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JOHN DE PECKHAM

BY

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THE subject of this memoir has been claimed by many as the first English author of a work on optics and as the discoverer of concave lenses. His fame is, however, so largely overshadowed by that of his great contemporary, Roger Bacon, that many will dispute his title. We have tried by a study of his life to show the possibility of interaction between them and to form some estimate of Peckham's influence on the science of his time.

The foundations of optics were laid by Euclid in the second century B.C. and its superstructure added, bit by bit, often at intervals of several hundred years and in localities as far removed from its original (Alexandria) as Paris and Oxford. Three names stand out in the story, names of men whose views held sway for centuries after their death and many of whose observations are still undisputed. Claudius Ptolemaeus, the Alexandrian astronomer, remained a name to conjure with until the fifteenth century. The great Al Hazen exercised an influence even to the time of Kepler, while our own Roger Bacon, himself primarily inspired by the Egyptian, remains to-day the father of modern optics, and indeed of British science in its broadest sense. Bacon's life perhaps exemplifies as well as that of any of his predecessors the lack of contemporary recognition of an original mind. We think

of him as imprisoned, suspected and disgraced, but we must not forget that here and there even among his immediate confrères were some who recognised his genius, and some who also held his views. He did not in reality stand as completely alone in the possession of scientific knowledge as he no doubt did in his whole-hearted devotion to it. Among his contemporaries are two, both churchmen, and one, curiously enough, of his own Franciscan order, to whom his views must have proved acceptable. The one was Pope Clement IV, the enlightened pontiff to whose friendship and protection Bacon owed what little security for work he had, and the other was Friar John, afterwards John Peckham, Archbishop of Canterbury. In the case of the Pope the connection is clear and historically indisputable. In the case of the Prelate it rests on coincidences of time, place and expressed opinion, too strong, as we hope to show, to be ignored.

John Peckham was in many ways a remarkable man, for he showed a rare combination of executive ability and zeal for reform with an eclectic scholarship and a scientific attitude of mind.

The date of his birth is not certainly known. It is given by the Dictionary of National Biography as 1240, but this is not found in Hook's *Lives of the Archbishops of Canterbury*, 1865, and certainly does not tally with the latter's statement that Peckham died in 1294, "in his dotage." His birthplace is also uncertain, though it was undoubtedly in the southern counties, Sussex, Kent and Surrey competing for the honour. Cave, *Hist. Lit.*, says "ex infima stirpe apud Cicestrensis natus." This leads to the idea that he was born at Chichester, of humble parents. Members of a family of the same name were among the benefactors of Lewes Priory, and from the *Annals*, from the birth of Christ to the year 1312, written by a monk of Lewes, we learn that John de Peckham was at one time an inmate of the Priory. This establishment stood on the site of an Anglo-Saxon church dedicated to St. Pancras. William de Warenne, Earl of Surrey, in founding the Priory of Lewes, retained the dedication to St. Pancras, thus indicating that education was to be the prime object of the monks of his new foundation. Here John de Peckham received his education. Parker states "in coenobio de Lewes puerilem instructionem accepit."

From Lewes he went to Oxford. Again the date is doubtful. It is true that his name appears on the register of Merton, but this entry almost undoubtedly refers to his second period of residence at Oxford in the capacity of tutor, since Merton was not founded until 1264. His education was completed at Paris, whence he returned to Oxford and took his D.D. (Sanctae Theologiae Professor). Again we are at a loss for an exact date, but it is probable that his return to Oxford from Paris and his appointment

Jo. Archiepiscopi Cantuariensis
Perspectiua communis.

FIG. 1.

as tutor took place between 1264 and 1270. He was not yet a member of any monastic order, though his education had obviously pointed in that direction from the beginning.

