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The Manor of Rothamsted

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I

HISTORY OF THE MANOR OF ROTHAMSTED

INTRODUCTION

The Saxon name 'Rothamsted', of which the present form appeared as early as 1248 although it did not prevail until considerably later, has been variously interpreted. 'The rooky homestead', suggested by the earliest known form 'Rochamstede' (1210–12) and 'Rokemstude' (in the early thirteenth century *Gesta Abbatum Monasterii S. Albani*), is the interpretation favoured by the English Place-Name Society.

However this may be, the region was certainly inhabited in pre-Roman times by the Belgic group of Celts, who had important settlements at Wheathampstead and St Albans; evidence of their occupancy, in the form of calcined flints and fragments of pottery, has been revealed by excavation. The Romans came here too, and left a more considerable monument to their presence—a small shrine (or tomb), in Little Knott field. The remains of this shrine, enclosed in a square flint wall and containing fragments of a draped figure in limestone, have been assigned to the early second century; burials comprising an urn, a 'screw-neck' flagon, a Samian dish and a cup of rough-cast Castor ware, were laid bare within the enclosure in 1937. At least two of the agricultural practices of these early inhabitants have survived; they grew corn, and they dressed the land with chalk, hauled up through shafts sunk in the clay, as described by Pliny in his *Natural History* (17, 8). The Rothamsted fields still contain hollows formed by the collapse of chalk-pits, dug out at various times during the past two thousand years.

Within about one hundred years after the departure of the Romans in the fifth century, the Saxons arrived. Although we have no buildings from their hands, they left us our name. In their time Rothamsted was a small farm (as a large farm it would have been mentioned in Domesday Book): it has never been a village, and there is no evidence of strip cultivation, although the arable commons of Harpenden were laid out

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in strips. However, in less than one-hundred and fifty years after the Norman conquest it had risen to the status of a manor, for it is as such that it is described in 1212, the year of its earliest mention, when Richard de Merston held a knight's fee here of Baldwin Wake.

THE MANOR HOUSE

Much of the house we see today is due to Sir John Wittewronge, the first baronet. Throughout his occupancy he made such considerable alterations and additions that the features of earlier building are largely obscured. Certainly there is nothing to be seen now which can be ascribed to the days of Richard de Merston.

The Tudor House

In 1623, when he was five, Sir John Wittewronge's recently widowed mother, Anne, bought the house for him from Edward Bardolph. His father Jacob had in 1611 obtained a mortgage on the property by providing a loan to support the declining Bardolph fortunes.

The appearance of the house and estate at the time of purchase may be deduced from a particular of the Manor compiled in 1623 for purposes of the sale, from a sketch dated 1624 (adjoining page) and from the Demean map of 1623 (Plate VIII). Typical of a late Tudor house, the ground floor plan is E-shaped: the porch in the centre and the crosswings at either end projected forward from the hall range, each surmounted by a plain pointed gable. The presence of hall and parlour chimney stacks and a chamber over the hall show either that the house had been newly built during the latter half of the sixteenth century or had been modernized by the later Bardolphs. The house, with a frontage of about 96 feet, occupied the north side of a forecourt, whose foundations can sometimes be traced in the front lawn in dry weather. Part of a moat, still visible in 1908, has now disappeared.

The most significant remains of the Bardolph house are the mural paintings in the Dining-room and Hall and the painted frieze in the Tapestry room. Some of the timbers visible in the Hall and on the back-stair may belong to the period, but many are re-used. The Brew-house range (now converted to kitchen and flats) is probably that described in the 1623 inventory.

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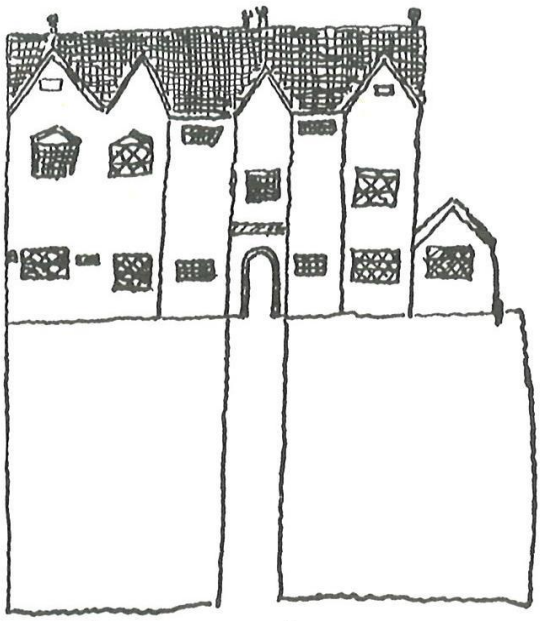
Inventory of the Estate, 1623

Inpr[imis] one capitall messuage, mansion, or Mannor house, two stories high, an indifferent large Hall; two parlors, whereof one of them is a verie faire and large Roome, both of them being to the face of the house: one lodging chamber belowe staires on the back parte of the house. One reasonable faire Kitchin; a larder, a Bakehouse with two faire ovens, a Brewehouse, one little closet by the parlour. A Butterie between the Hall and the lesser Parlor. A small cellar being verie shallow within the Earth, a little Butterie by the Cellar.

Over the Hall a very faire dineing roome, over the parlour a verie faire lodging chamber, a Chamber over the lower lodging Chamber, a faire chamber over the lesser parlour. A Chamber betweene the chamber over the Parlour and the dining Chamber. Over the Porch a Closset. Over the Kitchin, Brewhouse, and Bakehouse, lodging chambers for servants. A Garrett or Cockloft over the chambers, on the topp of the house, but most part of it is shutt upp and made of no use.

A prettie Courte before the house at the goeing in on the South being 30 yds square, and is paled about. Two little garden plotts lying on each side the Courte, one behind the house, on the North there is a dayrie house, a verie fair Pigeon or dovehouse, and a Well house, that goeth with a Wheele, wherein a dogg is putt, and draweth up the water. There is also a Moate that compasseth the back parte of the house, which Moate hath been verie badlie used and is dryed upp and stopped in one or two places. On the North parte of the said Moate there is a prettie orchard, that is planted with young trees, and hath verie pleasant walks about the said orchard if they were well looked unto and ordered. There is a[lso] a yard on the East parte of the house, whereon standeth two fai[re] Barnes, two Stables, and a Shedd for two Horse. All which [hou]ses, outhouses, Barnes, Stables, Garden plotts, Orchard, Courte and yards, doe by Estimation contayne 03 Acr . . .



Rothamsted Manor, 1624

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The Jacobean House

There is no record that Anne Wittewronge made any changes at Rothamsted but the style of the main stair and the Hall fireplace are perfectly acceptable for the period 1623–38. Sir John's account books, on the other hand, show that upon becoming Lord of the Manor he immediately set to work: 'I had an Oake groweing in the warren which I caused to bee felled when I began to repair my house at Rothamsted about Anno 1638 or 1639 . . . At the ground end was cutt 20 foote which was sawed into halfe inch boards for the wainschott in the ould little parlor (next the buttery)'.

His early years at the Manor were too preoccupied with the Civil War to do much building but about 1647 he began a programme of major reconstruction which lasted over ten years. The South front, 133 feet in length, and the adjacent three bays of the West side, with the distinctive 'Dutch' gables, moulded brick cornice, classical porch doorway and mullion and transom windows with ovolo mouldings and other characteristic features, date from this period. The cluster of five moulded chimneys above the Dining room bears the date 1654 inscribed in the base of the stack. Also about this time, the West side of the present courtyard (residents' dining room) and a cellar were added.

Sir John's development of the old Manor is very unusual, if not unique; while retaining the South face ostensibly as the main front and entrance, the gables of the West side are more elaborately treated, especially the centre one with its pilasters. The additional emphasis given by the moulded chimneys and particularly by the construction of a loggia (cf. Hatfield House), imply that the house was intended to be seen and approached from this side.

The Later Changes

The eighteenth century introduced little change, although John Bennet threatened a total remodelling in the Adam style (p. 21 and Plate I). The South wall of the Brewhouse range was rebuilt, some new lead rainwater heads were fitted and various repairs were effected, for example under 16th September 1721: 'To Cock & Smyth Bricklayers,

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for doing the two gable ends & repairing the Garden Walls & building a chimney in the drying room £10.6.0'.

In 1863 Sir John Lawes added to the west wing, faithfully copying its architectural features, the Great Drawing-room surmounted by two storeys. The ceiling was thus rather low for the area of the room. His son Sir Charles, during his alterations in 1900 and 1901, did away with the first-floor rooms above and raised the ceiling by several feet, at the same time enlarging the windows and adding the armorial glass. He also removed the Victorian bay-window his father had added to the Small Drawing-room and made numerous changes within the house, enriching it with fixtures and fittings from other houses. In 1900 the Library and its vestibule were added, from the designs of V. T. Hodgson, part of the wall of a studio put up about 1865 being built in.

