

## *A Brief History of the Rowland's Castle Brick & Tile Works*

### **Introduction**

This is a brief history of the brick industry at Rowland's Castle from the 1880's until the 1960's. Rowland's Castle Brick and Tile Works (SU 734 104) provided the building material for several major civic and public buildings such as Portsmouth dockyards, the Hotel Metropole in Brighton, Hackney College in London, Stansted and Ditcham Houses in Hampshire as well as many local houses. Production ceased in 1968 and the majority of the area of about twenty acres including the clay pits, was cleared in 1971. The site is now occupied by a builder's merchant with little evidence remaining of brick manufacture. This document chronicles the history of the Brick Works helping to preserve part of our industrial heritage.

### **Background**

This analysis of the brick industry in Rowland's Castle has utilised a theoretical model of the three linked but separate disciplines; continuity and change, open and closed societies, and industrial sectors. Roman ceramics were produced in Rowland's Castle starting a ceramic tradition of brick and pottery manufacture which continued, with changes, for over two thousand years.

Rowland's Castle is situated on the Hampshire – Sussex border and was during the late nineteenth on the edge of the two large estates of Stansted and Idsworth whose owners must have influenced the siting of the brickworks. The ownership of the land around

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Rowland's Castle was still controlled by nineteenth century feudal society which had a major influence on both social and any industrial activities on their estates.

The geology of the landscape had an influence on the land usage. The availability of clay as a low cost raw material and the introduction of rail transport for the brick and terracotta used in the construction industry were significant factors in the economic viability of the brickworks.

Any brickworks will have needed certain industrial equipment to manufacture bricks and the kind of equipment and processes used are important, but of paramount importance are the economic factors that influenced the development and growth of the brickworks and created its eventual demise.

The use of brick as a building material goes back many centuries but it was the Romans who brought the craft to this country. Bricks and tiles were used extensively in many of their buildings. The shapes of Roman bricks are easily recognisable as they were thin and more like tiles (Hammond, 2001, 30). After the withdrawal of the Romans in the fifth century, brickmaking ceased in this country but bricks and tiles robbed from Roman sites were incorporated in many vernacular buildings. A local example of the reuse of Roman bricks can be seen in the walls of the eleventh century church at Warblington (*Figure 1*). The Roman material was probably robbed from the Romano-British villa just two kilometres to the east.



**Figure 1; Reused Roman bricks in the wall of Warblington Church**

It was not until the late thirteenth century that brickmaking was reintroduced from the Netherlands (Beswick, 1993, 17). By the sixteenth century English brickmaking and terracotta became an art form with many complex shapes copying cut stone. Hampton Court Palace, which was built in 1515 with its twisted chimneys, is an excellent example of this art (Lynch, 1994, 6). Brick chimneys were introduced to replace the older style domestic open-hearth fires which constituted a major fire hazard. The Great Fire of London in 1666 provided a real impetus to the brick industry as Parliament passed laws banning the building of timber buildings and this created a demand for bricks. The canal building era of the eighteenth century and the railways in the nineteenth century demanded high quality bricks and it was during this period that many innovations were introduced to brickmaking. During the 1840's between 25% to 39% of the total brick production went into building the railways (Gourvish, 1980). A

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sign of the social acceptance of bricks as a building material must be the Red Brick Universities of the Victorians such as Birmingham and Sheffield. The modern brick industry is now highly mechanised and run by a few large organisations such as Ibstock and Hanson. Small craft brick makers have now all but disappeared.

## Geology and Topography

The last quarter of the nineteenth century and the first quarter of the twentieth century witnessed the creation of many local brick makers in Southern Hampshire. The majority of these brick makers, such as at Bursledon, Pycroft's on Hayling Island, Darce's at Hedge End and Charlie Church at Durley as well as Rowlands Castle, were established where bands of Reading Beds clay outcropped. All these brickworks were taking advantage of the excellent properties of the clay for high quality brick making.

The geology of Hampshire has a profound influence on the landscape, shaping the land, the vegetation and the hydrology. The surface geology also shaped the availability of construction materials which created the styles of the distinctive local vernacular buildings. This can still be seen in many wooden framed building with chalk and flint walls particularly in Southern Hampshire. The availability of suitable clays, however, promoted the use of bricks as an alternative building material and created a flourishing brickmaking industry.

The different rock formations in Hampshire are all sedimentary, but their properties vary considerably because they were formed under different conditions. Over the vast span of geological time, tectonic activity has moved the land surface geographically and altered the topography. This has created an outcrop of the Reading Beds which extends as a narrow belt along the border of the Upper Chalk where that formation dips beneath the Tertiary strata (Chatwin, 1948, 62) across the coastal plain of Hampshire.

Rowland's Castle is situated in a gently sloping valley running north to south through the Chalton Downs and on the edge of the ancient Forest of Bere. The geology

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of the valley is a head of variable deposits of sandy silty clay, locally gravelly with a chalky and flinty deposit in the dry valley that runs through the village (British Geological Survey, 1996). On the valley top is a layer of Reading clay consisting of red mottled clays, deposited under fluviatile conditions on top of upper Cretaceous chalks (Chatwin, 1948, 61–2). This narrow band of Reading clay extends across the Hampshire basin on which many brick and pottery manufacturing sites were situated. The high quality of the Reading clays attracted the Romans in the first century AD and the Rowland's Castle Brickworks in the nineteenth century. The geological formation of clay was the product of the weathering of harder rocks which were first eroded and then re-deposited as sediments on the beds of ancient lakes. The main constituent is quartz, in the form of sand or silt, which gives the material its strength and very fine particles of complex aluminium silicates that cling together when moist to give the material its plasticity.

The colour of bricks depends on the composition of the clay. Lime in the mix gives light colouring, 3% of iron oxides gives red and brown, and 10% of iron oxides makes blue bricks (Beswick, 1993, p3). The clays from the Reading Beds contain Ferrous Oxides which give a bright red colour to the fired bricks. The length of time and intensity of firing also have an effect on colour as well as texture. The introduction of gorse furze or salt during the final stages of firing produced darker glazed bricks. Colours ranged though near white, grey, blue, near black, brown, orange and red and the use of polychrome brickwork became very fashionable during the Victorian period (Figure 2).



