CHAPTER I

BOYHOOD AND YOUTH

> He is a person of great worth; and yet humble, and far from conceitedness and self-admiring...a conscientious Christian; and that's much said in little.
>
> JOHN WORTHINGTON to SAMUEL HARTLIB, *Diary*, I, p. 333.

In these days when we all realise the importance of heredity and early environment in determining and in interpreting character, the student of John Ray will deplore more strongly than did any of his biographers our almost total ignorance of his parents and childhood. To Derham or to Dale the fact that he was the son of a village blacksmith had to be stated but should then be forgotten. It was unconventional if not indecent. They knew it; but neither they nor their successors thought it necessary to amplify it. For more than a century[1] the year of his birth, though correctly given in at least one of his books, was wrongly stated as 1628; until 1847 no one had taken the trouble to search the parish register, and even then he was sometimes identified with the wrong John Ray. W. H. Mullens, who discovered that he had been baptised twelve months before the traditional time,[2] did not prosecute his researches further or spend the few hours needed to run through the long vellum pages that form the scanty annals of Black Notley in the first half of the seventeenth century. Of Ray's birthplace, family, school, and circumstances we are told almost nothing; and to-day it is impossible to recover more than a few fragments of what we have lost. We can only record those fragments, and estimate their importance in the light of the later life of their subject.

The hamlet, for even now it is little more, lies due south of the market town of Braintree, about a mile and a half away, and between the two roads that lead from it, the western to Chelmsford, the eastern above the right bank of the river Brain through White Notley and Faulkbourne to Witham. On this road lie most of the houses, a substantial rectory,[3] an

1 E.g. by *General Dictionary*; by Derham, *Mem.* p. 7; by J. E. Smith in *Rees' Cyclopaedia* (*Mem.* p. 65); and by Dale, *F.C.* p. 4; and as late as 1906 when J. Vaughan, *Wild-flowers of Selborne*, p. 127, says: 'The entry of his baptism...runs in almost illegible writing "John son of Roger and Eliz. Wray bapt. June 29, 1628"'—an error all the worse because it claims to be a transcript. It is given as 1627 on the frontispiece of his *Methodus Emendata* and as 29 Nov. 1627 in the *Englishwoman's Magazine* for 1847 (II, p. 257) with a copy of the entry in the Baptismal Register certified by the Rector, and in the *Cottage Gardener* for 1851 (V, p. 221), presumably by G. W. Johnson, the editor.

2 The entry of his baptism was reproduced in *British Birds*, II, p. 296: cf. *F.C.* p. 3.

3 Not the rectory of Ray's time but 'new built by the late incumbent Geoffrey Barton' (Morant, *History of Essex*, II, p. 125). Barton died in 1734.

inn, a small mill and a few cottages where a stream running from the west crosses the road. This is 'the little brook that runs near my dwelling'[1] from which Ray worked out his famous theory of springs. On the rising ground beyond it are the outhouses which still mark the site called the Dewlands on which in 1655 Ray built a house[2] for his widowed mother, the house into which he moved on her death in 1679 and in which he died in 1705. Leez Lane (or as we should spell it Leighs Lane), where he found Field Garlic (*Allium oleraceum*), a plant then new to science,[3] and which led to 'Leez House, the seat of the Earl of Warwick', where he found both species of Reedmace growing together in the rivulet nearby,[4] leaves the Witham road beyond the modern sanatorium, some six hundred yards south of Dewlands. The road across the Brain to Cressing lies closer to the hamlet.

