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**The Epping Forest Survey.**  
SECOND YEAR.

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1944.

## The Epping Forest Survey.

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### Progress Report.

By the Council of the Chingford Branch.

**F**OR reasons which, it is hoped, will not apply in 1944, it has not been possible to make a great deal of progress during 1943 with detailed work at the Cuckoo Pits.\* In consequence it has seemed wiser to postpone reports on this work until next year. However, two important general investigations have been made, concerning the forest area as a whole. These are: (a) A new presentation of the history of Epping Forest, the work of Mr C. S. Bayes; and (b) The climate of the forest, as represented by the rainfall and temperature records for Chingford; the analysis has been made by Dr D. G. Tucker from the original observations (over 40 years) by Miss M. L. Mathieson.

The history has been presented as a lecture by Mr Bayes to both the Branch and the Central Society, and is published in this report in a somewhat abridged form. The rainfall and temperature figures have been analysed in considerable detail for Branch records, but again only a summary appears in this report. The original papers are available for inspection, if required.

### A Historical Sketch of Epping Forest.

By C. S. BAYES.

On such days as August Saturdays before the war, when Chingford Plain was a white waste of paper, and even in the deepest thickets the drone and wail of traffic quivered in the songless, sultry air, the lover of Epping Forest could wryly reflect that, by some turn of fortune now sinking into the lap of history, this unique area had been preserved for the enjoyment of the people.

In the popular sense of the word, "forest" means thick woodland, and Epping Forest is certainly that. But the legal and etymological meaning is "place of wild beasts," which the Forest is also; and since Danish times the wild beasts were understood to be "beasts of the chase," which exist to-day in the dark, softly-moving forms of the fallow deer.

There have been deer in these parts for more than ten thousand years, though in those farthest times they were reindeer. They roamed about the snow-swept, moss-covered ridges among patches of stunted birch and arctic willow. As the climate became moister with the northward movement of the ice-cap, the reindeer moved northward, too;

\*A preliminary account of this work was published last year in *The London Naturalist*, p. 43.

and in the pine-woods which later spread, red deer lived and moved. The pines in turn gave place to oaks, and by 7000 B.C. a vast oak-forest was firmly established on all the ridges and uplands of Essex. Human life was concentrated on the borders of streams, for the forest impeded movement, and man the hunter gave way to man the cultivator, for whom the forest was not only a dark horror full of evil spirits, but the home of his enemies, the wild animals.

Though many peoples from the continent of Europe came, and introduced their ways of life and passed on, it was not until the Celtic tribes of Upper Austria arrived in the Lea Valley about 600 B.C. that the forest was used with some freedom and lack of superstitious fear. These people, the Trinobantes, lived in pile-dwellings at the edge of the Lea, kept cattle, and tilled the gravel terraces above (1). They knew that the Lea was the highway and the entrance to their lands; and that where they had come, others could also. So they built stockaded dwellings as protection against man and beast, and hill forts for shelter and defence. Cobbins Brook and the Ching Valley led to the forest uplands by easy gradients, and along these routes retreat was made in times of difficulty. To this period probably belong Ambresbury Banks and Loughton Camp. Wild cats, wolves and boars lurked in the woods, and beavers built their dams in the river.

These people were unconquered by later invasions and by the time of the Roman occupation had a dense population. They had chariots; and chariots indicate roads. Their dwellings started the Essex tradition of timber and plaster (2). The story of their subjugation by the Romans, and of their smouldering resentment culminating in the resistance of Boadicea, has been fully chronicled. Legend has long connected Ambresbury Banks with the great battle described by Tacitus (3); suffice it to say that his description of "a position approached by a narrow defile, closed in at the rear by a forest," may possibly refer to the Loughton-Epping area.

Colchester was the Roman centre for the Eastern Counties, and from there Stane Street led to St Albans and the Great Road to London, both of these having later significance as forest boundaries. It is probable that the Romans cut down considerable portions of forest, chiefly alongside the roads, for greater safety, and near the settlements for cultivation.

Roman rule ended in disorder at the beginning of the fifth century; the new Teutonic invaders, seeking sanctuary and settlement in these islands from the westward-thrusting Huns, had little use for the forest, which they feared, though they settled fairly thickly in Essex (4). But in all these centuries before the Norman conquest, and in spite of the variety of new immigrants, there is little to suggest that the forest of Essex was changing. One clue is the place-name ending "-field," whose original Scandinavian meaning is "clearing in the forest" (5). The distribution of such names is significant in that few are in the extreme east of the county.