**Figure 2: A local house built with Rowland's Castle multi-coloured bricks and terracotta circa 1893**

## Continuity and Change

Rowland's Castle has been the centre of brick and pottery manufacture for two thousand years. Evidence of Roman pottery production was found near Maize Copse Farm (SU 735 101) in the mid-nineteenth century (Bingley, 1817). Further finds of pottery kilns, grey ware pottery sherds with black earth and spreads of ash were investigated by Margaret Rule in 1963 indicating that clay was being exploited by the Romans for the production of domestic pottery (Dicks, 2009).

As was the case in most of England, there is no evidence of further clay working until the eighteenth century. The availability of wood and flint as building materials in this part of the South Downs satisfied the predominantly agricultural population. This, coupled with limited means of transportation to larger markets, restricted any large scale brick making activities until the mid-eighteenth century. Transport in rural settings was a problem as delivery was by horse or bullock cart over poor tracks similar to the muddy bridleways of today. Prior to the eighteenth century, most brick workers

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were itinerant, moving round the building sites, taking a contract and hunting down the local clays for brick production.

During the eighteenth and nineteenth centuries the owners of big estates, who wished to rebuild or extend their houses, established their own brickmaking facilities. This involved employing a brick maker and supplying clay, fuel, and transport from the estate. The plan of the Stansted estate dated 1785 shows a brick kiln and clay pits to the south-east of the house and the 6 inch Ordnance Survey Map of 1914 shows old brickworks and kiln at Durrant to the north of the Leigh House (Ordnance Survey, 1914). William Stone's new mansion was built in 1863 and the house was constructed of red bricks and tiles that were made on the estate (Russell, 1983, 22). Kilns were set up at Red Hill and Rowland's Castle near to the estate works. After fire destroyed Stansted House in 1900 it was rebuilt using Rowland's Castle bricks (Bessborough, 1983, 91).

The first evidence of brickmaking in Rowland's Castle comes in the early nineteenth century. The 1810 – 1824 Ordnance Survey Map shows a 'Red hill Brick kiln' on the Emsworth to Horn Dean Road (Ordnance Survey, 1810). By the 1870's St. John Church, which was erected in 1838, had been built on the site of the brickworks (Ordnance Survey, 1878–92). There were, however, two other brickworks marked at Durrant near to Leigh Park House (built in 1863) and in Havant Thicket at Manor Lodge. By 1897 the brickworks at Durrant was recorded as 'old' brickworks (Ordnance Survey, 1897). This could be because the brickworks was only established to produce bricks for the construction of Leigh Park House but as this building has now been demolished there is no way of verifying this connection. By 1909 the Manor Lodge brickworks were also 'old' and had stopped production of bricks (Ordnance Survey, 1909). The reasons for the demise of the Durrant brickworks were not clear but could again indicate both transitional and temporary nature of brick manufacture in the late nineteenth to early twentieth centuries.

More evidence can be found in the census returns of 1841, 1851 and 1871 for Rowland's Castle. In 1841 Thomas Quinell and his son Alfred were described as 'Lime

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Burners' and Thomas Bishop as a Bricklayer (Mason). In 1851 Thomas Bishop had been replaced by John Bodley, a mason from West Moreland. Most significantly, however, was Charles Pearson of Redhill, who was described as a Farmer and Brick maker. Brick making in the early nineteenth century was still a seasonal occupation. The clay was dug in the autumn and allowed to weather over the winter. Moulding would have begun in the spring and the green bricks left to dry in the open. The bricks were burnt in the summer until the frosts of the autumn brought an end to the brick making year (Beswick, 1993, 36). The 1871 census records that Thomas Quinell, aged 28, was by then a brick maker and that Ellen Stevens, aged 37 from Trotten, was a Brick maker's wife. This would indicate that whilst there were brick making activities in Rowland's Castle, it was not a major employer as the majority of the people were recorded as agricultural labours. Some of these may have been involved in brick making as it was still a seasonal activity and may not have been regarded as their prime occupation.

## The Development of Rowland's Castle Brick Works

The first evidence of the Rowland's Castle Brick Works that can be identified was in the 1880's and can be found on the 1<sup>st</sup> edition of the 1878–1892 25 inch Ordnance Survey map. The earlier 1841 Tithe Map of Warblington (Lewis, 1841) and the London and Portsmouth Direct Railway deposited Plan of 1846 both show the site marked as Pond Field and Chalk Pit Field was used as arable land and owned by Ralph Fenwick. This indicates that the brickworks were started after 1846 and indeed the company letter heading of the Rowland's Castle Brickworks states that the company was established in 1884 (*Figure 3*).



