense tedium. Their patience was impressive.

Allaleigh,
Christmas 2010

A photograph of the author's oven at Allaleigh shortly after its completion in 1988. No external render has yet been applied, and the roof is exiguous.I now have a lean-to canopy springing off the gothic screen on the left-hand side to protect both the oven and the work space. (Photograph, Clare Pawley.)

Gideon Hollis's oven in a garden in north London. The chimney and flue arrangement is extremely neat. (Photograph, Gideon Hollis.)

Freddie Dudbridge's oven in Devon shortly after its completion. (Photograph, Freddie Dudbridge.)

David Parker's oven in New Zealand. The site is enviable. (Photograph, David Parker.)

Two studies of David Parker's oven in construction. The upper picture shows the lower blockwork, with the lintels in place to take the sole of the oven itself. The lower photograph shows the oven completed before the chimney and superstructure have been built. (Photographs, David Parker.)

INTRODUCTORY

COOKING

The list maker can happily tick off ways in which food may be cooked: roasted, grilled, boiled, fried, baked, and .... They all, for that is cooking, require the introduction of heat. And they might, with the addition of smoking – an attenuated form of roasting – be reduced to three: direct exposure to flames or smoke; the use of a heated medium (water or liquid, oil or fat) that transfers that warmth to the food immersed in, or lubricated by it; and finally, cooking in a dry heat at one remove from the flame itself, be it on a griddle or hot stone set atop the fire, or an entire structure (or excavation) that has itself been heated in order to cook the food in the residual heat stored in its walls, floor and ceiling.

Cooking techniques may be viewed as successive steps away from the primitive. At first, direct application of the flame; then the construction of pots to enable heat transference; then the development, over millenniums, of structures to retain heat and return it in measured and useful fashion.

This reflects the broad pattern of development in the food of early man. Roasting is best suited to flesh of all sorts; boiling, or the interposition of a medium, is most apposite for vegetables or fruit, if they are not eaten raw; and baking, on a bakestone or in an oven, is the preferred – though by no means the first – way of coping with grains. Cereals and the settled agriculture they imply came relatively late in man's history – just like ovens.

While a close link between methods of cooking and basic ingredients would be difficult to sustain in every instance – boiling could be applied as well to meat as to vegetables, gruels or fruit – it does become relevant in thinking about wood-fired

ovens. We usually refer to them, and they invariably seem to have a primary use, as bread ovens. What was there about bread, therefore, that urged mankind towards ovens?

Bread, and ovens, are essentials of a Mediterranean, near-eastern, and southern European culture. The two are indissoluble, and have colonized the world as supercargoes on the packet-boat of European migration. Where a technique of baking food existed beyond European confines, it was in the form of a pit of heated stones, such as the North American clambake, or the Polynesian paupau: nothing to do with bread, but cooking out of the circulating air, by means of borrowed, indirect, or residual heat.

BAKESTONES AND POT OVENS

There are many strategies available for dealing with grain. The technical steps that ended with grinding into flour do not inevitably lead to the beehive oven. At first the seeds may be cracked and made into porridge or gruel. Or the milled flour can be made into a paste and boiled, as with central Asian pasta, or dumplings. Or the paste can be wrapped round sticks and roasted for the Boy Scout favourite, twist. The use of controlled dry heat by means of a flat bakestone or metal griddle, or the surface of the hearthstone itself, once swept of ash and embers, was a further primitive method that appealed to cultures across the world whether in Ethiopia, Pakistan, the Middle East, Latin America, or Brittany and other Celtic upland zones of northern Europe.

The two essential techniques, bakestone and ashes of the hearth, might co-exist. When two Anglo-Saxon historians described Alfred's bloomer with the cakes (which were flatbreads) one described them as burning in the fire, the other has him with a pan and the fire underneath.

Flatbreads, like pancakes, have little or no leavening. They are satisfactorily cooked on a griddle, not requiring the all-round heat of the oven. Griddle baking is not wholly restricted

to unleavened breads, even if the 'loaves' are always flat. The Ethiopian *injera*, made from the indigenous grass seed *tef*, was given a sour, natural leavening which makes the giant flatbread much lighter, softer and more spongy than it would otherwise have been. The yeast-raised crumpet or pikelet is also full of holes and spongy in texture. But cooking these on a griddle has inevitable consequences on their form. If a dough is leavened and worked into a shape that requires more complex and gradual application of heat than a griddle can supply, then practical modification is essential.