Royal huntsmen are mentioned first in the colloquy of the Abbot Aelfric, written in the tenth century, and their job seems fairly pleasant. The wild beasts were driven by hounds into specially-prepared nets, or were run down on foot; boar, hart, roe and hare, whatever were the spoils, were presented to the King, who, in return, fed and clothed the hunter well, rewarding him with horse or bracelet for special skill. Better his lot than the ploughman or shepherd in the same record, toiling long hours, fighting off the wolves and protecting the plough-oxen from thieves by night. But the royal interest in the forest was becoming exclusive; and it is certain that forest laws existed under Canute, and that the penalties for breaking them fell on all, bar abbots, bishops and thanes.

1066 can conveniently mark for us the end of the period when the forest-wastes were merely the acorn-grounds for pigs, and no-one's especial property and care. William the Conqueror's first and fundamental assumption, on which all his laws were based, was that he was the legal owner of all the land in England. Thus, the lords of the manors held their lands directly from the King, to whom they owed fees and service (6). But the forest, with everything that grew or lived within its boundaries, was the absolute property of the King and its sole purpose was royal sport. A thorough social and administrative change was wrought by the Norman (7) and the new forest laws, savage in their severity, applied to all Essex save a small portion in the north-west.

The new organisation was efficient and complete, and it is only possible to summarise the system here. The forest was divided into "walks" each under a forester, whose duty it was to preserve the rights of "vert and venison," to arrest offenders, and present them at court. His office was held direct from the King and was transferable only by royal licence. Other officials were the woodwards, whose care was the timber; regarders, who had to report encroachments on the forest; agisters, who superintended the feeding of domestic animals; and reeves, who branded the cattle. Apart from these key-men were plenty of under-keepers and huntsmen (8). Minor offences were tried and punished at the Court of Attachments (held every 42 days by the verderers); another Court, that of Swainmote, met three times a year to hear more serious charges, but could not pass sentence; it passed the cases on, a year later, to the Court of Justice Seat, presided over by the Chief Justice of Forests, who had the final decision.

Punishment not only included imprisonment and heavy fines, such as £10 for a mad dog loose in the forest, and £60 if it bit a wild animal, but bodily mutilation and death. To assault a forest officer meant the loss of the right hand, and a serf who chased and killed a royal stag forfeited his own life. Nobles and ecclesiastics were largely exempt, and were tried only if they killed a stag without permission. (Seeing that the church collected a tithe of the fines there is, of course, no reason why the Abbots of Stratford and Waltham should wish the punishments lighter for their less-privileged brothers). But if a serf

so much as caused a hart to run so that it panted for breath, he was scourged—or, in the exact word of the law, "he shall lose his skinne," literally (9).

The distribution and numbers of the animals were changing meanwhile; the wild boar, which had been so plentiful and destructive in the days of Canute, was now under special protection as a "beast of the chase"; and wolves were probably extinct by this time.

It is one of the truths of history that in the wake of the dictator comes chaos. So after William died, there were stormy years when barons and King struggled for mastery. Henry I and Stephen gave away much of the forest to keep the support of their friends, and Henry II on his accession promptly put the lands back in his domain. Richard I subsequently sold much of it again to get money for the Crusades. This state of confusion lasted till 1217, when the *Charta Forestae* was forced from Henry III. The load of tyranny was lightened somewhat; freemen were now permitted to plough their lands within the forest boundaries, the right of pannage, i.e., keeping pigs in the forest, was restored, the boundaries were set as in 1154; and, very important, the penalties were revised in the tenth heading:

"No man shall henceforth lose either life or member for killing of our Deer. But if any man be taken, and convict for taking of our Venison, he shall make a greivous fine, if he have any thing whereof; and if he have nothing to lose, he shall be imprisoned a Year and a Day; and after the Year and Day expireth, if he can find sufficient sureties, he shall be delivered; and if not, he shall adjure the realm of England."

Cap. 13 is of interest to us in hinting of the abundance of large birds six hundred years ago: "Every Freeman shall have, within his own Woods, ayries of Hawks, Sparrow-Hawks, Faulcons, Eagles and Herons; and shall have also the Honey that is found within his woods."

It was a feature of the Forest that, though unfenced, it had definite boundaries, determined by perambulation. In 1225 such a perambulation, ordered by the King in accordance with the *Charta Forestae*, Cap. 1, was undertaken; and having been "viewed by good and lawful men" only the south-western quarter of Essex was judged to be Royal Forest. This result was not to Henry's liking, and in 1227 he quashed the charter. By 1250 he had foresters, verderers and all the other officials all over the county, even at Tendring and Tiptree; yet it is judged that long before this the wooded parts of Essex lay mostly west of a line drawn from Tilbury to Haverhill (10).