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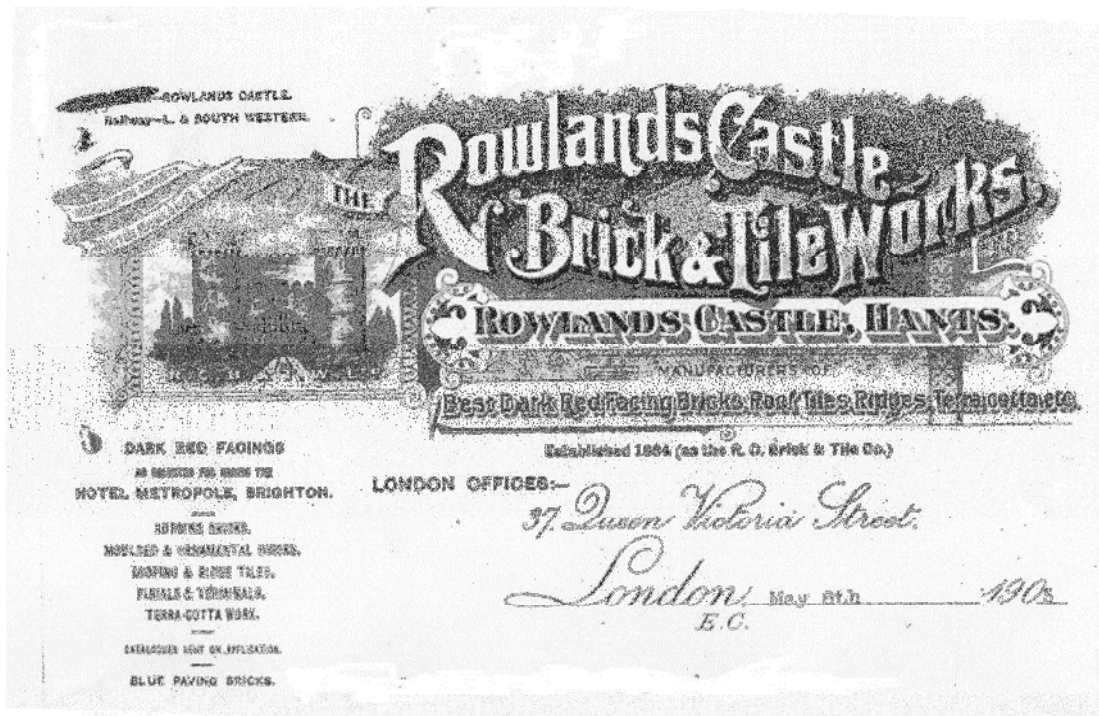
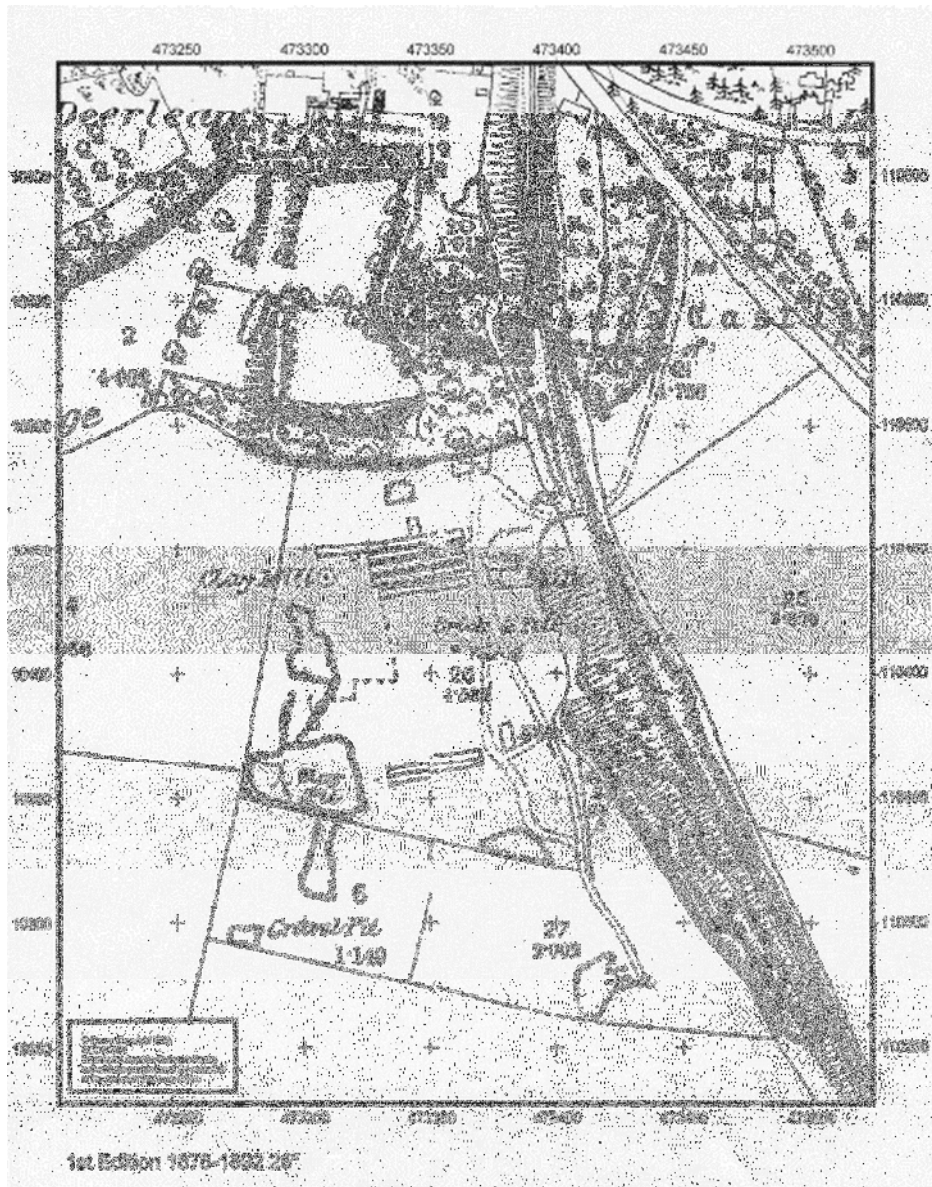


Figure 3: Copy of the Company letter heading dated May 1903 (PRO, Kew, BT31/8229)

The repeal of the Brick Tax in 1850 and the railway, which was opened in 1859 between London and Portsmouth, would have been the catalysts for the establishment of the brickworks. Transport was a prime cost and good communications were essential to the placing of a brickworks if it was to conduct trade outside its immediate vicinity. The 1878–92 Ordnance Survey Map shows that next to the railway line are several long buildings which were probably drying sheds, two rectangular kilns and a circular clay mill (*Figure 4*).

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**Figure 4: 1878 25 inch Ordnance Survey map showing the brickworks**

The circular mill would have been a horse operated pug mill used to knead the clay prior to moulding. The shape of the sheds indicates that the bricks were hand moulded and stacked in covered sheds to dry. The two kilns marked were rectangular in shape suggesting that they were probably intermittent up draught kilns. A small building near the entrance to the brickworks could have been the office. The station was

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500 metres to the north allowing coal to be delivered and bricks shipped utilising the railway goods yard.

