

# SUSSEX INDUSTRIAL HISTORY



CHRIST'S HOSPITAL SOUTHWATER  
Dining Hall, Court Room and Water Tower

© R.G.Martin

**H.A. Waller & Sons – Electrical Generation at High Salvington –  
C.V.A./Kearney & Trecker – Coking Lime Works –  
Nutley Windmill – Longleys at Christs Hospital**

ISSUE 33

PRICE £3.95

2003

# SUSSEX INDUSTRIAL HISTORY



Journal of the Sussex Industrial Archaeology Society

---

THIRTY THREE

2003

---

	Page
H.A. WALLER & SONS OF WHITECROSS STREET, BRIGHTON John Redfern	2
WIND-POWERED ELECTRICAL GENERATION, HIGH SALVINGTON Roger Ashton	6
C.V.A./KEARNEY & TRECKER Peter Groves	10
COCKING LIME WORKS Ron Martin	23
NUTLEY WINDMILL – A DENDROCHRONOLOGICAL INVESTIGATION M.C. Bridge	32
JAMES LONGLEY & Co AND THE BUILDING OF CHRIST'S HOSPITAL, WEST HORSHAM Peter Longley	36

---

Edited by Dr. Brian Austen, 1 Mercedes Cottages, St. John's Road, Haywards Heath, West Sussex RH16 4EH (Tel. 01444 413845). The Editor would be interested to hear from prospective contributors of articles of any length. Shorter notices can be included in the Society's *Newsletter* which is issued four times a year.

The annual subscription to the Sussex Industrial Archaeology Society is £10 payable on 1 April. Life membership is available at fifteen times the annual subscription. Members are entitled to copies of the *Sussex Industrial History* and the *Newsletters* without further charge.

Membership enquiries to the Hon. Secretary, R.G. Martin, 42 Falmer Avenue, Saltdean, Brighton BN2 8FG (Tel. 01273 271330).

## H.A. WALLER & SONS of WHITECROSS STREET, BRIGHTON A brief history of a family firm

*John Redfern*

In a world of corporate business, far-flung enterprise, bids, take-overs and mergers, it is hard to recall the era of private enterprise, personal drive, application, self-denial and sheer hard work of the nineteenth and early twentieth centuries. Brighton, like many towns of similar capacity, well-versed already in the world of leisure and entertainment, expanding in many directions with an excellent connection to the capital, offered opportunity to verve and talent. Henry Waller had both.

Henry Arthur Waller was born in Kemp Street in 1881 one of nine children, son of a painter and decorator who also undertook small building works, and this central busy part of Brighton was to remain the focus of his long career. At 14 he was apprenticed to W.A. Gooding, sheet metal worker and electrical engineer, (Gooding himself was at one-time apprenticed to W. Skeat of Queen's Road and Windsor Street), a prestigious firm whose extensive premises were located in Upper Russell Street, forgotten now and submerged beneath the sprawling shopping complex of Churchill Square.

In 1902, after seven years with W.A. Gooding, Henry Waller aged 21 started on his own in Whitecross Street where he had a brother on the premises. Work was routine, although one had to be versatile and resourceful and prepared to undertake a challenge: roof and kitchen work, pots and pans, surface canopies, chimney cowl, always a lucrative source of work, traditional Brighton patterns of which he had brought from Gooding. (See *Sussex Industrial History* 31, 2002). Between 1914 and 1918, then married, he was directed into work of national importance, employed by Bolton and Paul in Norwich (who made aircraft), working on the bench, but soon to take over the running of the workshop and, after that, back to Whitecross Street.

By 1914 Henry Waller's reputation in the trade was established and from 1918 the business went from strength to strength. It was hard work and long days. The steep streets, narrow lanes, "cats' creeps" and steps of Brighton generated various strategies for survival. It seems almost incomprehensible now that heavy equipment, materials and ladders were propelled by hand in a choice of two barrows. Even a straightforward journey, say to Hove, was not necessarily that straightforward. To minimise exertion one might start



Fig 1 The Family: left to right:  
John, Gordon, H.A., Geoffrey, Donald. (*Brighton Standard*)

off slightly in the wrong direction: leave Whitecross Street, drop down to Sydney Street, go on to Kensington Street, continue down Jubilee Street (gone now and site of the new public library) or Regent Street, through New Road into East Street on to The Front and double back westerly towards Hove and gentler inclines. Bear Road, Elm Grove, Southover Street and Albion Hill were challenges of another order.

John Waller his son recalls such a trek, and with good reason: "In 1938: I left Whitecross Street at 0600 hrs. and pushed a barrow to Shoreham loaded with sheets of zinc plus fire pots, all tools to lay the flat roof. The man [who should have assisted, but stayed put] lived in Shoreham so I was on my own. We laid the zinc in the same day, which meant that I had to push the barrow back to the works, reaching the shop around 2000 hrs. – a very long day (I was only 15 years old at the time). This was common then, a walk of about 12 miles." "One had to be agile and quick-thinking", recalled Wally Vinall, who died in 2001, long employed in the firm, and later by Percy Vye in Hove. "Scaffolding was rarely used for straightforward jobs. Ladders and planks and some leaping on occasion from roof to roof (undeclared to one's employers) usually got one through the day." Similarly tough was one of John Waller's first jobs, to scale the steep roof of the large building that dominates the skyline on the corner of Belgrave Street and Southover Street to fix two large rotating Archimedean ventilators on the ridge, particularly daunting not only in height and incline but also in the slippery wintry frost-covered slates – but one got used to it.

Transport was slow to come, not in fact until after the Second World War. One usually got to site on foot

with tool bag over one's shoulder or by cycle. Occasionally the builder could be persuaded to use his van and really large work was, by arrangement, conveyed by Bartup of Trafalgar Street. Eventually the firm lashed out on a Ford Transit, in turn displaced by a van and finally a Bedford lorry.



Fig. 2 Part of the workshop. The big "B" is one of many for Montague Burton, familiar throughout the country: "Tailoring with Taste". (*Brighton Standard*)

Apart from Geoffrey, the youngest, Henry Waller's three other sons were educated at Pelham School. John at 14 and in his last year recalls the school being closed, prior to being re-built; he assisted with a Waller's barrow in carrying various paraphernalia for safe keeping until the new school was completed. The boys brought impetus to the business and expanded the work force. Their individual contributions to the continuing success of the firm were considerable. Gordon applied himself to roofing, cowls and general work, at 18 going into the office undertaking pricing, measuring and associated tasks; Donald, a good welder, offered general work and iron work such as gates and railings; John turned to zinc and general galvanised work, cowls and enjoyed delicate and exacting commissions; Geoffrey, physically less robust than his brothers, like John, interested in more artistic work, when demobilised from the Royal Engineers, went into the office (Fig. 1).

The firm continued to thrive and after their demobilisation in 1945 and when all four sons had

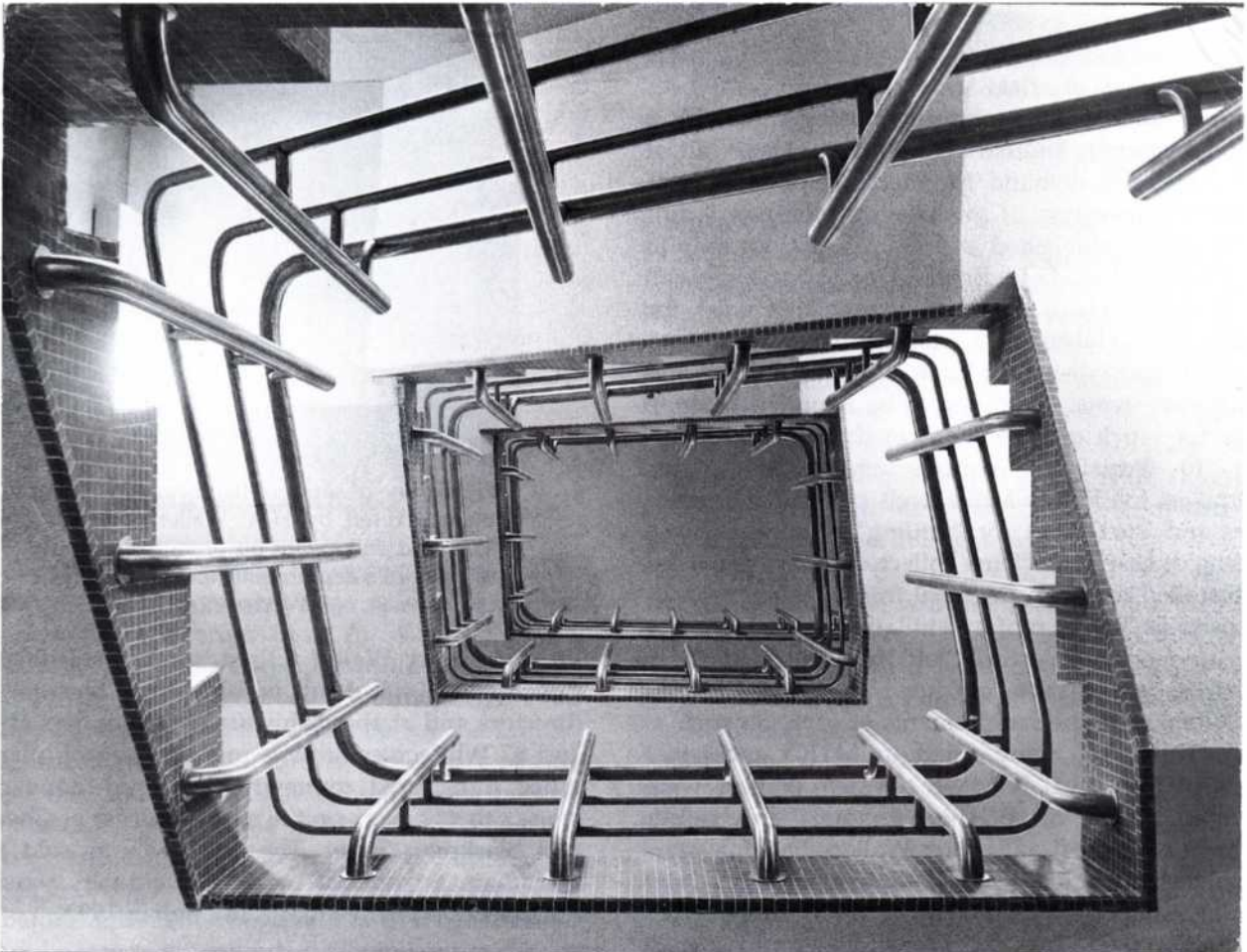


Fig. 3 Stairwell – County Hall, Truro

An exacting commission in stainless steel that 'rusted'. The over-zealous cleaning staff regularly scoured the rails with wire wool. Special measures from Brighton restored the finish. (*Camera Craft, Truro*)

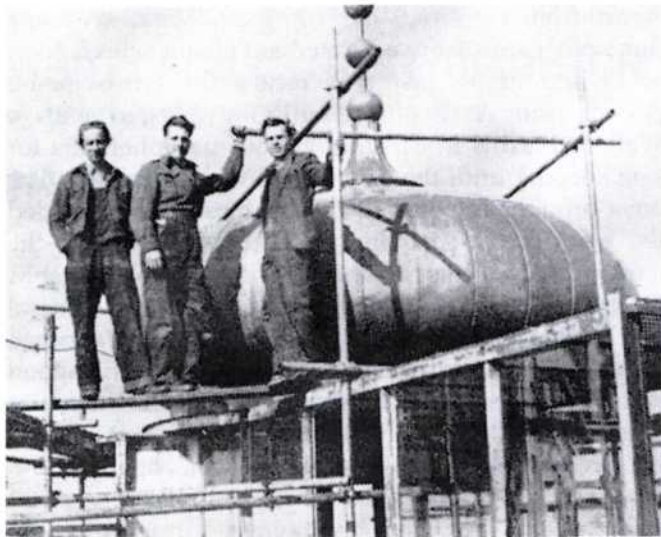


Fig. 4 John and Donald (centre & right) on one of the "onions" of the Palace Pier. (*Brighton Standard*)

returned to Whitecross Street, the range and scale of the work began to change. Large contracts of much more involved nature began to arrive. The gradual recovery from the privations of wartime accelerated the development of new technologies. Urgently needed blocks of flats and housing complexes appeared, small factories sprung up together with a new phenomenon, industrial units and estates, all of which created a demand for metal work of a quite different dimension. Commissions arrived, connections were established and maintained not only in Sussex but further afield: Bristol, Devon and Cornwall (Fig. 3) and much of the south coast. Duct work for Spencer and Halstead, a sterling firm in Ossett, Yorkshire, specialising in first class ventilation and extraction systems, continued to be supplied by John Waller for much of their work in the south after his move to Portslade. Various metal work was undertaken for Elliots at Sizewell such as protective covers and duct work for "fettling" (the hitting and grinding of castings). "Dust collectors" were provided and installed for open-cast coal mines; safety railings for Tesco in Truro; roofs, ventilating systems and a host of associated work left the workshops in Whitecross Street. It was, of course, all very specialised work adapted to the requirements of each job such as ships' ventilators, many fitted to MTB's and other vessels of the Royal Navy, for which Wallers were renowned. Work on Brighton's hotels and public buildings continued as before; Wallers had for years maintained the roofs of the Palace Pier (Fig. 4) and when W.A. Gooding closed in the 1950s similar work was undertaken for the West Pier and small, individual orders were honoured as before.

The traditional smaller works continued: guttering, piping, fan housings and the making of storage cupboards, ice-cream cabinets, bakery trays and

trolleys, kitchen water tanks for caravans, specially devised cooling tanks for Iraq, storage cabinets for firms and factories all came within the astonishing range of Wallers. "There was simply no repetition. We did one job one day and a totally different one the next." The list of metals employed was equally varied: sheet iron, copper, corrugated iron, galvanised iron, bronze, brass, tinplate, lead coating, stainless steel and tinned copper all carried out with gas welding, and cutting, electric arc welding and many other operations, new ideas and techniques constantly taken on board.

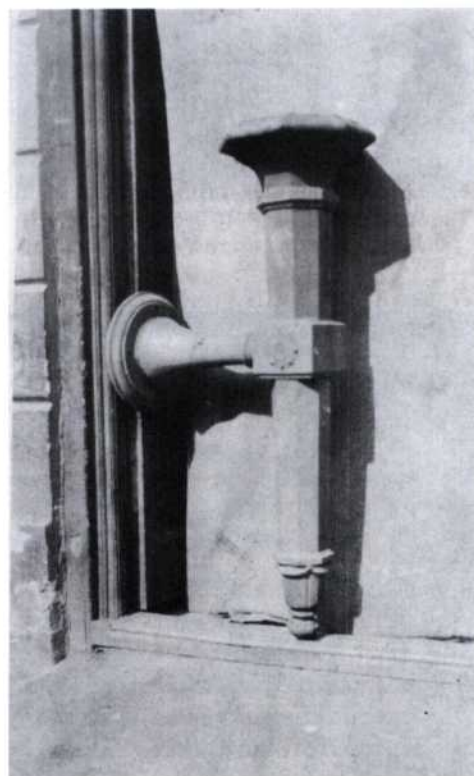


Fig. 5 One of series of flambeaux in copper manufactured by H.A. Waller & Sons in 1925 and still extant on premises formerly of Stafford's department store on the corner of Crown St. and Western Road, Brighton.

In 1965 Henry Waller retired, though still managing director until his death in 1971 with the sons as co-directors and at about this time the premises at 1, 2, 3 and 37 Whitecross Street were disposed of, plant and office transferred to newly-built workshops only a stone's throw away on the eastern corner of Cheapside and Blackman Street. The business was sold to Mr. Herdman, accountant in 1982, eventually passing to the present owner W.J. McCullough in 1992.

Not quite the end of the story, however. John, youngest surviving brother, with Pat his wife, took on a unit in Mill Road, Portslade in 1980 and, against some odds (it was not at that time an ideal economic climate in which to begin a small enterprise) made a

success of it until his second retirement in 1988 when Ian, his younger son, continued to run the business. Family talent persists: Keith, Ian's brother, worked for the Southern Railway as a draughtsman, moving on to Longleys (see *Sussex Industrial History* 31) as site manager, later to return to the railway as an engineer. Ian, a talented "tig" welder, involved with girders, iron railings, anything in steel, including stainless steel, carried on the family tradition of involvement with Brighton's public buildings, most recently in an exacting and difficult task on the roof of the North Gate of the Royal Pavilion during the recent bout of extensive restoration in the area.



Fig. 6 John Waller (mid 1990s) with galleon wind-vane in copper.

It is not difficult to pinpoint the secret of the steady cumulative growth, persistent success and reputation for work of a high order of H.A. Waller & Sons. Paramount among the various contributory elements were quality and excellence. Nothing left the workshops unscrutinised by a member of the family. An eccentric chimney cowl, for instance, easily passed off above the roofline, would find itself under the foot of the master, its perpetrator sent back to the bench a wiser man and as with such humble artefacts so, of course, with bigger, more exacting commissions. For years before and in its heyday Wallers had been a household name in the town and beyond and a chance recent reflection on two 'rare commodities', respect and loyalty (apparently in short supply now) seem relevant. Henry Waller, a firm and fair employer, of



Fig. 7 A petrol-driven drill built for British Rail by H.A. Waller & Sons. A petrol-driven saw to cut through the rail-track was, among others, a companion device. (S.W. Kenyon)

authoritative bearing and demeanour, with hands-on experience and an eye for excellence inspired respect and loyalty from talented, valued craftsmen. This was two-way: in their turn the employers considered their staff: no hands were ever laid off in slack times between commissions. No idle hands, however: "Brightons", "Lobster Backs", "Hovels" and "Rotaries", each head with spindle and oil-sleeve, taking each a man perhaps three-quarters of a day, were stored and stockpiled against the rush for replacements that succeeded the first winter gales.

The long association with the area is not yet through, however: John, a frequent visitor to McCulloughs, is welcomed by the firm where he occasionally avails himself of facilities for small projects of his own or of his many friends.

#### SOURCES

The sources for the information contained in this article are conversations with John Waller and members of his workforce, Waller family papers and photographs and a description of the Company included in the issue of the *Brighton Standard* for 7 January 1953.

# WIND POWERED ELECTRICAL GENERATOR AT HIGH SALVINGTON

*Roger Ashton*

High Salvington Windmill at TQ 123067 ceased working full time on 15 September 1897 but produced small amounts of animal feed until 1905/6. The mill had been purchased by Colonel T.F. Wisden on 20 January 1887 and when he died, on 22 October 1904, his will ensured that the mill was to be kept in working order. It was inherited by Frederick Wisden who sold it, together with 20 acres of surrounding land, for £350, on 15 October 1906, to Alfred Charles Jackson who was to become a local councillor and later an Alderman. By the summer of 1907 the concrete and brick roundhouse had been constructed and was serving teas.<sup>1</sup>

Jackson who had purchased another large tract of downland started to develop the area by laying out roads; a few summer residences were constructed but lack of fresh water proved an obstacle. In early 1912 Jackson commenced boring operations for a source of water. A six inch bore hole was driven to a depth of 238 feet through solid chalk before water was struck.<sup>2</sup> A three storey brick water tower some forty five feet high containing pumping equipment and a storage tank was erected. At the same time a development plan was prepared by Singer Hyde and Sons, a Worthing practice of architects and surveyors showing forty plots commencing at the top of the present Salvington Hill, west along Furze Road, both sides of Gorseland Lane and the west side of West Hill. "Having chosen a site you build a castle in the air, or perhaps, on the downs"<sup>3</sup> the developers brochure proclaimed. The buildings were to be bungalows and supplied with water from the well at "£4 per annum for drinking and culinary purposes; the water for lavatories is supplied by pumping rain water from the roofs from underground storage tanks"<sup>4</sup>. Gas, electricity and mains drainage were not available. At the sale held on 22 July 1912 some thirty plots were sold. To this community in 1914 came Frank Redgrave Cripps "who was born in Liverpool Gardens in Worthing, left the town when he embarked on a career as an electrical engineer, and worked for an electrical traction company that installed the tramway systems in Liverpool, Dublin and other towns"<sup>5</sup>. By 1922 he was supplying many of the residents with electricity for lighting from a small generating plant powered by an American style windmill (Fig. 1). The following is a description of the operation taken from the *Electrical Times* dated 3 August 1922.