It is, of course, not to be wondered at, that the Kings should attempt to keep as much land as possible under Forest law, for it meant additional revenue to them; the only administrative change was that, whereas formerly the laws had been the fruit of their own despotic whim, there was, since 1225, a small advisory body of councillors. In 1277, Edward I issued a proclamation that "The Forest of the Lord the King in Essex is from the bridge of Stratford unto the bridge of Cattywad in length, and in breadth from the Thames unto the King's highway which

is called Stanestrete." But increasing disaffection made him consent to another perambulation in 1301 and the 1225 boundaries were roughly restored (11). Perhaps it is significant that, about this time, the forest was being called, not the "Forest of Essex" but the "Forest of Waltham" (5); at the latter place, a hunting-lodge had existed for many years (12). And the Charter was confirmed subsequently by Edward III (1327), Henry IV (1405), and Henry V (1416) (13).

Just as important as Kings to the forest, and not nearly so much trouble, were pigs. They played an immense part in the economy of the countryside, and the right of pannage reflected this. One of the features of the Domesday Book is that the number of pigs in each parish is listed; this gives a clue to the extent of the forest, for acorns and beech-mast were their food. Using as a basis the number of pigs per 100 acres, Dr Round has calculated that a thick belt of woodland continued beyond Epping through Ongar as far as Thorndon, near Brentwood. Farther north, the Takeley area contained particularly dense woodland. Pannage meant that from the middle of September to the middle of November each year, pigs with rings on their noses (that was a rule) grubbed in the forest, and the owners paid one penny per pig for the privilege.

Not all animals were so favoured: sheep were severely restricted as the deer (especially red) refused pasturage where they had fed, and goats were a dire offence as they tainted the pasture. Any found were immediately seized without redress, fifty-six being so confiscated in 1323 alone. Geese were also taboo (8).

Cattle were allowed on the forest for eleven months of the year; for the remaining period, called the "fence-month," from 21st June to 21st July, the deer needed quiet and protection. However, the number of cattle allowed was regulated, and if at any season, food had been scarce, they were barred from the forest. All had to be branded with the mark of the parish, being a letter usually surmounted by a crown. (This system of intercommoning of parishes was unusual for England, though bearing a resemblance to the mark system in Germany) (14). Any cattle not removed from the forest in the fence-month was impounded, and auctioned after seven days at Epping, Waltham Abbey or Romford.

Not only were cattle withdrawn from the forest during this time, but the regulations against men were tightened also. Even in normal months, a toll was exacted from whosoever required passage through the forest, on account of the disturbance to the wild beasts, and it was absolutely forbidden for a cart to leave the highway; but in the fence-month special permission was needed to enter the forest at all.

The number of deer must have been enormous in mediaeval times. There are many records of fee-deer, that is, yearly gifts; and many nobles were presented with deer to stock their parks, thirty or forty at a time being often granted. Hard winters and disease wore down the numbers when they became too prolific, and in 1489 alone, 316 were found dead, mostly of murrein (8). Fallow-deer were by now commoner and the roe was also in fair numbers.

Every deer found dead or wounded had to be reported by the foresters, and some of the records make interesting study. "A doe killed at Rokoll (Leyton) by butcher's dog of Edmonton and given to ye poor;" "A buck found killed with pitchfork and hanged up;" "One buck found with back broken fighting with one of its fellows;" "A buk smyte with a smale arrow, ded and lost. God save the Kyng." Several of the deer thus found are mentioned as being given to the poor, and our hearts are duly warmed by this generosity. But a true explanation is found in an unimpeachable source: "The ordinance that flesh of wounded or dead deer is to be sent to the nearest leper's house, or, if none is near, to the poor and infirm, must be intended to apply only to such deer which are not sweet or fit to be eaten by the better sort of people" (15).

Poaching was obviously common in spite of the fact that to keep cross-bow or nets was an offence in itself, and that even to keep a dog capable of hunting was forbidden to laymen with less than £2 per annum and priests with less than £10. (This distinction is certainly curious and probably significant.) Even keepers were forbidden to have bows and all dogs within ten miles of the forest were examined at intervals to have three claws from each foot chopped off. A few of the privileged landowners were allowed by special royal licence to hunt with a specified number of dogs for specified animals, usually badger, wild cat, fox and hare. But they were not allowed to hunt at night! (8).