By 1897 there has been a significant amount of change with many more buildings and kilns (*Figure 5*).

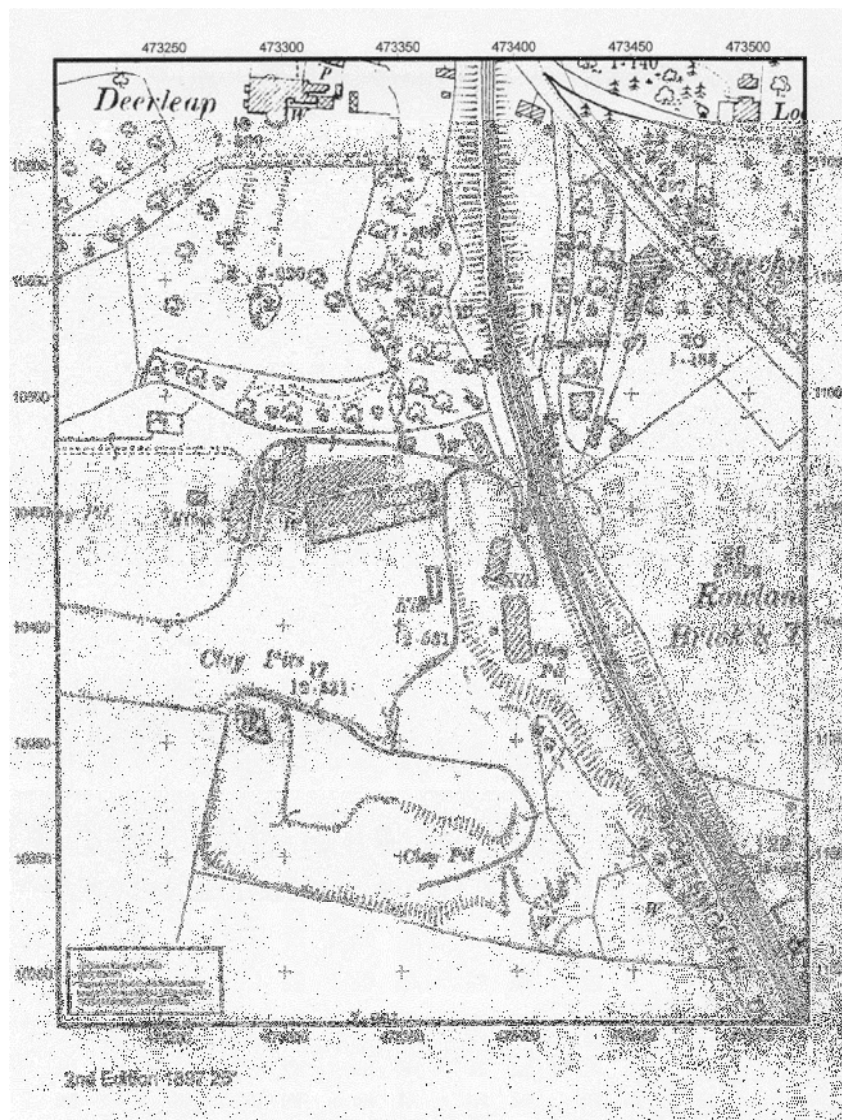


Figure 5: 1897 25 inch Ordnance Survey map showing the brickworks

The rectangular kiln which had a separate chimney may have been a Staffordshire continuous kiln. The brickyard by 1897 had its own railway siding indicating the growth in brick production and demonstrating the importance of good transportation for the receiving of coal and the shipment of finished bricks. Access to

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brickworks was from the east where there was a road up to and across the level crossing with the manager's home, Glen House, guarding the entrance. Just across the railway was a line of four buildings that may have been workers' cottages. There was a narrow gauge rail track running from the clay pits to the various buildings and kilns. The brickyard was incorporated as a Joint Stock Company in November 1898 (*Table 1*), but went into voluntary liquidation in December 1908 and was dissolved in April 1909.

**Table 1; Share Register 1898 on Incorporation as a Joint Stock Company**

<b>Stock Holder</b>	<b>Occupation</b>	<b>Ordinary Shares</b>	<b>Preference Shares</b>
<i><b>Bastin, Edward Philip</b></i>	Engineer	3800	608
<i><b>Bastin, Robert</b></i>	Engineering Agent		1
<i><b>Bastin, Jane</b></i>	Wife of Edward Bastin		726
<i><b>Bastin, John</b></i>	Clerk		100
<i><b>Allen, Edward R.</b></i>	Drug Miller/Grinder	1100	1331
<i><b>Allen, William C.</b></i>	Drug Miller/Grinder	1100	1332
<i><b>Allen, Francis</b></i>	Engineer		1524
<i><b>Allen, Joseph</b></i>	Manufacturing Chemist		400
<i><b>Allen Edward W.</b></i>	Drug Miller		1
<i><b>Allen, Malcolm W.</b></i>	Drug Miller		1
<i><b>Allen, Edward R.</b></i>	Drug Miller/Grinder		468
<i><b>Fry, Ellen</b></i>	Spinster		100
<i><b>Thorp, Annie</b></i>	Spinster		200
		<b>6000</b>	<b>6792</b>

The major shareholder and Managing Director was Edward Bastin (1841–1916). It is probable that the Allen's were investors as from their occupations they were involved in the chemical/pharmaceutical business. There was, however, a family connection as Jane Bastin, Edwin Bastin's wife, was Edward R. Allen's sister.

In 1908 Harry Robinson was appointed the manager of the brick works and in January 1909 he bought the business for £11,111 19s 7p.