The Franciscan Friars had arrived in England in 1224. Their numbers were at first small, and they were simply lodged in a house of the preaching friars in Holborn. Very soon, however, the reformatory zeal of the order began to attract novices and they were forced to hire a house of their own in Cornhill. The order rapidly gained in popularity, and by 1250 owned numerous religious houses throughout the country and could boast as well the inclusion of some of the most brilliant thinkers of the time within its ranks. Of these for our present purpose we can mention Roger Bacon and Thomas Bungey, both closely associated with Oxford and both remarkable for their scientific leanings. Bacon indeed was already in 1250 engaged at Oxford in the study of experimental physics and astronomy, and it seems not unlikely that Peckham, in his undergraduate days (presumably somewhere between 1250 and 1260), had already come under his influence. It is, however, certain that when Peckham returned from Paris to join his old university in a more official capacity he was immediately attracted to the order and joined it about the time of taking his doctorate. He was then appointed Chief Professor Regent to the Franciscan School, succeeding Thomas Bungey, whose scientific spirit, though little recognised to-day, earned him a place with Bacon in Robert Green's satirical comedy "Frier Bacon and Frier Bongay" three centuries later. To quote Hook, Peckham became "henceforth a vehement, though judicious partisan of his order; his new profession did not take him immediately from Oxford, where he formed one of that phalanx of learned friars, who were labouring, with success, to make their University famous among the schools of Europe. Like Roger Bacon he did not confine himself to theology but studied natural philosophy; he studied anatomy and was acquainted with the geometry of Euclid, the works of Aristotle, and the scientific treatises of the Arabians." We have thus an undisputed link, in thought at least, with the great Friar Roger. Peckham himself was a voluminous writer. Anthony Parkinson, in his history of the Friars Minor in England gives a list of fifty-six works. Of these twelve are still extant, according to Hook. They deal mainly with questions of ecclesiastical law and polity, dogma and heresies, and the majority of them were obviously written later in life after his second visit to the Continent in 1277. Three of them, however, *De Sphaera*, *Theorica Planetarum* and *Perspectiva Communis*, are purely scientific and belong to an entirely different category. The first two are astronomical treatises, the third is said to be the first text book on optics of English authorship, and as such was in constant

use as an undisputed authority until well into the 16th century. The exact date of its appearance is unknown, but in view of the fact that (as we shall explain later) after 1277 Peckham's life was an extremely busy and public one and that his entire activities seem to have been devoted to questions of church government, reform and politics, it seems extremely probable that these scientific works, which show both practical knowledge and a scientific attitude in advance of his time, were produced during the earlier years of quiet and uninterrupted study in Paris and Oxford. It is of interest that Bacon's *Opus majus* was completed in 1267, and that he then returned to Oxford, where he was engaged on a much larger work which occupied him until his imprisonment by Jerome of Arcoli in 1278. It is thus certain that Bacon and Peckham had ample opportunity for exchange of ideas since Peckham is known to have been in Oxford in 1275-6, and probably for five or six years before that. If in addition we admit the possibility of a meeting in Paris during Peckham's student days (Bacon was in Paris from 1256 to 1267), and a possible earlier contact at Oxford in 1250 the inference of interaction between the already ripening scholar and the impressionable youth from Lewes Priory becomes almost irresistible. The course of events subsequent to 1277 is conditioned by the characters of the two men. Bacon stands out as the whole-hearted investigator of truth, ready to suffer ignominy, persecution and disgrace if he can but continue his work, but Peckham is the active man of affairs, reformer, statesman and orator, and is inevitably distracted from the pursuit of scientific truth by an ever-widening sphere of administrative and political activity. This becomes apparent in 1277, when he is appointed Provincial Minister of the Franciscans for England, a position of both honour and responsibility. Thereafter his career is one of church preferment, semi-political intrigue and active and ardent reform; that ardour for abstract truth which had produced *De Sphaera* and *Perspectiva* made itself manifest as an uncompromising partisanship of justice and morality, and carried with it the inevitable consequence of friction and strife. Peckham was a stern man, intolerant of differences of opinion and disobedience. But if harsh to others he was equally severe with himself. "A tempore consecrationis suae ab esu carnum abstinuit," says the Chronicle of Lanercost. He set himself to correct abuses which already existed and to guard against others which soon after his time proved detrimental, if not fatal to the usefulness of his order.