To realise how fully the whole forest administration centred on the deer we need consider only the rules governing the woodlands. No man might cut down a tree, even in his own freehold. If, in an estate, it were possible to see five felled trees at once, the wood was judged waste and seized on the King's account. Every owner had to appoint a woodward; if he failed, or if he were neglectful, the woods were seized by the King. (Of course, it must be understood that they were recoverable—at a price.) All woods had to be fenced, with fences low enough for a doe and her fawn to pass over (9). Some ingenious owners therefore made "deer-leaps," whereby the deer could jump into the estate but not out again.

Vegetation which was the food of deer—the pear, crab-apple, thorns and holly—formed a special class, of which the King's woodwards had special care. One of their main tasks was the supervision of pollarding. This was a privilege enjoyed by the occupiers of houses in the manor and parish of Loughton to lop for their own use as fuel, from 11th November to 23rd April, the boughs and branches of trees about six feet from the ground. Monk Wood was not allowed to be touched, and to lop trees marked by the woodward for future growth was a punishable offence.

For five hundred years the sovereigns of England hunted in Waltham Forest. Queen Elizabeth was a frequent visitor though the hunting lodge with which her name is linked is thought to date from an earlier reign (16); by the end of her reign the forest laws were being disregarded. Poachers were much bolder, worked in gangs and gave a rough time to any keeper who tried to interfere. They still used both cross-bows and long-bows, presumably because of their silence. Small houses and cot-

tages were springing up on forest land, together with brick-kilns and gravel-pits. This encroachment was no new thing, for as far back as Henry III there are long recorded lists of fines for the tillage of forest clearings (12).

The accession of James Stuart saw a great stiffening of the rules; he hunted frequently and threatened to revive the forest laws in all their severity. The position of the inhabitants was hard; and prosecutions were so numerous that a gaol was built at Stratford, solely for forest offenders. One legacy of his reign remains to-day—the road from Goldings Hill to Epping, finished in 1622 (17). Charles I made an attempt to restore the forest boundaries of Edward I, that is, from Stratford to Manningtree. There was a court to sanction this and its procedure is enlightening: thus, Sir John Finch, the King's Advocate, "pressed the jury to give a verdict without going from the box: but the foreman making some scruple he fell into a rage, threatened and swore that he would have a verdict for the King before he left; threatened whoever voted against the King, and refused a view of his documents." The object of this extension of boundaries was simple; to get the money that Parliament refused him. The method, too, was simple: owners of houses and estates were fined for having encroached on forest land. If this crippled them, they had to go. But if they had any money left, they could then pay to have their land removed from forest law. By this means, £300,000 was raised in Essex by 1640. In that year it was announced that "His Majesty, understanding that Forest laws are grievous to subjects of this kingdom, out of his grace and goodness to his People is willing that the Bounds be reduced to same condition as before" (18). (Essex was very pro-Cromwell in the Civil War.)

The Commonwealth brought the first sharp break in forest history; no longer was the Forest for the King's "pleasure, disport and recreation from these pressing cares for the publique weale and safetie, which are inseparable incident to their Kinglie office" (19). The first order was that all forest belonging to the late King was to be sold for the benefit of the Commonwealth. In a few years we detect a change, for in 1654, His Highness the Lord Protector ordered the restoration of forest rights and the letting of enclosures (8). But there was immense wastage during this period due to the lack of responsible officers, and in 1664, after Charles II had been reigning four years, the chief ranger of Waltham ordered that no fallow or red deer should be killed in the forest for three years, owing to the severe destruction of game during the civil wars. And this was in spite of the fact that James I had caused some fallow-deer to be imported from Norway and transferred to Waltham Forest (12), from which time fallow far outnumbered red deer. By now, however, the forest was regarded as a utility, chiefly a nursery of timber for the navy, and fines for "vert" offences were heavy. There is a note of anxious alarm in this memorandum of 1670: "If many more pollard oaks are felled, all His Majesty's oaks in Waltham Forest will soon be destroyed" (12).

The lawless had quarry other than deer at this time; for the days of the highwayman were in full bud. The "Waltham Blacks" were notori-

ous and feared. They were originally discharged soldiers from the Civil Wars, living in a settlement at Waltham Cross. They were so powerful that they signed and sent a manifesto to the Government, and cavalry had to patrol the area every night for the protection of travellers (20). A verse by John Byrom sets the scene:

"Now then, as fortune had contrived, our way  
Thro' the wild brakes of Epping Forest lay.  
With Travellers and Trunks a hugeous load  
We hagg'd along the solitary road,  
Where nought but thickets within thickets grew  
No House nor Barn to cheer the wandering view,  
Nor lab'ring Hind, nor Shepherd did appear  
Nor Sportsman with his Dog or Gun was there;  
A dreary landscape, bushy and forlorn,  
Where rogues start up like Mushrooms in a Morn."

