



**Heinz Klemp hand topping sugar beet at Broom's Barn.**

town, Bury St Edmunds, and was not cluttered with existing buildings. The derelict steadings were ready for demolition; the wood framed, cladded barn could stand for some years. (It had been used early in the nineteen hundreds as an isolation hospital during a smallpox outbreak in the neighbouring village of Barrow).

It was decided to buy in 1959. The asking price was £120 per acre. However, as the money was to come from the ministry-held research fund (although subscribed by the industry and growers) the district valuers assessment had to be taken into consideration. This was about £50 per acre – was this to be the end of the Broom's Barn project? The SBREC persuaded the Minister of Agriculture, Christopher Soames (later Sir Christopher and then Lord Soames) to appoint an arbitrator. He assessed the fair price as £110 per acre, the vendor accepted and the purchase went ahead. The SBREC raised the money for purchase and building by a temporary large increase in the levy on beet deliveries. The grant for purchase and building was made to the Lawes Agricultural Trust, who became the owners.

## BUILDING BROOM'S BARN 1962

The Rothamsted architects, Cowper Poole and Partners, were commissioned to prepare plans. They visited us at Dunholme to

study the work pattern and facilities, and the layout of the Broom's Barn buildings basically followed the pattern we had developed at Dunholme. The plans also included houses for some staff members and a residence for the head of station. The plan for the latter incorporated several of the Georgian features of the Little House, but the proposed scheme of clerestory windows, giving bedrooms 15 feet high on one side and seven feet high on the other, as in the farm cottages, was, on protest, abandoned in favour of a conventional roofline and level ceilings. The absence of an eaves overhang, which gives the house a rather bleak and naked appearance, was an economy measure, later regretted.

The SBREC appointed a working party which vetted the plans, discussed siting of the buildings and the general layout. The first draft plans for the laboratories included another building parallel to the present laboratories on the north side. This was abandoned as being superfluous to current needs, but provision was made for services to supply it should it be needed later. So far it has not been needed but considerable alterations and additions have been made to existing buildings which have, as requested, proved very flexible. Also, plans for a hard tennis court were deleted. Later, however, the Irish Sugar Company paid for this in appreciation of our advice in controlling an outbreak of virus yellows which affected their sugar beet crop in 1960.

The architect's brief was to make the buildings flexible, so that they could be adapted readily to changing needs. The tare-house was to be a two level arrangement, to ensure a downward flow of beet from the storage platform through the machinery. The meeting hall should accommodate an audience of about 200 and should be airy and not a long low room. In the event, the room is certainly airy but has heating problems!

Tilbury Construction Company was awarded the contract for laying the roads and services and erecting the farm buildings. They started work in August 1960 but progress was continually delayed by rain and mud. There were no public services available so the site had to be self-sufficient for water and sewage. A 10 inch borehole, lined for 127 feet was sunk 282 feet into the chalk and yielded water at 120-130 feet. The yield of water proved inadequate for irrigation so on the recommendation of the Geological Survey it was deepened to 390 feet. Pumping at 11,500 gallons/hour for 12 hour periods on three consecutive days in July dropped the water level from 117 to 174 feet, where it remained constant, and the yield was enough to irrigate two acres at a time.

The farm road was extended from its originally planned terminal point at the top (south end) of the farm to return to the main road, giving excellent paved access to most of the farm. A grass road was laid northwards from the farm buildings to the railway to service the north end of the farm. The original wind-break traversing the farm east to west was retained and later strengthened by further tree planting. The services contract was completed in June 1961 when Kerridge and Company immediately started work on the laboratories and houses, due for completion in 1962.

When we took over the farm in the summer of 1959, the very poor crops of barley and sugar beet were infested with weeds. The crops were harvested by contractor, the land was ploughed and resown with barley, oats and clover and sugar beet under the supervision of Mr E. J. Cousins, the agriculturalist at Bury St Edmunds sugar factory. The British Sugar Corporation staff helped with sowing and mechanically thinning the sugar beet. Broad-leaved weeds were controlled in cereals using chemical herbicides but all crops were infested with wild oats which grew densely in places. About 35 acres were infested with couch-grass and were treated with dalapon in the autumn. In the spring of 1961 C. J. Hingston was appointed farm bailiff. He was equipped with appropriate machinery and set about getting the land into a clean, fertile state suitable for field experiments. This involved sub-soiling, stone collecting and controlling weeds. Some of the large, erratic boulders which were ploughed up, weighing as much as five hundredweights, were later incorporated in the plinth outside the main hall, and in rockeries in the nearby gardens. The ice age had certainly left a miscellany of sandstone, granite, etc., here, and early man left occasional flint knives, arrow heads, pot boilers and pottery. Later, aerial

photos revealed the line of Shakers Way, the boundary ditch of a coppice in the area of the farm buildings and gravel or marl pits which had been filled in by the contractors with soil excavated from the tarehouse yard area and building foundations.