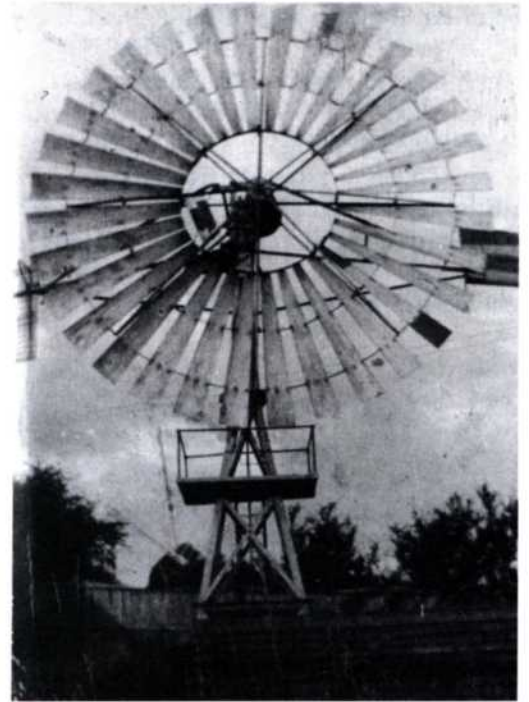


Fig. 1 The wind generator in original position showing High Salvington post mill in the background.

"Owing to the difficulty of obtaining drinking water, there are few uplands of the South Downs with more than a stray farm or lonely shepherd's cottage as a sign of population. The enterprise of a retired engineer in sinking a deep artesian well has made Salvington Hill, near Worthing, the exception, and has transformed its summit into a village of High Salvington with over thirty houses. Thither the writer retired early in 1914 after years enough of public supply, and of course, installed a small private plant for his bungalow. First one neighbour and then another have coveted the light, until the High Salvington Electric Light Company had to come into being to supply the needs of twenty-three of the present thirty-three residences, all of which are fortunately situated within a radius of 350 yards from the "works".

The chief source of power is now an American-type windmill of 18 ft diameter, to the vertical shaft of which is belted a 3 kw Crypto dynamo, which charges a 28 cell Premier battery of 250 ampere-hours capacity (at ten hour rate). A simple centrifugal governor puts resistance into the shunt circuit when the charging current reaches a predetermined limit, and the mill, of course turns out of the wind automatically before the dynamo r.p.m. become too high.

The wind is an extraordinarily fickle element. One must be prepared for the charging current to fluctuate from zero to maximum in a few seconds,

and steps must be taken to prevent the consequent variation in the supply voltage. This has been found possible, and instantaneous jumps from 0 to 60 amperes produce only a slow rise of 1½ volts.

The wind wheel is on a very short tower – only 20 ft – in order that it shall not be too conspicuous; but it stands over 300 ft above sea level, and has a clear approach from S.E. to W., which includes the prevailing winds. The vertical shaft is driven through a worm gear of phosphor bronze and steel, and ball bearings are fitted throughout, making generation quite noiseless. This is an absolute *sine qua non* where a mill is situated near dwelling houses, as this one is. The Crypto dynamo has not ball bearings, but several years use has produced no appreciable wear in the brasses, and it is only fair to the makers to state that the machine has come safely through exposures to some shocking weather and still more shocking speeds in early stages of experimenting when the wind has sometimes taken charge.

The shed seen in the photograph is divided into store, battery room and switch-room, and from here the overhead wires run on Solignumed poles. There are about 1,000 yards run of mains, mostly aluminium, and some 1,200 yards run of service wires, practically all aluminium. It is interesting to note that in the hurricane of a few months ago it was the newly-erected telephone wires that fell, not the eight-year-old, lightly-erected lighting wires.

A 2½ kw. Aster G.E.C. set provides the necessary standby, and this is housed in a tiny shed by itself. It is hoped, by improvements now in hand, to be able to bottle the very lightest breezes, and thus to render the Aster's job a sinecure.

At present the lighting connections total 4.7 kw., and a few small pumps and irons make up an additional 1.5 kw. This latter is a strictly daytime load, and the observed maximum demand last winter was only 1.25 kw. For the seventeen houses then connected, the installations varied from five to thirty-five lights.

Unlimited service, day and night, is provided at 8d. per annum per watt of lamps installed, and "from information received" from a friendly but unnameable source, it does not appear that the privilege is abused. An alternative charge of 1s. per unit, with 2s. per quarter meter rent, is offered, but is used by very few consumers. There is, of course, no reason why a reduced price should be offered for power and heating, and such use is not encouraged. Consumers, however, from their town experience, expect some reduction, and so a rate of 8d. per unit is given. It is clearly understood that this will only obtain so long as the wind remains at pre-war prices! The Government has long shown

that it is as ingenious as it is impecunious, and sooner or later, no doubt, the commercial use of wind power will be taxed. In the meanwhile an immense field is open to development in this sea-girt and wind-swept island to those with a little capital and some imagination.

The capital cost has been about £450, covering everything bought; and the running cost, as far as the windmill is concerned, is a matter of a few shillings per annum to keep the grease cups filled. The past year was as poor in wind as in rain, and the fuel for the standby engine cost some £9 from Christmas to Lady Day, and 30s. from Lady Day to Mid-summer. Since the advent of "Summer", however, wind has become so plentiful that it has had to run to waste.

An interesting point is that the actual fuel account is much heavier in summer than in winter, and this is because oil stoves universally replace coal in the colony in summer, and consumers find it a convenience to obtain their paraffin from the Company's bulk supply, thus adding considerably to its revenue.

It is hoped that the above brief notes and figures will be of some use to those who have thought of using the wind, and will indicate possibilities to those who have not. It is by no means necessary to be on a hill, so long as the windmill tower is high enough to give a clear approach for at least 100 yards. Naturally, with a properly designed wheel, such as are largely used in Denmark and Holland, much better results can be obtained; but even with the less efficient American-type wheel as used for pumping in this country, quite good work can be done. Before many months, the writer hopes to have proved that anyone with a small pumping mill can light his house for practically nothing a year, and with a very small capital outlay involving no structural alterations to the mill.

Mr. Cripps has kindly sent us his general conditions of supply, and those interested in small country installations of this kind might like to note the following items in this document:-

Service lines will be laid free of charge in a public thoroughfare, and for a distance of 150 feet upon consumer's private property, but beyond that distance a charge of 1s. per yard will be made. The route of all service lines will be determined by the company, whose responsibility shall end at the point at which the service lines enter the private property of the consumer. In the event of the company's mains or service lines being required to be carried over private property, the necessary wayleave shall be obtained by the consumer.

The internal conductors and other fittings must be erected in accordance with the standard prescribed



by the Institution of Electrical Engineers. The company will not be responsible for any of the consumer's apparatus beyond the company's terminals.

The company will not be responsible for interruptions, or defects, or failures of supply caused by accident to machinery, conductors, or other apparatus, by *force majeure*, or by operations of the local authority or Ministry of Transport, or by strikes or industrial disturbances of any kind. The company may also disconnect the supply for short periods without notice to make tests, alterations or repairs. But any loss of light suffered by consumers under the contract system from failure of the company's supply will be allowed for proportionally in the next quarter's accounts.

The price charged for supply will be either (a) 8d. per annum per watt of lamps installed, paid quarterly in advance, or (b) 1s. per unit by meter, with meter rent of 2s. per quarter. In case of delay in making payment in accordance with these conditions, or if the consumer shall not in all things observe and perform the agreements and conditions herein contained, the company may without prejudice to any other remedies it may have, cut off the supply, and also at its option terminate this agreement."



Fig. 2 Wind generator with dynamo shed at base, and standby engine shed to the right. A distribution pole with wire and insulators stands nearby. The main shed, divided into store, battery room and switchroom can just be seen in the left background.

The exact location of the wind generator and the dynamo shed are not known but from photographic evidence (Fig. 2) it would appear to be a few hundred yards to the south west of the mill. However there is hearsay evidence of a site to the east of the water tower (i.e. due west of the mill) which may be supported by the location of a modern electrical sub-station there.

From photographs (Figs. 1 & 2) it can be seen that there were 32 blades which were exceptionally large for this country, with one or possibly two tail boards projecting from the rear. These were presumably kept fully extended by a coil spring the tension of which could be adjusted to suit the wind conditions and turn the wheel out of the wind before the dynamo r.p.m. became too high. If the wind became stormy or gusty the board would fold flat and thus turn the wheel out of wind. Two minor inaccuracies in the account are that the well was not artesian and the American-type windmill was never used as a wind pump.

On 6 December 1923 the company was registered as the High Salvington Electric Supply Company Limited with a registered office at 21 Chapel Road Worthing. The limited liability company was "To acquire and take over as a going concern and carry on the electric supply business now carried on by Frank Redgrave Cripps and Dorothy Summerhays Cripps at High Salvington. Nominal capital £1,300 in 1,300 shares of £1 each under control of the directors who can allot or otherwise dispose. Directors F.R. Cripps, Arcana High Salvington; H.J.M. Millbank Smith, Worthing Lodge, Worthing; (medical practitioner) and V.H. Poynter, Furze Holm, High Salvington (soap manufacturer). The valuation of the original business was £500 made up as follows:-

For goodwill and benefit of contracts	£50.0.0
For tenants and trade fixtures and fittings	£415.0.0
Loose plant, loose machinery stock in trade and furniture.	£35.0.0

The share registers show that the major shareholders were Cripps with 400 shares and Edith Emily Taylor, spinster of Whitegates Salvington with 100. Smaller allocations, of between 10 and 50 shares were held by between thirty and thirty six others residing at twenty two to twenty four addresses mostly in High Salvington; these were obviously consumers.<sup>6</sup>

In about January 1925 the plant was moved to what is now 16 Heather Lane, 200 yards to the north (Figs. 3 & 4). The reason for the move is unknown, it is possible the original site was required for building or the lease had expired but the move had been planned as in February 1924 Cripps had bought the plot which was next to his own bungalow Arcana at 17 Heather



Fig. 3 Generator being taken down before removal to rear of 16 Heather Lane December 1924.



Fig. 4 Generator being erected at new location January 1925. F.R. Cripps' bungalow *Arcana* can be seen.

Lane. When re-erected the tower had an additional section at the bottom making the total height about 32 feet. With the passing of the Worthing Corporation Act of 1922 which extended the area of supply by the Corporation's Electricity Department to include the parish of Durrington, and incidentally gave the Corporation power to purchase A.C. Jackson's water-works and water supply undertaking, it was not many years before new mains arrived and houses were rewired to the new voltage of 230V. The plot of land at the rear of 16 Heather Lane was sold on 21 April 1927 to Worthing Corporation.<sup>7</sup> Generation presumably ceased but the underground cable on the site continued in use until recently.<sup>8</sup> The Company applied to be voluntarily wound up on 19 May 1927 and it is recorded that the property of the company had been disposed of on 1 November 1927.<sup>9</sup>

In the garden of 16 Heather Lane can still be seen a raised area of lawn about 12 feet square with a few pieces of concrete showing. This and a few rusty artefacts dug up by the owner are all that remains of an interesting lighting venture provided for the pioneers of High Salvington.

#### ACKNOWLEDGEMENTS

The author would like to thank John Norris former curator of the Milne Collection at Amberley Working Museum and John Blackwell and Peter Holtham of SIAS for their assistance in the preparation of this article

#### REFERENCES

1. The notes on the mill are from documents and extracts from local newspapers in the author's collection. The tea house was demolished in 1989 during the restoration of the mill to working order.
2. Worthing Reference Library. Developer's brochure c.1912. Sussex Topographical Pamphlets Vol. XXVII.
3. *Ibid.*
4. *Ibid.*
5. *Worthing Gazette* reporting the eightieth birthday of F.R. Cripps on 5 June 1960.
6. PRO BT 31/28240/194237.
7. Deeds in possession of owner of 16 Heather Lane.
8. *Ibid.* The owner had them disconnected and rerun fronting the property before completion of purchase in 1998.
9. PRO *op.cit.*

Photographs are from the author's collection.

# CVA/KEARNEY & TRECKER

*Peter Groves*

## CVA No. 1 Factory, Portland Road, Hove, 1950s Development

The Hove based Machine Tool Company, known for much of the twentieth Century as CVA, was founded at the end of World War I. Its headquarters for over 50 years was in Portland Road, Hove, near the bottom of what is now Olive Road, on the site currently occupied by Seeboard Energy. Commercial activities operated from this vicinity prior to 1918. Fig. 1 shows the rural location of Portslade Station in 1899, with Portland Road at the bottom. This has a number of buildings close by to the Olive Road area, which are listed as an Ice Works. This confirms that commerce operated in the area before any residential housing development started.

Initially the Company was named CAV Small Tools Ltd and had links to the electrical giant CAV of Acton, London. The Company manufactured small hand tools for engineers. Fig. 2 is taken from the CAV 1926 sales catalogue and shows the type of tools manufactured. Note the price for a precision square! In today's decimal currency it equates to a starting price of 42½p. It was in the 1920s that the company first started its association with metal cutting Machine Tools. Fig. 3 shows a No. 1 Wade Bench Lathe, one of the first machine tools manufactured by the Hove Company.

After a split with CAV of Acton, in 1933 Eric Aron (see Fig. 4) became Managing Director and the company name was changed to CVA Jigs Moulds & Tools Ltd.



Fig. 4 Eric Aron, Managing Director from 1933

Eric Aron was a particularly astute businessman. Under his direction the Company manufactured a wider range of products and were always able to find a market for one or more items from its range. This ensured the success of the Company at a difficult time, when many other business failed.

The manufacture of larger more complex tools and machines became the main core products, and the Portland Road site developed with the addition of a number of new buildings. A large foundry was opened in early 1930s, and a joint railway siding was used by both CVA and Greens Cake Company, who occupied buildings nearby, for delivery of materials.

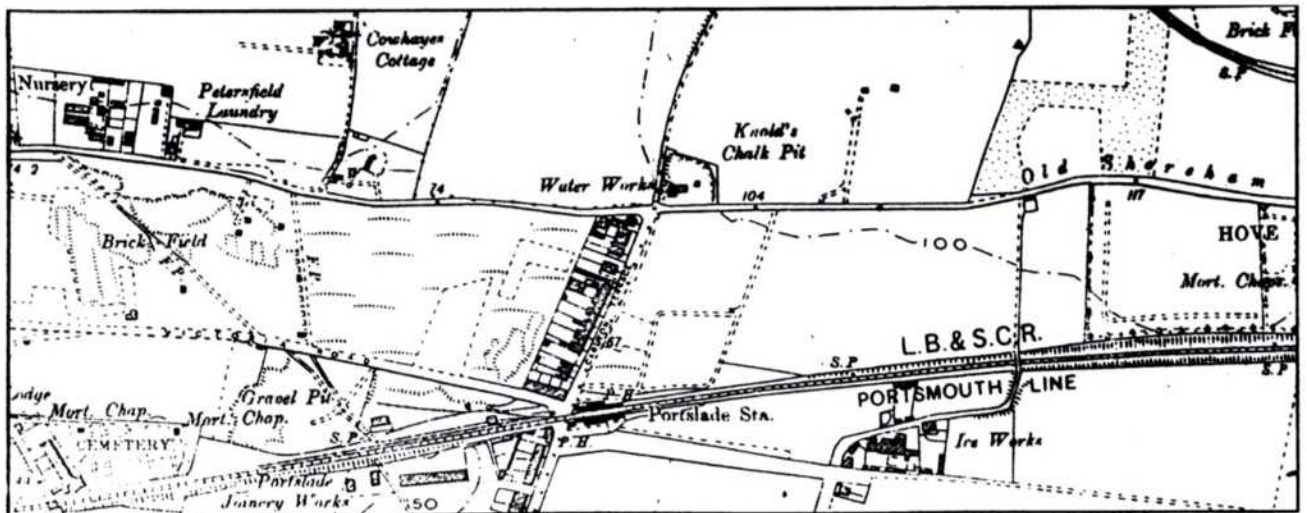
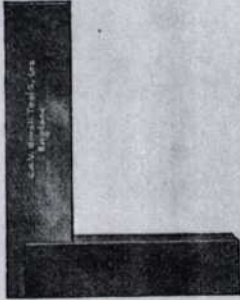


Fig. 1 1899 6" OS map of Portslade area

C.A.V. SMALL TOOLS LTD. ENGLAND.

## Standard Solid Steel Hardened Square

No. 301.



These Squares are not graduated. They are made of steel, solidly constructed with heavy beams. The length of blade given is from inside edge of beam to end of blade. Wooden cases are furnished for the 6, 9 and 12 in. squares for protecting them when not in use.

TOOL NO.	LENGTH OF BLADE	FULL LENGTH OF BEAM	PRICE
301	1	1	8/6
	2	11	10/0
	3	21	14/0
	4½	3½	17/6
	6	4½	20/0
	9	5½	22/6
	12	6½	25/0

Price—6 in. Case ... 3/6  
 9 in. Case ... 3/6  
 12 in. Case ... 5/0

Fig. 2 Page from 1926 Sales catalogue

C.A.V. SMALL TOOLS LTD. ENGLAND.

## No. 1 "Wade" Lathe



No. 2001 PRICE £3-0-0 AS ILLUSTRATED

THE SALE OF THIS LATHE AT THE PRICE LISTED IS A CONVINCING PROOF OF BRITISH ENGINEERING ENTERPRISE.

### SPECIFICATION

THE LATHE will turn up to 4 in. dia. by 12 in. long. THE WORKING PARTS are massive, and give great accuracy in turning brass, iron or mild steel, ivory or other materials of a like nature. THE BED is of welded steel tubing, accurately ground and polished. The circular form provides a very strong type of construction and is not liable to distortion. THE SADDLE has a travel the entire length of the bed, and is fitted with cross feed as well. The lead screw situated within the bed actuates the slide rest along the bed by means of the hand wheel at the tailstock end. The cross slide itself has an exceedingly long bearing surface on the bed, thus avoiding any tendency to cross-wind. THE TOOLHOLDER is of massive and rigid construction, which ensures steadiness and smooth finish to the work. The tool is held solidly in place by means of the two bolts, and the toolholder can be swivelled to any desired angle, the large and accessible nut firmly clamping it into place. THE SPINDLE is made of mild steel cut from the solid, and is bored HOLLOW for bar and rod work. It is fitted with three-step cone pulley for different speeds, and there is suitable provision for oiling. THE TAILSTOCK SPINDLE is fed forward by means of the small hand wheel, provision being made for securely locking it into place. THE BEARINGS are of white metal of exceptional hard wearing quality and are adjustable for taking up wear.

NET WEIGHT 15 LBS. GROSS WEIGHT FOR SHIPPING ABOUT 24

Fig. 3 1920s Advertisement for the C.A.V. No.1 "Wade" lathe

During World War II, the Company's expertise became very important towards the war effort. At least one of the buildings was reclassified as a Munitions Shop. This made the factory a potential target for German planes, and plane spotters used the flat roof building towards the front of the site throughout the war. Fig. 5 shows the Portland Road site just after the war. Because of the importance of its work towards the war effort, the Company expanded during this period opening a number of other factories in the Brighton area. Following the war, CVA was in a good position for expansion. It was one of the biggest manufacturing employers in the area and further development was planned.

Fig. 6 shows a view taken from the south side of Portland Road at the top of Chelston Avenue, looking north. The Company's entrance can just be seen on the very far right, leading up to the main "D Block" building, set back from the road, with the flag poles on top. Below the flagpoles are coronation crowns; this confirms the year as 1953. The Company's plans included demolition of the old workshop behind the hoardings and the building of prestige new offices with frontage onto Portland Road. What was unusual

was that the Company themselves were to be the main contractor for the development. This was only possible because of the large Works Department. An example of this is that all the bricklaying was carried out by the Company's own bricklayers. Fig. 7 shows "D Block," set well back from the road, with Eric Aaron's car on the right. The photo appears to have been taken in the summer, with flowers in bloom in the garden on the right. Many employees lived close to the factory. Chris Duck, one of the supervisors, lived in the house on the right of the development area shown in Fig. 6. No excuses for being late for work!