We note that by this time (1728), "Waltham" was no longer the forest title.

The feature of the early part of the 18th century in the forest was the positive mania for wood-cutting, 680 acres so disappearing between 1713 and 1723, while licences to stub up woods were also issued. The applications to cut down trees averaged 250 a year and the Lieutenant announced that he never refused leave either to cut or enclose (8).

One unfortunate effect of the enclosure movement was that the cultivation of the land fell into the hands of those who could buy or grab the complete fields essential to the new system. And naturally forest wastes were tempting. How this affected Epping Forest may be shown by the following recorded case (21). On 5th May 1766, Mr Fowell applied to the Leyton Vestry for leave to enclose a piece of ground; he was instructed to stake it out for inspection. On 9th June the Vestry considered and voted—6 for, 9 against. It, moreover, applied to the Lord of the Manor not to make any further grants of waste land "as the poor are already deteriorated by them." On 29th September it was reported that Mr Fowell had begun to build a wall round the land, and the Parish Beadle was instructed to inform him that unless it were immediately pulled down, the vestry would do so. However, the Parish Beadle was apparently ineffective—maybe he was not unbribable—for on 1st December notice was taken that the land had been enclosed, the vestry still being determined to remove the wall. A week later Mr Fowell appeared at the meeting: he no doubt gave excellent reasons why the wall should stand, and, as proof of his charity and goodwill, offered £100 for the poor of the parish. This offer was, of course, accepted, and so more public land was lost and Mr Fowell's heirs enriched for ever. In this true story are heaps of morals and only two unusual features: the first is that the parish meetings were not always consulted; the second that the sops to the conscience were usually nearer £5 than £100.

Previous to 1760, enclosures were only permitted by Act of Parliament and hundreds were passed (22). After that, anarchy reigned, and by the end of the century the 60,000 acres of Charles I's Forest were 12,000 only. But it was in this period too that one of the earliest natural history records appeared: for in 1771 Richard Warner completed his great "Plantae Woodfordiensis."

The Forest Courts were still functioning sporadically and half-heartedly and the Forest itself was being exploited to the utmost. A report of 1813 mentions gravel and sand-pits everywhere, with the turf stripped from whole acres of ground. Encroachments were continuous, timber destroyed, and deer-stealers abundant. (It was not for nothing that nearly every cottage in the Forest had a movable hearthstone.) The Court of Attachments virtually surrendered by declaring that it would not interfere with encroachments by public roads or where deer did not feed. The fact was that the laws were now obsolete, being framed for ministering to a King's pleasure no longer exercised.

The Crown was by this time represented by the Commissioners of Woods and Forests. In 1817 they made their first official attempt to convert Epping Forest to a patch of normal countryside. Their proposal was to extinguish the rights of common, remove the deer, uproot the trees and divide the land between Crown and Commoners. In spite of local opposition, a bill passed the Commons but petered out. No other official interest was shown for over thirty years, though it needed no interference from outside to destroy the rights of centuries: for the very man appointed to guard the Forest rights, the Lord Warden, ignored, destroyed and sold them. In 1831 he openly supported enclosures, and later sat on the Court of Attachments himself, claiming to be sole judge. A few officials tried to do their duty, but as one Keeper said, "Finding nothing done we gave it up in despair." The last of the Forest Courts was held in 1854 after an existence of at least seven hundred years (8).

Meanwhile Parliament had shown its interest again; it appointed a commission, and what is rare (and unfortunate in this case) acted on its recommendations immediately. This commission of 1849 made the amazing suggestion that the Crown should recoup itself for losses caused by unlawful enclosures, by making further enclosures of its own; that the deer should be removed and the land disafforested. An act was promptly passed for the disafforestation of Hainault Forest. 2000 acres containing 100,000 oaks and hornbeams were allotted to the Crown and the entire area was cleared of trees in six weeks by steam ploughs and drags. A few years later the Commissioners were able to announce proudly that the former precarious yearly income of £500 from timber-cutting had been succeeded by a farm rent-roll of £4000 (8). Philistinism had triumphed again and something beautiful had gone for ever. The popular view of Epping Forest in the late 18th and early 19th centuries may be well illustrated by quotations from Young's "Agriculture of Essex": "the . . . forests of Epping and Hainault are viewed as an intolerable nuisance . . . These forests . . . are well known to be the nursery and resort of the most idle and profligate of men . . . At pre-

sent they remain in a state of nature and are productive of no one good . . . As to enclosure . . . all must wish for such an event who are witnesses to the evils arising from its present state of barbarism" (23).