From the rectory a road, now called Baker's Lane, branches off to the south-west and in a quarter of a mile passes to the north of the church and the Hall.[5] These stand on a rounded knoll looking over the valley of the stream. The Hall is a simple fifteenth-century building much reconstructed but with some fine timbered rooms upstairs; opposite to it is a magnificent barn of the same period, a barn larger than the church and plainly of the same age and tiling as its roof. Going along the road one comes to a fork where another road runs north to Braintree, passing the house of Ray's friend James Coker, then called Plumtrees, but now 'The Buck'.[6] Beyond the fork and on the south side of the road stands the forge, now disused, but still containing its two brick fire-places and chimneys, bellows and anvil. Beside and behind the forge is the six-roomed cottage of timber and plaster in which the blacksmith and his family lived, a two-storeyed building running north and south with wash-house, kitchen and parlour on the ground floor and three bedrooms, one with a dormer window, above. Tradition declares this to be Ray's birthplace; and in such a place tradition, supported as it is by the unquestionable age of forge and cottage, is sufficient evidence.[7]

The church, in which on 6 December 1627 he was baptised, is small and faced with flint-work, with a wooden belfry and steeple on the west and two brick buttresses dated 1684 and marked I. P. (that is, Joseph Plume, rector from 1638 to 1645 and from 1662 to 1686) at the corners of the chancel. Its interior has been tragically restored in the nineteenth century. The pews have gone: the floor has been tiled: the rood-screen, which may have been already demolished in Ray's time, is only marked by the sealed doorway to it. The building is said to have been erected by Sir Geoffrey

1 *Miscellaneous Discourses*, p. 74.
2 Destroyed by fire 19 Sept. 1900.
3 *Syn. Brit.* ed. II, p. 229.
4 *Cat. Angl.* p. 308.
5 For these cf. *Historical Monuments in Essex*, II, pp. 18–20.
6 Plumtrees probably 'Plumptre's' from the owner's name: *History of Essex*, l.c. speaks of it in 1770 as 'Plumtrees alias The Buck'.
7 It is accepted as such in 1851: *Cottage Gardener*, V, p. 221.

de Mandeville and is manifestly Norman: the rounded windows and main door still remain in the nave: but later centuries have added windows of varying periods and an attractive porch. To the east of this stands the monument erected originally by Henry Compton, Bishop of London, and other subscribers in Ray's honour and bearing the elaborate Latin inscription composed by the Rev. William Coyte[1] and translated into hardly less elaborate English couplets in the *General Dictionary*.[2] Near it stands the flat-topped tomb of his friend Benjamin Allen, the Braintree doctor. In the vestry of the church is a record of the bequest to the poor of the parish by another friend already mentioned, James Coker 'of the house called Plumtrees',[3] a retired grocer and general trader of Braintree,[4] in whose labyrinth one of Ray's best insects was caught.[5]

The registers of the parish for this period consist only of a single volume containing the baptisms, marriages and burials from 1570 to 1669. The first fifty years are well kept, being apparently copied into this book from earlier records: the writing is good and the ink well preserved. After that the entries are very variable, sometimes defective and often hard to decipher. From 1670 till 1735 the registers have been lost.

The story is neither long nor full. In May 1592 John Ray, subsequently the grandfather of the naturalist, lost his first wife, Mary, perhaps at the birth of a daughter of the same name whose wedding to Richard Nichols is registered in 1610. John must have married his second wife, Elizabeth, shortly afterwards; for Roger, the father of the great John, was baptised on 28 March 1594. There were eight other children; Elizabeth born in 1597, who perhaps married John Calloge at Bocking in September 1636;[6] William, who must have died in infancy,[7] in 1599; Thomas, afterwards father of a family registered at Black Notley, in 1601; another William, who was buried in June 1621, in 1602; Sarah, who seems to have married Thomas Barker, a widower of Braintree, in 1647, in 1605; Ellen, in 1608; Katherine, who died in 1631, in 1611; and John, in 1614. Their mother, Elizabeth Ray senior, died in May 1623.

In 1624 Roger Ray, whose marriage to his wife Elizabeth must have taken place elsewhere, had his eldest son baptised Roger on 16 July: he died in childhood and his burial is registered on 26 December 1632. In 1625 a daughter Elizabeth was baptised on 17 November. In 1627 John, the third child, was baptised on 6 December. There is no further record of Roger's family except that of his own death on 31 August and burial on 1 September 1655.