The English Franciscan province was divided into seven districts, each with a custos, who was subordinate to the provincial minister. John de Peckham was the 9th (or according to Parkinson the 12th) provincial minister of the order in England. As such he went to live in 1277 in the Metropolis, where the Grey

Friars stood, on the site of the present General Post Office. Both Roger Bacon and Peckham contended against the narrow views of their superiors, who were antagonistic to learning, and Peckham is said to have been instrumental in founding the Greyfriars library. It was not completed until nearly a century later when it was rescued from decay by the munificence of Whittington.

Hook states that "as a leading man in his order, ambition was now satisfied." But Peckham found it essential, if he was to succeed in the correction of abuses, to have some knowledge of civil canon law. This subject was not in favour at Oxford, and he went immediately to study in Italy. His way led him through Paris and Lyons, at which latter place he was endowed with a canonry—a preferment which is said to have remained with the see of Canterbury for two centuries. At Rome his eloquence and ability attracted the attention of Nicholas III, who appointed him *Causarum Auditor* and *Lector Palatii*, but obliged him to resign the position of Provincial of England. He held office in Rome for two years, his duty being, among other things, to dispute with heretics who were summoned to Rome to substantiate their heretical doctrines. Peckham was at Rome when the Archbishop of Canterbury, Robert Kilwardby, arrived to assume his place in the *curia* as a cardinal, and Peckham "sore against his inclinations" (Angl. Sacra, Pt. I, p. 117), was appointed to succeed him as Archbishop. This appointment was a bit of papal usurpation, and how it was that the appointment was not resented and resisted by Edward the First does not appear. The chapter at Canterbury had already elected Robert Burnell, Chancellor of England and Bishop of Bath and Wells, but Hook states that Burnell made no objection as he probably found it more convenient to have a theologian than a statesman as Archbishop. Peckham was unwilling to take the post, but he had to yield and he was consecrated by the Pope on February 10, 1279. No sooner was he enthroned at Canterbury than the Pope sent in his little bill for 5,000 marks for board and lodging while Peckham was at Rome. To this bill Peckham demurred. He described it as "*horribilis in aspectu et auditu terribilis*." His predecessor, Kilwardby, had emptied the treasury at Canterbury of all the ready money to meet the expenses of his Cardinalate: the last year's rents had been taken into the king's hands. The Pope treated his demur with derision: payment was demanded and excommunication was threatened, but finally Peckham was given a year's grace to find the money. Meanwhile Kilwardby had died intestate, and the Pope claimed the administration of his goods. Peckham sent a lawyer to Rome to claim the 5,000 marks as a debt due to the see of Canterbury, or that failing, to propose that this sum should be set off against the demand against himself. But he was not so fortunate as to get

round the Pope; both the Popes and the mendicant orders were more used to receiving than paying, and His Holiness claimed the whole sum to give to the poor and for other pious uses.

Peckham was rather a thorn in the side of Edward I. The Archbishop's first act was to convene a synod at Reading in 1279 without first obtaining the royal sanction. Edward haled the Archbishop before Parliament and compelled him to revoke all the constitutions which had been passed to the prejudice of the royal prerogative or contrary to the rights and customs of the realm. It was natural that Peckham should have opposed the Statute of Mortmain, but of course his opposition had no effect. Hook states that Peckham, "though not instigating, did not oppose the severe methods adopted by Edward against the Jews." In ecclesiastical matters he was a stern disciplinarian, and diligent in holding visitations. At Chichester he sentenced a priest convicted of immoral conduct to three years' penance as well as enjoining a pilgrimage to Rome, Cologne and Compostella. At Salisbury he was for excommunicating a knight, but relaxed the sentence on condition that the offender should be publicly whipped in the church at Shaftesbury, and that he should perform a pilgrimage to the Holy Land. At Lewes he appeared in a rather more pleasant frame of mind, since he behaved with kindness and dined with the monks off their humble fare in the garb of a mendicant.*

