

Taranaki's Red Brick Roads

Ron Lambert



Burning papa was an innovative solution to the problem of finding a material suitable for surfacing roads in Taranaki's unstable hill country.

It is little more than eighty years ago that large areas of the rugged eastern hill country of Taranaki were settled by European farmers. Life in the area has never been easy and many remoter settlements and farms were abandoned during the 1930s depression. Transport in the soft mudstone country presented near insurmountable problems, particularly when harder rocks were not available for road surfacing. Winter saw the "highways" become quagmires. It was not uncommon for horses and bullocks to break their necks trying to haul waggons through the clinging plastic mud. In summer the roads were little better, unless the surfaces were flattened after winter to remove the ruts before they set into near-concrete-like waves. Initially, where road metal was not available, roads were corduroyed with split slabs, but the slabs had to be replaced constantly.

In 1898, as the fully formed Ohura Road was pushed further eastward, replacing the bridle track over the Whangamomona Saddle, some

Head of page: Clinging mud on the road over Pohokura Saddle, Stratford County, in 1916. (Photo: Alexander Turnbull Library)

Opposite page, bottom left: A muddy central North Island road, 1910. (Photo: Alexander Turnbull Library)

trials of burning papa were undertaken in an attempt to create a suitable material for surfacing roads. The first use of fired papa for roads appears to have been on the notoriously unstable Alfredton to Weber road, east of Pahiatua, in 1894. Two "burns" totalling 412 cubic metres were made and some 500 metres of road surfaced. The results of this trial gave rise to some optimism, although the Engineer's report was, for the time, uncharacteristically guarded.

The following year, the Department of Lands and Survey in Taranaki reported its intention of using burnt papa as a substitute for metal or sand. William Nathan, the Public Works Overseer at Whangamomona, arranged the trials but, it was noted, "the result has not been entirely satisfactory." The first firing was in an "excavated kiln, building the [roughly squared] papa blocks as in a brick kiln and then firing it from below in the usual kiln manner".

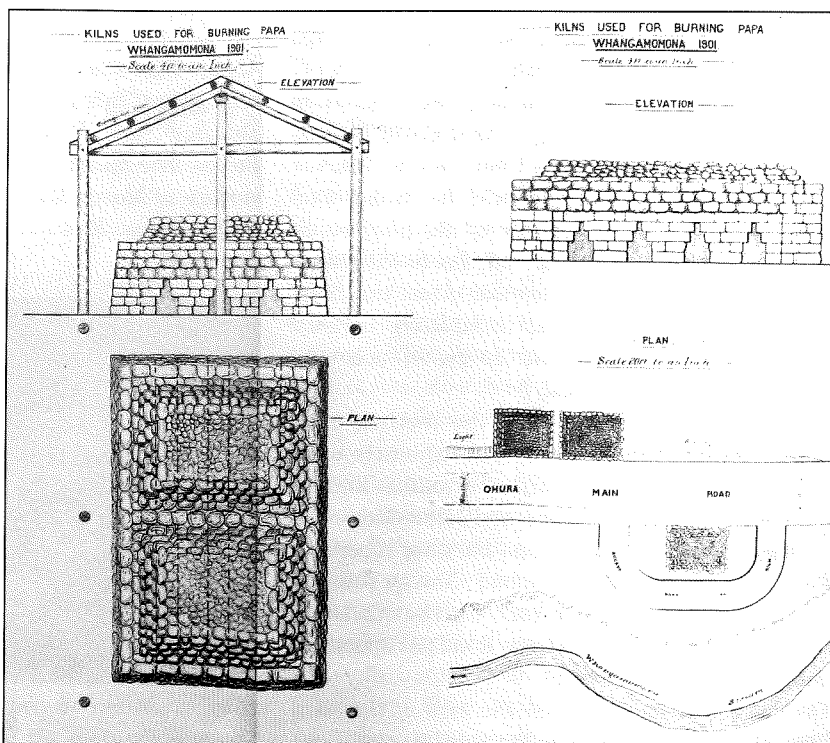
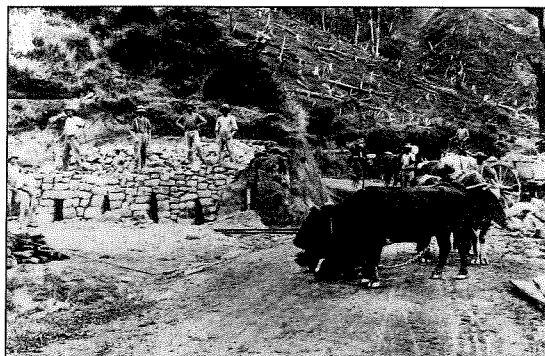
Although this method, similar to a brick clamp, used less wood for firing, the time and

manpower needed to excavate and unload proved too costly and a second, and subsequently more widely used, kiln was employed. This was recorded in some detail:

The method of burning papa is as follows:— The kilns are arranged in groups of three; one of them is being filled while the second is being burnt and the third is being carted away on to the road. The kilns are usually about 24 ft by 18 ft, with walls 7 ft or 8 ft high, and are built in the open of blocks of ordinary papa, freshly quarried from suitable faces. To prevent wet weather interfering with the burning and chilling the papa, the kilns are roofed over with iron or light scantling on rough frames. The roof-ridges should be about 6 ft above the top of the papa. Fire-holes, usually four in number, are run from the front to the back wall, but not through the wall. These fire-holes average 1 ft 10 in wide by 2 ft 10 in high, and are arched with rough square blocks of papa. They should be strongly made, for upon them depends the success or otherwise of the burning. The walls — front, back, and sides — are made of roughly-squared blocks. Under these walls and over the fire-holes the papa, in rough blocks suitable for lifting, is piled up indiscriminately for 2 ft or so above the walls. The accompanying diagrams show general appearance of kilns. The fires are then lighted, wood from the adjoining bush being cut into 4 ft lengths and shoved into the fire-holes. The heat at first is mostly absorbed in drying the papa, but after a few hours of continuous stoking the heat becomes very great, and after thirty-six to forty-six hours of constant firing the top of the kiln is sealed up with a foot

Right: Burning papa for road metal Whangamomona. (Photo: Taranaki Museum)

Below: Plans for a papa kiln, 1901. (Annual Report, 1901, Lands and Survey Department)



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or so of fine clay and the fire-doors plugged up. It takes about four days for the material to cool down before it is fit to handle. It is then carted on to the road, broken to proper size, and spread on the road to depths varying from 6 in to 12 in. The colour of the material varies from terra-cotta to black. If a sufficient thickness is put on a solid bottom it will, no doubt, make a first-class water-proof metalling for the road.

Even this labour-intensive method was later replaced with "face kilns" which were vertical hollows blasted from a papa face. Alternate layers of timber and papa were then built up, fired, and covered with earth.

The procedure in papa burning required ... a moderate papa bluff perhaps 20 ft or 30 ft high topped by a supply of beach [sic] trees, Tawhai and Tawhera. The trees would be fallen and rolled and stacked at the foot of the bluff so as to form a complete burning bed. On to the fallen trees papa would be broken out from the bluff until a suitable layer had completely covered timber. More timber would be fallen over the papa and the heap lighted.

This appears to have been the method used in the Wairarapa which was subsequently used on Mount Messenger (North Taranaki) and in the Ohura area at Tokirima and Nihoniho.

One of the last major papa-burning contracts was let by the Whangamomona County Council as late as 1921. This contract, for the surfacing of several kilometres of Marco Road set specifications for the contractors:

The kilns will be placed on the side of the road clear of traffic ... A base of logs will be put down alongside each other to consist of timber which will not easily burn and which will serve as a platform to keep the kiln dry and clear of the ground. On this platform will be laid a layer of good burning timber such as rata or tawa and then a layer of papa lumps. The timber will be spaced to allow air to ventilate up as the burning proceeds. The thickness of the papa layer must not exceed the thickness of the layer of timber on which it rests. The timber will be arranged crosswise, like a grid and the whole kiln will be made in this way to a height not exceeding 20 feet.

Road widening and sealing have all but eliminated most of the obvious evidence of Taranaki's red brick roads. Patches of red-fired papa can be seen on a considerable length of Marco Road. It could also be seen on the Tahora Saddle stretch of State Highway 43, until the road was reconstructed and sealed in the late 1980s. In 1988, grading in the area revealed, temporarily,



Above: Kiln site on the road verge, Tahora Saddle.

Below: The burnt papa surface of Marco Road. (Both photos: Ron Lambert)



three roughly rectangular "patches" of fired papa, presumably the sites of kilns.

A more substantial kiln site 1.5 kilometres west of Whangamomona township is situated in a small gully fifty metres off State Highway 43. This site consists of a papa quarry from which a track leads twenty to twenty-five metres to the firing site. A tunnel flue connects the kiln site with the floor of the quarry four metres above. Its position — off the road — and the presence of a flue suggests this may well be the site of Nathan's 1898 "excavated" kiln.

Notwithstanding the cautious reports of the engineers involved, locals who recall the spreading of burnt papa all agree it was an efficient road surfacing material. Official recognition of the technique came in 1911, when seventeen papa burning reserves were created within Ohura, Mahoe and Pouatu Survey Districts. As many of these reserves are, however, sited along roads which have seldom been developed beyond pack tracks, it is likely that few have been used for their planned purpose. There is little evidence for the use of burnt papa after about 1911 in the Whangamomona area, except for the 1921 Marco Road contract.

That William Nathan considered the process of some significance is indicated by his presentation, in 1901, of a specimen of "paprite (burnt papa for road formation)" to the then New Plymouth Museum. A reconnaissance of the Taranaki Museum's collections failed to identify this specimen.

The advent of rail transport and of more efficient roading combined to ensure a consistent supply of natural road metal, which was cheaper and ultimately more effective. Whether papa burning was utilised in other geologically similar areas has not been ascertained. The roads of the mudstone hill country of south-eastern Hawkes Bay and the Gisborne hinterland would be likely places where it might have been used. The process appears to have been a short-lived, geographically restricted solution to a major transportation problem of the late nineteenth and early twentieth centuries. □

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Editor's note: This article was submitted with footnotes and a bibliography. For a copy of the original manuscript, including footnotes and bibliography, send \$1.50 to The Editor, New Zealand Historic Places, P O Box 512, Christchurch.