The steel structure can be seen well under way in Fig. 8, and Fig. 9 shows the view from the other side. The size of the new building can be appreciated, with the old block now partially hidden. Fig. 10 shows a view of the side of the new building with the work nearing completion while Fig. 11 shows the newly completed office block 'Garantools House' with the grand front entrance onto Portland Road and works entrance to the right. The top corner of Glebe Villas can be seen in the foreground, with no traffic in Portland Road. E.H. Jones Limited was the sales company for CVA machines.

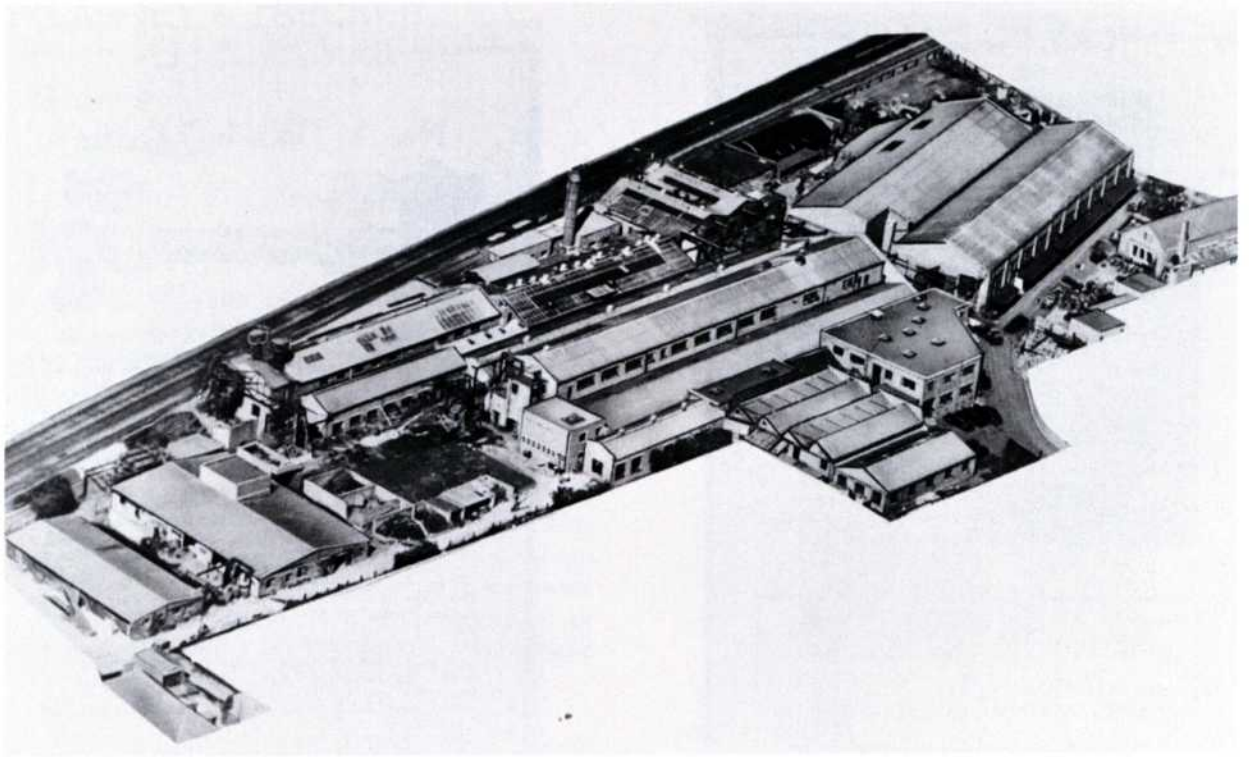


Fig. 5 Portland Road site immediately following World War II



Fig. 6 North side of Portland Road showing the entrance to CAV's works at far right (1953)

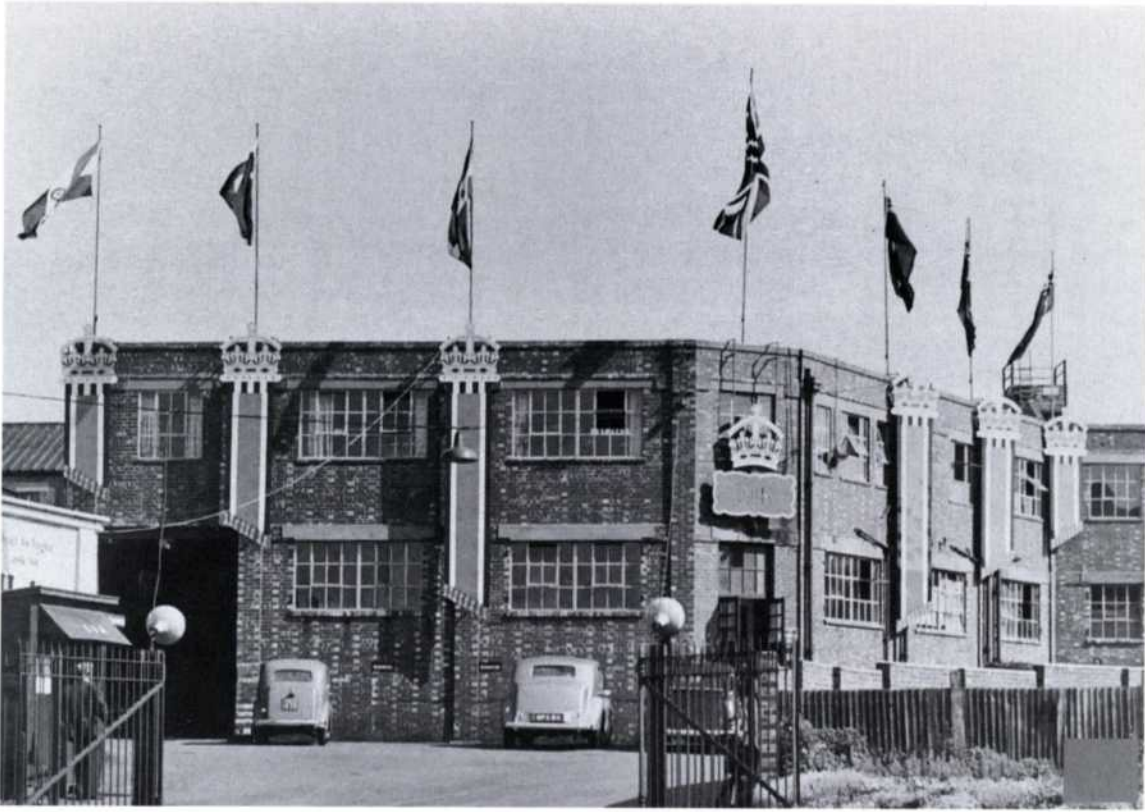


Fig. 7 'D' block of the Portland Road works in 1953



Fig. 8 Steel construction work proceeding on the Portland Road site

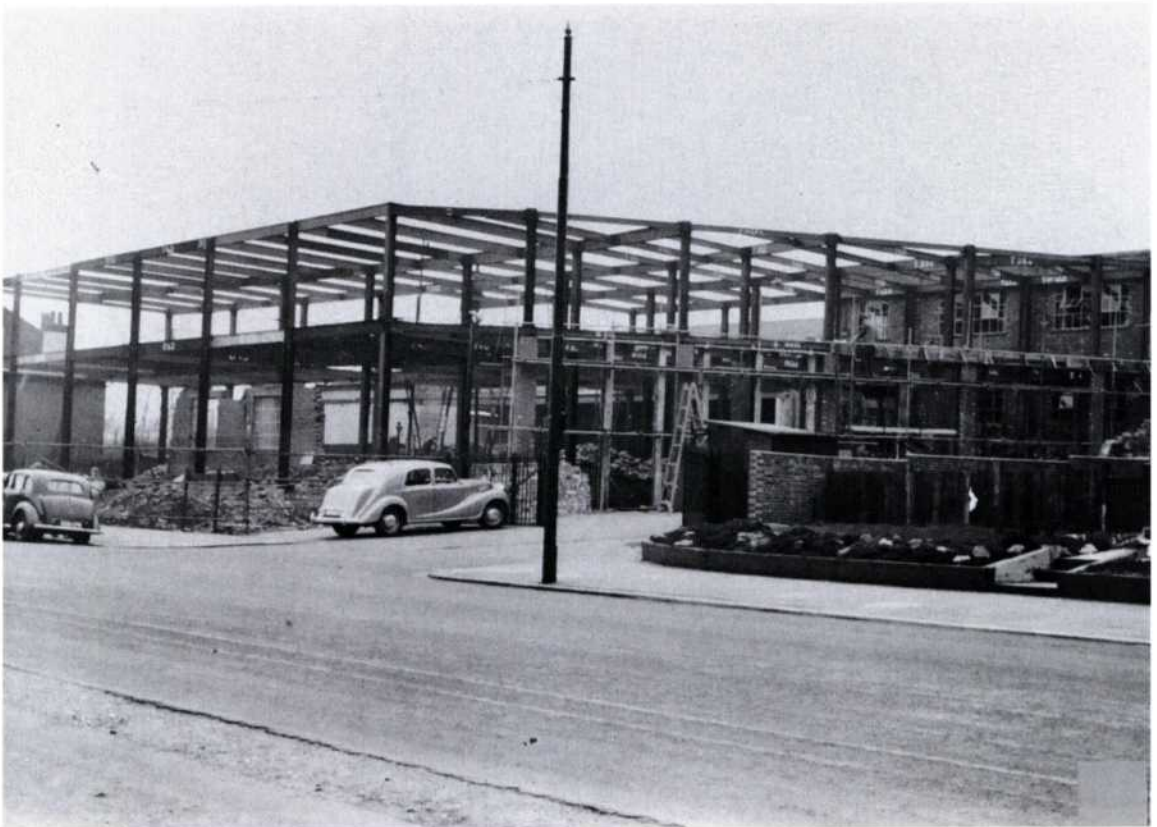


Fig. 9 Other side of Portland Road building under construction

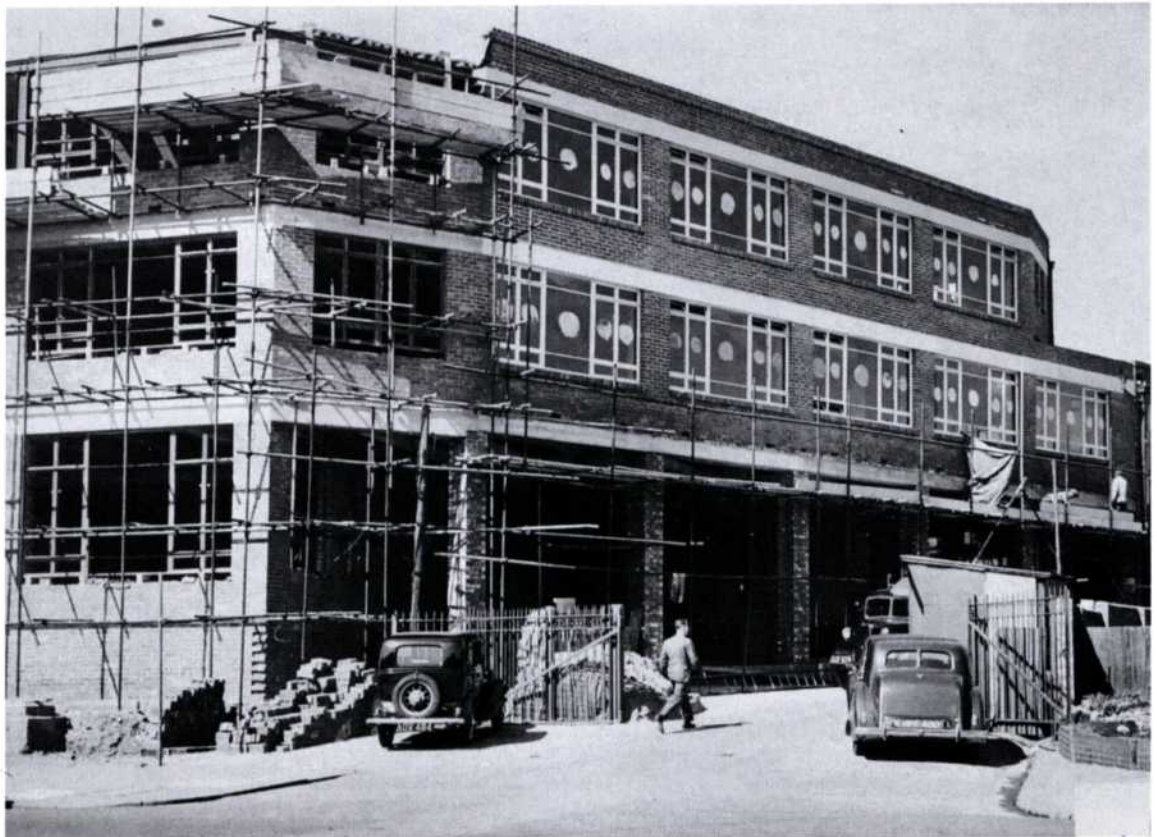


Fig. 10 Portland Road building nearing completion

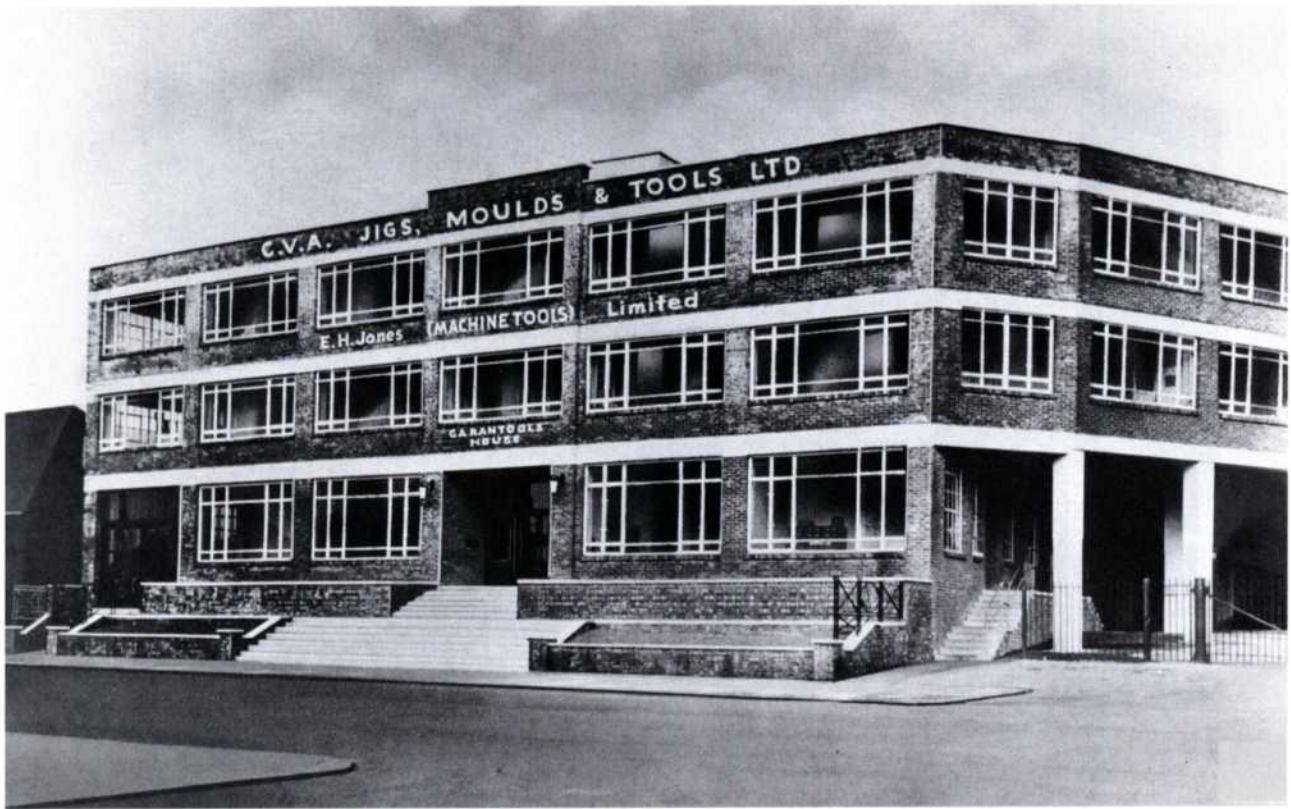


Fig. 11 The newly completed office block "Garantools House" c.1955

The Company had ties since the forties with the U.S. Machine Tool manufacturer Kearney & Trecker Corporation of Milwaukee, Wisconsin. This was one of many reasons why the Portland Road site would not prosper for much longer! Kearney & Trecker manufactured very large machines and by the late 1950s these U.S. machines were to be built by CVA. The Portland Road site was not really suited to production of this size, and two new sites were chosen, Hollingbury in Brighton and Lineside in Littlehampton. In 1966 Kearney & Trecker Corporation, who had owned some CVA shares since 1957, bought the remaining shares held by Eric Aron and his family. Now holding 96% of the equity the name was changed to Kearney & Trecker. Hollingbury was to become the new headquarters! Production was gradually moved from Portland Road and many other sites in the Brighton area to Hollingbury. This move was completed in 1973 with the closure of the Portland Road site. The new building had lasted only 20 years! The Portland Road site was redeveloped in the 1970s, with the houses on either side being demolished to give additional frontage. It is now occupied by Seeboard Energy.

### **CVA/Kearney & Trecker No's 2, 6 and 8 Factories, Hollingbury, Brighton, 1950s and 1960s Development**

During the post-war period the machinery that the Company was producing increased in size. The CVA Dieing Press was one of these larger machines. Machine tools produced by Kearney & Trecker were also very large, some weighing many tons. A number of these U.S. machines were to be produced by CVA, for the U.K. and European markets.

Immediately after World War II had ended Brighton Corporation had the forethought to consider the provision of employment. It proposed to build an Industrial Estate to ensure the prosperity and employment of local people, to be built on the outskirts of the town, north of Patcham, below the junction of Carden Avenue and Ditchling Road. Work started on access with the construction of Crowhurst Road in 1946. Fig. 12 shows the proposed layout with some plots already let. The first of the new factories was completed in 1948 and from then on the new Hollingbury Industrial Estate really took off.