*To show that John de Peckham was, for the age in which he lived, a broad-minded man, the following story from his register may be cited. A man was attacked by robbers and was found by neighbours at the point of death; he died before a priest could be brought to him and was buried in the high road. At this early date there was an intense horror of intestacy. The idea was that a man dying without having uttered his "*novissima verba*," or last words, before a priest, died unconfessed and was therefore unfit for burial in consecrated ground. As time went by men learnt to discriminate between the case of a man who met with sudden death, *subita et impreparata morte*, and the obstinate party, who, lying sick, refused to utter his "*novissima verba*," and make his confession, and died "desperate," as the saying was. In the present case the man was buried in the high road almost as a malefactor; but Peckham took a merciful view of the case:—"It is said that the poor wretch asked for a priest; if this can be proved, let his body be exhumed and buried in Christian fashion, for he did what he could towards making a testament." Before this order could be executed, the rector of Ightham died suddenly. The Archbishop ordered his commissary and the rector of another parish to take possession of the dead man's goods. His debts were to be paid, and the residue was to be disposed of according to the Archbishop's orders for the benefit of the departed.

It will be remembered that Peckham's predecessor as Archbishop had died intestate at Rome, and that the Holy Father had promptly annexed his goods together with a large sum of money which, in Peckham's view, belonged to the see of Canterbury, to spend in masses for his soul and other pious works. A contrary idea prevailed in Normandy; here the goods of the "desperate," as also those of the suicide, were confiscated to the Duke. The church was entitled to nothing, having done nothing for the man's soul. Perhaps John de Peckham knew of this rule and therefore may have considered that mercy was the best policy, so as to ensure the church getting her perquisites.

In any case this story throws a pleasing sidelight on the Archbishop, and can be set off against the opinion of Trivet, who, in his *Annals*, described him as *gestus affatusque pompatici*.

John Peckham died on December 8, 1294, according to Hook, though some authorities give the date as two years earlier. His body lies at Canterbury, in the north-west corner of the Martyrdom (the N.W. transept) under a most beautiful altar tomb of grey Sussex marble with pyramidal canopy of carved stone, and his effigy in black bog oak lies upon it. His heart is buried behind the altar of what is now Christ Church, Newgate Street, E.C., formerly the church of the Grey Friars in London. No inscription appears ever to have been placed on the tomb at Canterbury, and there is no record among the cathedral historians of one. Dr. Cotton, of Canterbury, has kindly informed us that Peckham's register is at Lambeth, and that the Canterbury Cathedral library, in his charge, contains only one book by Peckham, *De oculo morali*, printed by A. Sorg at Augsburg in 1475. This is a beautiful example of early printing. There seems to be some doubt as to whether this work is rightly ascribed to Peckham, but Dr. Cotton states that it is attributed to him by the printer and by the authorities of the British Museum.

Of his works, beyond the three scientific treatises which hold special interest for us, those still extant are :—*Quaestiones de Vanitate Rerum Mundanarum, super sententias*, lib. 4; *Quodlibetum; De Vanitate*, lib. 1; *De Paupertate; Questiones de Sacramento Eucharistiae; Haereseôn a se Damnatorum*, lib. 1; *Itinerarium Epistolarum*, lib. 1; *De Mysterio Minorum; Constitutiones Provinciales*. His *Collectanea Bibliorum* was printed at Paris in 1514 and reprinted at Cologne in 1541. In addition to his other abilities he seems in his youth to have possessed a streak of artistic genius, and a long poem, "Philomela," often attributed to his teacher in Paris, S. Bonaventura, is undoubtedly by him. His ecclesiastical works were famous at the time, but it is on his *Perspectiva Communis* that his scientific reputation rested. The manuscript is in the British Museum. Three editions were printed—the first in 1480, by Petreus Corneus, at Milan—the second and third in the same year, 1504, at Leipzig and Venice respectively. The work was in regular use as a text book at that time. The illustrations and extracts below are from the Venice edition. The book is arranged in three parts. The title page shows a fine woodcut of the author seated at a desk with three attendant disciples, within a black and white border of Florentine design (Fig. 1). The first part deals with the nature of light, its propagation in straight lines, the structure of the eye and nature of vision. As an example from Part I, Fig. 2 shows the section dealing with the question of the visibility of a star in daylight from the bottom of a well. The portions dealing with the anatomy of the eye are crude, the lens being shown, as in all the Arabian diagrams, in the centre or towards the back of the vitreous (Fig. 3).