1 Of Balliol College, Master of Woodbridge School, 1703–8; father of William Coyte, the botanist.

2 Vol. VIII, p. 695, published in 1739.

3 Cf. *Syn. Brit.* p. 95.

4 *New History of Essex*, I, p. 421.

5 *Hist. Insect.* p. 219.

6 Cf. Bocking Register.

7 The register of burials 1599–1602 is very ill-kept: there is one entry of a William, parentage and details completely illegible, under 1602.

The other entries refer only to the family of Roger's brother Thomas, whose wife Dorothy had five children: Elizabeth, baptised 26 October 1626; John, 29 June 1628; Thomas, 11 December 1629; Roger, 28 August 1630; and Sarah, 22 June 1637. Of these, Elizabeth died in January 1639 and Sarah in October 1639.

It seems probable that the other children of the older John moved away from Black Notley: but two Rays[1] were buried and a third[2] married there during the period of the second register, 1735–50, these being probably grandchildren of Thomas. The name was not uncommon at that time in Bocking where a Henry Ray, clothier, had a son, also Henry, in 1685 who on his death in 1760 left property in Black Notley.[3]

Two points in these records deserve comment. The first concerns the spelling of the family name.[4] John Ray, as all know, spelled his name Wray on every occasion at Cambridge and until the year 1670 when he published his *Catalogus Plantarum Angliae* as Joannes Raius and told his friend Martin Lister that he had dropped the 'W' because it had been added 'without any adequate reason and altering the old and his father's spelling'.[5] In the register there is no evidence of consistency: Ray, Raye, and Wray all occur apparently according to the taste of the writer. This is not solely due to the illiteracy of the curates or parish clerks of Black Notley: at this time and throughout the seventeenth century orthography in the spelling of names was freely disregarded even by people of education.[6]

The second point is the existence of an elder brother and sister. Roger certainly died in childhood, possibly of the smallpox, which John also had;[7] and to Elizabeth there is no certain allusion later.[8] But the fact that he was not an only child and had companions in his babyhood is not unimportant. It may help to explain the dread of loneliness, the devotion to his family, the genius for friendship which are marked characteristics of his life. If he had been always solitary it would be hard to account for his sociability: if he had not known loss when he was beginning to be impressionable, the fear of failing, or of being estranged from, his friends would be less explicable. He was a man naturally reserved: the few occasions on which he reveals his feelings are all associated with the threat of solitude.

1 John, 26 Nov. 1737; Sarah, a widow, 7 April 1743. This John represented the naturalist on the jury of the Manor Court on 8 Oct. 1695 and sat on it till 1735.

2 William Ray and Lydia Clay, both of Braintree, 23 May 1738.

3 I owe this information to Mr Alfred Hills of the Old House, Bocking.

4 For details cf. transcript of the register in note at end of chapter.

5 *Corr.* p. 65. Lister replied: 'I was pleased with the derivation of your name whilst U was at it.... You well know what Vray in French means': *Corr.* p. 66.

6 Thus of Hooke's Diary the editors write: 'the spelling of a person's name sometimes differs as much as four times on one page', *Diary of Robert Hooke*, p. 2.

7 So Dale, *F.C.* p. 5: 'he had had the smallpox, yet it was in his younger years'.

8 Withering's story drawn from William Atkinson that Ray's sister collected plants for him (*Arrangement*, 3rd edition, II, p. 286) is quite unsupported.