Before the 1960 crops were sown, the Ministry of Agriculture survey section kindly surveyed the farm and fixed the sites for sockets to mark grid lines which divide the land into five-chain squares. Surface soil samples from each one-chain square, and sub-soil samples from each five-chain square were stored for reference purposes. The survey supplied large-scale maps of the farm which later proved invaluable.

The land was divided into ten fields of 10-23 acres, appropriately named, and mostly rectangular, on which a five-course rotation was established by 1962. Bullocks were bought in to fatten in the stock yard, largely on produce grown on the farm. The management system for the farm was established for the next 15 years to provide suitable sites for both long-term and annual experiments.

The building operations produced an unbelievable quagmire in any areas not under concrete, in weather that seemed continually wet and unfavourable. But persistence prevailed and by the end of 1961 we began to occupy some of the buildings. Dunholme laboratory was closed on May 19 1962. By the end



**Dr. Keith Jaggard emptying a sample of beet into the station's tarehouse washer.**



of July the new buildings were ready for the official opening. After 27 years, here was a dream come true! The Rt. Hon. Christopher Soames, CBE, MP, Minister of Agriculture, opened Broom's Barn Experimental Station on July 27 1962 in the company of over 200 guests of the Lawes Agricultural Trust Committee and the SBREC. Sadly, some of those from the early days with this vision in mind, who had encouraged the work at Hackthorn, were no longer with us – Colonel Balfour, first Chairman of the SBREC, Sir Alfred Wood, author of the Red Book on which the Act establishing the industry and the SBREC was based, E. M. Howard, W. Swannack and J. McCloy who supported the early work in Lincolnshire so enthusiastically, S. O. Ratcliffe, the Farmers' Union representative on the committee in the early days. However, happily among those present were Sir Edmund Bacon, Sir Peter Greenwell, successively Chairman of the SBREC, John Pheysey National Farmers' Union representative, G. F. N. Battle, Managing Director of British Sugar and his deputies O. S. Rose and R. Taylor, and F. C. Bawden, Director of Rothamsted. Without their continued support for this project through many ups and downs over many years it would never have come to fruition.

A move of this sort generates numerous problems. Some members of the Dunholme staff did not wish to move and were left behind. Others had to find new homes in Suffolk, leave behind family connections and disturb the education of their children. Some delighted in the move, to others it was a punishing experience.

Some of the problems are well illustrated by personal experience. In anticipation of a move during 1961 we had a farewell Christmas party in the old barn (village hall) behind The Little House with about 100 of the friends gathered over 26 years through our family of four children. Building progressed more slowly than anticipated but the house built for the Head of Station was promised for the beginning of December 1961, when our lease of The Little House terminated and a new tenant had arranged to take over. When I went to the new site about two weeks before the arranged removal date, there was a skeleton, without windows, unplastered, surrounded by a quagmire of mud up to two feet deep!

The architect and contractors had to pull out all stops. Two weeks later, the house was ready for occupation, a paved approach to the front door had been laid and services connected. In mid-December the furniture was moved, the new curtains hung and all made reasonably comfortable inside. In great contrast from a drafty Lincolnshire Georgian house, the central heating gave a pleasant atmosphere inside, but oh the bleak surroundings! No shelter, no garden, no shrubs, no trees and how the wind blew! We had sown grass on the site but in the immediate vicinity of the house the builders had produced a quagmire. In January snow accumulated in six feet drifts around the house. Hares devoured the few trees and shrubs we had planted the previous autumn. No friends, no neighbours – the family wondered what on earth they had come to. Soon there were more problems. The persistent condensation and damp atmosphere in the house was explained by the builders as 'the structure drying out'. In fact, it proved to be due to a fault in the central heating plumbing. After much deliberation it was decided that the hardwood strip floor in the drawing, dining room and hall and the tile floor in the kitchen had to be lifted and renewed. The decision was reached gradually as work proceeded, so the family furniture and furnishings were moved from the ground floor and came to rest in the bedrooms and in storage in the labs.