A bakestone is not the most adaptable of instruments. Its heat is delivered from one side only; whatever is cooked on it will usually have to be turned. But a stone with a cover was a radical improvement, for embers heaped around the lid could provide top heat. In short, an oven, albeit with inadequate temperature control (though Seneca refers to holes in the lids of Roman pot ovens to control the temperature more sensitively). Such a device served to bake soda bread on the peat fires of Ireland, barley bread in Cornwall, or spelt and wheaten breads in south-eastern Europe and the Mediterranean.

These pot ovens have a long recorded history, in classical cultures as well as the barbarian fringes. There were two terms in Latin: *testum* and *clibanus* (from the Greek *klibanos* and ultimately perhaps from the Indo-European root **kleibh-* which may mean 'to bake'), both describing the same vessel designed for cooking between two heats. These figure in later periods as *testo*, *tegamo*, *tiella* and *tian* in various Mediterranean languages, or as the 'trap' in northern France and England. Latin literary references like the instruction by Cato to knead, mould and bake your bread under the *testu*, or pseudo-Virgil's description in *Moretum* of cleaning the hearthstone for the bread, then covering it with tiles before heaping on embers, or Seneca's account of the development of ovens subsequent to the more primitive system of baking in a hot earthenware vessel, confirm the linguistic and archaeological evidence. In the Middle Ages,

the technique was often associated with making pies topped with a pastry crust, though the thirteenth-century Bolognese writer Pietro di Crescenzi said that 'bread baked in an oven is better, because it cooks evenly; that cooked in *testi* is not as good', so even in medieval Italy the oven did not reign entirely supreme.

The pot oven lives on in the Balkans, where Maria Kaneva-Johnson describes the *vrshnik* (Macedonian), or portable lidded oven; or on the Dalmatian island of Iz, where the pot goes by the name of *cripnja* (from *clibanus*), while in Romania the word is *test* – a straight-line derivation from the Latin, before the intrusion of the Greek loan-word.

Nor had the tradition entirely disappeared in Cornwall when the Women's Institute compiled their first local cookery book in 1929. A correspondent described arrangements current in the household of her youth where the clay oven was only used once weekly, and the flat iron griddle for every day. The griddle was placed on a trivet over the fire of brambles, furze and sticks which was allowed to burn hot then, as it died to embers, the trivet would be removed and the bakestone placed directly on the hot ashes. Once wiped clean, the bread would be placed on the griddle, a heavy 'baker' – 'like a huge iron frying pan without the handle' – would go over the top, embers would be piled right over and the loaf would take about an hour to cook.

The eighteenth-century writer William Ellis eloquently described this process in an account of baking barley bread in Devonshire,

> under a large iron kettle, that is chiefly made use of for washing dishes in. As soon as the dough is ready, they make it into a loaf of about three parts the size of the kettle; a large kettle will cover a loaf of near half a bushel of flower [approximately 28 lb (12.6 kg), yielding a loaf of approximately 35 lb (15.75 kg)], which being clean and dry, they sweep the hearth, and on the hottest part of it

they lay down the loaf, and immediately cover it with the kettle, then put over it a good quantity of damp straw or horse litter, and upon this a few ashes: This done, they set fire to the straw, which will burn leisurely away, and cause the upper part of the loaf to be baked equal to the under part; and to this end they commonly allow four or five hours for baking it, if it is a loaf of moderate size; but if very large, they frequently bake it thus all night.

FROM POT OVENS TO BRICK OVENS

To speculate on the century by century progress of leavened bread and its means of cooking would be too much for this place, but the short answer has to be that the covered griddle buried in embers may answer requirements to a degree, but soon becomes practically inadequate for large-scale use, and in a culture where sun-dried bricks and clay are readily available, some larger version of the *clibanus* must have presented itself as a viable alternative. The presumption must surely be that the bakestone and pot oven antedate the beehive oven, even if latterly their courses have run parallel.