Conversion into a Hall of Residence, 1951–2

The alterations involved in the conversion left the south and west fronts unchanged. In the courtyard the nineteenth-century servants' hall and pantry were cleared away; the gatehouse, game larder and part of the brewhouse range were made to house two flats; the rest of the brewhouse was converted into a kitchen, and the old kitchen into a residents' dining-room. Beyond the gatehouse to the north, a further outbuilding was turned into a small house.

Apart from rooms set aside for a warden's flat, most of the remainder were turned into bed-sitting rooms. The principal ground-floor rooms were retained as common-rooms and for social functions.

In April 1952 the conversion was completed: Rothamsted Manor House had entered a new stage in its long history.

THE INHABITANTS OF THE MANOR HOUSE

The Earliest Owners

We have seen that in 1212, when the name of Rothamsted first appears, Richard de Merston held a knight's fee here of Baldwin Wake. In 1221 Henry Gubion owned the estate and granted it, apart from the house, the chapel, and 80 acres of land, to the same Richard de Merston for life in return for certain services. The Gubion family were still in

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possession in 1248, after which we hear no more of them. Another early owner, as Lt.-Col. J. Busby suggests, may have been Godfrey of Rothamsted ('Godefridus de Rokamstede'), who is mentioned in the St Albans Book of Benefactors. In 1292 William Nowell owned Rothamsted, and members of the Nowell (or Noel, or Nele) family held the manor until half-way through the following century.

Cressy

Rothamsted was purchased from the Noels in 1355 by Ralph de Creçi, who had appeared in this locality as witness to a grant of land in the parish of Wheathampstead in 1348, two years after the famous battle; indeed, it has been conjectured that he owed his name (and fortune) to distinguished services on that field. Of his descendants only Sir John Cressy (1407–45) achieved distinction, serving in the French wars and becoming Governor of Lisieux, Orbec and Pont-l'Evêque in Normandy. He was knighted in 1432, and represented Hertfordshire in Parliament in 1439–40. The last of the Cressys to own Rothamsted was Edmund, whose younger brother William is commemorated in a mural tablet in the north (Rothamsted) transept of Harpenden Church. Elizabeth, only child and heir of Edmund Cressy, married Edmund Bardolph, of Crowborough Manor, Watton-at-Stone, in 1519, so that when her father died in 1525 Rothamsted passed to the Bardolphs.

Bardolph

Edmund, the first Bardolph owner of Rothamsted, enjoyed the estate for nearly thirty years. He was buried in Harpenden in 1554. His son, likewise named Edmund, married twice; his second wife, Margaret, widow of Nicholas Brocket and daughter of Thomas Hoo, owned Mackerye End. The estate had been enlarged by the purchase of the adjoining Hoos manor in 1540 and (probably about the same time) of the fields called Fosters, Sawyers and Whitlocks—names indicating earlier owners, who figure in contemporary letters. But at the beginning of the Stuart period the family fell upon evil times, and Edward Bardolph, having mortgaged the estate in 1611, sold it outright in 1623 together with the manors of Hoo, Saunceys, Claviles, and Thamys, to Anne Wittewrongle who purchased the properties on behalf of her infant son John.

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Rothamsted had been in the hands of the Cressys and Bardolphs for nearly three centuries; this unbroken descent was followed by the even longer tenure of the Wittewronges and families allied to them.

But we must retrace our steps to the middle of the sixteenth century, when there lived in the city of Ghent one Jacques Wittewronghele (born 1531), a notary public of well-connected family, and an adherent of the Protestant faith. His wife was called Mary Everdey, and they had two infant sons Abraham and Jacob, whose births stand recorded by him in a small note-book which is still to be seen among the Wittewronge papers. The tyranny and religious persecution of Philip II of Spain in the Netherlands becoming intolerable, Jacques[1] fled in 1564 with his wife and sons to England. As his grandson puts it in his Memoir: 'It was in this hott time of persecution that my grandfather left his countrey to enjoy his conscience, and made shipwrack of his outward estate to preserve his inward peace.' (The motto *Pour la foi* sometimes used by his descendants alludes to this flight.) Arrived in London he was able to continue in his profession; seven more children were born to him, and he died in 1593.

His son Jacob Wittewrongle (as his name is most commonly spelt), born in Ghent in 1558, was only six years old when his parents fled with him to London. After education at the Free School in St Albans, where one Helicomius, a fellow-Fleming, was a master, he proceeded to Magdalen College, Oxford. A few years later he married Susanna, daughter of Bernard Tielman, a wealthy German merchant, gaining by the alliance property in the Duchy of Cleve and in England, including an estate at Walthamstow. On 10 May 1582 he was granted letters of naturalization. After some years of partnership with Matthias Otton, a brewer in London, he decided to set up on his own, and, pulling down some houses in Grantham Lane (as his son John relates in his Memoir),

erected (to his great charge) a faire new brew-house, together with a mansion-house thereunto adjoyning, where he lived many yeares, exerciseinge that callinge by himselfe; and, by the blessing of God, attained unto a very considerable estate, which may be the less wondered at, considering the paucity of those that in those dayes exercised that mistrey [trade] within the citty...And I have heard from my mother, that my father for many years cleared at least one thousand pounds...

[1] His portrait hangs in the Great Drawing-room.

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In 1611 he obtained a mortgage on Rothamsted by means of a loan to Edward Bardolph, as recounted above. His first wife having died, he married in 1614 Anne, daughter and co-heiress of Gerard van Acker or Vanacker, an Antwerp merchant settled in England. Anne bore him a daughter (1616), and a son, John (1618). The memoir goes on:

> My father continued in London about five yeares after his marriage with her, viz. until the yeare of Grace 1619, when being (as it seemes) desirous to lead a more private life, hee retired to a house which he had, a little before, purchased at Westham in Essex, where he lived untill the 22d day of July, anno 1622, when it pleased Almighty God to take him to himselfe, after hee had a long time conflicted with a sore tedious fitt of the gout, (with which malady he was much afflicted,) which brought him to his end. He was buried in the Church at Westham....

Jacob Wittewrongle was a man of considerable wealth (he left a personalty of over £16,500), and in high standing with the Flemish colony in London, being an elder of the Dutch Church. John Strype, the historian of the Reformation, called him 'a singular Friend to the Ministers of the City, a Maecenas of Studious Youth, a Favourer of Piety and Learning'. His portrait hangs in the Great Drawing-room.

In the year following his death his widow bought Rothamsted outright for her son.

Sir John Wittewronge, 1st Baronet

Sir John, who became the first Wittewronge to reside at Rothamsted, was born in the parish of All Hallows, Barking, in October 1618, the son of Jacob Wittewrongle and his second wife Anne Vanacker, and was baptized in the Dutch Church in London. Eighteen months after his father's death in 1622 his mother married Sir Thomas Myddelton, who had been Lord Mayor of London in 1613. John, who was henceforward brought up in the house of his stepfather, wrote of him years later: 'He gave mee the same breeding as if I had been his owne child; and I cannott...but acknowledge his care of mee was such, that it resembled more an owne father's then a father-in-law; and I shall need to name but one instance of his affection, which was his earnest desire to match mee into his owne blood, viz. to a grandchild of his, by his eldest sonne.' (A portrait of Sir Thomas is reproduced on Plate XIII.)

Accordingly in December 1638 (after studies at Trinity College,

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Oxford, where he matriculated on 17 October 1634, and a period of travel abroad in 1637) John married, in the chapel of Chirk Castle, Denbighshire, Mary, daughter of Sir Thomas Myddelton the younger;[1] a short but elaborate epithalamium in the 'metaphysical' style, celebrating the occasion, survives among the Wittewronge papers. On attaining his majority a year later John became Lord of the Manor of Rothamsted, although continuing to reside in London. His eldest child, John, was born in February 1640, but his wife died two months later of smallpox.

On 16 February 1641 John was knighted; the letter conveying the news to his mother at Plaistow on the following day betrays considerable uneasiness, presumably on account of her anti-Royalist feelings:

To his deare and ever honnoured Mother the Ladye Anne Myddelton at Plastowe these:

Most deare and honnoured Mother:

I thought it my dutye to certifye you of the good newes which yesternight caused soe much joy in this cittye; His Majestye was yesterday in the morninge in the house of Parliamente, the ende of his comminge there was, to let them knowe that he was contented to yeeild his assente that there should be a triennialle parliamente accordinge to there desyres:...

And now I have some newes which concernes my perticular, which (I hope beinge usshered in by such happye tydings) will not be displeasing to you: I was yesternight at courte, and (amidst all this jollitye) by the meanes of some good freindes, his Majestye was pleased to make me a Knight; The perticular Carriadge of the busines I will certifye you of, when I come home, (which shall be tomorrowe or on Friday) & I hope I shall give you ample satisfaction, of the whole busines: I pray doe not entertayne anye prejudicate or sinister opinion of me for not acquaintinge you of it, which indeede I coulde not doe, beinge not certayne of it myselfe when I parted from you: but leavinge it to my verball relation, I humblye take my leave, desyringe you to esteeme of me, as I am

Your most dutifull &
Lovinge Sonne
JOHN WITTEWRONGE

Three months afterwards he married again (his second wife, Elizabeth, daughter of Timothy Myddelton of Stansted Mountfichet, Essex, being

[1] Chirk Castle, now the home of Lieut.-Colonel Ririd Myddelton, is described and illustrated in *Country Life*, London, 28 September, 5 and 12 October 1951.