The second and third parts of the book deal with the laws of reflection and refraction respectively. Plane and curved surfaces are considered and in the third section apparently occurs the famous mention of concave refracting surfaces, beginning "Concavitate

Prima

auferit intuidonem eorum que sunt ultra ignem, propter dictam cau-
fam. Conclu. IX.

LVcem fortem super quedam uisibilia orientem ipsa oculo
abcondere existente loco lucis temperatae.

Hoc patet quoniam luce forti oriente super corpus sculptum subtilibus
incisionibus sculptura non apparêt, necesse splendoris uisum occupans
impediente. Similiter multa sunt que posita in tenebra uidentur. luci
uero exposita disparant uel ad minus non lucent, sicut squamæ piscium &
ignis mediocri: eadem ratione propter excessum i. fortioris impressio-
nis excludentis impressiones debiliores. Concl. X.

LVcem fortem multa uisibilia ostendere que debilis occultat.

Hoc potest ostendi quia que in luce modica non apparent ad for-
torem deducta declarantur. Hec tamen propositio præmissæ uidetur
contraria si enim lux fortis abcondit, qualiter ostendit? Sed nota q. lux
fortis abcondit quando p. portionem eius excedit, quia tunc occupat
totam capacitatem sensus: aliter non. Concl. XI.

LVcem fortem ex materia flammea radiantem, maiorem in
nocte quam in die & de longe quam de prope infallenter ap-
parere.

FIG. 2.

FIG. 3.

diaphani densioris ad oculum versa accidit converso illi quod con-
tingit conversa ad oculum convexitate."

Whether this remark antedates their mention by Bacon in his *Perspectiva* is a moot point. On both Bacon and Peckham the influence of Al Hazen is predominant, but both have surpassed their master and along the same lines. Some writers even go so far as to claim for the Prelate the priority of discovery. Hirschberg (*Geschichte der Augenheilk. in Europ. Mittelalter*. Graefe-

Saemisch Handbuch, p. 281) states "die Brillen für Kurzsichtigkeit kamen erst um die Mitte des 16ten Jahrhunderts auf. Papst Leo X ist in 1457 mit seinem Konkav-glas von Rafael gemalt worden. In der Perspectiva Communis von Joannes Archiepisc. Cantuar., 1542, werden sie erläutert." Dr. Charles Singer also notes the coincidence and considers Peckham as possibly directly influenced by Bacon. He says of the former in Vol. II. of his *Studies in the History and Method of Science*, 1921, that "his views are mainly derived from Al Hazen, though perhaps partly from Bacon. His work was important as having drawn wide attention to optical principles, and from the fact that he refers to the possibility of concave glasses."

We have done our best to show that in coincidences of time and place we have much to support the intrinsic evidence of interaction between the two philosophers, though the final proof of priority of discovery, the date of publication, must of necessity be always lacking in data given to the world in manuscript only. In any case it is pleasant to reflect that, in spite of the accumulation of ignorance and prejudice which was the burden of the Middle Ages, there were already here and there men whose search for truth and whose interchange of ideas laid the foundation for our later learning and whose attitude of mind and practical knowledge bore a much greater resemblance to our own than we sometimes stop to think.

CATERPILLAR HAIR OPHTHALMITIS (OPHTHALMIA NODOSA)

BY

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CASES of serious damage to the eyes as a result of penetration by caterpillar hairs, are well recognised, but are of considerable rarity. It is worth while, therefore, to report the following case which recently came under my care.

A boy, aged 12 years, came to the Moorfields Eye Hospital on May 30, 1928, with a sore right eye. His tale was that whilst at play fourteen days previously, another boy threw a caterpillar at him, which struck him in the eye. He was an intelligent boy, and when asked what caterpillar it was, immediately said a "woolly bear." He was at once admitted to hospital.

On examination his right eye was greatly inflamed, with a general diffuse injection of all the ocular vessels; there was no staining of the cornea. The anterior chamber was about a quarter full of pus, and numerous fine deposits were present on the back of the cornea. The pupil dilated freely. There was intolerance of