That this spirit was hard in dying is shown by the fact that the Crown disposed of their rights in 16,000 acres between 1856-63 at £5 per acre, encouraging and even bullying the lords of forest manors to buy them. In 1863, however, came a significant change when the House of Commons recommended that no Crown land within 15 miles of London should be sold or enclosed.

In Loughton the Lord of the Manor was the Rector, and in the 1300 acres he had fenced were trees used for lopping. An old man of seventy, Thomas Willingale, determined to lop where, by ancient rights, he had always lopped. In 1866 he, his son and two nephews struck the blow for justice, and the younger men were imprisoned (24). The Commons Preservation Society noted and acted, summoning in their turn the Lord of the Manor. The case hung on for several years, was never decided but gave valuable time during which further encroachments were prevented.

Nevertheless, the encroachers were strong and wealthy. A motion in Parliament suggested in 1870 that the forest be made over to the various landowners with 600 acres for public use. So black was the outlook that the proposal was nearly accepted. The Corporation of London, using as the key to their case, their rights as owners of 200 acres to pasture pigs on the Forest Wastes, took proceedings against the lords of sixteen manors to prevent enclosures. The suit began in 1871, and ended in 1874 with a decision that enclosures were illegal. Yet even then it was undecided what to do with them: the commissioners recommended easy terms for those who had bought forest land. As answer to this, a party of commoners began to pull down the fences.

Of the 6000 acres of forest land, half were enclosed (17). The deer were in a sad state. The last of the red deer had been removed to Windsor Forest in the 'twenties, but there were over 200 fallow in 1849. By 1855 the number had fallen to 86, in 1858 to 48, and in 1870 to 12, which included only one buck (8).

The final settlement came in 1878 when the Epping Forest Act was passed. The Crown rights, the Forest courts, officers, laws and customs were ended and the Corporation of London were appointed conservators. Queen Elizabeth's Lodge and the deer were transferred to them, and illegally-enclosed lands ordered to be thrown open. (Over 400 owners were dispossessed by this.) The owners of lopping rights, fuel-assignments and gravel-digging rights had to be compensated. The central duty of the Corporation was to keep the Forest unbuilt upon, to protect and manage it as an open space for the recreation and enjoyment of the public, to preserve its natural aspect, ancient remains, timber and underwood (9). And so 5530 acres of woodland were formerly dedicated to public pleasure on 6th May 1882, when Queen Victoria drove through to High Beach.

Though forest histories usually end at this point, what has happened since is far too important to ignore. The Corporation's policy at the

outset was very much that of providing a public playground; bye-laws put an end to the old gypsies, beggars, vagabonds and bird-catchers, and William Morris (25) lamented the retreats and steam roundabouts, saying that in his boyhood days the only foes of the forest were the gravel-stealer and fence-maker. Later in 1882 Wanstead Park was added to the forest; Oak Hill, Theydon, provided another twelve acres in 1889, and two years later, Highams Park was acquired. In 1899 Yardley Hill was added with its superb views over the Lea Valley, and the old Fairmead Lodge was demolished, its grounds being thrown into the forest. There were fears in those years that landscape-gardening was being attempted, and considerable protest at the practice of shooting deer by City gentlemen to keep their numbers down. The fallow-deer have maintained their numbers at about 120 in recent years, but the position of the roe-deer is very obscure. A few were released by Mr E. N. Buxton in 1884 and multiplied, but their successors have proved elusive, none having been seen since 1917 (26).

Vast hordes of people visited Epping Forest at Holiday-times at the end of the nineteenth century, and Chingford Station alone used to handle 37,000 trippers on Bank Holidays (27). In 1897 it was reported that the primrose, foxglove and Solomon's Seal were fast disappearing.

The years prior to the 1914-1918 war brought little change if we except the partial reforestation of Hainault Forest in 1903 and an attempted revival of charcoal-burning in the Cuckoo Pits in 1908-9 (28). (Though this had been illegal under the old forest-laws, records of prosecutions exist and an old coal-hearth has been reported in Lord's Bushes) (29).