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a cousin of his first), and in the autumn presumably took up his residence at Rothamsted. Some of the numerous alterations and improvements made by him in the house during the next forty years have already been described (p. 4 above). It is to him that we owe especially its fine south front; and in spite of changes in the nineteenth and twentieth centuries the Manor of today is still substantially the Manor of Sir John.

But he was not to be left in peace there for very long. On 22 August 1642 Charles I set up his standard at Nottingham as a sign for war. Two days later Sir John was appointed Deputy-Lieutenant of Hertfordshire, and on the following day was commissioned Captain of the trained bands for part of the Cashio and Dacorum hundreds. His ancestry and temperament made it natural for him to join the Parliament forces, who placed him (from April to August 1643) in charge of the garrison at Aylesbury, where on 16 May he and Thomas Tyrrill, the governor of the town, wrote a letter to Hampden complaining of the conduct of Royalist forces, who had burnt the village of Swanbourne and committed atrocities. This letter, having been read to both Houses of Parliament, was ordered to be printed. It appeared two days later in heavy black-letter together with an ordinance concerning the Archbishop of Canterbury. The Parliamentary command having decided to maintain the garrison at Aylesbury, the Earl of Essex wrote to Sir John the following letter, which is preserved among the Wittewronge papers:

S^{r}.

Considering the keeping safe of the garrison at Ailesbury to be of great importance, and understanding the house of Comons have taken specialle care for the raysing of six hundred pounde weekely for maintenance thereof, I would have yo^{u} use all the meanes yo^{u} can to keepe the officers and souldiers of yor Regiment together, and likewise of Collonel Tyrrills Regiment now at Ailesbury, notwithstanding any other forces sent by mee to that place; About wch I expect yor especiall care:

[*signed:*] your assured
frend
ESSEX

Aug: 8°:
1643.

[P.S.] If you shall desire any Commissions from mee, I shall upon notice thereof send them to yo^{u}; And also that all care be taken that may be for strengthening both the Regimentes.

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The autumn of 1643 seems to have seen the end of Sir John's active service, but he remained a member of the Grand Council of War for the Eastern Association, sitting at Cambridge. The tradition runs that Oliver Cromwell was his guest at Rothamsted and that a pair of riding-boots preserved there while the house was in private ownership had belonged to the Protector.

Sir John's second wife died in 1649, having borne him three sons, of whom the second, James, eventually succeeded to Rothamsted. Within a year Sir John married his third wife, Katharine (daughter of Maurice Thomson, a London merchant), by whom he had three daughters.

In 1654 he was elected to the first Parliament of the Protectorate as one of the members for Hertfordshire, and in January of the following year was a teller in the debates on Cromwell's control of the army. This Parliament was dissolved in 1655, but Sir John was returned for Hertfordshire again in 1656, when he signed the declaration of protest against the exclusion of the Hundred Members, which was headed by the signature of Sir Arthur Haselrigg and contained those of Sir Rowland Lytton and of Sir Harbottle Grimston, Sir John's neighbour at Gorhambury. Lt.-Col. Busby writes: 'This was the Parliament when Cromwell decided to admit members on tickets that would be issued only to his friends, and we read in a contemporary letter:

> Many of the Parliament men which were elected and returned are kept out of the House (a hundred or thereabouts). No particular charges as yet against them, but by the Instrument of Government the Council is to allow or disallow of who shall sit in Parliament and they have ordered it that such men shall have no tickets from the Clerk to the Crown to sit, such fiery spirits as Haselrigg, Cowper, Wittewronge, Buckley and others, that would make disturbances in the House if they were in, and many men are glad of it, for now we have hopes that they will agree and keep the peace that are admitted in.

'Little is known of Sir John's actions in Parliament or how his name came to be linked with that of Sir Arthur Haselrigg, the leader of the Republican Opposition.' Parliament was dissolved in 1658, for which year Sir John was High Sheriff of Hertfordshire. In the following year Katharine, his third wife, died; her body was embalmed. Sir John remained a widower for the rest of his life.

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At the Restoration Sir John received the royal pardon in the House of Commons on 28 May 1660. Two years later he was created a baronet. 'Soon after this', relates Lt.-Col. Busby, he 'fell foul of the Lord Lieutenant, Lord Fanshaw of Ware, who accused him amongst other things of having been "A Committee man, a Decimator, a Persecutor of all the King's Friends and one who had the King's goods in his house when his Majesty returned". In the end Sir John was arrested but was released through the efforts of local friends, Lord Clarendon of Watford, Sir Harbottle Grimston of Gorhambury and Sir Henry Caesar of Bennington. In his defence Sir John admitted having served on Committees but not for his own ends and denied that he was ever a persecutor of the king's friends or a decimator; he admitted having purchased some of the king's pictures but said that he voluntarily handed them back to the king at Whitehall and that he was the loser thereby to the tune of £300. Sir Harbottle Grimston in his plea said that Sir John was only in arms against the king from April to August 1643 when he was at Aylesbury and that since the king's return he had given practical signs of his loyalty. He also says that "no dangerous or ill principled people" had ever been observed to resort to Sir John's house or be entertained by him.' In 1666 he was again in trouble. On 4 August he 'appeared the 2d time', he records in his diary 'before the Lord Fanshaw at Hertford when the Master of the Rolls (Sir Harbottle Grimston) and Sir Hen. Caesar appeared there with me and Engaged for my fidelity to his Majesty and peacable Deportment for one year to come which was accepted'.

In 1664 Sir John was High Sheriff of the county of Montgomeryshire. Recalling that exactly a hundred years had passed since his grandfather had left the Netherlands to enjoy freedom of conscience in England, he decided to mark the centenary by composing a Memoir on his family, for the benefit of his children (to whom it is dedicated) and of posterity. This document, written in his neat hand and preserved among the Wittewronge papers, easy and vigorous in style and exact in its recital of facts, is our most important source of information on the early Wittewronges. (It was printed in Vol. 1 of Robert Clutterbuck's *History and Antiquities of the County of Hertford*, 1815, p. 407. See Plate IX below.)

The autumn of this same year saw the marriage of his eldest son, and Sir John decided to enlarge and remodel the house standing on his property at Stantonbury, near Wolverton, Bucks., which he had bought

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a twelvemonth before. Work went on throughout 1665 and by the autumn of 1666 the house was ready for son John's occupation. The only relic of it now is the coat-of-arms in stone of Wittewronge quartering Vanacker, dated 1665, in the west wall of Rothamsted House; preserved at Wolverton when Stantonbury House was pulled down, it was set in its present position in the early years of the present century.

For Sir John the running of his farms and the administration of his affairs were now his life. His other interests were few and he spent little time on amusements: his visits to the play were rare, nor does he seem to have cared much for music even though he had taken lessons in lute-playing as a young man. He played bowls now and again, not always with great success, when he was with the Myddeltons at Stansted: 'Lost at bowlls and otherwayes spent therabout—4.6d', he recorded in August, 1681. In his fifties he began to collect coins,[1] and most of his London journeys now included visits, not only to the familiar 'Pillars of Hercules' or the 'Swan' in Fish Street and Mr Tyton's bookshop 'at the Three Daggers neere Temple Gate in ffleete Streete', but to numismatists and dealers in coins. A cabinet which he bought for £6 in 1678 to hold his collection remained at Rothamsted until 1936.

Sir John was now a man of considerable substance, not to say of wealth. From his childhood, when nearly £4000 of his father's personalty of £16,534 had come to him, he had been fortunate. His mother had bought Rothamsted for him, and he owned a brewery in Dowgate, London, which he leased to his brother-in-law. In 1656 he had been able to buy £1000 worth of East India Company shares. But his own energy and sound business sense had stabilized and made the most of his good fortune: he had certainly worked to achieve his present position, in which besides Rothamsted, Harpendenbury, Topstreet and Stanton he owned lands in Lincolnshire, in the county of Montgomery and even in Ireland.[2] However, it is clear from the surviving documents that in the midst of his prosperity he was generous both to public causes and to individuals in less happy circumstances than his own. In 1670 his old

[1] During the alterations of 1951 two coins which at one time jingled in Bardolph and Wittewronge purses were found in the courtyard at Rothamsted Manor—a farthing of Charles II (1673) and a silver sixpence of Elizabeth I.

[2] From 1664 onwards he also leased the lordship of Grantchester from King's College, Cambridge.

It is interesting to learn that in Sir John's day there was a windmill on Harpenden Common. He bought it in 1654, built a house by it and let it for a rent of £7 per annum.