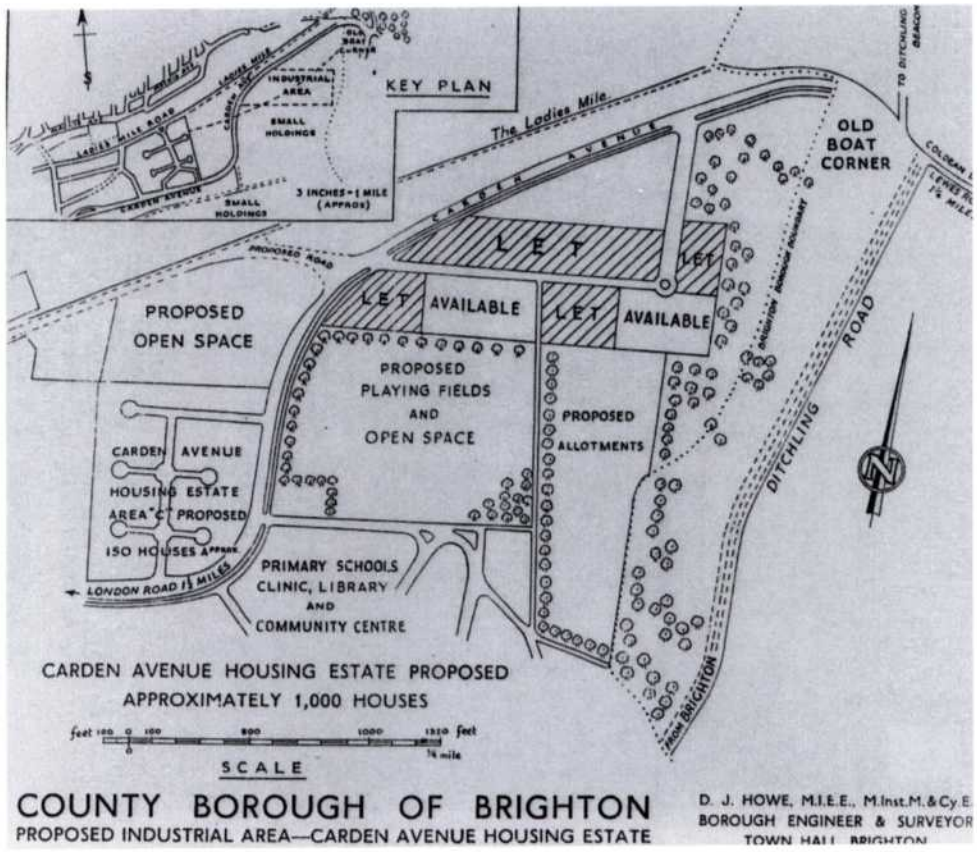


Fig. 12 Proposed plan of Hollingbury Industrial Estate

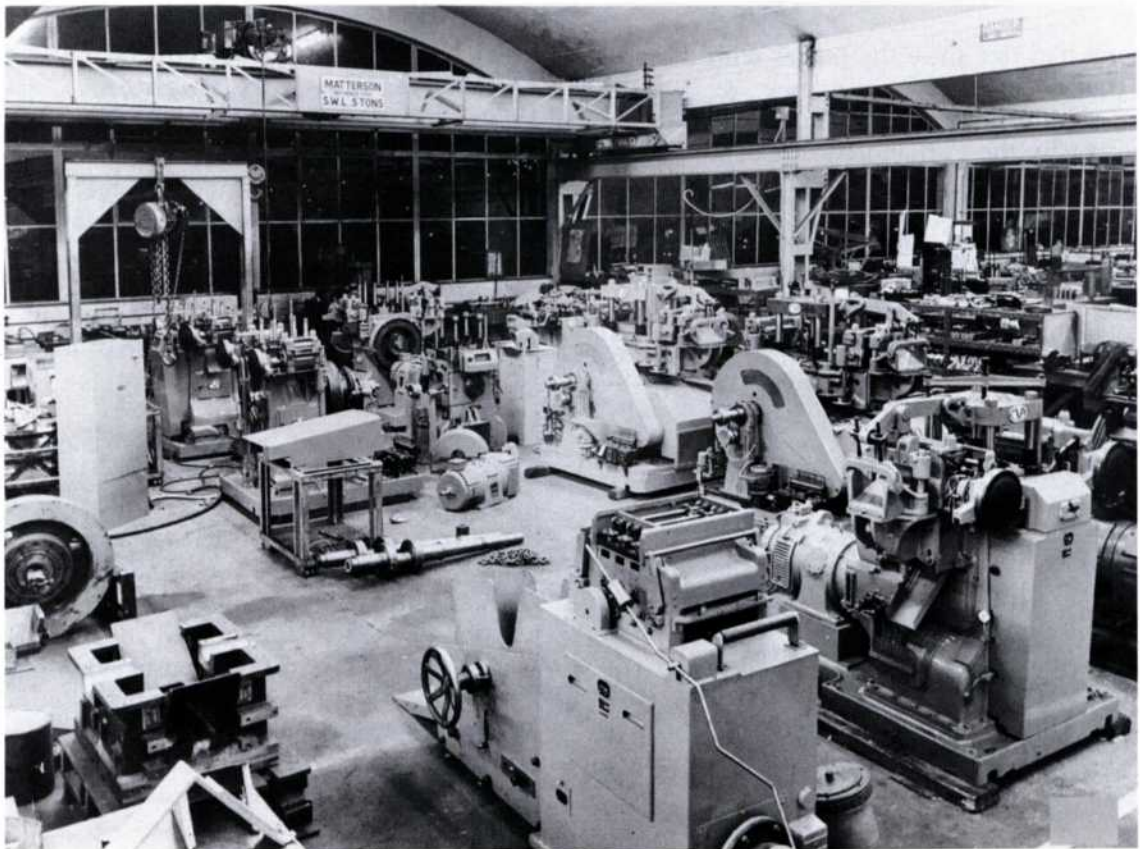


Fig. 13 CVA No. 2 works interior showing dieing presses



Fig. 14 Rear of CVA's new factory at Hollingbury

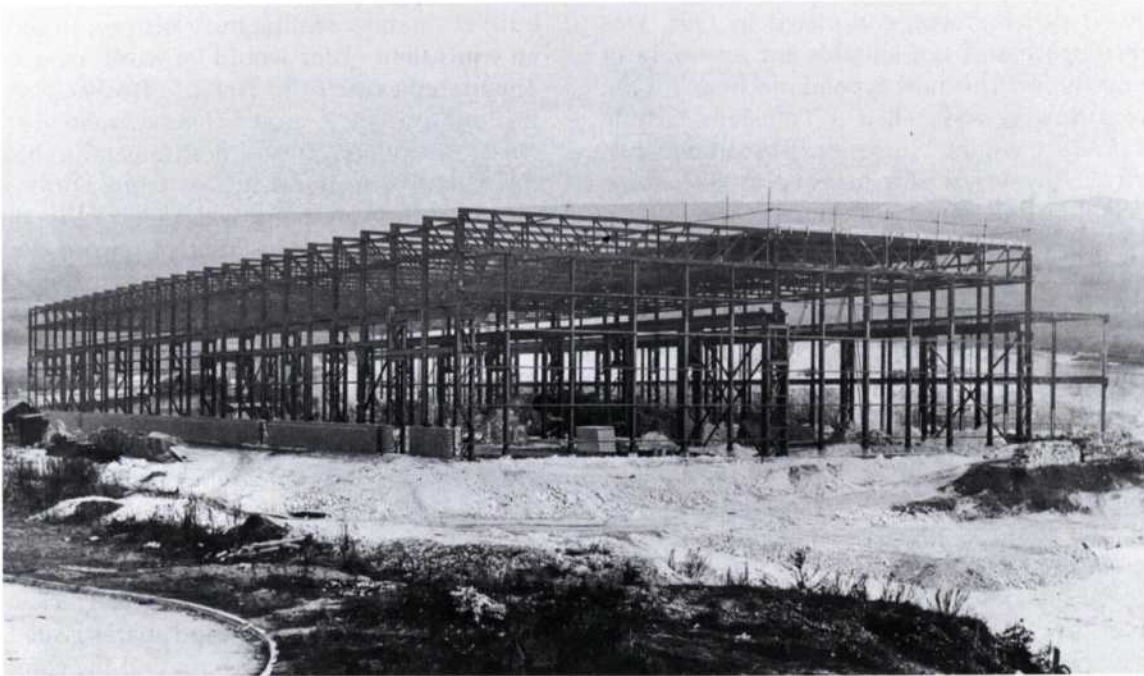


Fig. 15 Steelwork for the CVA No. 6 factory at Hollingbury c.1956

The CVA site in Portland Road, which was called No. 1 Factory, was in the middle of a residential area. Because of the growth experienced by the Company during the war and post-war period, plus the increased size of the Company products, new facilities were required. The Hollingbury Industrial Estate had great potential and the Company decided on a purpose built factory with grand frontage onto Crowhurst Road. Wells Thorpe were the consultant architects and the building, now the headquarters of the Evening Argus, was completed in 1952. This was originally used for the assembly of Dieing Presses. Fig. 13 shows the inside of the new CVA factory Die Shop. The unusual vaulted roof can be clearly seen. This was designated No. 2 Factory.

With environmental forethought, Brighton Corporation had the industrial estate built into a natural fold in the South Downs, barely visible from all but the southern approach. The hills on three sides and uneven ground were to cause problems with future CVA developments on the estate, as we shall see later. Fig. 14 is a rare view of the rear of the new factory. In 1952 the rear of the factory faced open playing fields and a children's playground, Carden Park, which sloped away to the south.

Although the new No. 2 factory was over 50,000 square feet in area, this was still not enough to meet the needs of the expanding business. Also the new Portland Road development, completed in 1954, was mainly office space and not suitable for assembly of very large machines. This new type of machine, for the automotive industry, was called a Transfer Machine and could produce engine blocks, or like components, economically. However it was massive in size, some up to 200 feet long and hundreds of tons in weight.

The Company decided on a further factory development on the Hollingbury Industrial Estate, 50 metres from the newly completed No. 2 factory. London architects Townsend were used for this massive undertaking. Levels were set by the surveyors on the uneven ground and work was started in 1956. Fig. 15 shows the steel skeleton viewed from No. 2 factory in Crowhurst Road. In the background, on top of the hill, the footings for the flats at the end of Cuckmere Way can be seen. These flats were built at the same time. No sooner had the steelwork been erected, than the Company realised that the massive new building would not be big enough! The architects were quickly consulted and it was decided to increase the size of the building by extending in front. However the uneven ground was to cause a major problem, as the land in front was 3 metres lower. There were two alternatives; either build the level of the ground up, or have a 3 metre level difference inside the new factory. The latter was decided and construction of the new

section was started, making the total area 85,000 square feet.

Fig. 16 shows the steelwork of the new second section, with the rear part of the factory almost complete. The photograph has been taken from the roof of the No. 2 factory, which is now the Evening Argus building. On top of the hill, work on the first of the new flats is also almost complete. Figure 17 shows the newly completed factory. This photograph seems to have been taken from high up on the opposite side of Crowhurst Road, currently the filling station end of the Asda car park. Figure 18 shows a view of the inside of the new No. 6 Factory, note the 30-ton overhead crane with the operator sitting up in the control cabinet. This was required to lift the very large components and machines.

The late 1950s and 1960s were to be the Company's most prosperous times. In 1957 Kearney & Trecker Corporation invested \$1.5 million in the Company. A new manufacturing plant was built at Littlehampton in that year, and six of the most sophisticated computer controlled metal cutting machines (N.C.) were installed there. This was the second largest N.C. installation in the world, the largest being in the U.S. factory. Transfer machine sales to the automotive industry were doing very well. An example of this was an order from diesel engine manufactures, Perkins of Peterborough for a £900,000 transfer machine, to be built at the new Hollingbury factory. In today's terms an equivalent order would be worth over £40 million. The manufacture of Kearney & Trecker N.C. machines in Brighton was planned. Record sales for 1965 were nearly £6 million. It was not unusual to have government ministers or executives from Fords or the like visit and the Company was involved in many major projects like the Anglo-French Concord. Prospects for the future looked bright! The area prospered as well, it was estimated that the Company put over £1 million into the local economy. Again, a huge amount of money in today's terms.

1966 was to be a year of change for CVA. In June of that year, Eric Aron, who had been managing Director since 1933, sold the remaining family shares, amounting to 308,606 ordinary shares, to Kearney & Trecker Corporation. This brought the total number of ordinary shares held by Kearney & Trecker to 966,284 out of the 1,000,000 one pound shares issued. Mr. Aron resigned as managing director and the company name was changed from CVA to Kearney & Trecker. A new managing director, Bill Neill (Fig. 20) was appointed by the parent company. Scottish born Mr. Neill had been awarded the M.B.E. in 1946 for his services to the aircraft industry during the war. Following the war he had been Production Manager at de Havilland Propellers Ltd.

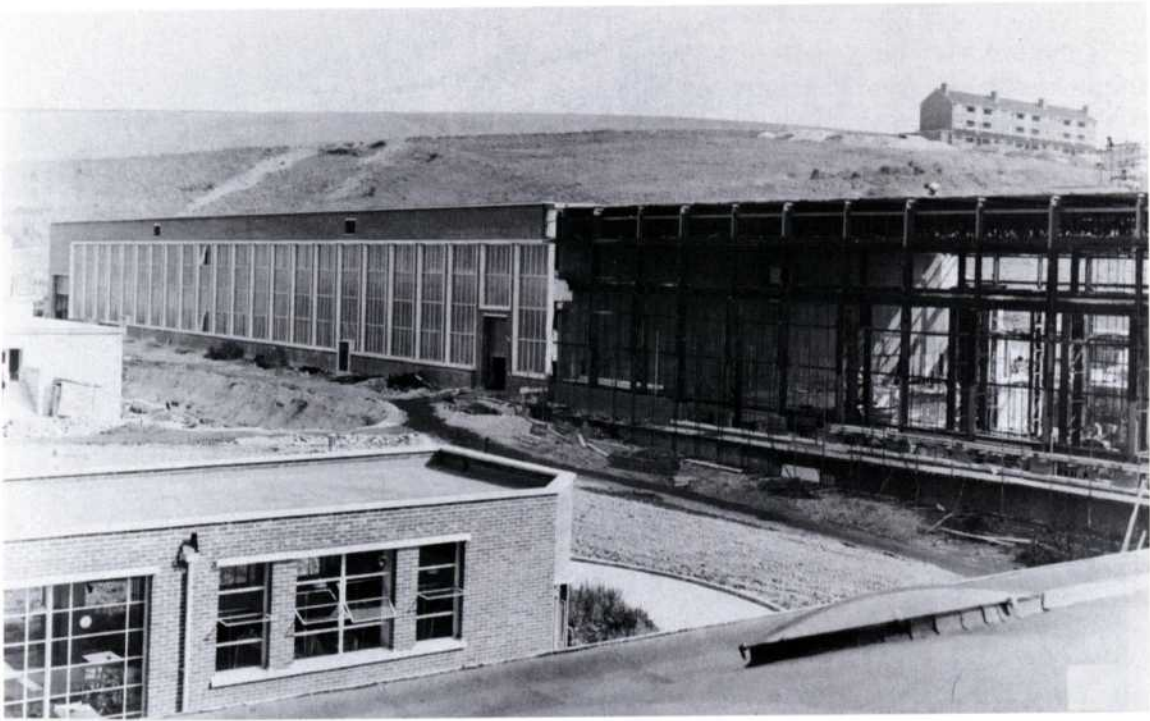


Fig. 16 View of extension to No. 6 factory in progress



Fig. 17 CVA No. 6 factory after completion

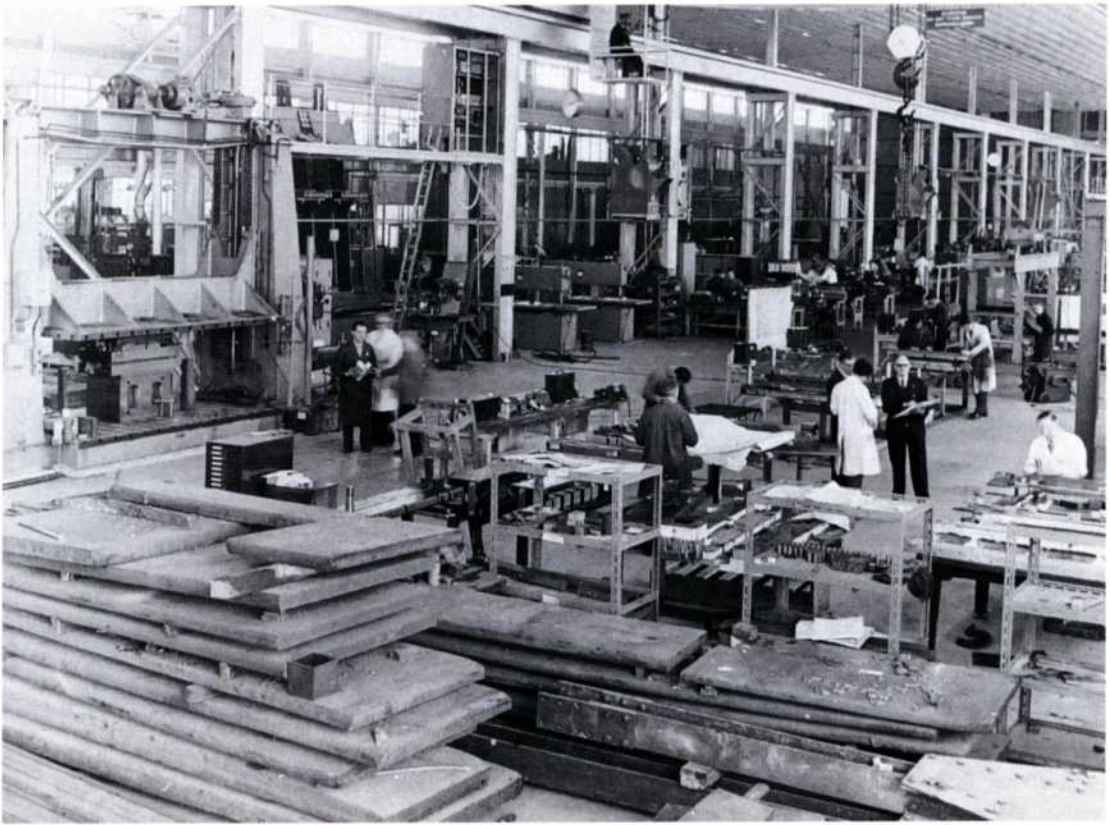


Fig. 18 Interior of the CVA No. 6 factory



The playground which the firm wants

Fig. 19 Carden Park, Hollingbury looking towards the end of the No. 6 factory



Fig. 20 W.T. Neil Managing Director of Kearney & Trecker UK appointed 1966

It was perhaps with insight into the future that the Company decided to build a new factory and consolidate the numerous factories in the area onto one site, Hollingbury. The No. 2 and No. 6 factories were 50 metres apart, the Company's plans were to build a massive new factory, linking the two existing buildings. This would house production and in particular assembly and a centralised stores, from the other factories in the Brighton area. However Carden Park occupied the site between the two existing factories! Fig. 19 shows a view of Carden Park, taken from the area where the MFI building now stands, looking towards the massive end of No. 6 Factory. The vaulted roof of the No. 2 factory can just be seen in the top left hand corner.

Discussions were held with Brighton Council in the summer of 1966. Although the proposal was supported by many of the Planning Committee, the Parks Committee were strongly opposed to the release of the 5 acre park. This was widely reported by the Evening Argus at the time. Concerns were also raised in Littlehampton, if the proposal was approved there would be job losses at the Fort Road, Lineside factory. Kearney & Trecker were also one of the largest employers there! Brighton Council asked the government to intervene. The departments concerned, Ministry of Housing and Local Government, although wishing to help, were not able to as the procedures had to follow certain law. In the mean time Littlehampton Council were hopeful that the Hollingbury proposals would be refused and perhaps a move to centralise operations in Littlehampton would be possible. The Company played its trump card by

producing a letter from East Kilbride Development Corporation. The letter was offering the Sussex company industrial development and housing land in Scotland. Brighton Council had many reasons for concern, apart from the £1 million the company put into the local economy and 1,700 jobs. Also the factory buildings were leased from Brighton Council at a rent of £42,000 per year, plus £24,000 per year rates. The Council had borrowed the money to build the factories and the Company was repaying this at 2.5% above the borrowed rate. If the Company moved to East Kilbride would anyone else want the huge factories? This was the persuading factor, the Parks Committee relented and the proposal was approved. The building of No. 8 assembly and stores factory was underway.

The uneven ground, which sloped away lower than the No. 6 factory, again caused the surveyors problems. This time they decided to build up the level to the same height as the lower floor of the No. 6 factory. This was done using ashes from the Southwick Power Station, which were transported to the site by lorry. Many thousands of tons were deposited, and by damping down the ash as it was laid, it made a very suitable foundation for the heavy machinery. The new building was to be 70,000 square feet and connected to the two existing factories would make a total of over 200,000 square feet! The next decisions was how to connect it to the No. 6 factory. There were a number of alternatives, but by far the most technically complex was to demolish the massive end wall of No. 6 factory seen in Fig. 19. Dave Gunn was the young Kearney & Trecker Project Engineer and the architects wanted to know which method the Company had decided on. It was a massive decision for the young engineer but he chose the most complex and expensive method, to demolish the massive end wall. This was to prove to be a sound decision, as it provided a good link between the existing and new buildings, where massive 20 and 30 ton cranes overlapped, enabling heavy machinery to be easily moved between the two. This was named the "Link Bay" and lorries could also drive right inside to be loaded within the bay. Also it made the two factories as one, running parallel the full length of Crowhurst Road. One could barely see from one end to the other, as it was over 800 feet long.