The consensus that leavened bread was a discovery of the ancient Egyptians may or may not be confirmed by the fact that the earliest ovens are found in the eastern half of the Mediterranean basin. Excavations in distinct culture zones have produced variant forms, all with us today. An ancient Egyptian oven from the 2nd millennium BC, 'was a squat, beehive-shaped clay mound about three feet tall with internal shelving and with a hole at the base designed to allow the removal of ash. It was principally used to bake bread, although food could also be cooked in a saucepan placed on the flat oven-top, and the cook sat or squatted in front of the mouth of the oven while preparing her food.' From the Jordanian site of Deir' Alla comes a version of the modern tandoor, the *tannur*, dating from around 1000 BC, with a fireplace in the bottom of the oven, and a large opening at the top. Pots could also be placed over the aperture,

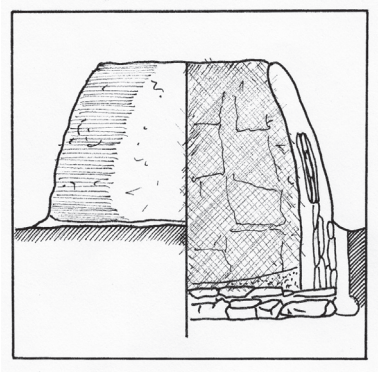

Figure 2: a section and reconstruction of an Iron Age tannur *from Tell Keisan near Deir'Alla in Jordan. The drawing is based on that published by Eveline J. van der Steen.*

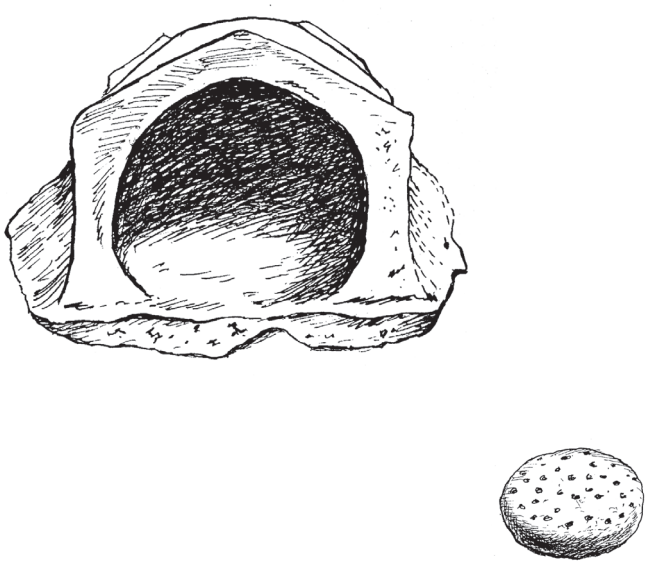

Figure 3: a clay model, dated approximately 4,300 BC, of a bread oven, found in Stara Zagora, Bulgaria; and another of a loaf, carbon-dated to approximately 5,100 BC.

as in Egypt, for cooking as if on an open fire (Figure 2). At Deir' Alla, there was also the *wagdiah*, a closed domed oven or beehive, with two levels. In this case, the fire was built at the bottom, and the bread cooked on the heated floor. This form is sometimes termed, by writers at the beginning of this century for instance, the 'Jewish' oven. Both the *tannur* and *wagdiah* are found in Middle Eastern villages today.

Older than these, however, are the clay models of beehive ovens found in tombs around Stara Zagora in Bulgaria, dating from approximately 4,300 BC, together with models of the loaves baked in them (Figure 3). The pricks in the surface, and the entire shape and appearance of the loaf illustrated must indicate leavening, which would antedate the risen loaves illustrated in Egyptian wall paintings, or those excavated in Egyptian sites. On Minoan Crete, a community that shared the same Mesopotamian-Egyptian cultural nexus as the Nile valley, such ovens do not occur in the archaeological record for another thousand years, so these Bulgarian remains seem to imply a development of bread and baking that was without and beyond the accepted 'cradle of civilization'.

The Bulgarian finds are the clearest sign of the symbiosis of risen bread and ovens. A paste of flour and water was given a leavening, be it a lactic fermentation from the souring and working together of the two ingredients, or alcoholic fermentation caused by the introduction of yeasts, or a combination of the two, which meant that bubbles of air or expanding gas were created at the very heart of the dough. If the flour was of the right sort, this gas could be trapped within the dough by the cells expanding elastically – the magic of gluten – and it was the operation of the gas which the oven captured and sealed within a crust of sugary starch formed by exposure to heat. No instrument could do this more effectively than an oven.