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college at Oxford, Trinity, received £20 from him as a contribution towards the money laid out upon their new buildings; he also subscribed in the 1680's to the new St Paul's Cathedral, then in course of construction under the direction of Sir Christopher Wren. In his account books we frequently come upon sums given to a 'poore scholer', a 'widdow' or a poor minister; and he was ready to contribute money to the relief of the Protestants in Piedmont and to other similar causes which attracted his sympathy; he kept Richard Bardolph, kinsman of the impoverished previous owners of Rothamsted, on charity for over nineteen years until he died at the age of 91; nor, in his will, did he forget the poor of the parish in which he lived.

In spite of his considerable activity in the fields of government and of affairs Sir John had always taken a keen interest in the management of his estate at Rothamsted and in agriculture generally—a tendency which, after lying dormant for two centuries, revived with such far-reaching results in his descendant Sir John Bennet Lawes; and as the years passed he tended to entrust his business affairs increasingly to the capable hands of his younger son James, and to concern himself more with the details of his home-farm and that at Harpendenbury, with his crops, livestock and timber, his fruit and vegetable garden, and his little brewhouse. He started in 1684 a note-book in his own hand, still firm and clear, in which for five years he recorded the weather each day, adding notes on the progress in his kitchen-garden—his 'hartichoaks', 'sparrowgrass', apricots, peaches, nectarines, plums, cherries, apples, pears, quinces, grapes, and especially his beloved melons which he now looked after in person, supervising every stage in their cultivation:

> 3d March [1685]: Made the hot bed for mellons
> 6 of March Sowed the seeds
> 11 Prickt them out
> 26 Transplanted them into ranges.

Later on in the year came reward for his labours:

> The 15th instant cut and eat a very large mellon weing 4 pound, and it was as good as it was great.

—and general observations on the season:

> This summer in generall from the beginning of May: till the latter end of August, was the hottest and dryest that I ever remember; or (I thinck) any

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man els, being more like Spain for hot dry settled weather than England; wee had 203 ripe bunches of grapes before Bartholomewtide but the peaches and Roman Nectrines ripened later then usually; not till the middle of this month and some not till the beginning of September, and the late peaches, as the blouddy peach, French peach and Portugall and Man peach not till the middle of that month and after, seven not till Michalmas.

Then came the making of cider and wine:

The 28th [Sept. 1686] pickt all the grapes off the Vine by the Arches, whereof made about 3 gallons of Wine.

The 17th [Oct. 1685] made a vessell of 12 qts of the Clarrett and frontiniack grapes, to which I putt (when it was up) 2 pounds of fine shugar.

—and operations on the farm:

The 4th [Oct. 1684] wee made an end of soweing haveinge begune and ended in 3 weekes time.

Sometimes the weather would disappoint his hopes: 'Before the end of this month [May 1685], all our expectations of plenty of fruit (viz. apples peares quinces &c.) were blasted (as the blossoms were), all the leaves eaten up by the caterpillars, not only of fruit trees but severall Oakes and other great trees also.' Other seasons would make recompense, such as that of 1688, which seemed to make especial welcome to William and Mary newly enthroned: 'The 27th August made an end of my harvest. Such a fine season both for haytime and Harvest I believe no man ever saw.' (A page of these records is reproduced on Plate XI.)

Sir John was now in his seventieth year, and he decided that it was time he set his affairs in order. On 7 June he made his will. To his eldest son John, who had already been presented with the property at Stantonbury on which he lived, he bequeathed lands in the county of Montgomery, forgiving him a long-standing debt of £300 and all the interest on it. James, named as executor, was to receive land in the parishes of Wheathampstead and Harpenden, and would succeed him at Rothamsted. He leaves 'unto the poore of the Parish of Harpenden the summe of tenne poundes', and '£100 to be distributed among poor ministers of the Gospel or Widows of such'.

In October his portrait was painted for the last time. Seated, in a fine coat of the colour of terra-cotta, the hair falling to his shoulders on either side of the determined but kindly face which reminds us

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slightly of Milton, Sir John returns our gaze. In the background are the arms of Wittewronge, with the inescutcheon of baronetcy: argent three bends gules; on a chief sable a bar dancetty or. (See Plate XII.)

Although still in good health he now felt inclined to take life somewhat more easily. He would sit in his loggia or 'arched walk' (as he called it: at that time it was unglazed), watching for the first swallow and listening for the cuckoo, or, as autumn approached, remarking how few wasps there had been this year, 'scarce twenty from first to last'. In January he would grow anxious about the carp in the stable pond; perhaps he should move them to the pond in the mead, as he had done last year: it was only two years ago that they had all but six perished in the February frosts.... Son John at Stanton was in financial difficulties again. Would he never learn to stand on his own feet? However, one must be thankful that James had a good head on his shoulders. Yes, James was a man after his own heart; Rothamsted was going to him: he would know how to look after it. What happened to Stanton did not matter so much, even though all that money had been spent on extending it. It was a pleasant house close to the willow-lined river, with the little church just beyond the garden wall; but it did not compare with Rothamsted....

Sir John died in the spring of 1693 and was buried at Harpenden on 23 June. The baronetcy and the Stantonbury estates passed to John, and Rothamsted to James.

James Wittewronge the Elder

James Wittewronge, as we have seen, was a son of Sir John by his second wife Elizabeth Myddelton. Sir John, in the Memoir of his family, records his birth thus: 'My second sonne James was borne in Coven Garden parish, London, on the 13th of June, 1647, being the Lord's day, about six o'clock in the afternoone, and was baptised on the 22d of the same month.'

After studies at Magdalen College, Oxford, where he matriculated on 11 November 1664, James turned to law, in which profession he achieved success, becoming an 'utter barrister' of Lincoln's Inn and (in 1681) Treasurer of the Middle Temple and Clerk of the Petty Bag in Chancery. He was a Justice of the Peace for Hertfordshire, and from 1698 until

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his death Recorder of St Albans. He was buried at Harpenden on 5 March 1721.

His first marriage was to Elizabeth, daughter of Thomas Diconson of Hillingdon, Middlesex, on 11 June 1667. She bore him numerous children, one of whom, Elizabeth (whose portrait as a girl is in the Great Drawing-room), married Thomas Bennet, a London publisher of whom we shall hear more later, while another daughter, Eleanor, became a maid of honour to Queen Anne.

After the death of his first wife in 1685 James married twice more, first Mary, daughter of John Cock of St Albans, and secondly Susanna daughter of Sir Nicholas Pedley, Recorder of Huntingdon.

His father Sir John seems to have lived in closer familiarity with him than with the elder son John at Stantonbury. The surviving correspondence (dealing mostly with business, though touching frequently on personal matters as in this postscript to a letter from James dated at Lincoln's Inn on 7 February 1682/3: 'Here is excellent sherry 20: pence the bottle, but if you take a quantity you may have it at 6s the gallon') presents James, the lawyer, as a man of affairs, competent, reliable, entrusted with much legal business by his father, whose place as steward of Rothamsted he took from 1680 onwards, and in whose will he is named as executor; and there is no doubt that his father felt himself temperamentally more akin to this son than to his rather feckless and ineffectual heir, in whose hands neither Stantonbury nor anything else seemed to pay.

The two half-brothers appear to have been on good terms. In a letter dated 16 August 1694 James thanks John (then newly Sir John) for 'very kind and free entertainment of me and mine at Stanton', adding that the twenty-five mile journey back to Rothamsted took eight hours —'the wayes were very badd'; and in the previous year his loan to John of £2000 had shown his readiness to take up the burden, let fall by their father's death, of the elder brother's financial instability.

After encountering abundant evidence of James's practical and efficient nature we learn with some surprise that there is another side to him. In a letter to his father dated 6 May 1689 he writes: 'I dayly pray for my sister's safe delivery being much concerned for her, and am the more trobled till I hear of her welfare because I have some lice again in my shirt, which use to boad me noe good, I know 'tis a foolish

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thing to be superstitious, but can't help it.' The 'sister' is his half-sister Anne, wife of Robert Sidderfin of Croydon and the Middle Temple. Whether his forebodings about her were realized we do not know.

Jacob Wittewronge, his eldest son, baptized in Harpenden in 1671, was one of his numerous children by his first wife, Elizabeth Diconson. Like his father, Jacob followed the law at Lincoln's Inn. He married in February 1692/3 Elizabeth, daughter of Henry Coghill of Aldenham. His career, however, was cut short by his death in 1693 at the age of twenty-two. Letters of administration were granted to his father. He had one child, Jacob.

Jacob Wittewronge the Younger

Born posthumously in 1693, he succeeded his grandfather at Rothamsted in 1721. He had married in 1719 his first cousin Anne Hale, a widow, daughter of Thomas Bennet, and became a Justice of the Peace for the County.