The new factory was completed in 1968 and is seen in Fig. 21. Land in front was used as a car park and the Company had options for further extensions out to the road. Gradually the other factories in the area were closed and production was moved into the new building. This started with the closure of the heavy machine shop, Lineside, at Littlehampton and the Cricket Ground assembly plant in Eaton Road, in 1969. Production at Portland Road and Coombe Road was gradually transferred to Hollingbury and they both closed in 1973.

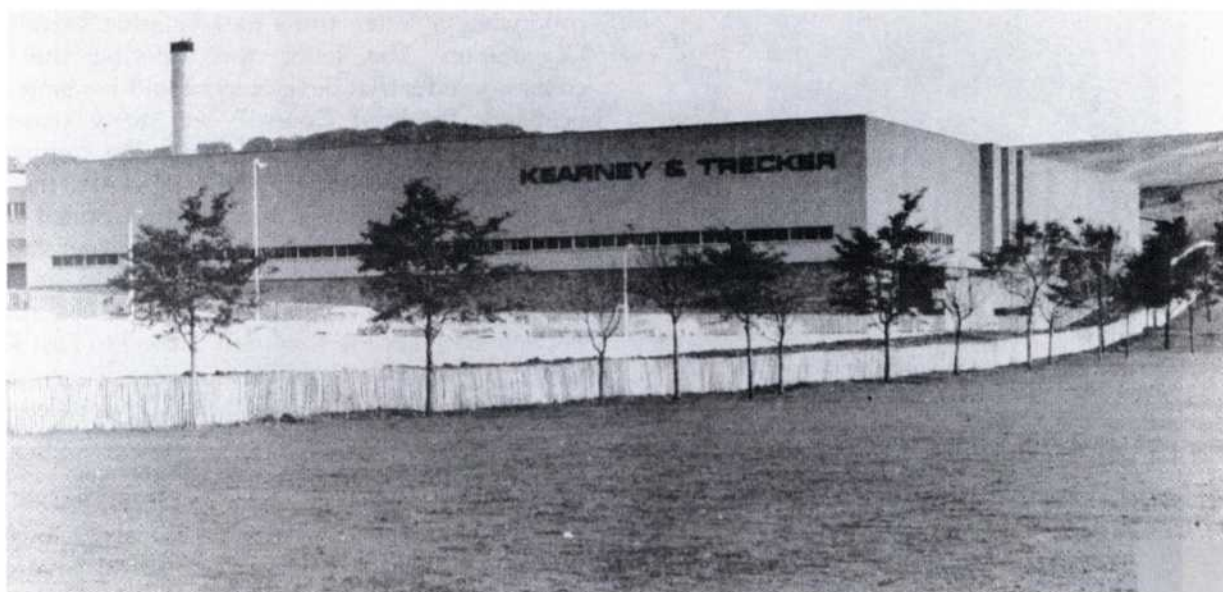


Fig. 21 Kearney & Trecker No. 8 factory soon after completion in 1968

The Company was never again as profitable as it had been in the 1950s and 1960s, and by the early 1970s got into financial difficulties. The government intervened and the business amalgamated with Marwin Machine Tools of Leicester who were also in difficulty. The name was changed to Kearney & Trecker Marwin (KTM). By the late 1970s, with the Company still rarely very profitable, control was transferred to come under the guidance of Vickers, who put Michael Bright in charge as Managing Director. In the early 1990s Mr. Bright headed a management buyout, and the Company name changed yet again to Flexible Manufacturing Technology (FMT). However the land perhaps seemed more important than manufacturing. First the lease on the car park was sold and the MFI store was built on the land. Next the 1948 No. 2 and 1968 No. 8 factories were sold to the Evening Argus, who built the massive Print Room in the assembly factory. A new dividing wall was built and the Company consolidated into the No. 6 factory.

For a short spell things looked promising, new products were developed and the Company was involved in many high tech projects for firms such as Jaguar, Rover, JCB and Shorts of Belfast. Additionally exports were doing well, with the Company working on projects in Belgium, China, the U.S.A, and with government approval, Iraq. However the management decided to increase the product range by acquisition and purchased 2 failing machine tool companies. Both Nobel & Lund of Newcastle, and Kearns Richards from Manchester were in receivership. The Company also purchased the derelict Jotun-Henry Clark building on Crowhurst Road, which had been empty for some

years. It was perhaps these investments, along with a decline in sales, which was to be the downfall of the Company. In February 1994 FMT went into receivership. The employees were made redundant, with a few kept on to complete existing contracts and help clear the factory. All the plant was sold off by the receiver and shipped out to the Far East. Eventually the No. 6 factory was sold to Sussex Stationers, British Bookshops and is now, following a complete refurbishment, their headquarters.

#### SOURCES

The illustrations Figs. 5-11 and 13-18 are the property of Tony Brown who also owns the 1926 C.A.V. sales catalogue from which Figs. 2 and 3 are reproduced. He was an employee of the Company from 1976 to 1994. Figs. 4, 19 and 20 came from a press cuttings book maintained by the Company between 1963 and 76 and now in the possession of Bill Sadler who worked for the firm from 1939 to 83.

Additional information came from John Pawsey and Dave Gunn, two ex-employees who worked for the company between 1942 and 1993, and from two articles by Hugh Fermer:

"The Hollingbury Industrial Estate, Brighton" *Sussex Industrial History* 21, (1991).

"Machine Tool Manufacture in Sussex" *Sussex Industrial History* 23 (1993).

Figs. 12 and 21 are derived from this last source.

# COCKING LIME WORKS

*Ron Martin*

## INTRODUCTION

This survey was stimulated by the article by George Cloke published in *Sussex Industrial History* 30 (2000) on the history of the Midhurst Whites Brickworks. Cocking was the source of lime which was one of the constituent materials for the manufacture of sand lime bricks.



Fig. 1 Cocking Lime Works. General view of lower site.

The site is part of the Cowdray Estate and is located beside the Chichester to Midhurst A286 road about 0.5 km (1/3 mile) south of the village of Cocking. There are two sites, lower and upper, some 500 m apart, linked by an embanked roadway. The lower site (Fig. 1) occupies an area of about 3 hectares (7 acres) at SU 877171 and comprises a battery of eight limekilns, a primary and secondary chalk crushing plant, a screening plant, a two-storey workshop, two storage sheds, an office and a small garage all contained within a small chalk pit, much overgrown.

The upper site is the pit from which most of the chalk was obtained and covers an area of about 6 hectares (15 acres) and is located at SU 882168, just to the south of Sun Coombe and with the level of the pit about 80 m above that of the lower works. The pit contains the remains of two small buildings.

For the purposes of descriptions within this article the extant battery of kilns is referred to as the South Battery and is deemed to be orientated due east - west and are numbered K1 - K8 from east to west.

I am grateful for the help I have received from Mr. R.A. Windle, the Cowdray Estate Manager, from Dudman the lessees of the site and from Mr. Leslie Knight, who worked at the site between 1940 -1942 and 1946 -1985, latterly as the works foreman. Assistance has been given on site by Peter Holtham and much advice on lime burning by Paul Sowan.

## DESCRIPTION OF SURVIVING BUILDINGS

### South Battery (Fig. 2)



Fig. 2 Cocking Lime Works.  
General view of South Battery of kilns.

The South Battery comprises eight limekilns. The six kilns K2 - K7 are draw kilns all of similar design with a continuous retaining wall 6.3 m (20'8") high along the front, which appears to have been added at a later date, as have the concrete buttresses located between each kiln. At the level of the top of the retaining wall, there is the remains of a redundant steel chequer plate walkway supported by a steel framework. Above this level the kilns have been raised with free-standing tapered shafts by a further 2.9 m (9'6") each kiln encased in tensioned steel reinforcing fabric in an attempt to control distortion.

The kiln pots are about 3 m (10'0") diameter at the top and tapering down to rectangular draw holes at the bottom 1.6 x 0.8 m (5'3" x 2'7") with an arrangement of grates supporting raking irons in the bottom of each kiln. There are draw arches at the front of each kiln with semi-circular arches over. The steel chequer plate charging platform at the upper level is supported on steel framework.

At the west end of the battery and set forward, kiln K8 is located as a free standing structure 4.5 x 5 m (14'9" x 16'5") with a pot 2.13 m (7'0" ) diameter at the top, the



same height as kilns K2-K7 and with a similar draw hole. Adjacent to this is a separate furnace chamber 0.6 x 1.75 m (2'0" x 5'9") connected to it by a flue. This kiln has also been raised as with kilns K2-7 with the charging platform over continuing around kiln K8.

At the east end is an additional kiln of similar size to kilns K2 - K7 but set back from the rest and built with concrete outer walls. The charging platform continues over this kiln.

Along the whole length of the south side of kilns at the level of the upper charging platform there is a 21" x 6" steel joist supported by steel channel A-frames extending beyond the kilns at each end and surmounted by a railway line. Under the steel joist there is a reinforced concrete retaining wall, the height of the raised pots of the kilns.

### North Battery (Fig. 3)

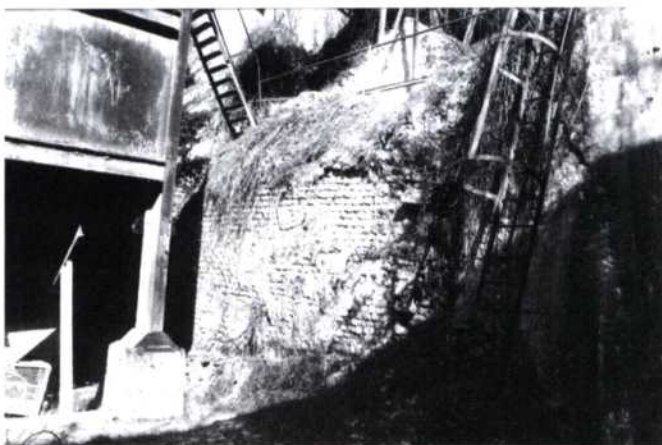


Fig. 3 Coking Lime Works. End Wall of North Battery.

The only remaining part of this structure is the east end wall of the end kiln built of fire bricks in header bond. This was originally a battery of four flare kilns, each square on plan with rounded corners about 12 feet square and 18 feet high. There was an access opening in the side of each kiln and two firing tunnels extending the depth of the kilns.<sup>1</sup>

### Primary Chalk Crusher (Fig. 4)

At the south side of the lower site at SU 8778 1711 and some 16 m above the base level of the South Battery is an electric driven primary chalk crusher with rotating teeth fed from a hopper. This discharges onto an inclined conveyor belt leading to the intermediate chalk crusher.



Fig. 4 Primary chalk crusher.

### Intermediate Chalk Crusher

The intermediate chalk crushing plant is located at SU 8778 1715 at a level of about 7 m above the base level of the South Battery and comprises a sequence of crushing machines and ball mills connected by conveyor belts all housed in a steel framed building covered with corrugated asbestos-cement sheeting. Chalk was fed into the plant either from the conveyor belt from the primary crusher or directly fed from hoppers. Other conveyor belts returned unsorted material for further working. A conveyor belt formerly transferred the crushed chalk to the north side for transport by road.

### Final Screening Plant (Fig. 5)

This is located immediately west of the intermediate chalk crusher and is connected to it by two overhead conveyor belts. It is a two-storey high steel framed building encased with corrugated asbestos-cement sheeting the upper floor housing two sets of *Niagara* screens, with at the lower level a hopper at one side discharging onto a conveyor belt for lorry loading, with a store on the other side. Adjacent to this building at the north side is another store for loose crushed chalk with access from the screening plant by way of overhead conveyor belts.



Fig. 5 Cocking Lime Works. Screening Plant

### Two-storey store (lime crushing plant)

In front of kiln K7 is a small two-storey building with concrete block walls, steel supported first floor and corrugated asbestos-cement pitched roof, adjacent to which is a large store.

### HISTORY

The earliest evidence of any limekilns in Cocking was in the 1861 Census Returns which included the entry 'James Bennett, a tramp, slept in lime kiln'.<sup>2</sup> Admittedly, there is no direct connection between this reference and the site as there were other limekilns in the parish.

On the first edition of the 25" OS map of 1874,<sup>3</sup> there are three limekilns shown. One in the upper pit at SU 8825 1677 has been destroyed by subsequent excavation. The other two kilns were in the lower pit, one at SU 8775 1715, being on the site of later kilns and is no longer extant, but the other one at SU 8776 1709, is on ground which is substantially unaltered, although positive evidence has not yet been found. All these kilns were probably small scale wood-fired flare kilns probably making hydraulic grey lime.

On the second edition of the 25" OS map of 1897<sup>4</sup> the limekilns are described as 'Old Limekiln' (sic).

However, the Cowdray Estate granted leases to various persons, including the Pepper and Sons of Amberley in 1906, which referred to two limekilns, "one in good working order".<sup>5</sup> The 1914 edition of the 6" OS map shows a tramway running from the kiln at SU 8775 1704 into the lower chalk pit. This was still shown on later 6" maps up to 1970s<sup>6</sup> and there are remains of a 2ft gauge tramway track and the chassis of a truck still on site. This kiln was still extant in the 1930s, albeit derelict.<sup>7</sup>

In 1921 a lease was granted to Frederick Searle,<sup>8</sup> later assigned to his brother Eli who went into partnership with Robert Dunning who, in 1924, promised to 'build new flare kilns on the site of old wood flare kilns'.<sup>9</sup> Dunning took over the Midhurst Brickworks in 1925, where sand lime bricks has been made since 1913 and the estate was persuaded to construct an overhead ropeway from the upper pit, to facilitate the access to chalk more suitable for the making of sand lime bricks.<sup>10</sup> These new kilns which were actually built in 1926 and are probably the lower part of the six draw kilns K2 - K7 still extant as the South Battery. Also in 1926, Benjamin Cloke became the owner of the Midhurst Brick and Lime Company.<sup>11</sup> He was the uncle of George Cloke the writer of the article in *Sussex Industrial History* 30 who became the Assistant Works Manager in 1927.

Throughout the rest of the 1920s and the 1930s there were continuous developments at the site but the precise dates and chronology of these is uncertain. The North Battery of four flare kilns was built parallel to the South Battery and spanning between these was an overhead crane which was able to transport the chalk from the "banjo" at the end of the overhead ropeway and deposit it into the kilns, to carry the coal from the coal store and to transfer the lime into the lime grinding plant which was located in the two-storey store. The steel joists still extant along the south side of the South Battery supported one of the rails on which the crane ran.<sup>12</sup> The other alteration which was made was the conversion of the draw kilns to flare kilns.<sup>13</sup> The reason for this is that it was necessary to ensure that the lime was clean for use for making bricks and the draw kilns would have coal residue mixed in with the lime.

In 1938 at the behest of the Ministry of Agriculture the production of lime for agricultural purposes was started. Later the intermediate chalk crushing plant was installed for this purpose. George Cloke patented *Calco*, a

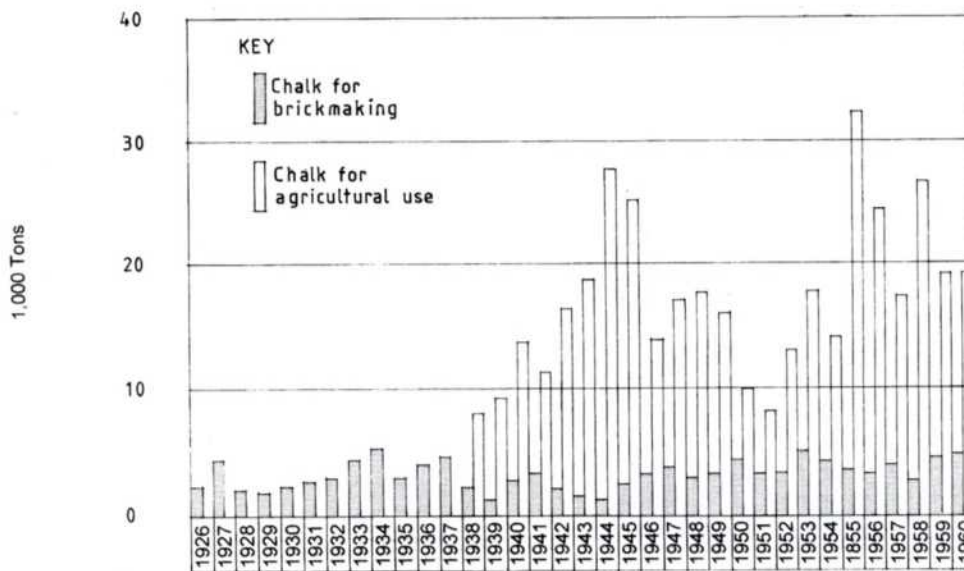


Fig. 6 Quantities of chalk excavated from Cocking Pit as recorded by royalty payments

mixture of powered chalk and lime and carried out contract work for farmers for spreading the material on the fields.<sup>14</sup> The shed in front of kiln K8 was used for this purpose.

The graph (Fig. 6) shows the quantities of chalk excavated and this was the basis of the royalty payments made to the Estate and has been obtained from their papers. No chalk was used for agricultural purposes prior to 29th Feb 1937. The quantity of chalk for brickmaking decreased sharply during the war but overall the quantity was fairly consistent, averaging out at about 3,200 tons p.a., producing some 13.7 million bricks p.a. The quantity of chalk used for agricultural purposes varied considerably from just over 8,000 tons up to 32,000 tons p.a., presumably depending on local demand. No figures are available after 1960.

Kiln K8 was erected and was used for drying chalk. It was found that the chalk obtained for the site was not suitable for grinding to a fine powder without prior drying.<sup>15</sup>

In the 1950s various other alterations were carried out. The North Battery was demolished, the kilns of the South Battery were raised and as a result, the overhead crane was no longer viable and was also removed. The front retaining wall of the South Battery was built and the kilns were converted back to draw kilns. Loading of the kilns was now carried out using a dragline excavator running along the built-up ground at the south side of the South Battery, with the chalk and coal stored in bunkers at the south side.<sup>16</sup> The kilns were unloaded using a portable conveyor belt pushed into the draw holes for loading into lorries.

Kiln K1 was erected in 1958, as recorded by an inscribed date on the structure. The use of the overhead ropeway was discontinued at about this time and chalk was transported by way of the A286 road, until in 1962, the road directly from the upper pit was constructed.<sup>18</sup> Production of sand lime bricks ceased in 1985<sup>17</sup> and in later years the only production on the site was *Calco* and powered chalk, marketed as *Nurslim*, for use on gardens and nurseries. The Primary chalk crusher was erected some time after 1985 and in 1993 the Dudman Group of Companies occupied the site. All work on the site has now ceased and demolition is expected shortly.