The circumstances of his childhood explain several other features of his character and work. Though near enough to Braintree to secure for him a small circle of congenial spirits, the neighbourhood was not lively and was certainly very rural in its outlook. In 1695, when John Aubrey asked him to procure subscriptions for his *Monumenta Britannica*, he could only reply: 'To tell you the truth this country wherein I live is barren of wits; here being but few either of the gentry or clergy who mind anything that is ingenious'.[1] Though Braintree was 'a great thoroughfare from London into Suffolk and Norfolk', and though a carrier's wagon came weekly through Witham[2] and the posts do not seem to have been very irregular,[3] there is no sign of any newsletter or of the *London Gazette*, and apart from private correspondence isolation was almost complete, even in the days when Ray had become eminent. For the blacksmith's son the world must have been limited to a few miles; and within them nothing of national importance could have touched the boy's life or made him aware of the momentous events that were in fact preparing. Probably the only change that affected Black Notley was the removal of Joseph Plume from the benefice and the intrusion of Edward Sparhauke in 1645; and by then Ray had gone to Cambridge.

It has often been remarked that in all his books and letters there is in fact hardly a single allusion to national or political history. He gives indeed a lively account of the changes in the Colleges at Cambridge after the Restoration in his letters to Courthope:[4] he mentions the Protector's death in his first Itinerary:[5] he deplores in a single sentence 'the Dutch insolency' in 1667 when Ruyter and De Witt sailed up the Medway, but says that 'the particulars of our loss are not certainly known to me':[6] he breaks into fervent thanksgiving for the Revolution and for William and Mary in the Preface of his *Synopsis Britannicarum* in 1690, and alludes to the unsettlement and hope of long life for the king in a letter[7] of the same year. Otherwise there is literally not a word to indicate that he was living in one of the most exciting periods of English history or that he knew or cared what was happening. His silence is not due to lack of intelligence or interest: his *Observations* on his continental travels shows a singular alertness to the condition of culture in the places visited, to their government, education and manufactures. Nor was he personally unaffected by the nation's struggles: his whole career was changed by the Act of Uniformity, and he

1 *F.C.* p. 181: yet in the seventeenth century East Anglia produced a cluster of men famous in science: cf. Pledge, *Science since* 1500, p. 53.

2 Cf. *F.C.* pp. 168, 290: 'the Braintree carrier inns at the Pewter Pot in Leadenhall Street and goes out of town on Friday morning weekly.'

3 *F.C.* pp. 147–8: the post-boy called at Dewlands to deliver and collect.

4 *F.C.* pp. 17–18. 5 *Mem.* p. 130.

6 To Lister, 18 June: *F.C.* p. 113; the raid had been on 10–13 June.

7 *F.C.* p. 204.

was keenly interested in religious and social movements. But his upbringing had given him no share in the world of government and enabled him to find full satisfaction outside the realm of politics or business. When he realised that if he was to be true to his conscience both fields were closed to him, he accepted the verdict without regret. To live a recluse and a student in his own village and family was his deliberate choice.[1] He was no misanthrope nor pedant: he had indeed a genius for friendship: but he welcomed the world of personal relationships rather than that of ambition, of causes and activities; and was happy.

That he should have found his outlet not in philology or archaeology, subjects then attracting attention, but in the comparatively neglected sphere of botany and zoology, is perhaps also due to his early environment.[2] Black Notley and its neighbourhood are not rich in historic or antiquarian remains. But Stock Doves still nest in the trees round its church; Purple Emperor butterflies were once not uncommon in its woods;[3] the Gladdon Iris still grows 'ad sepes sed rarius where I now live at Black Notley, not far from the Parsonage towards Braintree';[4] and there are Brimstone butterflies and an abundance of marsh plants (even if not now 'the Black Currans or Squinancy-berries'[5]) 'by Braintree river side near the bridge called Hoppet-bridge'[6] which he crossed daily on his way to school. Gardens, though he complained of Dewlands that its soil was cold and its aspect ill-situated, fascinated him, and the little plot behind the smithy was no doubt then as now bright with flowers.[7] Even if he did no scientific work until after his election to a fellowship in 1649 he must have been profoundly interested in nature; for his breadth of range, his power of

1 So his friend, Benjamin Allen (cf. *Essex Naturalist*, XVII, p. 11).

2 It is significant that of the only two reminiscences of his youth in all the mass of his writings one should refer to a plant: 'I remember that when I was a boy I saw the flower of a Buttercup exactly like that which J. Bauhin describes. It was then frequent in gardens near my home': *Hist. Plant.* I, p. 583, dealing with *Ranunculus repens flore pleno*. The other is of a proverb recalling schoolboy antipathies:

'Braintree for the pure
And Bocking for the poor,
Cogshall for the jeering town
And Kelvedon for the whore':

cf. *Collection of Proverbs*, pp. 227–8.