His diary reveals his love for country life and his interest in the Rothamsted estate. As soon as he came into the property he began planting and improving. The vista of elms 'ffronting from the House to the Lane' was set by him at Christmas 1721; and in the following autumn he planted several dozen fruit trees—'peaches, apricocks, ffiggs, pears, 2 plumbs, 2 Gold pippins, and 2 quinces'. Some of his observations remind us of the notes made by his great-grandfather, Sir John Wittewronge:

July 20th, 1723. This day was taken in my water at Whethamsted a Trout two ffoot long and fourteen inches abt. Weighed better than five pounds.

July 23rd. I this day gathered a Nectarine full ripe and found two ripe peaches fallen off one of my trees which peaches never used to ripen till towards the end of August.

Mem. This Summer Anno 1725 has been the wettest that any man can remember. My wife was forced to feed her Bees in June or they would have been starved, the weather being so wett every day that they could not get out to gather any honey....

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Like Sir John, too, he seems to have lived well, to judge from a typical year's expenditure on his cellar:

Mem. What wines I bought Anno 1722.

Champaigne	1 doz.
Canary	1 doz.
White Wine	7 doz.
ffrench Claret	5 doz.
Port Wine	26 doz.

1 Chest of fflorence containing 60 fflasks.
6 gallons of Brandy and 1 gall. of Arrack.

He died in 1728 leaving two sons, James and Thomas. Rothamsted passed to the elder of them, James.

James Wittewronge the Younger

Born 3 July 1720. After studying at Trinity Hall, Cambridge, from 1736 until 1739, James went to Gray's Inn. In 1745 he married Martha, daughter of the Rt. Hon. Sir John Strange, master of the Rolls and Recorder of London. There survives among the Wittewronge papers a small vellum-bound note-book, started by James when he was at Trinity Hall, in which he recorded his current expenses during several years. At the end he has added a few personal notes from which we can deduce the course of his studies. He acted as his brother Thomas's guardian (their father having died in their boyhood), as the following entries show:

Pd for my Brother when he had ye small pox	£21. 7. 1½.
Expences of Binding him Clerk to Mr. Whitfeld	21. 1. 0.

together with others in the same vein.

Portraits of James and his wife Martha hang in the Great Drawing-room. James having no children, at his death in 1748 Rothamsted passed to his brother.

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Thomas Wittewronge

Thomas Wittewronge was born at Harpenden, 16 October 1723. He was High Sheriff of Hertfordshire in 1750. (His portrait, which hangs in the Great Drawing-room, is reproduced on Plate XIV.) When he died unmarried in 1763, the last of the Rothamsted Wittewronges, the estate passed to his first cousin, John Bennet.

In order to clarify this relationship we must return to Elizabeth Wittewronge, granddaughter of the great Sir John. She was married at Harpenden early in 1695 to Thomas Bennet, a publisher of mark who was in business in St Paul's Churchyard and afterwards in Fleet Street, London. Over two hundred works published by him appear in the Term Catalogues, including the catalogues of Archbishop Tenison's library and of the Dugdale bequest to the Ashmolean Museum, Oxford. He was something of a writer, too, and had a brush with Bentley in the famous *Phalaris* controversy. He died in 1706 and was buried in the crypt of St Paul's. (See Plate XV*b* below.)

His tombstone bears the following inscription:

Here lieth the body of Mr Thomas Bennet Citizen and Stationer of London who married Mrs Elizabeth Wittewronge eldest daughter of James Wittewronge of Rothamsted in ye County of Hertford Esq., by whom he had one son and two daughters and departed this life August the 26th in the year of our Lord 1706 and in the 42nd year of his age.

Of his children, Anne, as we have seen, married as her second husband Jacob Wittewronge, while Thomas Bennet the younger went up to Queens' College, Cambridge, where he took the degree of LL.B. in 1727 and was Esquire Bedell of the University in 1749. He died at Cambridge in 1770 and was buried in St Botolph's Church. His wife Catherine, who died in 1729, bore him several children, only two of whom concern us here, John and Mary.

John Bennet

Born at Cambridge in 1722. He was forty-one years of age when, as related above, he inherited Rothamsted from his first cousin, Thomas Wittewronge.

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For some years the Manor House had been let—in 1738 to the 5th Earl of Dysart, in 1757 to the 3rd Earl of Harborough, also to John Crawley (for a rent of £100 per annum) during the erection of Stockwood House, Luton, and (1758) to Lord Huntingtower. In 1764 the tenant was Mrs Geary, presumably a member of the Gery family with whom Elizabeth Wittewronge became connected by her second marriage; but we may assume that she left Rothamsted soon afterwards.

John Bennet, who had been clerk to the chief Justice of Chester in 1749, had a mind to remodel his newly acquired manor house in the fashionable Adam style. Some unsigned plans, drawn up for him not long after he inherited the estate and preserved among the Wittewronge papers, show a fine if somewhat stern south elevation with a bow at either end and faced with stucco. But the project never emerged from paper, and Sir John Wittewronge's more friendly, if more homely, brick front remains unaltered. (See Plates I and XV*a*.)

Bennet, who had been a Justice of the Peace for Hertfordshire, died childless in 1783 and his widow Sarah remained at Rothamsted until her death in 1801, although the estate passed to John Bennet Lawes, son of his sister Mary who had married Thomas Lawes, an attorney-at-law in London.

In 1785 Thomas Lawes purchased an Elizabethan house called Bennetts, which is still to be seen on the west side of Harpenden common, and probably lived there until his death in 1789.

John Bennet Lawes the Elder

John Bennet Lawes (1768–1822) followed the profession of law in London, and became Deputy-Lieutenant of Hertfordshire. He also served in the Hertfordshire militia as a Captain at Canterbury, where it was embodied for service in 1799. Shortly afterwards he was forced to resign his commission, but in 1804 he was a Captain in the 1st Herts Volunteers.

As we have seen, his aunt remained at Rothamsted until her death in 1801. Meanwhile, John Bennet Lawes presumably stayed at Bennetts when shooting or hunting or other occasions brought him down to Harpenden. It was here, too, that he entertained the Prince Regent, afterwards George IV, with whom he was on friendly terms, and for whose convenience he added the stables afterwards converted into

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a cottage and garages. Upon the death of his aunt in 1801 he moved into Rothamsted House.

He married on 19 August 1812 Marianne Knox, widow, of Harpenden. When he died ten years later his widow moved to Rothamsted Lodge (an earlier building on the present site at Hatching Green) where she spent the greater part of her time until her death in 1875.

They had two daughters and one son, called, like his father, John Bennet Lawes.

Sir John Bennet Lawes, 1st Baronet

Sir John Bennet Lawes, the father of agricultural science and founder of Rothamsted Experimental Station, was born at Rothamsted on 28 December 1814. He was only eight years of age when, on the death of his father, whose friendship with the Prince Regent had proved extremely costly, the family moved to Rothamsted Lodge, which was to serve as their home for some years to come.

From Eton he proceeded to Brasenose College, Oxford, where he matriculated on 14 March 1833. He attended some of the lectures of Dr Charles Daubeny, Professor of Chemistry, and probably knew of Daubeny's plan for experiments at the Botanic Garden, where crops grown continuously were to be compared with the same crops grown in rotation, for Lawes's own field experiments, begun soon afterwards, had much in common with this plan. But Oxford in those days had not much to offer to a man whose interests were predominantly scientific: Lawes came down in 1834, without taking a degree, took up his residence at Rothamsted Manor, where he converted one of the bedrooms into a laboratory (see below, p. 53), and set his hand to the management of the home farm.

A document throwing some light on his early years came to light recently among the Wittewronge papers: it is an account by Sir John, in his own hand, of his schooling and of the beginnings of his scientific research. Being brief, it can be quoted in full:

> I was born in the house where I now reside, and which has been in my family for 250 years, in December 1814, and am therefore in my 59th year. I have little recollection of early events, and the death of my father which occurred when I was nearly 8 years old made but a slight impression on me.

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This place was let during my minority and my Mother resided in a smaller house in the same parish. Shortly after my father's death I was sent to a private school at Hatfield. I remained there between one and two years learning very little and was always in mischief. I went from there to a private school at Brighton where I learned even less and was always in mischief and disgrace. I remained there about two years and at the age of 14 I went to Eton. I learnt just enough to escape punishment but no more. I took no part in the sports of the School such as football, cricket, nor did I enter the boats as one of the crew, but I was a good deal on the water in a desultory way; and most of my pursuits were more or less mischievous, such as digging mice out of the fields and moving them into my tutor's house.

I remained at Eton between two and three years and left it without regret. My Mother rarely resided long in one place; my holidays were therefore spent at any locality where she happened to be. Twice or three times I went to France and we were in Paris during the revolution[1] of 1830. I thought it great fun and helped to build the barricades. After this my Mother went to reside with her parents in Oxfordshire[2] and I was sent to the vicar of the parish for an hour or two daily to prepare for college. The principal part of my time was spent in fishing and shooting. Of the latter sport I was passionately fond. At the age of 18 I went to Oxford where I remained two years learning little or nothing and following no particular pursuits. I did not go up for my degree.