## The Terracotta Era



**Figure 6: The office built in the late nineteenth century showing the highly decorated pediment above the porch**

The building known as the old office was used to display examples of the terracotta products produced at the brickwork (**Figure 6**). The Manager's house, *Trewetha* built for Edwin Bastin and his wife Jane, and the entrance piers (**Figure 12**) were other fine illustrations of this art. The ornamental designs can be dated to the last decade of the nineteenth century and were illustrated within a contemporary brochure (Sears, 1890, p55–66). The most outstanding example of this art was the Hotel Metropole, Brighton and a reference to this fact was incorporated into the company's headed note paper such was its importance (**Figure 3**). The Metropole was designed by Alfred Waterhouse (1830–1905) and built in 1890. Waterhouse was born in Liverpool and worked at first in Manchester, where he designed the Gothic Law Courts and the enormous Town Hall. He became one of the more prolific architects, working in a variety of styles, often choosing terracotta for details. When Waterhouse designed London's

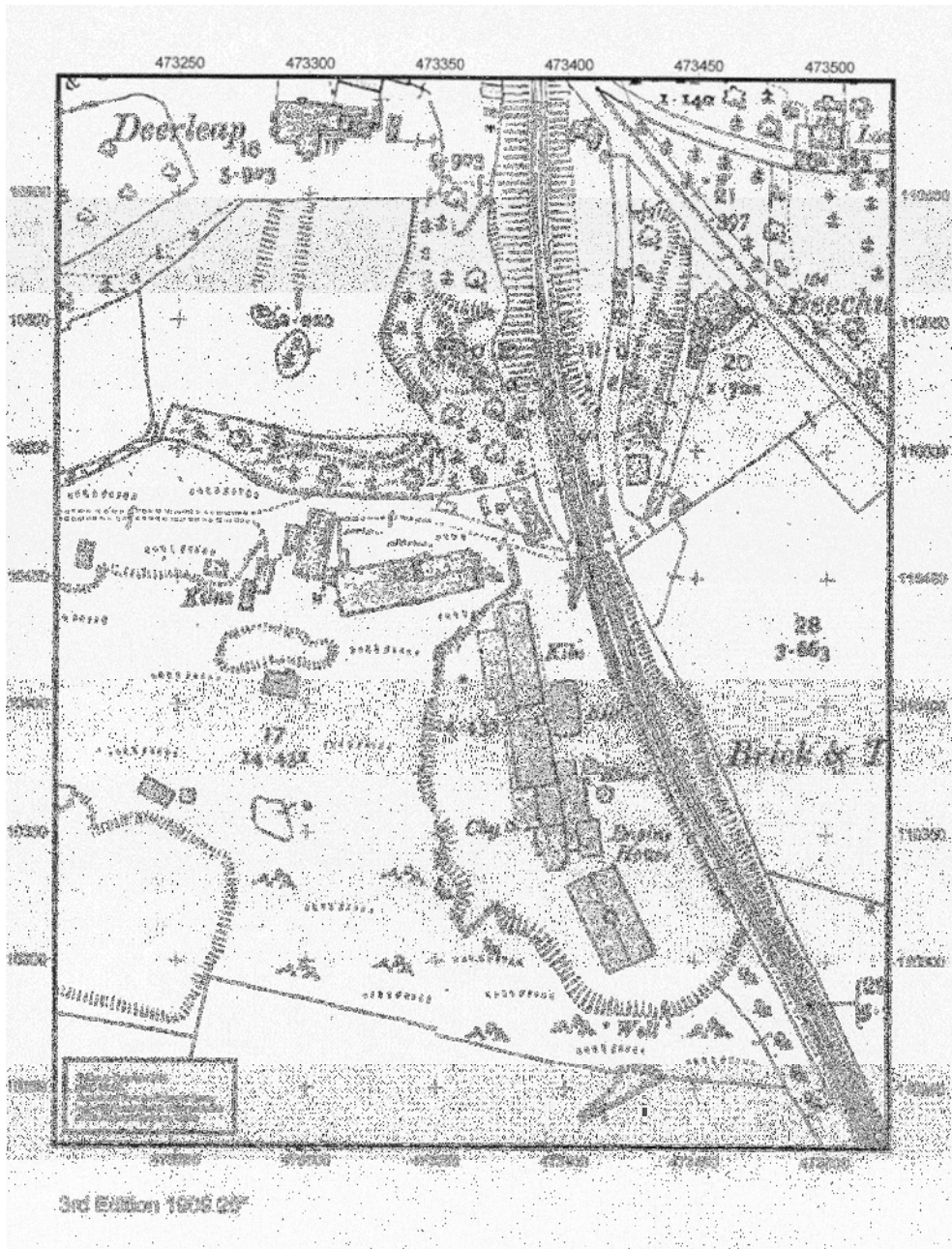
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Natural History Museum, he integrated into its structure sculptured examples in terracotta of the flora and fauna that were featured in the exhibits. Terracotta monkeys climb the interior arches and flowers grace exterior columns.

It is difficult to understand how a small brickworks in rural Hampshire was selected to provide the terracotta mouldings and red facing bricks for the construction of the Metropole by such an eminent architect as Waterhouse, a president of the Royal Institute of Architects. A possible explanation could be that Waterhouse had connections with the owners, the Allens, who lived in London. The company had London Offices at 37, Queen Victoria Street and 49, Finsbury Pavement and traded under the name of E. P. Bastin and it may have been this London connection that encouraged Waterhouse to use Rowland's Castle moulded terracotta and red facing bricks. The terracotta mouldings on the Old Office could have been designed by Waterhouse as samples for the Metropole (*Figure 6*). The terracotta era lasted for a relatively short period. An example of the use of terracotta mouldings was a house built in Rowland's Castle with a date plaque of 1893 (*Figure 2*) but a similar local house built in 1901 had no terracotta decoration. More significantly, the rebuilding of Stansted House in 1903 used the red bricks from Rowland's Castle but contained no terracotta decoration suggesting the end of the era.

By 1909 the brickworks had developed significantly with additional buildings and an Engine House (Figure 7).