After the war came the popularisation of motoring and the spawning of pink villadom, the ugly tide of brick creeping up and clustering round Chingford and Woodford and Loughton. Two things have prevented further spoilation; the first is the River Lea, which thanks to its previous lack of road-crossings, was an effective divide between the Forest and London. The second is the L.N.E.R. whose intensive suburban service was mainly limited to ten miles from Liverpool Street, and which leaves many forest areas quite untouched. But the coming electrification to Ongar, and the vast housing plans impending, nullify both these safeguards. And unless there are forthcoming additions to the Forest far larger than Knighton Wood, 40 acres of which became public forest in 1930, what remains comparatively remote and unspoiled will, all too soon, be but a memory.

Epping Forest, with its twiggy slopes of hornbeam, the spring sun on the beech-boles, the antlers among the bracken, its whispering groups of tits, and badgers sniffing the night-air, is a jewel of unpriceable worth and deserves a worthy setting. All who love it must be grateful for the liberty that is theirs, to wander freely in this old hunting ground of kings, their favourite of all the seventy Royal Forests in England: but they must never forget that the price of that liberty is unceasing vigilance.

## BRIEF BIBLIOGRAPHY AND REFERENCES.

1. A. R. Hatley: *Early Days in the Walthamstow District* (Walthamstow Antiquarian Society Publication No. 28), 1933.
2. Guy Maynard: "The Britons of Essex and the Roman Conqueror" (in *Memorials of Old Essex*, ed. A. Clifton Kelway), 1908.
3. Tacitus: *Annals*, xiv.
4. Rupert Coles: *Essex Naturalist*, Vol. xxiv, p. 115, 1934.
5. J. C. Cox: "Forest Records of Essex" (in *Memorials of Old Essex*, ed. A. Clifton Kelway), 1908.
6. H. W. C. Davis: *England under the Normans and Angevins*, 1905.
7. F. Bradshaw: *Social History of England*, 1921.
8. W. R. Fisher: *The Forest of Essex*, 1887.
9. E. N. Buxton: *Epping Forest*, 1884.
10. J. H. Round: *Victoria County History of Essex*, i, 333, 1903.
11. P. J. S. Percival: *London's Forest*, 1909.
12. J. H. Round: *Victoria County History of Essex*, ii, 615, 1907.
13. G. G. Turner: *Select Pleas of the Forest*, 1902.
14. J. H. Maitland: *The Domesday Book and Beyond*, Cam., 1897.
15. J. Manwood: *Treatise and Discourse of the Lawes of the Forest*, 1744.
16. W. W. Love: *Essex Naturalist*, Vol. xi, p. 151, 1900.
17. C. B. Sworder: *Essex Review*, Vol. xxxi, p. 66, 1922.
18. G. Shaw-Lefevre: *English Commons and Forests*, 1894.
19. Sir Robert Heath, 1628: quoted in 17.
20. T. B. Macaulay: *History of England*, v, 1861.
21. J. Kennedy: *History of Leyton*, 1894.
22. A. F. Pollard: *The History of England*, 1912.
23. A. Young: *The Agriculture of Essex*, ii, 132, 1807.
24. P. Thompson: *Essex Naturalist*, Vol. xxi, p. 157, 1926, gives the true facts of a much misquoted case.
25. J. W. Mackail: *Life of William Morris*, Vol. i.
26. J. E. Harting: *Essex Naturalist*, Vol. i, p. 46, 1887; F. J. Stubbs: "The Mammals of the London District," *School Nature Study*, 1917.
27. W. M. Acworth: *Railways of England*, 1890.
28. *Essex Naturalist*, Vol. xv, p. 46, 1907.
29. Miller Christy: *Victoria County History of Essex*, ii, 448, 1907.

The references are not so much authority for data, as indications where fuller information may be found. For general reading, Fisher's *Forest of Essex* is notable for a wealth of legal and historical detail, and Rupert Coles's "Past History of the Forest of Essex" (*Essex Naturalist*, Vol. xxiv, p. 115) deals exhaustively with the woodland densities and areas. Buxton's *Epping Forest* has a sound historical summary and Percival's *London's Forest* gives a wide and picturesque survey.

### The Climate of Epping Forest.

Detailed observations of the rainfall and minimum night temperatures have been taken in Chingford, by Miss M. L. Mathieson, over a period of about 40 years. It is thought that a summary of these observations will be of interest and value, particularly in connection with the survey. The following tables and particulars have been computed from the original records, and the Branch Council wish to express their gratitude to Miss Mathieson for making her note-books available to them.

(a) *Rainfall.*

The annual totals of rainfall show a wide variation (14.0 to 32.4 inches), and consequently a complete set of totals is given in Table 1.