About this time the tenant of Rothamsted became insolvent and my Mother decided that we should live there. My education was therefore supposed to have been finished and I was to set up as a country gentleman. I had no idea or wishes about farming, but the home farm was vacant and therefore I took it. Up to this period I had formed no opinions of my own on any subject. I was a Tory because most of my associates were Tories, a member of the Church of England because my Mother was a member; and although I had so far evinced a slight taste for science when in Paris by purchasing a number of bottles of acid and combustibles, I caused such destruction to my clothes and the furniture that my Mother got rid of them as quickly as possible.

Much to my Mother's annoyance my first act after my arrival at Rothamsted was to order one of the best bedrooms to be fitted up as a Laboratory. This was done by Mr. Squire of Oxford Street. I then commenced experimenting in a very desultory manner and devoted a great deal of time in

[1] Caused by the attempt of Charles X to seize absolute power. After three days (*les trois glorieuses*) of fighting in July, Paris was left in the hands of the insurgents. Charles fled to England, and the Duke of Orleans was proclaimed 'King of the French' under the name of Louis Philippe.

[2] At Drayton near Banbury.

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reading books of Chemistry. Thompson's Materia Medica[1] and other works by the same author were much read by me. Recent discoveries had been made of two active principles of vegetable [?growth]. In order to extract them I procured seeds of the various plants such as Belladonna, Hemlock, Madder, Saffron etc., and sowed them about the farm. I also grew some acres of Poppies and procured a considerable quantity of Opium. Having managed to make the acquaintance of Dr. A. T. Thompson I got him to allow me to work in his Laboratory at the London University. I do not however think that I learnt much or that any accurate investigations were carried on while I was there. Dr. Thompson informed me that he had invented a process for making Calomel and Corrosive Sublimate by the combustion of Mercury in Chlorine Gas, and he either persuaded me or I persuaded him to make it the subject of a patent and to manufacture it for commercial purposes. This being done I commenced turning an old barn situated about ½ a mile from this house into a chemical manufactory. I got an introduction to Tenant of Glasgow and went there to learn how to make Chlorine Gas. I spent a great deal of time in trying to carry out this invention successfully on a large scale, and although I made many tons of Calomel and Corrosive Sublimate I am disposed to think the process had nothing to recommend it and was no improvement over the process commonly employed. In these failures there can be no doubt I was acquiring much knowledge which was destined to be of the greatest use to me at a later period of life.

It was about the year 1837 that I commenced a few experiments upon the action of Chemical salts on the growth of Plants. Shortly after that I began to manufacture chemical products for the use of Agriculture and at the same time to investigate systematically the action of these substances in the growth of plants; and to these two occupations a great portion of my time has been devoted.

As I had no male relations my Mother was the only person to influence me in my pursuits, and she was violently opposed both to science or [*sic*] business, although at the same time devoted to me. Home influences and education all tended to make me in pursuits an ordinary country gentleman, in Politics a conservative, in religion an ordinary member of the Church of England accepting as truth all that they teach. Whereas for some causes to be enquired into and explained, I have been very largely engaged in manufacturing pursuits, devoted to scientific investigation, very liberal in politics, and in religion although firmly and thoroughly believing in the truth of the Christian Religion and [ready] to accept it as the guide of my life as far as I can under-

[1] *The London dispensatory: a practical synopsis of materia medica, pharmacy and therapeutics* (London, 1811), by Anthony Todd Thomson (1778–1849), the first professor of materia medica and therapeutics at University College, London (then London University) and founder of the *British Pharmacopoeia*.

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stand it and being at the same time a regular attendant at the service of the church of England, still I cannot admit the right of that church or of any other church to teach dogmatically what truths are necessary for my salvation; and the feelings which would cause me to resent any interference with the liberty of conscience are quite as strong in me as they were in the breast of my ancestor[1] when he gave up the land of his birth and property more than 300 years ago.

JOHN BENNET LAWES

Further insight into his interests and aspirations during those early years of which we know so little (for he kept no diaries and made few notes) is furnished by a letter written by him many years later to John Chalmers Morton, in answer to a request for information about his earliest researches, and published in the *Agricultural Gazette*, 2 January 1888. It is probably worth quoting in full:

Dear Mr. Morton,

In answer to your inquiries, it is always difficult to predict whether a juvenile taste will develop in after life into anything useful. To write upon the door of a dark room with a stick of phosphorous, to dissolve a penny in nitric acid, or to convey an electric shock to your old housekeeper, who 'refused to touch the jar with the hand, but did not mind touching it with the end of the poker'—these are feats which, with the accompanying destruction of clothes and furniture, cause the elders of the house to look with unfavourable eyes at a boy with a taste for chemistry. In my day Eton and Oxford were not of much assistance to those whose tastes were scientific rather than classical, and, consequently, my early pursuits were of a most desultory character. Matters, however, began to look serious when, at the age of twenty, I gave an order to a London firm [Squire, Chemist, of Oxford Street] to fit up a complete laboratory, and I am afraid it sadly disturbed the peace of mind of my mother to see one of the best bedrooms in the house fitted up with stoves, retorts, and all the apparatus and reagents necessary for chemical research. At that time, my attention was very much directed to the composition of drugs. I almost knew the pharmacopoeia by heart, and I was not satisfied until I had made the acquaintance of the author, Dr. A. T. Thompson.

The active principle of a number of substances was being discovered at

[1] Jacques Wittewronghele (1531–93) of Ghent, who fled to London from the Spanish persecution in the Netherlands in 1564. His portrait is in the Great Drawing-room at Rothamsted Manor, which was purchased in 1623 for his grandson Sir John Wittewronge, first Baronet. (See p. 7 above.)

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this time, and in order to make these substances I sowed on my farm poppies, hemlock, henbane, colchicum, belladonna, &c. Some of these are still growing about the place. Dr. Thompson had suggested a process for making calomel and corrosive sublimate by burning quicksilver in chlorine gas. I undertook to carry out the process on a large scale, and wasted a good deal of time and money on a process which was, in fact, no improvement on the process then in use. Failures, however, have their value, as I found out afterwards. All this time I had the home farm of about 250 acres in hand. I entered upon it in 1834. Farmers were suffering from the abundance of the crops, and wheat, although rigidly protected, was very low in price. For three or four years I do not remember that any connection between chemistry and agriculture passed through my mind; but the remark of a gentleman who farmed near me [Lord Dacre, of Kimpton Hoo], who pointed out that on one farm bones were invaluable for the turnip crop, and on another farm they were useless, attracted my attention a good deal, especially as I had spent a good deal of money on bones without success. Somewhere about this time a drug broker in the City of London asked me whether I could make any use of precipitated gypsum and spent animal charcoal both of which substances held at the time no market value. Some tons of these were sent down, and, as sulphuric acid was largely used by me in making chlorine gas, the combination of the two followed.

The successful application of the superphosphate on my own fields caused me to take out a patent, and to send it out for trial elsewhere. I put up an Edge runner to grind the charcoal finer, but to manufacture the substance on a large scale profitably with a carriage of twenty-five miles by wagon was out of the question. It was, however, a serious step to set up a manufactory in London, and it did not take place for some years afterwards. All this time I was carrying on a very large number of experiments with chemical manures, but they were performed upon areas of land too small to give trustworthy acreage results. I think the Gardeners' Chronicle, which was first published in 1840, contains the result of my earliest experiments with various chemical salts.

The publication of Liebig's book on Agricultural Chemistry in 1840 influenced considerably the direction of our experiments, and later on brought us into a somewhat heated controversy with one of the greatest geniuses of that time. Nearly fifty years have passed since that book was written. It was a bold work; and for some years afterward everyone could give confident opinions upon all subjects relating to agriculture—but where are we now? Have we a foundation laid, and can we say that such a thing exists as a science of agriculture? Another half-century will doubtless show more rapid progress, as there are so many more brains at work on the sub-

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ject in various parts of the world; but when we consider that almost every other science contributes its share to form what we call the science of agriculture, those who follow the pursuit must expect plenty of hard work and be content with a moderate amount of success.

J. B. LAWES,

Rothamsted, St Albans

The investigations made by Lawes as a result of Lord Dacre's observations on bones as manure may be regarded as the beginning of the experiments which have made Rothamsted world-famous. He had already, from 1836 onwards (stimulated perhaps by the work of de Saussure on plant nutrition) conducted pot experiments on the manuring of agricultural plants; but in 1838 or early 1839 he decomposed bones, burnt bones and mineral phosphates by means of sulphuric and other acids, the resulting fertilizer being termed 'superphosphate of lime'. In the spring of 1839 he engaged the man who had been his 'scout' at Oxford, Henry King, to assist him in his laboratory and in the 'chemical manufactory' recently established in a barn close to Rothamsted Lodge, and during that season the superphosphate was tested on a small scale, in pots or on a certain number of plants in the field. The results, especially on turnips, were very striking. Accordingly in the following spring a chemist from University College, London, named Dobson, was engaged to assist with the experiments, and a new source of raw material utilized—spent animal charcoal (charred bones), a waste product of sugar refineries; during this season the experiment was repeated on half an acre or more of grass and other crops, again with very encouraging results. In 1841 he used twenty tons of superphosphate and purchased thirty tons of animal charcoal. His success prompted him to take out a patent for his process; but his friends could not approve of his engaging in trade, particularly in the manure trade, and both his own family and his wife's were convinced that he would be ruined. However, his own purpose soon prevailed and on 23 May 1842 his patent was granted (afterwards numbered 9353). It enumerated three processes:

1. By means of sulphuric acid, decomposing 'bones, bone ash, bone dust, apatite, or phosphorite, and other phosphoritic substances', for purposes of manure.