The Bulgarian oven may be compared to a modern beehive oven from Peru (Figure 4) – the consequence of Spanish invasion

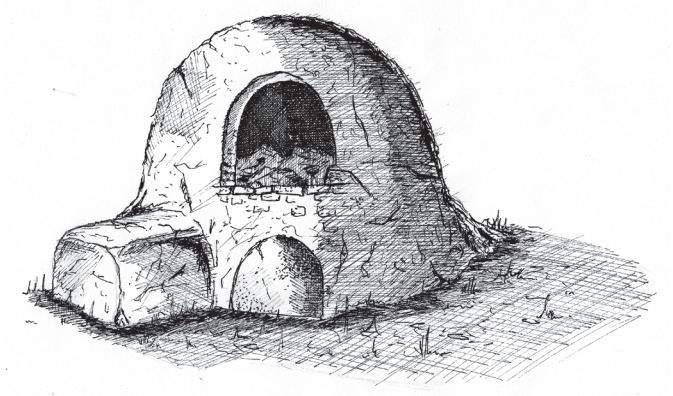

Figure 4: a beehive oven made of clay in the courtyard of a house in Peru. Drawing based on a photograph in The Cook's Room. *The ledge on the left is a working platform, the stone door is propped up in the front.*

Figure 5: a drawing based on a photograph of a modern tannur oven maker's shop in Turkey.

and colonization, not native Inca ingenuity. That there is little to tell them apart speaks volumes for the enduring simplicity and satisfaction of the original concept.

How then does an oven of this nature work? A space is enclosed by floor, walls and roof, with a single aperture at the front. On the floor, or the sole, a fire is kindled. Air enters through the opening to feed the flames, smoke leaves through the same hole, an invisible line separating the incoming and outgoing, bottom and top respectively. The fire heats the entire structure, more or less efficiently depending on its size and shape, and the competence of the fire-builder and the fuel used. At a certain moment, the structure is deemed sufficiently hot for the purpose of baking and the fire and ashes are withdrawn. In their place is thrust the risen dough. The aperture is closed and the loaf cooks in the residual heat which will, if the architecture is sound, radiate in equal amount from all angles thus browning the loaf evenly and allowing the action of leavening to take effect in all parts of the dough. On the elapse of time gauged by experience, the door is opened, the loaf removed and left to cool.

There may be an infinity of variables, caused by design, weather, materials, skill, location and mere happenstance, but that is how all bread ovens worked until modern times. The fuel can be anything, provided it burns; the heat may be delivered by a variety of routes; the oven can be made of many different materials, in a whole range of shapes and sizes, but the principle of residual, radiant heat is enduring. The bread oven differs from the normal run of domestic appliances because the heat combines radiation from the structure itself, and the convection heat of the air contained within the cooking space. Many domestic ovens rely on convection alone, which gives a different character to the bread cooked in them, particularly to the crust.

While the oven was developed to cook bread, its utility was more general. It was bread first and last because loaves are not amenable to other forms of cookery in quite the same way as

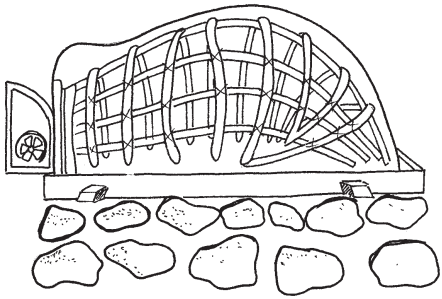

Figure 6: a view of a Quebec oven, showing the boulder foundation, the withy or lath framwork on which the clay envelope is formed, and the iron doors in place.

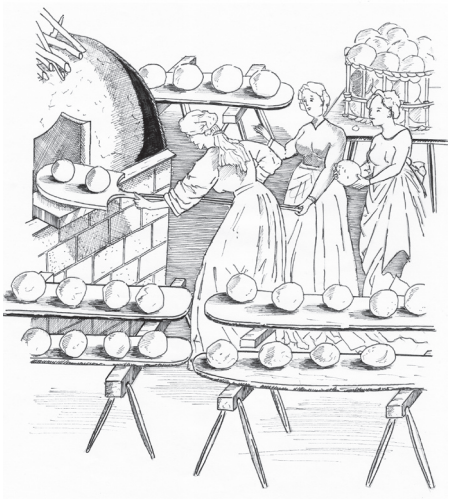

Figure 7: an outdoor oven, from a fifteenth-century French manuscript. The loaves are characteristically round – at least when represented in pictures. There are trestles of loaves proving and the lady is charging the oven with the aid of a peel.