3 He described it when it was new to science: *Hist. Insect.* pp. 126–7.

4 *Syn. Brit.* II, p. 234: for its abundance to-day cf. J. Vaughan, *Wild-flowers of Selborne*, p. 130—an attractive account of the neighbourhood.

5 Cf. Gibson's edition of Camden's *Britannia*, c. 364: reported lost by G. S. Gibson, *Flora of Essex*, p. 124 (1862).

6 Still called Hoppit Bridge on the road from Black Notley; rebuilt 1925.

7 Among his earliest work was a Catalogus Plantarum non domesticarum quae aluntur Cantabrigiae in Hortis Academicorum et Oppidanorum (*General Dictionary*, VIII, p. 693). This was adumbrated in a letter of 1660 to Willughby (*Corr.* p. 2), but was never printed and now seems to be lost. See below pp. 108–10.

acute and accurate observation, his flair for discriminating the vital from the superficial, bespeak not only natural gifts but early habit. He had the authentic love of living things, animals, birds, insects and plants, of the countryside and its denizens, which marks the real naturalist. He enjoyed seeing their growth, watching the development of seeds and the change from caterpillar to chrysalis; and never lost his sense of the continuity and wholeness of the process. He was eager to see them alive and in their natural setting; and though much of his work later in life had to be done from books and dried specimens he always deplored the lack of first-hand field-work and was ready to travel anywhere in order to observe for himself.[1] Only a boyhood spent in daily contact with wild nature could have given him this vital part of his equipment. His greatness as a scientist is constituted by this double capacity: the refusal to concentrate upon one phase or part of an organism to the exclusion of everything else, and the refusal to supplement verified knowledge by guess-work or speculation. If much of his achievement was in the task of description and classification, of discovering synonyms and collating records, yet he belongs to the company of Gilbert White and Richard Jefferies, of Hudson and Selous, rather than to that of the academic and 'museum' scientists.

We can go further and ascribe to the direct influence of his parents some of the outstanding features of his work.

His father was a craftsman. If in 1851 the smithy had fallen upon evil days, it still bore signs of former prosperity;[2] and in Ray's time, when all the transport of the country was by horses and roads were still dangerously bad, the blacksmith was a man of importance. Few crafts require a more exacting artistry; few, as some of us are old enough to remember, are so fascinating to the young. John Ray must have spent many hours watching the delicacy and strength of his father's work and drawing from it his enthusiasm for methods of manufacture. When he visited and described the silver mills at Machynlleth or the alum works at Whitby, the smelting of Sussex iron or the refining of Cornish tin,[3] he revealed an interest native to him, an interest which had a profound effect upon his work as a scientist. It was this desire to see how things are made and how they function that gave him his conviction of the importance of anatomy, his skill in dissection, his insistence that specific distinctions must be based upon structural characteristics, not upon colour or size or habit. It is very unusual to find the poet's sense of wholeness and life combined with the craftsman's

1 Thus in 1671, in spite of ill-health, he travelled with Willisel to the north to see for himself plants of which Willisel had sent him dried specimens.

2 Cf. *Cottage Gardener*, v, p. 221: in *Essex Review*, IX, pp. 243–5 J. W. Kenworthy suggests that Roger Ray was a man of property, a master smith who also farmed his own freehold: this is not impossible, but is hard to reconcile with John Ray's statement to Aubrey, see below, p. 17.