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**Figure 7: 1909 25 inch Ordnance Survey map (3<sup>rd</sup> Edition) showing the brickworks**

This would indicate that all clay preparation (winning) had been mechanised using grinding mills. An extrusion machine may have been used, as was the case in many brickworks of that era such as at Bursledon. There are two circular beehive kilns on the site which would indicate the production of high quality bricks and terracotta.

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From 1909 to 1920 the brickworks was owned by Harry Robinson as a private company when it was sold in June 1920 to Walter Tarrant (1875–1942) (Swenarton, 1993). Tarrant was a developer building homes in Virginia Water, Wentworth and Sunningdale where the bricks were presumably supplied from Rowland's Castle (Company Status PRO BT31/32431). In 1927 Tarrant floated the brickworks on the stock market under the name of Associated Brick and Tileworks Ltd perhaps encouraged by the building boom stimulated by the reduction in house deposits to 10%. The prospectus states that the annual output was 5,500,000 tiles and handmade bricks and 3,000,000 wire cut and pressed bricks (Company Prospectus PRO BT31/32858). By 1932 the brickworks has reached its final size with many more buildings and there is a single track rail track leading from the clay pits into the buildings (Figure 8). The grinding mill and clay extruding machine were producing wire cut bricks. There were brick presses as the brickworks was producing high quality blue bricks (Jones and King, 1968, 98). In August 1931 the company went into receivership owing the National Provincial Bank £175,000. It was sold in February 1938 for £34,023 and become part of the Associated Brickworks Company.



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**Figure 8: 1932 Ordnance Survey map showing the brick works (Ordnance Survey, 1932)**

In 1959 the brick works at Rowland's Castle was purchased by Robert J. Winnicott, a business man from Portsmouth who already owned the large house, Deerleap, next to the works.

The 1961 6 inch Ordnance Survey Map has one large building marked and several much smaller ones (Ordnance Survey, 1961). The clay pit was extensive with a single line track leading to a building that may have housed the clay mills. The small building to the south of the site was the office. Access was from the West on to Red Hill Road as the railway was electrified in 1937 restricting entry from the East. The clay pits occupy the entire site and this is confirmed by the Aerial Photograph dated April 1963 (*Figure 9*).

By now reinforced concrete construction was favoured by architects for block of flats and public buildings which had formerly required large quantities of bricks. The

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change in building construction in the 1960's towards concrete significantly reduced the demand for bricks and tiles from Rowland's Castle and production stopped in 1968. The area reverted to woodlands with large pits and pools perhaps reflecting the landscape two thousand years earlier.



**Figure 9: Aerial photograph taken in 1963 of the brickworks (National Monuments, Record Film OS/63016, Frame 161, Dated 12th April 1963)**

## Open and Closed Societies

In the eighteenth and nineteenth centuries open societies were typified by many small landowners operating a diverse independent rural economy with farmers having small land holdings and dual occupations. The population was large with a well-

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developed range of trades and crafts that encouraged the growth of industry. The open society supplied services and labour to nearby closed societies. Closed societies were dominated economically and culturally by one or a few very large landowners. The population was kept low to control the poor rate and seasonal needs for additional labour were rigorously controlled. The landowners had the patronage of the church and represented the community as magistrates and members of Parliament. The population was small with controlled accommodation which did not encourage nonconformity or industrial manufacturing. Rowland's Castle is at the junction of the five parishes of Stoughton, Racton, Warblington, Blendworth and Idsworth. Two parishes are in Sussex and three in Hampshire. It was not until 1933 that the boundaries were changed to create the parish of Rowland's Castle. The Tithe maps and the apportionment of the five parishes have been used as a basis to establish land ownership in 1840 (*Table 2*).

**Table 2: Land Ownership based on the 1840's Tithe Maps**

<i>Land Owner</i>	<b>Estate</b>	<b>Stoughton</b>	<b>Racton</b>	<b>Blendworth</b>	<b>Idsworth</b>	<b>Warblington</b>	<b>Acreage held</b>
<i>Charles Dixon</i>	Stansted	2800	660				3460
<i>Clarke-Jervoise</i>	Idsworth	250		2025	1668		3943
<i>Vernon-Harcourt</i>		900				529	1429
<i>Lord Dartmouth</i>			230				230
<i>Phips-Hornby</i>			260				260
<i>William Knighton</i>				165			165
<i>Ralph Fenwick</i>						1274	1274
<b>Acreage held</b>		3950	1150	2190	1668	1803	
<b>Parish Acreage</b>		5422	1188	2265	1674	3198	
<b>Percentage</b>		73	97	97	100	56	

The parishes of Stoughton, Racton, Blendworth and Idsworth are dominated by two land owners; Sir Samuel Clarke Jarvoise who owned the Idsworth Estate and Charles Dixon who owned the Stansted Estate and between them they controlled over 70% of the land. The parishes of Idsworth and Blendworth were entirely controlled by Clarke Jarvoise. The two estates meet at Rowland's Castle with a small peninsula of land belonging to the coastal

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parish of Warblington. Warblington had two major land owners, Ralph Fenwick and Reverend Leveson Vernon-Harcourt, but 177 small landowners controlled 44% of the land of the parish. This would indicate that Warblinton was potentially an open society and that the other parishes were closed. Idsworth and Stansted are large landscaped estates in the rolling chalk downlands ideal for sheep and on the fertile soils of upper greensand. Warblington contained the villages of Emsworth and Havant. Emsworth was an industrial centre for milling and fishing whilst Havant was famous for its tanning and parchment manufacture. This open society encouraged industry. Rowland's Castle Brick Works is situated in the Warblington parish on land originally owned by Ralph Fenwick. Fenwick also owned many other small plots in the parish but the brickworks was situated on the parish border.