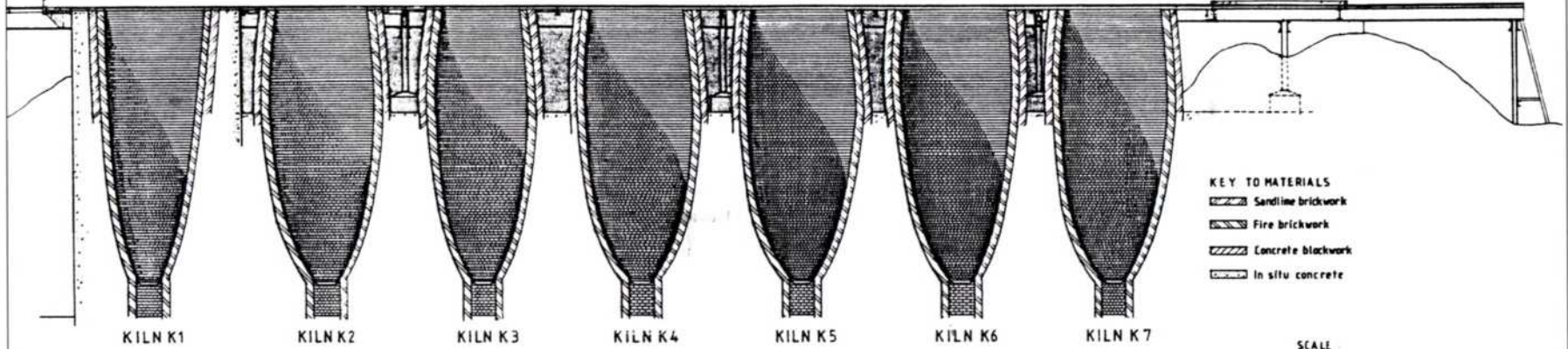
*A copy of the full Report on this project may be obtained on request to the author.*

#### REFERENCES

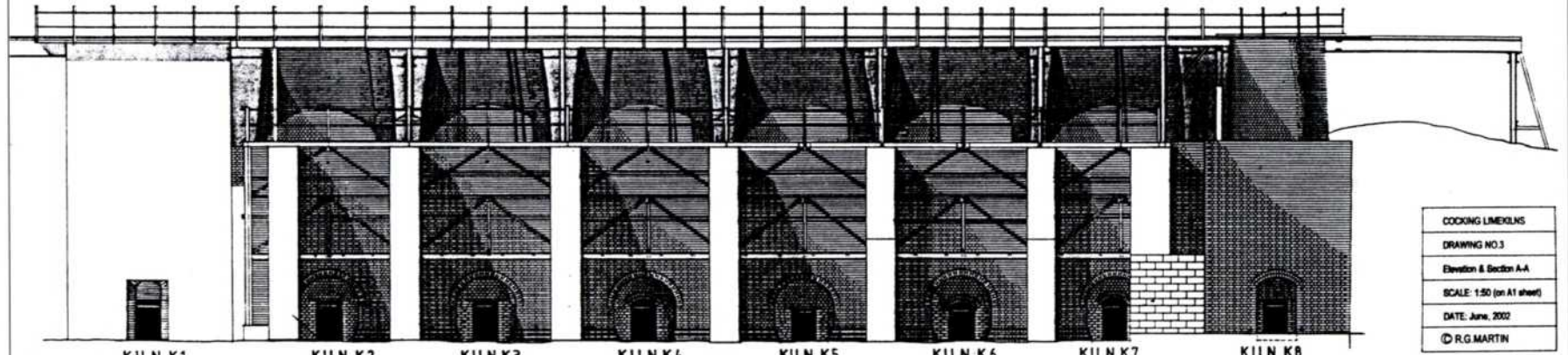
1. Leslie Knight, Pers. comm.
2. Cocking Census Returns, (1861)
3. 25" OS Map XXXIV/ 11 and 12, 1st. Edn (1874)
4. 25" OS Map XXXIV/ 11 and 12, 2nd. Edn (1897)
5. Cowdray Estate Office papers, Case 637
6. 6" OS Map 34.11 NE (1914) and SU 81 NE (1962)
7. Knight, Ibid.
8. Cowdray, Case 70/19
9. Cowdray, Case 384 1A
10. M.Beswick, *Brickmaking in Sussex*, (1993), 98
11. Cowdray, Case 637, 48A, 50A, 51A and 68A
12. Knight, Ibid.
13. G.Cloke, *Sussex Industrial History* 30, (2000),26
14. Ibid., 28
15. Knight, Ibid.
16. Knight, Ibid.
17. Knight, Ibid.
18. M.Beswick, Ibid., 211



COCKING, WEST SUSSEX *LIMEKILNS SOUTH BATTERY*

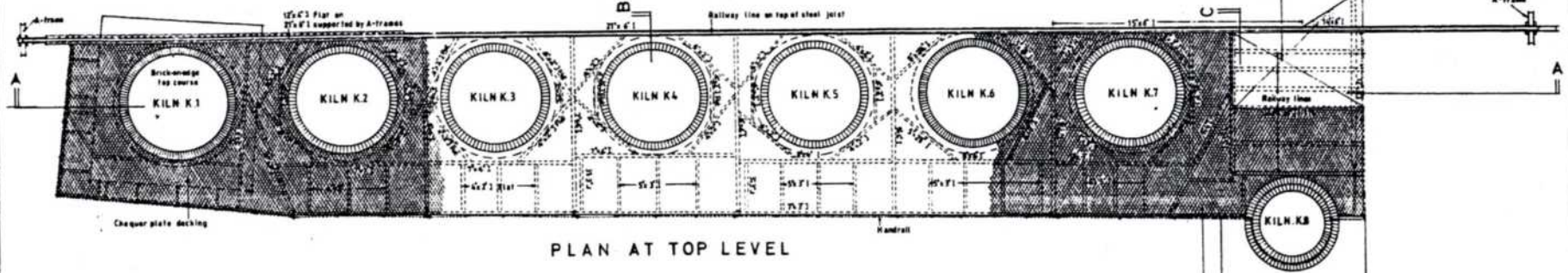


SECTION A-A

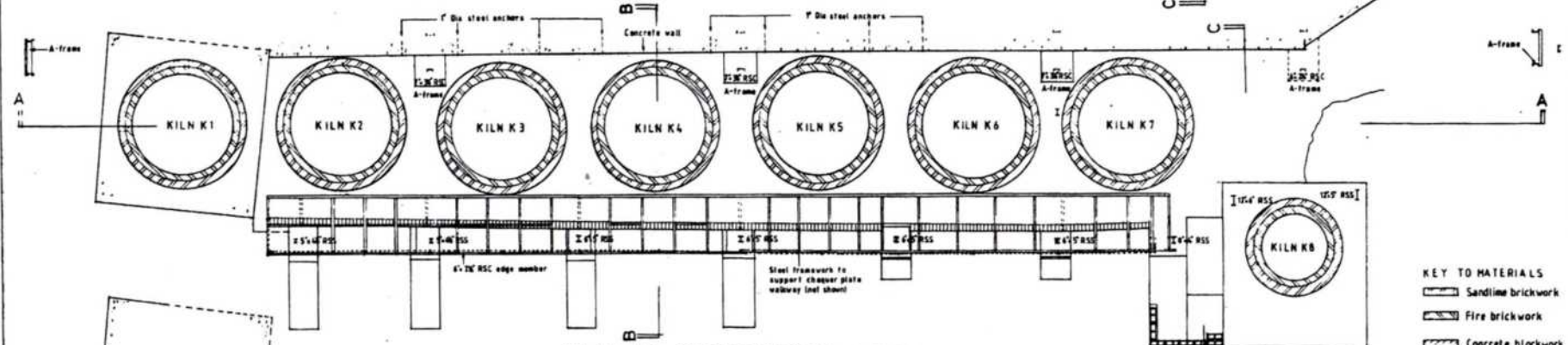


NORTH ELEVATION

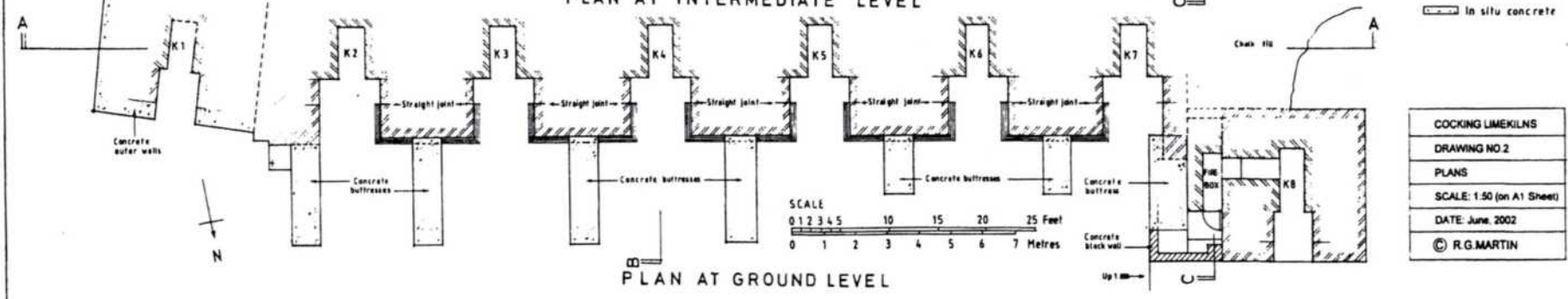
# COCKING, WEST SUSSEX LIME WORKS SOUTH BATTERY



PLAN AT TOP LEVEL



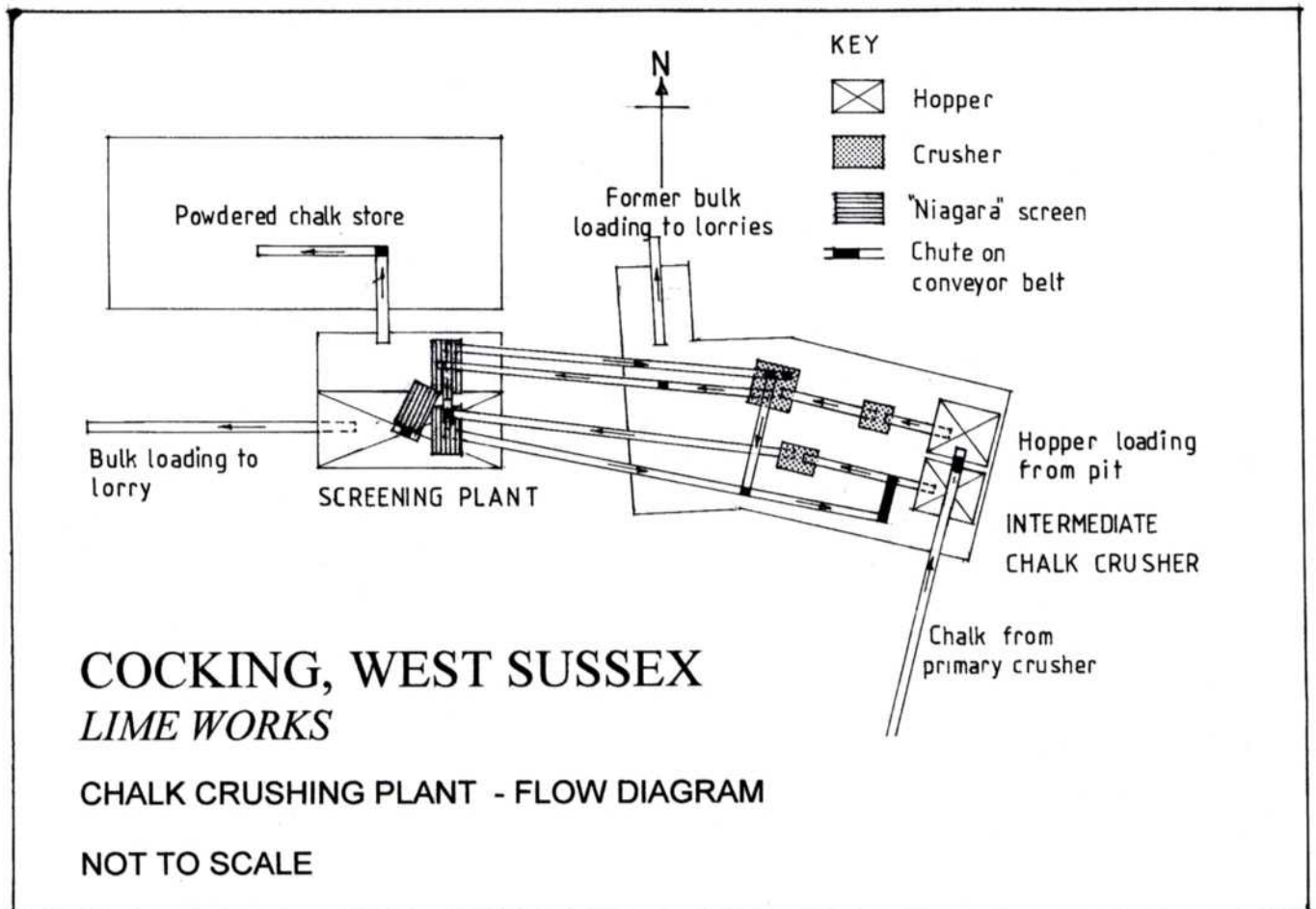
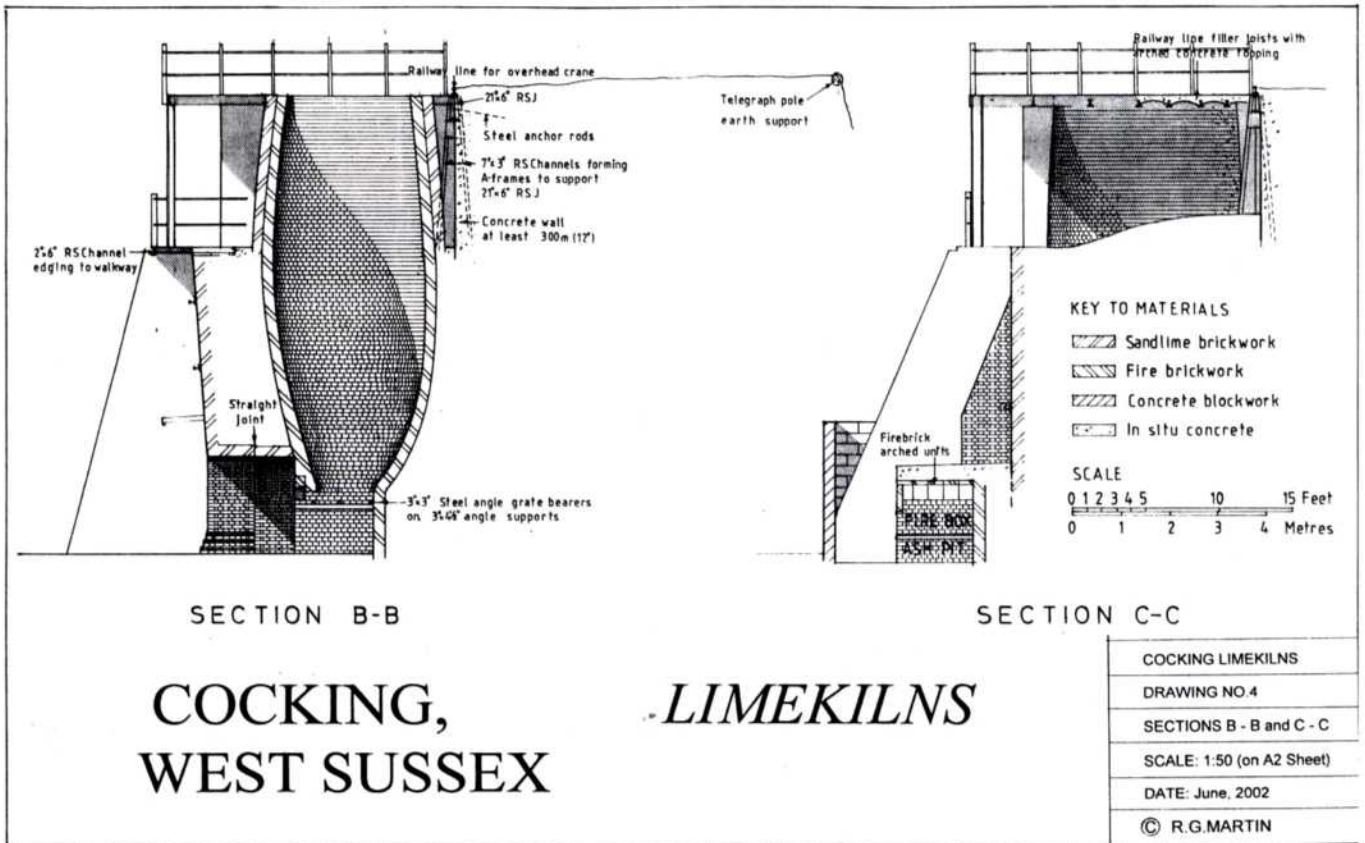
PLAN AT INTERMEDIATE LEVEL

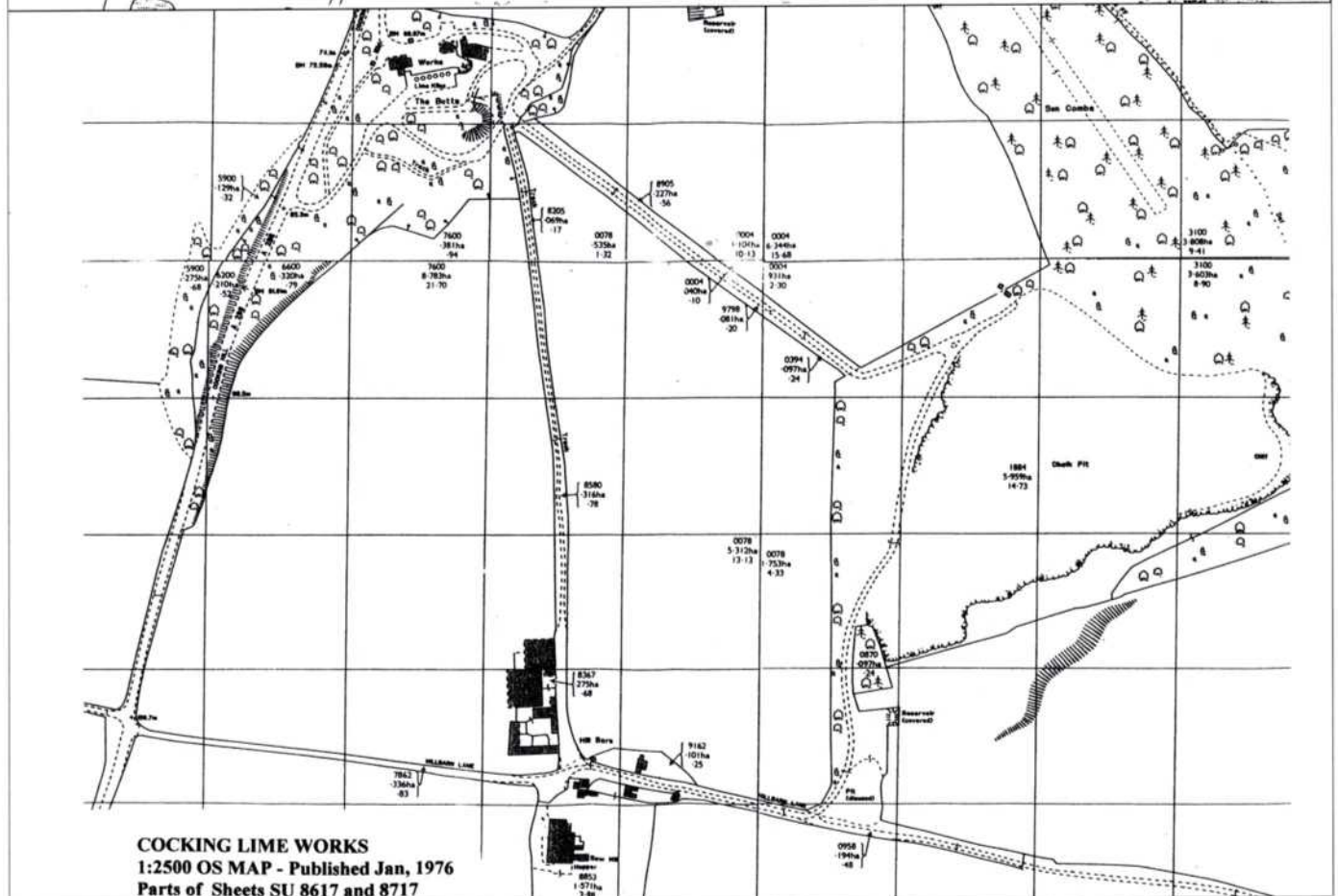
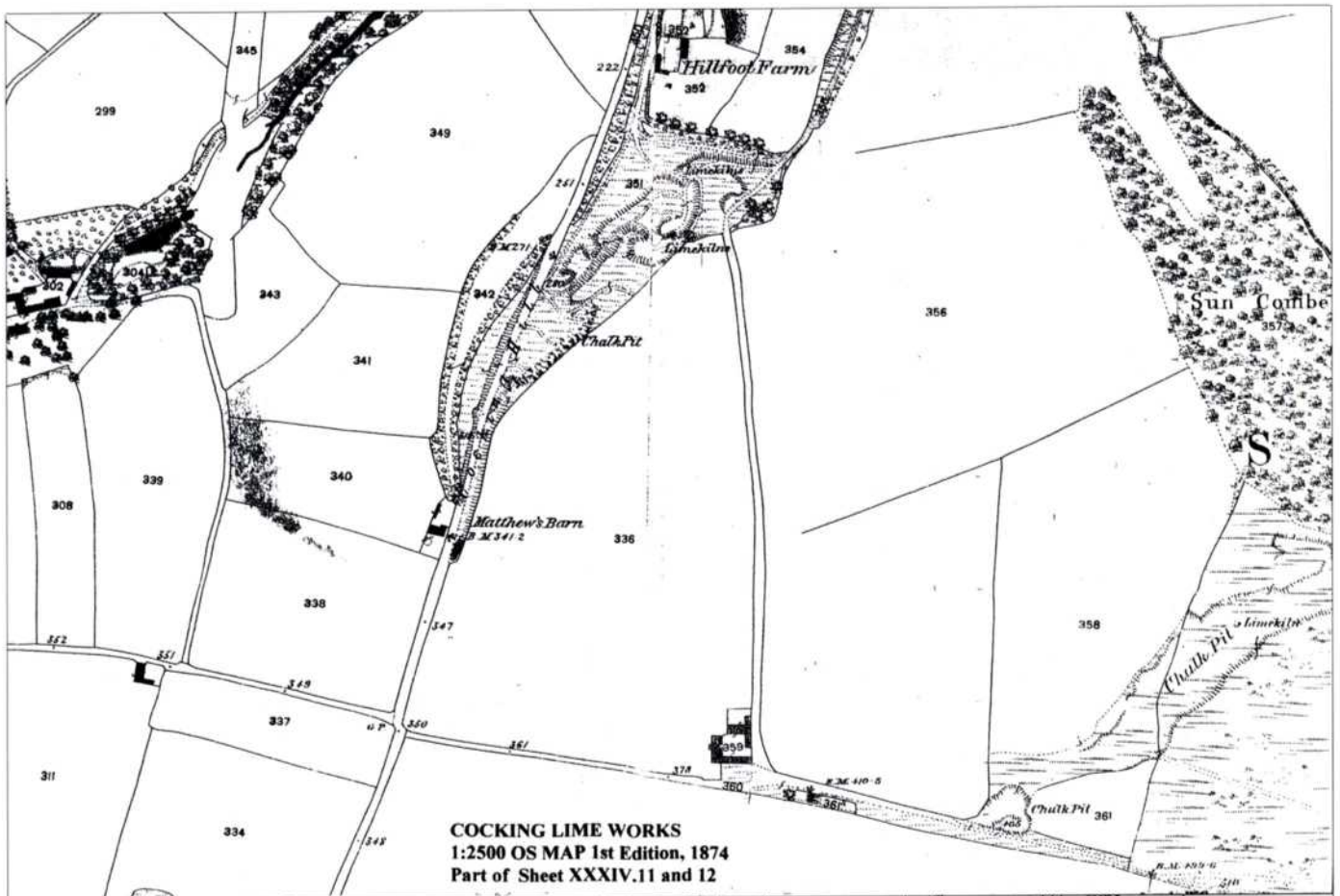