3 These are described in detail in the first edition of his *Collection of English Words*.

concern for details of construction and process. If Ray always refused to isolate one set of characters from the total make-up of the organism, he was equally insistent upon the exact exploration of each particular organ. His birthright on his father's side qualified him for a serious attempt to base taxonomy upon a study of comparative anatomy and physiology. His field differed from that of Grew or Swammerdam, Malpighi or Leeuwenhoek: he had no laboratory nor even a proper microscope:[1] but he was prepared to accept Grew's discovery of the function of pollen and Leeuwenhoek's of spermatozoa and to anticipate Malpighi in the study of cotyledons.

His mother's gifts to him were at once more profound and more specific. We know nothing of Roger Ray save his trade and the fact that he gave his son the best education in his power. Of Elizabeth we have a single sentence in Derham's Life, and the note written by her son on the day of her death 'March 15th 1678' (1679 new style)

being Saturday, departed this life my most dear and honoured mother in her house on Dewlands in the hall-chamber[2] about three of the clock in the afternoon, aged, as I suppose, seventy-eight; whose death for some considerations was a great wound to me. Yet have I good hope that her soul is received to the mercy of God and her sins pardoned through the merits and mediation of Jesus Christ in whom she trusted and whose servant she has been from her youth up, sticking constantly to her profession and never leaving the church in these times of giddiness and distraction.[3]

From her he got his religion, the motive evident and avowed in all his work; the faith that could see life steadily and see it whole, interpreting it not piecemeal or mechanically but in terms of the many-coloured wisdom which created and controlled it; the conviction which could surrender success and security for conscience sake, and so gain unforeseeable opportunities for scientific work; the principles which made him indifferent to money[4] or a career, sensitive to the worth of others, 'charitable to the poor according to his ability, sober, frugal, studious and religious, allotting the greatest part of his time to the service of God and his studies'.[5] No doubt much of his thought on the subject was expressed in the terms of the time, in the familiar language that his mother would have used; certainly he

1 *F.C.* p. 193: Ray comments on the work of Grew and others: 'I confess for want of a good microscope I have not observed them for myself': in 1692 Aubrey sent his wife and daughters a 'glass microscope' (*F.C.* p. 175), probably the sort of simple lens which he had always used.

2 I.e. the bedroom above the central room of the three into which the house was divided—Kitchen, Hall, Parlour.

3 *Mem.* p. 37 note. Ray may have inherited from his mother the land at Hockley mentioned in his will: cf. below p. 481.

4 Thus of the *Synopsis Britannicarum* he wrote to Robinson (epitomised *F.C.* p. 292): 'would publish for profit not want if had his due, but not genius to be importunate'. In fact he received £5 for it; and it became the standard British Flora for a century!

5 So his friend Samuel Dale: *F.C.* p. 7.

belonged to an age of transition; and we must not read into him, as some of his eulogisers have done, ideas of religion or of science that belong to a later century: but when Benjamin Allen reports him as saying that 'a spoyle or smile of grass showed a Deity as much as anything'[1] he expresses an outlook radically different from that of almost all contemporary Christians, an outlook which aligns him with Whichcote or Cudworth and far apart from the protestants and the traditionalists of his day.

Derham's comment upon Ray's mother draws attention to another trait that he derived from her. 'She was a very religious and good woman' he writes, 'and of great use in her neighbourhood, particularly to her neighbours that were lame or sick, among whom she did great good especially in chirurgical matters.'[2] When her son declares that he 'was by natural instinct devoted to the study of "res herbaria" from his earliest years',[3] we can see the origin of his interest. The herbalist and herb-woman held then a respected position not only among the ignorant but with the higher ranks of the medical profession. The 'uses and virtues' of plants were not only an essential part of botany; they were the chief incentive to its study. Dioscorides among the ancients and many workers in the previous century had developed a vast and curious lore; and if by some of its students the subject was mixed up with superstition and magic, by others it was pursued in a worthily scientific spirit. Ray gives explicit evidence that his own approach to botany was aesthetic and intellectual: he enjoyed plants and wanted to know them.[4] But even in his first book pharmacology has its place, and in the *Catalogus Angliae* there is a huge collection of prescriptions and a long list of diseases with the herbs appropriate to their treatment. Though as he insists he is not a medical man his knowledge of herbal practice is manifestly wide and enlightened. He will have nothing to do with the doctrine of signatures, still less with astrology and alchemy, and constantly pleads for observation and experiment. He may well have found his mother's example an incentive both to the appreciation of traditional practice and to the investigation of its improvement. For one who stood, as he did, between the old world and the new such a course was plainly the way of wisdom.