The arrival of the railways and more importantly the station at Rowland's Castle had a dramatic impact on the village. These were the motorways of the nineteenth and early twentieth centuries. The census of 1871 for Rowland's Castle shows a variety of traders such as a glove maker, chair maker, blacksmith, cordwainer, carpenter, draper, and tailor but only one brick maker called Stevens. The village began to change in the early twentieth century as Clarke Jarvoise released land especially along Links Lane and Bowes Hill. The golf club was open in 1902 and the railway was encouraging senior naval officers from Portsmouth to set up home in Rowland's Castle. By 1915 there was a Staff-Surgeon, an Admiral, three Captains and a Lieut-Commander (Kelly's Trade Directory of Hampshire, 1915, 137). The Rowland's Castle postmaster, Mr. F. O. Adams, was a local historian in the 1950's and wrote many accounts of life in the village but there is very little reference to the brickworks. During that time it must have been very active but most of the workers at the brickworks did not live in the village and travelled daily, on foot, from Emsworth and Havant. There were four cottages for the workers at the brickworks but most travelled in daily. The railway was not only important as a means of transportation but had a significant impact on land ownership. The Tithe apportionment of 1841 for the area states the Landowner is Ralph Fenwick but by 1884 the land was

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being operated as a brickworks and is owned by Edward Bastin, Edward and William Allen all of London. Easy access to Rowland's Castle from London by the railway introduced a new set of entrepreneurial landowners managing the industrial activities remotely. During the 1920's and 30's the brickworks was owned by W.G.Tarrant a builder of Bagshot. Walter Tarrant was a speculative builder taking advantage of the expansion of the suburban towns on the outskirts of London. Debentures taken out with the Westminster and National Provincial Banks were used to finance the construction of each house (Company Accounts, PRO, Kew BT31/32431). No other industries were established and the brickworks obtained its services from outside the village. This would seem to indicate that the village was changing from an open society in the eighteenth and nineteenth century to a closed society in the twentieth century. The only recorded evidence of the closure of the brickworks was in the local paper when the 185 foot chimney was demolished in 1971 (Anon, 1971). Rowland's Castle is now a rural residential village with very limited industrial activities and the site of the brickworks clay pits has reverted to woodlands.

## The Development of the Brick Industry of Rowland's Castle

Surface deposits of clay do not requiring any special excavation skills and early quarry sites were shallow whilst modern clay pits are large deep quarries using mechanical excavators and drag lines (Lynch, 1994, 4). As a low value but heavy raw material, clay was logically worked close to where it was excavated. There is evidence of clay mills at Rowland's Castle on the 25 inch 1878-92 O.S. Map 1<sup>st</sup> Edition. The clay was placed in a mixing drum called a pug mill with water and other materials such as sand. The drum was usually brick lined and turned by a horse until the clay was a smooth consistency. Sand was an important ingredient for without it the pure clay would crack in the kiln. For centuries bricks were moulded by hand in four sided rectangular wooden moulds with no base or lid. Moulds were placed either directly on the ground or on a roughly made brick maker's table. Bricks made on the ground were known as 'place'

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bricks and often contain grass impressions. From the nineteenth century rectangular block of wood, smaller than the mould dimensions, would be screwed on the table to create the *frog* or indentation.

The purpose was to reduce the weight of the brick and to serve as a key for the mortar (Beswick, 1993, 108). Names were carved in the frog to identify the brickyard owner (Holt, 1978). After moulding, the green bricks were placed in sheds to dry and harden after which they were stacked in a clamp kiln. A clamp was a temporary construction fuelled with wood, furze, and charcoal. Bricks were packed closely together to a height of 14 or 15 feet tilting inward to prevent the kiln from collapsing during firing. The outside was sealed with wet turfs. Most clamp bricks had a small percentage of breeze added to the clay during manufacture. This helped to 'self-fire' the bricks and ensured that the correct temperature of 1100°C was reached. Clamps contained 30,000 to 150,000 bricks and would take two or three weeks to burn out. This method produced very uneven burning and a high proportion of wasters (Raistrick, 1972, 73). A great improvement was the Scotch or Suffolk kiln. Four walls created a small tower within which the bricks were stacked. The top was open and fireplaces were placed external to the kiln, at the base. Heat was drawn into and upwards through the up draught kiln which had the advantage of a uniform temperature producing few spoilt bricks. This type of kiln may well have been in use at Rowland's Castle in the 1890's. An example of a rectangular *Staffordshire* design still exists at the Bursledon Brick Works.

Rowland's Castle is a typical brickworks having a sprawling layout with the brick preparation area surrounded by kilns. Most of the land was taken up by clay pits and level ground for stockpiling burnt bricks. In the 1960's the clay at Rowland's Castle was prepared for moulding by using a mill manufactured by Bennet & Sayer of Derby (Jones and King, 1968, 96). The mill had two 38 cwt. rollers in a circular pan about nine feet in diameter. The clay was first crushed under rollers and then mixed with water in a grinding pan. The clay was forced through a ½ to ¾ inch grating to collect any oversize material for further grinding. The clay was compressed and forced through two dies

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either side of the machine with enough material to form several bricks before it was cut off by a wire frame. This produced wire cut bricks that were of uniform shape, with straight arrisses, no frog, and show traces of wire marks on the surfaces. This process was devised by William Irving in 1841 (Hudson, 1965, 141). At Rowland's Castle, hand moulded bricks were formed using a triple-mould Berry machine which automatically sanded the moulds and filled them with pugged clay. An operative was required to strike off the surplus clay and place the green bricks on a revolving table ready to be transported to the drying sheds. The brickworks had two types of kiln in operation at the time of closure. Downdraught transverse intermittent kilns in which the temperature was easier to control used for the production of engineering bricks and a sixteen chamber continuous Hoffmann kiln used for facing bricks (Jones and King, 1968, 98). Fireboxes surround the chamber of the downdraught kiln and the heat was directed upwards from the fire to the top and then drawn down through the stack of bricks to a flue in the base leading out to a chimney which provided the draught. Although these kilns wasted heat, it was possible to maintain uniform temperatures necessary for special quality face bricks, engineering (high strength) and refractory bricks. These kiln types had to be filled, fired, cooled and emptied for each batch of bricks which took fourteen days and were known as intermittent kilns and had a capacity of about 12,000 green bricks. In the mid nineteenth century, the Hoffmann kiln was introduced from Germany which was designed for continuous burning over a long period. The kiln was built as a long succession of chambers with communications between them and a tall chimney providing the draught. The fire started in one chamber, burned the bricks there, its heat travelling forward through the others, drying and preheating them. The cold air drawn through the last finished chamber helped the cooling for emptying and restacking. The fuel was fed into each chamber from the top in a strict regulation allowing for continuous operation (Raistrick, 1972, 74). This design was modified in Britain to take advantage of the continuous operation but the shape was changed to

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rectangular. The Hoffmann kiln at Rowland's Castle was a rectangular building comprising of sixteen chambers similar to the one at Bursledon (*Figure 10*).