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2. Combining for manurial purposes phosphoric acid with any particular alkali, as potash or soda or magnesia or ammonia, or any earth containing such alkalis.

3. Making a manure by combining silica (in the state of ground flint or sand) with either potash or soda, or applying as manure crystal or glass ground to powder.

In December of the same year he married Caroline, daughter of Andrew Fountaine, of Narford Hall, Norfolk. From this time onwards his life divided into two lines of work—the manufacture of fertilizers, and agricultural research, a division symbolized in the following year, 1843, by the opening of his first factory at Deptford Creek, London, and the appointment on 1 June of Joseph Henry Gilbert as his assistant at Rothamsted in place of Dobson who had gone to Australia. The heavy demands made upon his capital by the establishment of the factory caused Lawes at this period to let Rothamsted Manor, and for four years he divided his residence between London and Devonshire.

With Gilbert's appointment there began a series of systematic field experiments, some of which are still carried on; indeed, Lawes always regarded Gilbert's arrival as marking the foundation of the Rothamsted experiments. Wheat has been grown on Broadbalk field without intermission since 1843, in which year also root experiments on Barnfield (later interrupted for a period) were commenced; in 1847 the field experiments on beans were begun, and in the following year those on clover and on a four-course rotation. In 1851 the rotations of wheat and fallow and wheat and beans were started, followed a year later by the barley experiments; indeed, much of the present-day lay-out was devised at this time. Altogether about 40 acres were put down to experiments. Meanwhile laboratory work was still done in the old barn on Barnfield, where Gilbert frequently remained until eleven o'clock at night, when he walked his solitary mile home, only to return to his bench at 4 a.m. But it was not long before the practical value of Lawes's experiments met with widespread recognition, an example of which was the meeting of Hertfordshire farmers on 24 December 1853, to present him with a testimonial. 'It was considered', runs their circular, 'that Mr. Lawes has for many years been engaged in a series of scientific and disinterested investigations for the improvement of agriculture generally, which have been carried out to an extent, with an attention to accuracy and detail,

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and at a cost, never before undertaken by any individual, or even by any public institution.' But the resolution embodying the thanks of neighbouring farmers was quickly enlarged and became national in its scope, some £1160 being subscribed. Lawes's wish was that the greater part of the sum should be used for building a new laboratory, which was opened on 19 July 1855 by the Earl of Chichester on the site of the present laboratories, which superseded it in 1914.

Meanwhile Lawes's fertilizer business had been expanding rapidly. His first advertisement, in the *Gardener's Chronicle* for 1 July 1843, ran:

J. B. LAWES'S PATENT MANURES, composed of Super Phosphate of Lime, Phosphate of Ammonia, Silicate of Potass, &c., are now for sale at his Factory, Deptford-creek, London, price 4*s*. 6*d*. per bushel. These substances can be had separately; the Super Phosphate of Lime alone is recommended for fixing the Ammonia of Dung-heaps, Cesspools, Gas Liquor, &c. Price 4*s*. 6*d*. per bushel.

At first his chief raw material was bone ash, the mineral phosphates such as the Felixstowe coprolites being too expensive. He charged £7 a ton for his superphosphate. By 1847 the business was established, and Lawes took up his residence again at Rothamsted with his family. It was still, however, necessary to practise great economy. 'Every sixpence I could spare', he wrote of this period in after years, 'went in increasing my business.'

But the profitableness of the process was tempting to other manufacturers, and it was only a few years before Lawes found out that the London Manure Company and others were committing substantial infringements upon his patent. He at once instituted proceedings, after making a disclaimer of the bone and bone dust which he could not have defended anyway, and at length in December 1850 the case *Lawes* v. *Purser* came on at the Guildhall, London. Lawes was successful in retaining his patent, with certain qualifications which were eventually circumvented by means of a second disclaimer, in 1857, of bone ash and of the second and third parts.

But infringements on the part of the London Manure Company still went on. Accordingly in November 1851 Lawes again set proceedings on foot against them; but this time they yielded. In a letter of January 1852 Lawes pointed out to them that they could use bones and bone ash, but not mineral phosphate; however he let them have a licence to

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use it on condition that they paid him a royalty of ten shillings per ton of phosphate used. Two other firms who had been manufacturing superphosphate, Edward Packard and Co. of Ipswich and Fison of Thetford, eventually came to terms.

But mineral phosphate was now beginning to be available in quantity. This caused Lawes's rivals to chafe more and more under his restrictions, and at a meeting in London in March 1852 they resolved to fight Lawes 'by every justifiable means', starting a subscription for the purpose. Lawes picked up the glove. A further case—this time *Lawes* v. *Batchelor*—came on in November 1853, fourteen pleas being presented. A number of distinguished scientists (among them Robert Warington, senior) were called as witnesses; argument was long and detailed. Finally, Sir F. Kelly emphasized that Lawes had put £10,000 of his own money into his experiments and was adding to this sum at the rate of £1500 every year, while the results were being freely published for the benefit of all concerned with agriculture; and that it would not be to the public advantage to deprive Lawes of 'a temporary monopoly fairly granted in his favour but yet a very inadequate compensation for the large amount of time and labour and money he has expended'. Judgement was given for Lawes on ten of the fourteen pleas; his position was established and infringements ceased. He built in 1857 a second and larger factory at Barking Creek: the business prospered, and twenty-five years later he was able to sell it to the Lawes Chemical Manure Company for £300,000.

The various field experiments initiated in 1843 and the years following have already been briefly mentioned. They were all laid out on the same lines, and they all received the same treatments: no manure; nitrogen only; minerals only; nitrogen + minerals; farmyard manure. This method was dictated by the controversy which Lawes and Gilbert were carrying on with the German chemist, Justus von Liebig, in whose Laboratory at Giessen Gilbert had gained his degree of Ph.D. in 1840. Liebig had advanced the view that all the nitrogen requirements of plants were satisfied from the ammonia in the air. Lawes and Gilbert disagreed with him: atmospheric supplies, they said, were inadequate and nitrogen should be given as manure. The field experiments designed to prove their point were supplemented by a laboratory experiment with pot plants. Liebig, however, was unwilling to accept Lawes's evidence,

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and proceeded to read him a lesson in the correct methods of experimentation in general; he then carried the war into his enemy's camp by airing his views at the British Association meeting at Glasgow in 1855, where Gilbert retaliated in favour of the Rothamsted viewpoint. Tempers became heated and personalities were exchanged. But the controversy was a powerful stimulus to investigation, and indeed became the chief interest of Gilbert's life, so much so that a lady whom Gilbert had on one occasion to take into dinner complained afterwards that he could talk of nothing else.

Meanwhile other experimental work was proceeding, particularly on the feeding of animals. In 1857 Lawes served on the Royal Commission on Sewage Disposal. Between 1860 and 1870 a number of important practical questions received attention: the value of silage, the value of malting barley before feeding it, and the closeness of milling. In 1876 Lawes had a considerable part in starting the field experiments conducted by the Royal Agricultural Society at Woburn on the Duke of Bedford's estate and at his expense. (These experiments, which duplicated on a purely sandy soil those of Lawes, were taken over fifty years later by Rothamsted Experimental Station.) British agriculture was prosperous, and the farmers had come to look up to Lawes and Gilbert as trustworthy friends and advisers. Even after the disastrous harvest of 1879 had inaugurated a period of agricultural depression, investigations at Rothamsted were pushed forward, enlivened by the vigour of a younger worker, Robert Warington, who had joined the staff in 1877 and made important discoveries on the microbiology of the soil—the last important work done in Lawes's and Gilbert's time.

In 1882 Lawes's services to agriculture were recognized by the conferment of a baronetcy: so that for the third time in its long history Rothamsted manor was held by a Sir John. He had already, twenty-eight years earlier, been elected a Fellow of the Royal Society; and both the Royal Agricultural Society and the Chemical Society had appointed him member of their Councils. Several foreign governments had awarded him honours; and both his own university and Cambridge recognized, albeit tardily, his achievements by conferring degrees upon him in 1893 and 1894. As early as 1855 Sir John Lawes had made up his mind to ensure the continuation of the Rothamsted experiments by placing the laboratory and fields in the hands of trustees, together with

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an endowment for their maintenance. In 1872 he made it known that he had set aside £100,000 for this purpose; and in 1889 he set up the Lawes Agricultural Trust, endowing it with this sum and leasing to it the fields on which the classical experiments were conducted, 52 acres in all, at a peppercorn rent for one hundred years.