PLAN AT GROUND LEVEL

- KEY TO MATERIALS
- Sandline brickwork
  - Fire brickwork
  - Concrete blockwork
  - In situ concrete

COCKING LIMEKILNS
DRAWING NO 2
PLANS
SCALE: 1:50 (on A1 Sheet)
DATE: June, 2002
© R.G.MARTIN





Reproduced by kind permission of Ordnance Survey. © Crown Copyright NC/03/18368.



# DENDROCHRONOLOGICAL INVESTIGATION OF SAMPLES FROM NUTLEY WINDMILL, CROWBOROUGH ROAD, NUTLEY, EAST SUSSEX (NGR TQ 444 288)

*Dr. M.C. Bridge*

## **Background to dendrochronology**

The basis of dendrochronological dating is that trees of the same species, growing at the same time, in similar habitats, produce similar ring-width patterns. These patterns of varying ring-widths are unique to the period of growth. Each tree naturally has its own pattern superimposed on the basic 'signal', resulting from genetic variations; in the response to external stimuli, the changing competitive regime between trees, damage, disease, management etc.

In much of Britain the major influence on the growth of a species like oak is, however, the weather conditions experienced from season to season. By taking several contemporaneous samples from a building or other timber structure, it should be possible to crossmatch the ring-width patterns, and by averaging the values for the sequences, maximise the common signal between trees. The resulting 'site chronology' may then be compared with existing 'master' or 'reference' chronologies.

This process can be done by a trained dendrochronologist using plots of the ring-widths and comparing them visually, which also serves as a check on measuring procedures. It is essentially a statistical process, and therefore requires sufficiently long sequences for one to be confident in the results. There is no defined minimum length of a tree-ring series that can be confidently crossmatched, but as a working hypothesis most dendrochronologists use series longer than at least fifty years.

The dendrochronologist also uses objective statistical comparison techniques, these having the same constraints. The statistical comparison is based on programs by Baillie & Pilcher (1973, 1984) and uses the Student's *t* test. The values of '*t*' which give an acceptable match have been the subject of some debate; originally values above 3.5 being regarded as acceptable (given at least 100 years of overlapping rings) but now 4.0 is often taken as the base value. It is possible for a random set of numbers to give an apparently acceptable statistical match against a single reference curve – although the visual analysis of plots

of the two series usually shows the trained eye the reality of this match. When a series of ring-widths gives strong statistical matches in the same position against a number of independent chronologies the series becomes dated with an extremely high level of confidence.

One can develop long reference chronologies by crossmatching the innermost rings of modern timbers with the outermost rings of older timbers successively back in time, adding data from numerous sites. Data now exist covering many thousands of years and it is, in theory, possible to match a sequence of unknown date to this reference material.

It follows from what has been stated above that the chances of matching a single sequence are not as great as for matching a tree-ring series derived from many individuals, since the process of aggregating individual series will remove variation unique to an individual tree, and reinforce the common signal resulting from widespread influences such as the weather. However, a single sequence can often be successfully dated.

Growth characteristics vary over space and time; trees in south-eastern England generally growing comparatively quickly and with less year-to-year variation than in many other regions (Bridge, 1988). This means that even comparatively large numbers in this region often exhibit few annual rings and are less useful for dating by this technique.

When interpreting the information derived from the dating exercise, it is important to take into account such factors as the presence or absence of sapwood on the sample(s), which indicates the outer margins of the tree. Where no sapwood is present it may not be possible to determine how much wood has been removed, and one can, therefore, only give a date after which the original tree must have been felled. Where the bark is still present on the timber, the year, and even the time of year of felling, can be determined. In the case of incomplete sapwood, one can estimate the number of rings likely to have been on the timber by relating it to populations of living and historical timbers to give a statistically valid range of years within which the tree was felled (Miles 1997).

## **Sampling at Nutley Windmill**

Sampling was carried out in May 2002. An assessment was first made of the timbers of this open trestle mill to see which were oak, and which were likely to have sufficient rings. Sampling was carried out using a 16mm diameter corer attached to an electric drill. Only four samples were removed – two of these yielding very few rings. The remaining oak timbers were



Fig. 1 Photograph of rear of Nutley post mill (Peter Hill)

judged to have been from fast- grown trees unlikely to yield sufficiently long sequences for dating.

The approximate locations of the samples taken are shown in Fig. 1, and described briefly in Table 1, along with other data relating to each sample. Samples were labelled and removed for further preparation and analysis. They were mounted on wooden laths and polished with progressively finer grits down to 400 to allow the measurement of ring-widths to the nearest 0.01 mm. The samples were then measured under a binocular microscope on a purpose-built moving stage with a linear transducer, attached to a desktop computer. Measurements and subsequent analysis were carried out using DENDRO for WINDOWS, written by Ian Tyers (Tyers 1999).

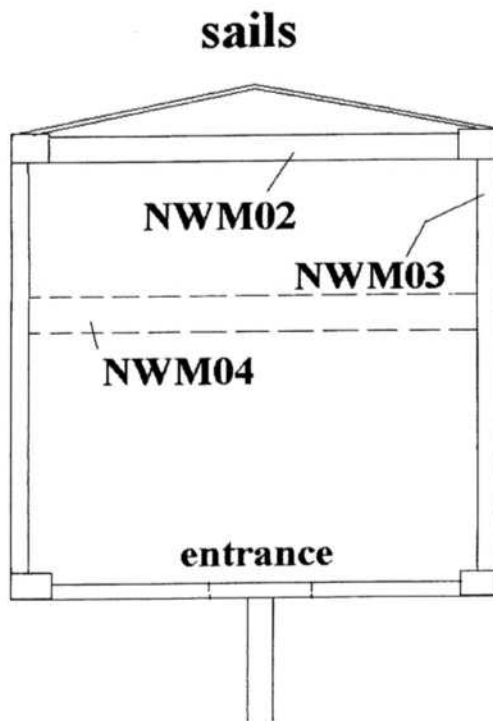


Fig. 2 Sketch of the mill with the sampled timbers

## Results

Some timbers were identified as elm (*Ulmus* species) and therefore not sampled. Of the four timbers sampled (Table I and Fig. 2) only two had sufficient rings to justify subsequent analysis. Both timbers were dated by comparison with a range of multi-site regional, and individual, site chronologies. The best results of these comparisons are given in Tables 2 and 3. Sample NWM01 was dated to the period 1410 - 1529, and NWM02 to 1669 - 1738.

Table 1: Timbers sampled from Nutley Windmill, Nutley, East Sussex.

Sample number	Origin of core	Total no of years	Average growth rate (mm yr <sup>-1</sup> )	Sapwood details	Date of sequence AD	Felling date of timber AD
NWM01	Main post	120	2.26	5	1410 - 1529	1533 - 65
NWM02	Front cross support to floor	70	2.33	9	1669 - 1738	1738 - 70
NWM03	Right-hand side bottom girt	<40	unmeasured	-	undated	unknown
NWM04	Crown tree	<40	unmeasured	-	undated	unknown

**Table 2:** Dating of the sample from the main post (NWM01)

Dated reference or site master chronology	NWM01 AD 1410 - 1529	
	t-value	Overlap (yrs)
Kent (Laxton and Litton, 1989)	7.5	120
London175 (Tyers pers comm)	5.1	120
Suffolk (Bridge unpubl)	4.6	120
Hants97 (Miles pers comm)	4.1	120
Mary Rose 'original' (Bridge and Dobbs 1996)	5.7	120
Hengrave Hall, Suffolk (Bridge 2001a)	5.1	103
Little Totham, Essex (Tyers 1996)	5.0	108
Myndet10, Herefordshire (Nayling 2001)	4.7	120
Windsor, Berkshire (Hillam & Groves 1996)	4.4	120
Walmer, Kent (Howard <i>et al</i> 1997)	4.4	114
Horsham, Sussex (Bridge unpubl)	4.2	104
Coolham, Sussex (Moir unpubl)	4.2	96
Hill Hall, Essex (Bridge 1999)	4.1	105
Martin Tower, Tower of London (Bridge 1983)	4.0	120

**Table 3:** Dating of sample NWM02

Dated reference or site master chronology	NWM02 AD 1669 - 1738	
	t-value	Overlap (yrs)
Oxon93 (Miles pers comm)	5.2	70
East Midlands (Laxton and Litton 1988)	4.9	70
Gt Doddington, Northamptonshire (Bridge unpubl)	5.4	66
Mapledurham barn, Oxfordshire (Miles pers comm)	5.3	70
Oriel College, Oxford (Miles and Haddon-Reece 1994)	4.6	70
Claydon, Buckinghamshire (Tyers 1995)	4.3	70
H.M.S. Victory (Barefoot 1978)	4.3	70
Barton on Humber, Lincolnshire (Tyers 2001)	4.3	59
Winchester, Hampshire (Barefoot 1975)	4.2	70
Chatham, Kent (Bridge 1998)	3.9	70

## Interpretation and Discussion

It is unusual for single timbers with relatively short wide-ringed sequences to date, but the two samples here give consistently strong matches against a range of reference material. The addition of the standard sapwood estimated for the region gives the most likely period of felling for each of the two trees although it should be remembered that there is a 5% chance that the actual date lies outside this range. Of particular interest is the felling date derived for the main post which firmly establishes it as of sixteenth-century origins. Clearly such large timbers capable of supporting the stresses of a rotating mill are relatively rare, and it is assumed that once employed in this role they are re-used several times as the mill is rebuilt. This phenomenon has been found before at Drinkstone in Suffolk (Bridge 2001b) where the mill superstructure was of possible late seventeenth-century origin or later, but the post was felled in the sixteenth

century. The Nutley main post is the earliest dated such post yet found.

Care must be taken in interpreting the date of the other sample from the front support to the present floor. A single timber could have been stored before use, or re-used from an earlier build of the mill, or even another construction altogether. It is tempting to suggest that the felling date range represents at least one rebuilding phase in the life of this mill. Wright and Gregory (undated) note that there is no firm evidence of a mill at Nutley before 1836, so this may represent some evidence of a longer history at the site. They also mention that some experts date the mill at between 1680 and 1730. All this is complicated by the strong possibility that the mill has been moved during its history, possibly from Goudhurst. A mill from Kilndown, Goudhurst 'disappeared' between 1710 and 1769, so the date range for the single timber (1738-70) may be associated with this move.

Sadly, none of the other timbers had sufficient rings to be dated using dendrochronology.

## Summary

Most parts of the mill were found to have been made from fast-grown material with too few rings to be suitable for dendrochronological analysis. Only four timbers were cored, and two were subsequently dated. The right-hand side bottom girt (taking the 'front' to be where the sails are attached) was made from a tree most likely felled in the period 1738-70. Clearly one timber does not date a phase, but the result is of interest. Perhaps most surprising is the dating of the main-post, from a tree most likely felled in the period 1533-65. This is the second example found of a sixteenth century main-post to a windmill, though this is earlier than the other. It appears that these sturdy timbers were kept and re-used when mills were rebuilt.

## ACKNOWLEDGEMENTS

I would like to thank Mr. Bob Bonnett of the Uckfield and District Preservation Society for arranging access to the mill and assisting at the time of sampling, along with his colleagues. The UDPS commissioned the work. The background information was derived from Wright and Gregory (undated) which was generously supplied by the Society. I would like to thank my fellow dendrochronologists for permission to use their data.

## REFERENCES

- Baillie, M. G.L. and Pilcher, J.R. (1973) "A simple cross-dating program for tree ring research." *Tree Ring Bulletin*, 33, pp.7-14.
- Barefoot, A.C. (1975) "A Winchester dendro-chronology for 1635-1972 AD – its validity and possible extension", *Journal of the Institute of Wood Science*, 7(1), pp.25-32.
- Barefoot, A.C. (1978) In: [Ed: J.M. Fletcher] "Dendrochronology in Europe", *BAR* 51, pp.157- 61.
- Bridge, M.C. (1983) *The use of tree-ring widths as a means a dating timbers from historical sites*, Unpub. PhD thesis, CNA.A.
- Bridge, M.C. (1998) "Dated buildings", *List* 86, *Vernacular Architecture*, 29, pp.105-106.
- Bridge, M.C. (1999) *Tree ring analysis of timbers from Hill Hall, Theydon Mount Essex*, *Anc Mon Lab Rep*, 55/1999
- Bridge, M.C. (2001a) *Tree ring analysis of timbers from Hengrave Hall, Hengrave, Suffolk*, Centre for Archaeology Report, 111/2001.
- Bridge, M.C. (2001b) *Tree ring analysis of timbers from the Post Mill, Drinkstone, Suffolk*, Centre for Archaeology Report, 60/2001.
- Bridge M.C. and Dobbs, C. "Tree ring studies on the Tudor warship Mary Rose." In: [Eds: Dean, J.S., Meko, D.M. & Swetnam, T.W.] *Tree Rings, Environment and Humanity*. Radiocarbon, Department of Geosciences, University of Arizona, Tucson. pp.491-496.
- English Heritage (1998) *Guidelines on producing and interpreting dendrochronological dates*, English Heritage, London.
- Hillam, J. and Groves, C. (1996) "Tree-ring research at Windsor Castle." In [Eds: Dean, J.S., Meko, D.M. & Swetnam, T.W.] *Tree Rings, Environment and Humanity*. Radiocarbon, Department of Geosciences, University of Arizona, Tucson. pp. 515-3.
- Howard, R. E., Laxton R. R. and Litton, C. D. (1997) *Tree-ring analysis of timbers from the keep of Walmer Castle, Walmer, Kent*, *Anc Mon Lab Rep* 75/97.
- Laxton, R. R. and Litton, C. D. (1988) *An East Midlands master tree-ring chronology and its use for dating vernacular buildings*, University of Nottingham, Dept of Classical and Archaeological Studies, Monograph Series, III
- Laxton, R. R. and Litton, C. D. (1989) "Construction of a Kent master chronology sequence for oak, 1158 - 1540 AD", *Medieval Archaeology*, 33, pp.90-8.
- Miles, D. (1997) "The interpretation, presentation and use of tree-ring dates", *Vernacular Architecture*, 28, pp.40-56.
- Miles, D.H. and Haddon-Reece, D. (1994) "Dated buildings List 56", *Vernacular Architecture*, 25, pp.28-36.
- Nayling, N. (2001) *Tree-ring analysis of timbers from the Mynde, Much, Dewchurch, Herefordshire*, Centre for Archaeology Report, 5/2001.
- Tyers, I. (1990) "Dated buildings, List 37", *Vernacular Architecture*, 21, pp.45-6.
- Tyers, I. (1995) *Tree-ring analysis of Claydon House, Middle Claydon, Buckinghamshire*, *Anc Mon Lab Rep*, 13/95.
- Tyers, I. (1996) *The Tree-ring analysis of five bell frames from the county of Essex*, *Anc Mon Lab Rep*, 12/96.
- Tyers, I. (1999) *Dendro for Windows Program Guide 2nd edn*, ARCUS Rep, 500.
- Tyers, I. (2001) *Tree-ring analysis of timbers from St Peter's Church, Barton on Humber, North Lincolnshire*, Centre for Archaeology Report, 51/2001.
- Wright, S. and Gregory, F. (nd) *Nutley Windmill, A Short History and Guide*, The Uckfield and District Preservation Society.

Dr. Bridge is Lecturer in Dendrochronology, Institute of Archaeology, UCL, London.

This article is published by permission of the  
Uckfield and District Preservation Society who hold the copyright.

## JAMES LONGLEY & CO. AND THE BUILDING OF CHRIST'S HOSPITAL, WEST HORSHAM 1896 - 1909.

### *Peter Longley*

Christ's Hospital was founded in London under the authority of a charter granted by King Edward VI in 1553. The institution was founded for the maintenance and education of orphan children, the funds coming from the property of religious houses confiscated by Edward's father and additional royal benefaction. It initially occupied buildings formerly belonging to the greyfriars in Newgate Street in the City of London. The Great Fire of 1666 destroyed the original buildings but these were rebuilt with additions at various dates. In 1829 a fine new gothic hall was completed and by this date the institution had grown to 1200 pupils. Apart from the London buildings, Christ's Hospital had additional schools at Ware and Hertford.<sup>1</sup> By the second half of the nineteenth century however, the London site was deemed to be congested and unhealthy and plans were put in hand to move to a country location within a reasonable distance of the capital.

Forty sites were visited by the governors to assess their suitability and of these one of 1200 acres was selected and purchased from the Aylesbury Dairy Company for £47500. The new site was on raised ground about 2½ miles south west of the town of Horsham and convenient to the Mid-Sussex line of the London Brighton and South Coast Railway. E.H. Pearce in his history of the school<sup>2</sup> was to wax lyrical about the site:

"Northwards the eye rests on the empurpled summits of the Surrey hills; southward it takes in the waving outlines of the Sussex Downs; and it is easy to tell blindfold in which direction they lie, for the wind speaks to the senses of the sea which is some eighteen miles away, and there is a never-failing invigoration in the air."