**Figure 10: Photograph of the Hoffmann kiln at Rowland's Castle (1969)**

The most significant building remaining on the site was the old office. This was a one-storey building with a pitched tiled roof and gable ends. The front and side elevation was used to display a wide range of the products of the company including terracotta decorative tiles (*Figure 11*). The building was dismantled in 2007 to be reassembled at the Bursledon Brickworks.



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**Figure 11: Elaborate terracotta work on the east gable wall**

Terracotta is made by a similar process to brick manufacture, but the clay must be of a much finer consistency and burnt at high temperatures. This results in a type of heavy, dark red pottery used for external adornment of buildings such as string course, tiles, ridge cresting and roof finials. The architectural terracotta would have been produced using the Suffolk downdraught kilns. All that remains of the original brickmaking buildings is a shell that could possibly be the old mill and the remains of the pumping house that is in a very sorry state. In the trees there are four brick piers that could have been part of the pumping system as they are connected by a 6-inch pipe to the pump house which removed water from the clay pits for use in the brick manufacturing process. The entrance to the brick works on Woodberry Lane and is still marked by two magnificent brick piers with terracotta plaques (**Figure 12**). The drive leads to the brick manager's house now called Glen House is a private residence.

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**Figure 12: The 1890's entrance to the brick works**

The maximum capacity of the brickworks in 1927 was 5,500,000 tiles and handmade bricks and 3,000,000 wire cut bricks (Associated Brick and Tile Works Ltd.). This does not increase over the next forty years and the capacity at closure in 1968 was 7,000,000 (Jones and King, 1968, 98). This may provide one of the reasons for the demise of the brickworks as to increase capacity would require significant investment in new equipment. The large brick makers with extensive clay deposits, such as London Brick, invested in mechanising production methods in order to reduce costs. The improvements in the road transport system after World War II provided an easier and cheaper alternative to railway transportation. The brick manufacturing industry is tied to the construction industry which is notoriously subject to fluctuating demand. The

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construction industry was also at a low ebb in the 1960's and many independent brickworks were forced to close. The accounts for the Rowland's Castle Brickworks for 1966 show a turnover of just £21,669 but a loss of £6,062. This turnover equates to less than a million bricks being sold. All these factors signalled the downfall of the Rowland's Castle Brickworks which finally closed for business in 1968.

## Summary

The high quality of the Reading clay at Rowland's Castle as a primary raw material for pottery and brick manufacturing was the attraction to both the Romans and the builders of the nineteenth and twentieth centuries. Over the centuries one of the causes of change was access to markets. In order to exploit the clay the Romans built roads connecting the site to the markets at Roman Chichester (*Noviomagus*) and it was the railway in the nineteenth century that created the infrastructure to change the area from pasture to large scale industrial brickmaking. The railway was the motorway of the nineteenth and early twentieth centuries reducing the cost and time of transportation. In the 1940's and 1950's the improvements to the road network and road transport created an environment that was to be the death knell for many small brickworks such as Rowland's Castle. These improvements allowed easier access to building site for the larger and more cost efficient manufacturers in the vast clay beds of lower Oxford clay such as at Fletton near Peterborough. Small artisan brick makers were unable to compete and most had no alternative but to cease production.

The open society of the Warblington parish and the availability of labour from Emsworth and Havant encouraged the development of the brickworks. This was helped by the fact that it lay on the border of five parishes. The repeal of the Brick Tax in 1850 and the arrival of the London to Portsmouth Railway in 1859 were the economic factors which influenced the establishment of the brickworks at Rowland's Castle in 1884. The availability of high quality clay as a raw material combined with easy access to reliable cheap transport produced dramatic growth in the 1890's. Over the 80 year history of the

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brickworks there were several owners but the unpredictable nature of the construction industry resulted in many financial failures. Significant buildings using Rowland's Castle red bricks were the Metropole at Brighton, Stansted House, Church at Eastney, and Portsmouth Dockyards. The brickworks had its hayday in the 1920's and 30's with the boom in house building triggered by the government's decision to reduce the deposit on houses to 10%. Much of the production from Rowland's Castle was used to build prestigious residential homes in the Bagshot area of Wentworth and Sunningdale. New building materials such as breeze and concrete blocks were introduced in the 1950's and reinforced concrete construction was favoured by the architects for the construction of blocks of flats and public building in the 1960's. To compete the large brick producers invested heavily in automation. Rowland's Castle was unable to invest and therefore to compete with these larger mechanised producers and with financial losses increasing production ceased and the brickworks was finally closed in 1968. The loss of the brickworks would have had an impact on supporting service industries. The transportation of coal to the brickworks and bricks to the customers, the supply of utilities and financial services all ceased with the closure of the brickworks.

The brickworks provided employment for as many as one hundred people in its hayday but most were not from the village but from the local towns. The demise of the brickworks was the end of industry in the village and it returned to its rural albeit residential atmosphere providing homes for the commuters to London and Portsmouth. The clay pits at Rowland's Castle have reverted to peaceful woodlands and pools inhabited by ducks and moorhens perhaps reflecting the landscape as it may have been over two thousand years ago.

The products of the Rowland's Castle Brickworks are evident in large civic buildings, town houses and villages contributing to the variety of the vernacular building of Hampshire and Sussex. One day perhaps the clay of Rowland's Castle will be exploited again to add another chapter in this long history.

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