TABLE 1.—ANNUAL TOTALS OF RAINFALL.

Year.	Inches.	Year.	Inches.	Year.	Inches.	Year.	Inches.
1905	22.0	1915	30.4	1925	24.0	1935	25.8
1906	23.4	1916	30.1	1926	27.7	1936	25.1
1907	23.3	1917	24.4	1927	30.7	1937	30.7
1908	24.0	1918	27.6	1928	25.5	1938	22.1
1909	26.6	1919	24.3	1929	22.8	1939	32.4
1910	25.2	1920	22.9	1930	26.8	1940	25.6
1911	24.3	1921	14.0	1931	24.5	1941	26.1
1912	25.7	1922	22.8	1932	21.3	1942	23.1
1913	21.9	1923	23.9	1933	18.7	1943	20.4
1914	25.4	1924	30.9	1934	20.0		

Annual Average, 1905-1941 = 24.92 inches.

Average for first six months of each year = 10.92 inches.

Average for second six months of each year = 14.00 inches.

The average monthly rainfall over the period 1905-41 is shown in Table 2.

TABLE 2.—MONTHLY AVERAGES.

Month.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Inches.	2.18	1.60	1.67	1.89	1.72	1.84	2.43	2.22	2.00	2.35	2.54	2.44

These figures do not agree with those published\* for various parts of Essex for the earlier period 1881-1915. However, they are in reasonable agreement with the figures for the 112-year period, 1815-1926, taken at Greenwich; see Table 3.

TABLE 3.—COMPARISON OF RAINFALL.

Period.	Chingford,		Greenwich,	
	1905-43.		1815-1926.	
January-March	...	5.45	4.98	
April-June	...	5.45	5.50	
July-September	...	6.65	6.91	
October-December	...	7.33	6.96	

Of course, the Greenwich figures are not strictly comparable, and the evidence suggests that 35 or 40 years is not a sufficiently long period to give stability in rainfall statistics.

The highest monthly rainfall over the 39-year period was 6.27 inches in November 1940. The wettest month of each year fell 9 times in the first half of the year, and 30 times in the second half; it fell only 4 times in the five months February to June.

The actual rainfall in 1942 and 1943 is given in Table 4.

\*The records used for comparison are conveniently summarized in the Land Utilization Survey Reports, Nos. 79 (Middlesex and London) and 82 (Essex).

TABLE 4.—RAINFALL IN 1942 AND 1943.

Month.	Inches.		Raindays.	
	1942	1943	1942	1943
January	2.06	4.69	15	24
February	1.11	1.29	8	8
March	2.30	0.40	13	6
April	1.14	1.21	8	9
May	2.37	1.53	14	9
June	0.25	1.60	5	10
July	1.49	1.32	9	11
August	2.35	1.49	15	13
September	1.49	1.75	13	13
October	3.87	2.19	16	13
November	2.27	1.57	13	16
December	2.39	1.37	20	9
Totals	23.1	20.4	149	141

(b) *Minimum Night Temperatures.*

The records of minimum night temperatures show a considerable constancy from year to year in the average figures of each month. Consequently only the 1943 observations will be given; these are shown in Table 5, all in degrees Fahrenheit.

TABLE 5.—MINIMUM NIGHT TEMPERATURES, 1943.

Month.	Average.	Lowest.	Highest.
January	34.6	21	45
February	33.4	20	45
March	32.9	23	46
April	41.0	30	51
May	43.2	33	58
June	48.7	42	57
July	52.0	40	59
August	50.9	37	61
September	45.5	27	59
October	43.4	29	56
November	34.6	24	52
December	31.7	21	44
Year	41.0	—	—

The averages given agree very well with the published figures for various parts of Essex over a 30-year period. The average maximum day temperatures are about 10° F. above the average minimums for the winter months, and about 20° F. above for the summer months.

The number of frosts occurring may be of significance, and is accordingly recorded in Table 6. The averages are for the ten years 1934-1943.

TABLE 6.—NUMBER OF FROSTS.

Month.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Total.
Average No.	15.0	13.4	13.2	6.3	2.2	0	0	0	0.1	2.1	7.5	11.4	71.2
No. in 1943	11	11	17	1	0	0	0	0	1	1	11	17	70



(c) *Hours of Sunshine.*

For completeness, it may be added that the total number of hours of bright sunshine averages about 1500 per year, or about 4 per day. Over two-thirds of the total is recorded for the six months April to September. No local records are available, but these figures are based on those for Enfield, only a few miles away.

D. G. T.