Some anxiety was expressed about the location being sited on clay which is "subject to those incidents which attend such a formation", but Pearce was convinced that "it has not injured the health of the school". The new cricket pitches and croquet lawns "are not to be despised" and when one considers how roses flourish "you realise that a clay soil has its compensations".

The architect for the project was Sir Aston Webb, then at the height of his career, and the contracts for erecting the buildings were placed with the local firm of James Longley & Co. of Crawley. Longley's entered into two contracts, the first in April 1896 for the

foundation work at a cost of £25000, their tender being the lowest. A second contract followed in 1898 to erect six boarding houses, classrooms, dining and school hall, chapel and married masters' houses. A preparatory school and an additional boarding house followed.<sup>3</sup> Charles Longley, the son of James Longley, and active in the management of the Company, recalled in his *Recollections* privately published in 1923, the involvement of the Company in the Christ's Hospital contracts.

#### REFERENCES

1. C.F. Partington (ed), *National History and Views of London* (1835) Vol.1 pp 47-50; William Trollope, *A History of the Royal Foundation of Christ's Hospital* (1834)
2. E.H. Pearce, *Annals of Christ's Hospital* (2nd edn 1908)
3. Clement A. Bryant, *An Essay on the Building of Christ's Hospital* (1902)

#### **Charles Longley writes:-**

1896 (April) – Christ's Hospital, Horsham, usually known as the Blue Coat School. We secured this contract for the foundations up to ground level, approximate cost £25,000. Our first introduction to set out the work was in April in a snow storm, however that did not damp the energy of my Manager, H.W. Tingley, and after getting half-way through with this contract the superstructure had to be tendered for and we were invited to tender with about ten London firms, we being the only firm south of London invited to tender, which, more or less, frightened some of the other firms when they paid a visit to the works and saw what we had done, so much so that one firm said we had better get on with it and wished us good luck. The Architects (Messrs. Aston Webb and Ingress Bell) and the Almoners were very reasonable in giving us a decent time for making up the estimate, which totalled to nearly half-a-million. We received the quantities by instalments from Messrs. Hunt & Steward, the Surveyors (Surveyors of the first order). Never to be forgotten by myself, Mr. Hunt, senior partner, had charge of this contract, who as a surveyor and gentleman, had very few equals, and I am always quoting him as a practical as well as a theoretical surveyor, he having been in the onset apprenticed to the bench, and set up to scale difficult work before he measured same, very few surveyors can do this at the present time.

This contract was reduced about £70,000 by cutting out stone-work and other expensive decorations, but after working here for about two years, the Almoners decided on two extra boarding houses, more kitchen

accommodation and other works amounting to about £80,000. After this they decided to build the Swimming Baths, one for junior and one for senior boys, utilising the old Aylesbury Dairy Company's cow sheds, and another for the Gymnasium. Then a set of cottages, entrance lodges and post office. The main entrance on the Southwater Road we removed from Newgate Street, London, as well as Sir Christopher Wren's work to the southern end of the School Hall, with niche in same. This work was gauged brickwork. We also removed the Portland stone centre archway to the Cloisters and cut same in halves for re-building at each end of the present quadrangle. This was a very tricky and heavy job and was done in the winter time. A few remarks with reference to the carrying out of this contract. The tower in centre of Dining Hall wing was up and finished about 130 ft. high, and then it was thought too plain. So we had instructions to fix all the stonework now seen on the top without scaffolding – a very delicate job, but fortunately we did it without any mishap. The Dining Hall, School Hall and Chapel roofs are a great feature in these buildings – constructed of Oregon pine, of large dimensions – the three roofs containing about 30,000 feet cube of timber. These roofs were all set out by Mr. John Peskett without any errors – something for him to be proud of. The whole of the oak joinery, panelling, elaborate doors to Chapel and School Hall, &c., were set out by the late Mr. John Weller, here again no errors worth speaking of. The whole of the Bath stone and Portland stone work was set out by Mr. H.W. Tingley and checked by the Clerk of Works, Mr. Proudfoot. The Bath stone was worked at the quarry at Bath, the Portland stone on the site.

The ordinary stock bricks were made at Horsham and Warnham, by hand, the red bricks at Cranleigh, the glazed bricks at Leeds, the tiles at Broseley, Staffordshire. Total quantity of bricks used was about twenty-five millions. The drainage system was a very troublesome work, being in several places 25 ft. deep, with about 8 to 10 ft. of solid hard rock at the bottom. The drainage included large septic tanks, design copied from the Manchester Corporation system, which we had to inspect to get particulars before commencing operations. With reference to this drainage, I have never heard of any complaints or trouble. One incident in connection with this drainage. We were instructed to chip all the spigot ends of the pipes to form a better key for the cement joints a very unnecessary operation. This expensive fad was introduced by a special Clerk of Works, employed to see the drains were well and truly laid.

The whole of the rooms were laid with Longley's patent wood block floors in 1½" pitch pine and some of Wainscot oak. The total area covered was about 20,956 square yards super.

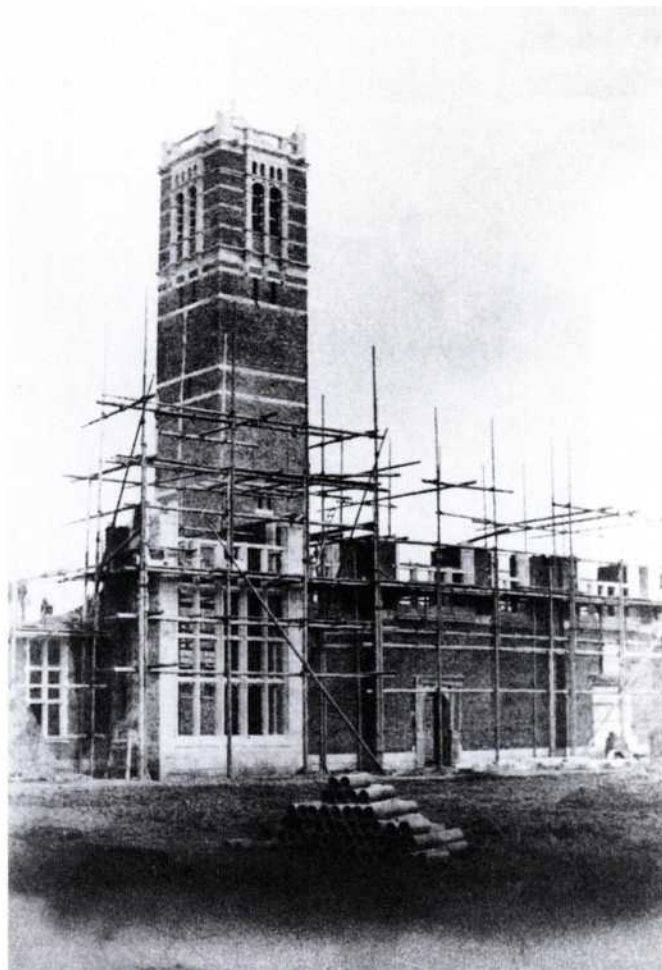


Fig. 1 The Water Tower under construction.

About three years after finishing the main contracts, we were called in again, to build seven cottages, large extension to the Head Master's house – this costing more than the original structure – four extra married Masters' houses, Cricket Pavilion, Lodge Entrances – one very elaborate, the Post Office, extension of boiler house, the Portland stone fountain in the main quadrangle, the Tuck Shop, oak wall panelling in Chapel, including carvings, Music School, Technical Schools, and for several years we had a small army of painters to re-distemper the boarding houses during the summer vacation.

The heating system of Christ's Hospital is somewhat a novelty. The main boilers being one-third of a mile away, the steam being carried through a subway, with special steam traps at intervals. In walking through this subway might remind one of a very hot place.

In connection with Christ's Hospital, we built the new Station for the L B & S C R, also the overline bridge, replacing the level crossing, connecting the road from Horsham to Slinfold. We also built the chimney shaft, 100 ft. high.



Fig. 2 Cloisters and classrooms under construction.

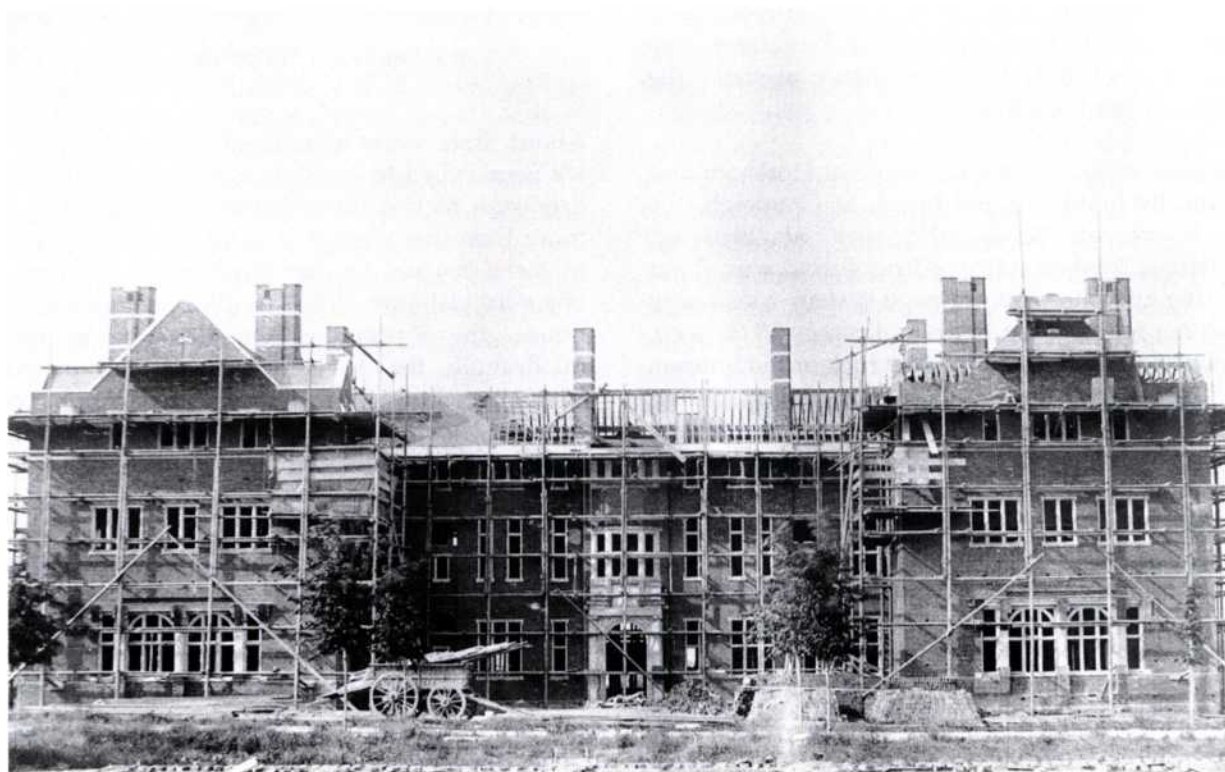


Fig. 3 One of the boarding houses, Barnes House, under construction.

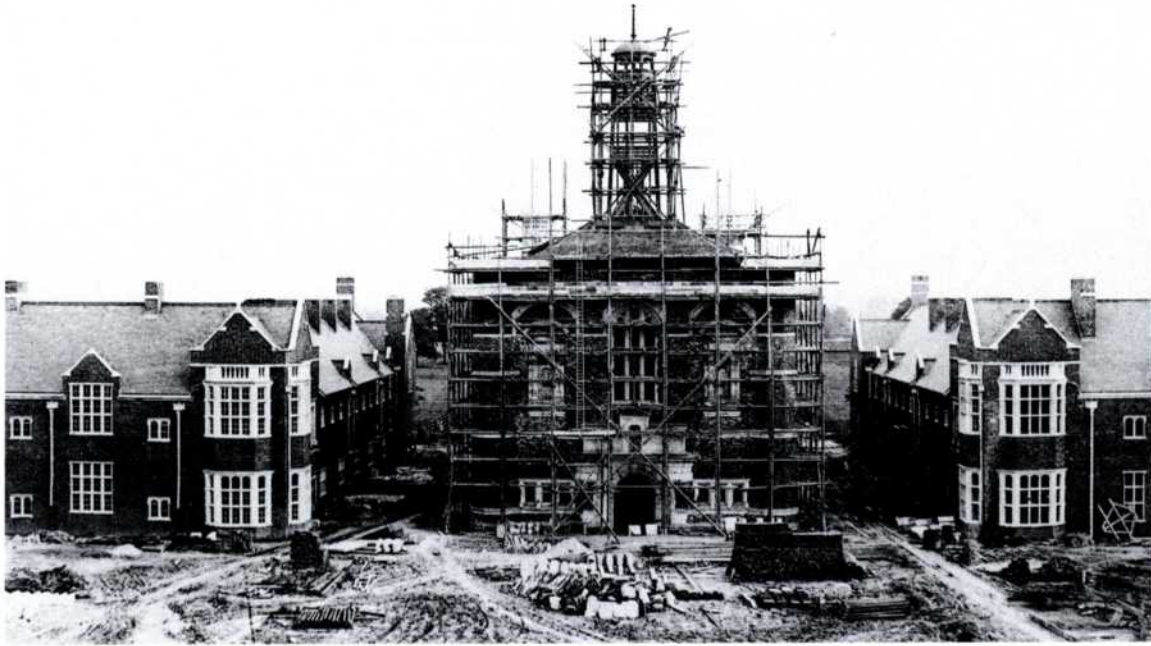


Fig. 4 North front of Big School under construction, with niches for the statues of Charles II and Sir John Moore, brought from the City of London site, on either side of the central window over the door.

In connection with Christ's Hospital, I should mention the Foundation Stone was laid by the Prince of Wales, for Queen Victoria, with full Masonic honours. The Prince and myself were Masons, but Sir Aston Webb and my father were temporarily made Masons for the occasion. The marquee erected for the ceremony held about 3,000 people, all fitted up with seats like a theatre. This was on October 2, 1897."

The school moved on 29 May 1902 but work continued until 1909. The total bill for the buildings was £546,000 excluding the station. The original estimates and accounts are in the archives of James Longley & Co. Ltd. (West Sussex Record Office). The family have the ebony and ivory mallet used by the Prince of Wales in the foundation stone ceremony. At the end of the contract, Charles Longley (or James his father) acquired two stone bluecoat boys 3 foot tall which were kept in the family home for nearly 100 years. These were given to the Christ's Hospital Museum in 1995. Research carried out in 1985 suggests that these statues were models for W.S. Frith's monument in the centre of the quadrangle. In the Longleys' rockery was a large stone boss from a vault carved with the Founder's head which probably came from the old site at Newgate with other preserved pieces that were used in the new school. This was also given to Christ's Hospital Museum. Other items from the Longley archives were lent for the Centenary Exhibition in 1997.

Christ's Hospital has an interesting ten page essay written by Clement A. Bryant, the Estate Agent, in

April 1902 on the building work. A feature mentioned both by Charles Longley and Clement Bryant is the glazed-brick subway known as the tube. Longley emphasises its function as a conduit for services while Bryant states that its main purpose is "for the servants to pass from one building to another without coming in contact with the boys".

In a commentary written in 1985, Sir Norman Longley then Managing Director recalled that "a special 'framing shop' was erected at Crawley to prepare the enormous Oregon pine roof timbers. The span in the Dining Hall was 56 feet and the rafters 33 feet long. It was said that **eleven** joiners would be working at the same time on **one** of these beams". This had a sequel in 1932 when doubts were expressed about the desirability of encouraging the Canadians to export pine for use in our damp climate. Norman Longley took a delegation into the roof and demonstrated the perfect condition thanks to the air space left round every timber where it rested on the brickwork.

The construction of the West Sussex Asylum (Graylingwell, Chichester), Christ's Hospital and King Edward VII Sanatorium (Midhurst) in the period 1895 - 1909 was an heroic achievement which would be difficult to match when you consider the resources available then and now.

#### ACKNOWLEDGEMENT

The photographs in this article are reproduced by permission of the Governors of Christ's Hospital.



## PUBLICATIONS

Previous numbers of *Sussex Industrial History* still available:-

- No. 2 (1971)            Dolphin Motors of Shoreham; Lime Kilns in Central Sussex.  
No. 3 (1971/2)        Lewes Population 1660-1800; Kingston Malthouse.  
No. 5 (1972/3)        East Sussex Milestones; West Brighton Estate;  
                                 A Bridge for Littlehampton 1821-2.  
No. 17 (1986/7)      The Bognor Gas, Light & Coke Company Ltd.; Mineral Transport  
                                 by the Telfer System (Glynde Aerial Railway);  
                                 Bricks for the Martello Towers in Sussex; Jesse Pumphery, Millwright  
No. 19 (1989)        Leather Industry; Bignor Park Pump; Lowfield Heath Mill;  
                                 B.M.R. Gearless Car; Wadhurst Forge.  
No. 20 (1990)        William Cooper, Millwright; Foredown Isolation Hospital;  
                                 The Ford Trimotor and Ford Aerodrome.  
No. 21 (1991)        Quick's Garage, Handcross; Punnett's Town Wind Saw Mills;  
                                 Hollingbury Industrial Estate.  
No. 22 (1992)        Swiss Gardens, Shoreham; Brighton Brewers; Mill Bibliography;  
                                 Beddingham Kiln.  
No. 23 (1993)        Sussex Limeworks; Mills of Forest Row; Machine Tool Manufacture;  
                                 Brook House Estate; Mill Authors.  
No. 24 (1994)        Pullinger's Mouse Trap Manufactory; Ice Houses; Forest Row Mills;  
                                 Lewes Old Bank; Lumley Mill; Estate Industry at the Hyde;  
                                 Slindon Bread Ovens.  
No. 25 (1995)        Ricardo at Shoreham; Windmill Hill Mill; Portslade Brewery;  
                                 Brighton General Hospital; Bognor Bus Station; Kidbrooke House  
                                 Farm; Contents *Sussex Industrial History*.  
No. 26 (1996)        Eastbourne Buses; Sussex Lidos; The Sea House Hotel; Bishopstone Tide  
                                 Mill; Mountfield Gypsum; Uckfield Workhouse; Brighton Oven;  
                                 Medieval Water Mills.  
No. 27 (1997)        Sheffield Park Garden; Brighton Tunbridge Ware Industry; Railway  
                                 Cutting Excavation; Eastbourne Mills; Tunnels of South Heighton;  
                                 Sussex Lime Kilns.  
No. 28 (1998)        Frank Gregory; Brighton Railway Station; Construction of H.M.S.  
                                 Forward; Bevendean Isolation Hospital, Brighton; Tank Roads on the  
                                 Downs; Hastings Early Power Supply.  
No. 29 (1999)        Sussex Windmills and their Restoration.  
No. 30 (2000)        Balcombe Tunnel; Ditchling Common Workshops; Midhurst Whites;  
                                 Keymer Brick & Tile.  
No. 31 (2001)        Chimney Cows; Longley's Wood Block Flooring; Private Press  
                                 Movement; Hunston Bridge; King's Standing Transmitter.  
No. 32 (2002)        Henry Turner, Brickmaker; Crawley Water Company; Tamplins, Brewers;  
                                 Ifield Steam Mill; Burgess Hill Pug Mill.

Issues 2, 3 and 5 £1 each, issue 17 £1.50, issues 19, 20, 21 and 22 £2.25 each, issues 23 and 24 £2.50 each, issues 25 and 26 £2.75 each, issues 27 and 28 £2.95 each, issues 29, 30 and 32 £3.95, post, issue 31 £4.25. Post and packing extra, 65p for one copy plus 40p for each subsequent copy. For a list of the articles in volumes no longer available for sale see *Sussex Industrial History* 25 (1995). The Honorary Secretary is prepared to quote for photocopying articles in these issues.

Also available:-

M. Beswick, *Brickmaking in Sussex* (revised edn 2001) £12.95 post free

F. Gregory, *A Sussex Water Mill Sketchbook* £6.95 post free

H.T. Dawes, *The Windmills and Millers of Brighton* (2nd edn.) £4.95 (£5.50 incl. post and packing)

Orders with remittance to:-

R.G. Martin, 42 Falmer Avenue, Saltdean, Brighton BN2 8FG.