After two months or so we were back to normal and at last friends could come to stay. In the middle of one particular night around this time an unusual noise proved to be water running from the tank overflow in the false roof on to the terrace below our bedroom. The obvious explanation was a stuck ball valve which could wait till morning for attention and avoid disturbing the household in the middle of the night. On opening the bedroom door at 6.30 a.m. there was a scene of devastation. Much of the ceiling had fallen on the landing, water was dripping down the staircase and the hall floor was awash. The overflow pipe had not been plumbed but put loosely in a hole in the side of the tank!

Subsequent problems were minor. The next winter was also

severe. Snow drifted off the surrounding fields against the wire we had put around the garden and the hares walked over it to devour the fresh shrub and tree plantings. After two years of tribulations we established a comfortable and enjoyable home and a garden that gave pleasure and eventually shelter. I was left with the thought that my career might well have taken me into the Colonial Service thirty years previously but I doubt whether the colonies would have produced the problems we experienced with this new house in the Suffolk countryside!

## POSTSCRIPT 1991

So Broom's Barn was established. The pioneers from Dunholme settled into continuing their work – what has happened since?

Although the new buildings were of a mellow brick with pantile roofs and were designed to fit into the landscape contours, they met local criticism as they appeared very bleak in the rural Suffolk countryside. So we embarked on an extensive programme of shrub and tree planting which began to have a mellowing effect within five years and in ten produced a congenial environment. We planted several giant redwoods, grown from seed collected on snow under the famous Wawona tree (now blown down) at the south end of the Yosemite National Park in California.

The original staff of ten was gradually augmented to about fifty, as fresh projects were taken on, for instance, seed production and nematology. The staff was organised in sections, based on scientific disciplines, as at Rothamsted. Eventually PhD students from the Universities of Nottingham, Reading, Cambridge and East Anglia came to us during the growing season to work on the field aspects of their projects, supervised by the heads of sections. We established long term and crop rotation experiments on the farm. With irrigation facilities we were able to investigate water relations of the crop. Much of our annual contract of 40 acres of sugar beet was filled with annual experiments and the plot yields were efficiently determined and analysed in the tarehouse.

Most years we held an open day when representatives from other research organisations and the sugar corporation's field staff from all factory areas came with interested growers to see the work in progress in the field and laboratories. During the winter months we held meetings, attended by a similar audience, at which recent results and thoughts on subjects of interest to sugar beet growers were expounded by members of staff and other experts. As the years passed, visits from European and American research workers increased and some came to work with us for extended periods. Thus from such activities and from our publications, Broom's Barn was put 'on the map' and acquired a national and international reputation.

The SBREC continued to finance other projects than those at Broom's Barn. Varieties were tested at the National Institute of Agricultural Botany, agronomic experiments and weed control at Norfolk Agricultural Station, breeding at the Plant Breeding Institute, physiology at Rothamsted and at Nottingham University School of Agriculture, mechanisation at the Institute of Agricultural Engineering, Silsoe, and some other projects. An organisation as large as the British Sugar Corporation also had its own laboratories; central laboratory, Peterborough for quality control and determining plot yields from field experiments in the factory areas; the research laboratory in Nottingham, later moved to a site near Norwich adjacent to the Food Research Institute and University of East Anglia, for technological research; Holmewood Hall, near Peterborough for developing the mechanisation of beet culture. There was regular contact and co-operation between the staff of Broom's Barn and these organisations.

After 16 years, in 1977, Dr. Keith Scott was appointed head of Broom's Barn and he instituted changes in the organisation of the work. The outstanding problems of importance were defined and project groups established from the existing staff to tackle them on an interdisciplinary basis. At this time the major projects for future research were identified as plant establishment, the influence of growth factors, leading to yield forecasting (of great importance to the factories for planning their cam-

paign and supplies) and the never ending and recurrent problems of pest and disease control. During this period the SBREC concentrated more on its projects at Broom's Barn and consequently the station's annual budget increased rapidly.