This matter of his attitude towards the problems of a time of transition is of primary importance for a right understanding of his work; and for us living in a similar period it has contemporary interest. His birthright, if it relieved him of direct concern for the world of affairs, qualified him for a place among those who were turning from the turmoil of politics to the exploration of nature; gave him a singular capacity for its enjoyment and investigation; and enabled him to grasp the general principles and employ

1 Miller Christy in *Essex Naturalist*, XVII, p. 11.
2 So Derham, *Mem.* p. 37.
3 Preface to *Catalogus Angliae*.
4 Cf. Preface to *Catalogus Cantab.*

the skilled technique of the scientist. But in his day there was no such body of organised knowledge as we now possess. On the contrary, there was a chaos of legend and superstition; of traditional lore gathered from Aristotle, Pliny and a dozen other ancient writers into the vast pandects of Aldrovandi; of fantastic hagiology and demonology preserved in medieval bestiaries and fostered by folk-tales and magic; and of scarcely more credible stories, 'The anthropophagi and men whose heads Do grow beneath their shoulders', of strange beasts and birds, sea-monsters and upas-trees, brought back by travellers from America and the East, and sufficiently often proved correct to forbid their summary rejection. If the unicorn was a fiction, what was to be thought of the narwhal or the hippopotamus? Was he to refuse the roc and yet accept the condor? to challenge the use of lungwort for tuberculosis and act upon the power of Jesuits' bark[1] against malaria? What was a student to believe out of the mass of claims old and new? How was he to strike a mean between credulity and scepticism? In the very year, 1682, in which Ray published his first *Methodus* or classification of plants with its momentous recognition of the systematic groups of dicotyledons and monocotyledons three women from Somersetshire were executed for witchcraft after a trial in which solemnly attested charges of bird familiars and criminal intercourse with the 'black boy' were argued, recorded and found valid.[2] Which world was real?

Only those who fail to appreciate the confusion of the time will criticise Ray's attitude towards it. He is ruthless in his demand for evidence and his rejection of the legendary and the irrational. He denounces witchcraft, but unlike his friends Sir Thomas Browne[3] or Andrew Paschall[4] never suggests that he believes in it.[5] He sweeps away the litter of mythology and fable; treats Aristotle with respect, but accepts or more often denies his conclusions in accordance with the evidence; sets his face against travellers' tales and weighs his authorities without prejudice; and always insists upon accuracy of observation and description and the testing of every new discovery. There were many who clung to tradition and denounced the new knowledge as impertinent and blasphemous; for them he has his answer and gives it unequivocally: nature is of God; its study is His

1 Cinchona, quinine, whose discovery and sensational effects were stirring the whole medical profession.

2 Howell's *State Trials*, VIII, pp. 1017–40: in 1661, when Ray visited Edinburgh, he saw the heads of Argyll and Guthrie on the city gate and the Tolbooth and noted that 'women were burnt for witches to the number of 120': *Mem.* p. 157.

3 He affirmed his belief in witches (*Religio Medici*, p. 43) and gave evidence against two at Bury in 1664: cf. *Works* (ed. Wilkin), I, p. lxxxii.

4 Four letters from him to Ray (*Corr.* pp. 271, 279, 280, 282) deal with tides and manna: but he contributed a poltergeist story to *Saducismus Triumphatus*, pt. II, pp. 281–8.

5 As did Jeremy Taylor and Richard Baxter, Henry More and Joseph Glanvill, all men of liberal and enlightened outlook.