The jubilee of the Rothamsted experiments was celebrated in 1893, when a distinguished gathering assembled to honour Lawes and Gilbert. A granite monolith commemorating the event had been placed on the lawn in front of the Laboratory, where it still stands; the Duke of Westminster, as President of the Royal Agricultural Society, presented to Sir John his portrait, painted by Sir Hubert von Herkomer, which hangs at the entrance to the Library at Rothamsted Experimental Station, and to both Lawes and Gilbert congratulatory addresses from the subscribers to the Jubilee Fund, signed by the Prince of Wales, afterwards Edward VII.

From the earliest years the Rothamsted experiments had been carefully recorded and their results described in scientific journals, chiefly the *Philosophical Transactions of the Royal Society* and the *Journals* of the Chemical and Royal Agricultural Societies. One hundred and thirty-two separate papers and reports were published in Sir John's lifetime, the greater part of them under the joint authorship of Gilbert and himself. Most of these were collected in the *Rothamsted Memoirs on Agricultural Science*. From 1863 to 1899 *The Times* published each year a long letter from Sir John giving an estimate of the wheat crop in the United Kingdom, based on the yield of selected plots on Broadbalk.

Sir John Lawes was of rather less than middle stature, but his vigorous and striking face made an immediate impression on all who met him. His constitution was very strong, and even when over 85 years of age he was not troubled by infirmities. His holidays were spent in deer-stalking and salmon-fishing, which took him up to Scotland every year until 1895; at home, his farm was his recreation. 'His interest in agricultural problems never tired, he was continually finding fresh subjects for inquiry. While gifted with a full share of the scientific imagination, he was thoroughly practical in his conclusions. His long experience as a farmer, and the careful attention to economy learnt in business, were of great use to him when he brought the results of scientific investigation before the agricultural world. He took a broad,

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statesman-like view of all agricultural questions, and was looked up to by the English farmer as his safest guide and his highest authority. Sir John Lawes seldom took part in public functions, he was not seen at meetings of scientific societies, and took no active part in politics; excepting the hours unavoidably spent on his London business, he lived as far as possible a country life. It was, however, in no sense a secluded life; his correspondence was very large, and the visitors to the Rothamsted experiments were extremely numerous and of all nationalities. They found at Rothamsted a genial host and a ready guide to the fields, where the lessons taught by the experimental crops were described in brief and pithy sentences by one who knew thoroughly the whole history of each plot.' [*Obituary Notices*, Royal Society.]

Sir John showed, furthermore, a practical interest in improving the lot of the agricultural labourer and of the villagers in near-by Harpenden. In 1852 he set aside some land as allotment holdings for them, and five years later provided them with a club-house, built at his expense but managed entirely by themselves. Charles Dickens paid it a visit and described his impressions in an article entitled 'The poor man and his beer' (*All the Year Round*, 30 April 1859), which gives an idea of the relationship of Sir John ('Friar Bacon') and his workers. A savings bank was started by him, giving 5 per cent. interest on all deposits, and it became his custom to spend an hour every Saturday evening at the Club in order to receive the money—a custom which he maintained until Post Office Savings Banks were introduced. Sir John paid equal attention to the welfare of the workers in his factories, and earned the gratitude of many by his acts of private generosity.

He died at Rothamsted on 31 August 1900, in his eighty-sixth year, after a brief illness, and was buried at Harpenden. His son Charles, then in his fifty-seventh year, succeeded him.

Sir Charles Bennet Lawes-Wittewronge, 2nd Baronet

Born at Teignmouth on 3 October 1843, Sir Charles was a very different type of man from his father. He possessed neither scientific interests nor an aptitude for business; his tastes, like those of his mother, lay in the direction of the arts.

From Eton he went to Trinity College, Cambridge, where he read for the natural sciences tripos, graduating B.A. in 1866. Of splendid

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physique, he was the chief amateur athlete of his time at Cambridge, where he won the half-mile, the mile and the two miles; he won the Cambridge Sculls in 1862 and afterwards the Diamond and Wingfield Sculls at Henley, and in 1865 stroked the losing Cambridge crew in the University Boat Race. Taking up cycle-racing at the age of fifty-five he set up a twenty-five miles amateur record.

The Great Drawing-room at the Manor was built in honour of his coming of age in 1864, and the occasion was celebrated at Rothamsted with a ball of considerable splendour.

On leaving Cambridge he took up sculpture, inhabiting for many years a studio near Chelsea Gardens. Between 1872 and 1908 twelve works of his were shown at the Royal Academy; his group *The Death of Dirce*, now in the garden of Rothamsted Manor, was exhibited at Rome in 1911: a smaller bronze replica is in the Tate Gallery. The Incorporated Society of British Sculptors, founded in 1904, elected him their first president.

In 1882 the sculptor R. C. Belt brought a libel action against him; Lawes on his part accused Belt of putting his name to the work of others. The case, which came up in June of that year, was the last heard in the old Westminster Law Courts, and was a *cause célèbre* of the day. Prominent artists gave evidence on both sides. At length, after sitting for six months, the Court awarded Belt £5000 damages.

On the death of Sir John Lawes in 1900 Charles, then aged 56 years, succeeded to the title and the estate. After the costs of the lawsuit, which had never been paid, had been taken out of his patrimony, Sir Charles at once set to work transforming Rothamsted Manor to conform with his own tastes. Victorian grates and wall-paper were replaced by seventeenth-century fireplaces and panelling brought from elsewhere; armorial stained glass was set in many windows; the Great Drawing-room was remodelled, and a library (later used as a billiard room) added to it; and during alterations part of the mural painting in the Dining-room, covered for nearly three centuries, was revealed. Furniture and hangings of the Tudor and Stuart periods brought the interior of the house into line with the antiquity of the exterior. In April 1902 Sir Charles revived the old family name of Wittewronge, adding it by royal warrant to his own.

He married in 1869 at St Paul's Church, Knightsbridge, his cousin

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Marie Amélie Rose, daughter of Charles George Fountaine, of Beaufort Gardens, South Kensington. Their only son, John, was born in 1872.

Sir Charles died at Rothamsted on 6 October 1911, the last member of the line of Wittewronge and Lawes to reside there. His son did not return from Australia, where he had lived for some time, to take up residence at Rothamsted, and the Manor was leased to Major Ralph B. Sidebottom and his wife the Hon. Mrs Sidebottom, in whose careful tenure it remained for nearly thirty years.

Meanwhile, in 1931, on the death of Sir John Lawes-Wittewronge, the third baronet, the family decided to sell almost the whole estate including the Manor House, and offered it first to the Rothamsted Experimental Station as tenants of the farm and part of the park. The Director at that time, Sir John Russell, realizing the importance of the estate to the work of Rothamsted, accepted the offer at once. The contract to purchase was signed on 16 March 1934. Since the funds of the Lawes Agricultural Trust were quite unequal to this demand, and no money was forthcoming from the Treasury, the only satisfactory course was to launch a public appeal. Sir John Russell threw himself into the project with characteristic energy and optimism, and nearly £35,000 was received in seven weeks. Contributions came in from all classes of individual and institution, a moving testimonial to the high regard in which Rothamsted is widely held. The first envelope opened contained five shillings; three weeks later Sir Robert McDougall made his munificent gift of £15,000. Generous subscriptions from the Halley Stewart Trust, the Carnegie Trustees, the Royal Agricultural Society, the National Farmers' Union, the Sugar Beet Factories, the Imperial Chemical Industries, and many others assured the success of the appeal: three centuries after the manor of Rothamsted had passed into the family of Wittewronge it was transferred to the Lawes Agricultural Trust, the governing body of Rothamsted Experimental Station.

Mr and Mrs Sidebottom remained at the Manor as tenants until August 1939, although the superb collection of furniture amassed by Sir Charles Lawes-Wittewronge was sold by auction in 1936. Two months after the outbreak of the Second World War the Army requisitioned the house; they remained in possession until September 1946.

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When they left, the whole fabric was in a very dilapidated condition, and the back premises and outbuildings looked almost derelict: it was obvious that unless some use could be found for it, the Manor would before long be a ruin. For the idea of converting it into a hall of residence for Rothamsted Experimental Station we are indebted to Sir William Ogg, the Director.[1] In his project he received encouragement and generous help from the Pilgrim Trust, and the Ministry of Agriculture was persuaded to defray the greater part of the cost. The adaptation, which has left the early parts of the building unchanged, was skilfully planned by Major J. B. F. Cowper, F.R.I.B.A., the architect for the scheme, and the work was ably carried out by Messrs E. C. and F. H. Jarvis, Ltd., a local firm. Once again Rothamsted Manor provides a home for those whose work concerns the fields in which it is set.

[1] Sir William was Director of Rothamsted from 1943 to 1958.