In 1987, Dr. Scott returned to the University of Nottingham, whence he had come to Broom's Barn, as professor of agriculture and he was replaced by Dr. Tudor Thomas. This was at a time of great change in agricultural politics and agricultural research organisation. Broom's Barn was designated a component part of the AFRC Institute of Arable Crops Research, together with Rothamsted Experimental Station and Long Ashton Research Station, but still financed solely by the SBREC. The objective of producing more, that had been our aim for six decades, no longer applied. The contribution of past research and the objectives of future work have been discussed

by Dr. Thomas [Ref. 7]. This account not only signals greater efficiency in producing sugar but the possibility of using the sugar beet, which is such an efficient medium for trapping solar energy in temperate climates, as a feedstock for other industrial and chemical needs. That there is, and will be, justification for continued research within the changing needs and circumstances of sugar beet culture in British agriculture is without doubt and Broom's Barn is well equipped to fulfil it.

The original idea formulated in the 1930s for the producers of the industry's raw material and the processors contributing financially to support research to improve the efficiency of an embryonic industry without resource to taxpayers' funds, has undoubtedly achieved its objective and may well continue to do so and be the template for the organisation of similar research.



Dr. and Mrs. Hull on the occasion of his retirement from Broom's Barn in 1977.



## SUGAR BEET 1930

LOCALIZATION OF BEET SUGAR FACTORIES, SUGAR BEET ACREAGE,  
DIVISION OF COUNTRY FOR RESEARCH & EDUCATIONAL PURPOSES,  
AND RELATION OF FACTORY GROWING AREAS TO OUTSIDE AREAS.

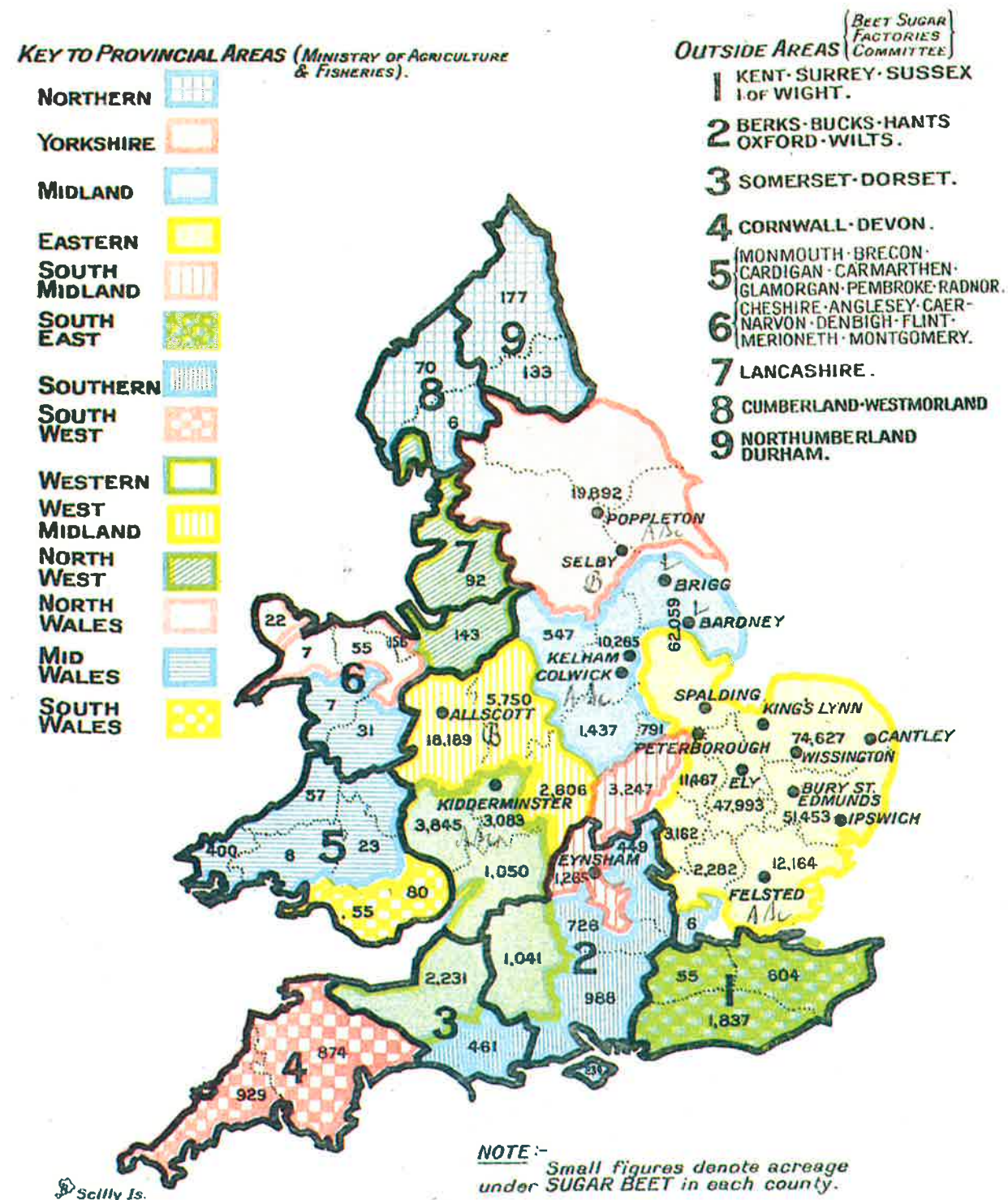


FIG. 1.

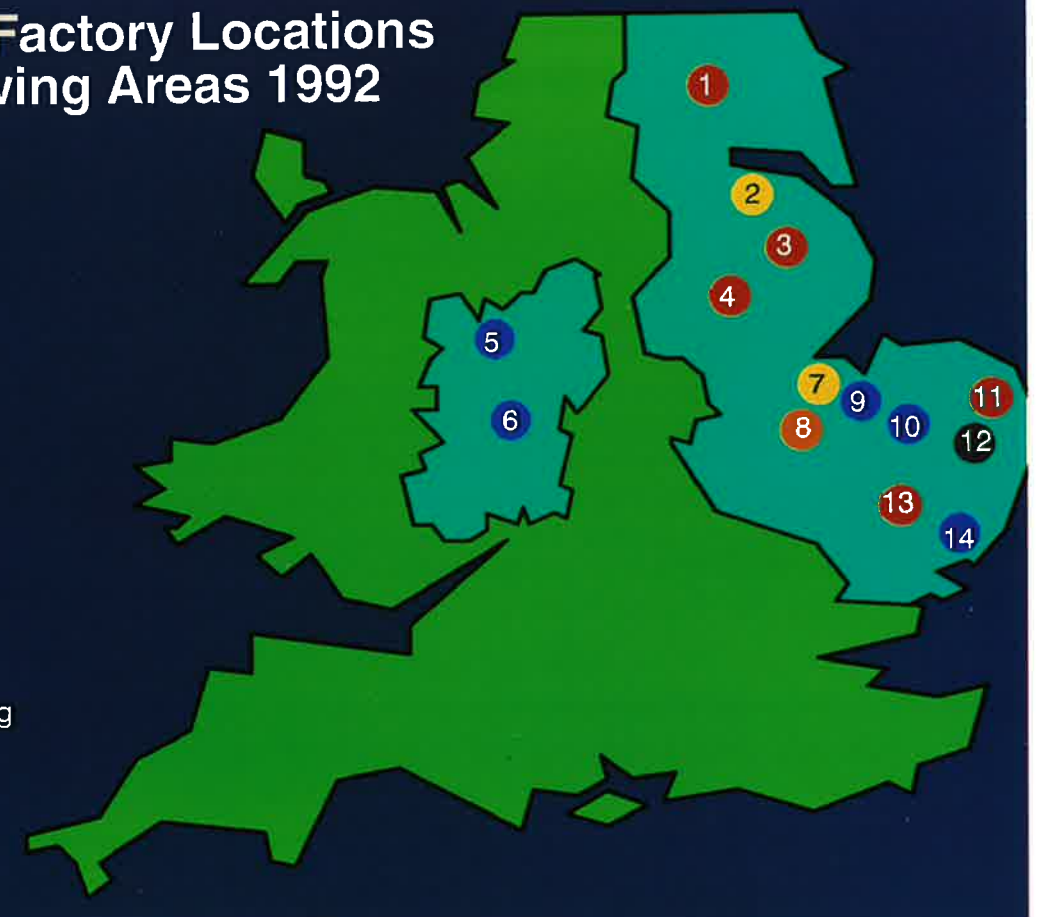
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Malby & Sons, Lith.

## British Sugar Factory Locations and Beet Growing Areas 1992

1. York
2. Brigg
3. Bardney
4. Newark
5. Allscott
6. Kidderminster
7. Spalding
8. Peterborough
9. King's Lynn
10. Wissington
11. Cantley
12. Norwich
13. Bury St. Edmunds
14. Ipswich

- [Blue circle] = Factories
- [Red circle] = Factory & Packaging
- [Yellow circle] = Packaging
- [Orange circle] = Head Office
- [Green circle] = Technical Centre



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