

the Court." The published account of his travels is interesting to naturalists from the information it contains. His son, the second Dr. Thomas Browne, was a fellow of the Royal Society and of the Royal College of Physicians, and died in July, 1710.

One of the scientific celebrities born at Norwich in 1510, to whom some notice is due, is Dr. John Kaye, better known by his Latinized name of Caius. He was educated at Gonville Hall, Cambridge, which was subsequently, by his liberality, endowed and erected into a college under the name of Gonville and Caius College. He travelled, studied, and wrote books abroad, and formed an intimate acquaintance with the famous naturalist Conrad Gesner. Returning to England he practised his art as a physician at Norwich with great reputation. On the outbreak of the disease called the sweating sickness, which ravaged the whole kingdom, having discovered a mode of cure, Dr. Kaye generously published it to the world. In the common room of Caius College there is a portrait of Kaye. One of his principal works is a treatise on the University of Cambridge. He produced also a work entitled "De Canibus, or an Account of British Dogs." This book was undertaken at the request of his friend Gesner, and is a masterly treatise for the time in which it was written. In a visit of King James I to Cambridge, as he passed through Caius College, the master, as a compliment to the monarch's learning, presented him with a copy of "Kaye's History of the University," on which the king observed, "Give me rather 'Caius de Canibus.'" Dr. Kaye, in addition to his treatise on dogs, furnished also brief accounts of rare animals and plants for a work by Gesner, which were published separately, with corrections and additions, in 1670. He was distinguished, not only as a physician and a naturalist, but as a linguist, a critic, and an antiquary. On a variety of scientific subjects he exercised his pen. He died in 1573, and was buried in the College Chapel of Caius. In "Fuller's Worthies" will be found a further account of this learned and accomplished Norwich physician.

Passing over a number of names, among others that of Edward King, born at Norwich in 1734, who in an account of his life is styled "the most erudite antiquary of modern times," we come to that of Sir James Edward Smith, already referred to. We have seen how the taste for botany of this eminent man, one of the founders of the Linnæan Society and its first president, was first encouraged and developed at Norwich, by the aid of the botanist Rose. After having received instruction in the city school, Smith, in the year 1780, repaired to the University of Edinburgh, where he distinguished himself by obtaining the gold medal given to the best proficient in botany. Becoming acquainted in London with Sir Joseph Banks, an acquaintance which helped to confirm his attachment to botanical pursuits, Smith, through Sir Joseph's advice, became the purchaser of the library and collections of Linnæus. The ship which conveyed these precious scientific treasures to England had just sailed from Sweden, when Gustavus III, who had been absent in France, returned, and, hearing the story of the sale, sent a vessel in pursuit, but happily it was too late. This splendid acquisition decided the bent of Dr. Smith's studies. In co-operation with other naturalists, he formed the Linnæan Society, which held its first meeting on the 8th April, 1788, when, as first president, he delivered a discourse "On the Rise and Progress of Natural History." The greatest works of Dr. Smith are his "English Botany," which he brought to a successful termination in 1814, and which extends to

thirty-six volumes, and contains 2,592 figures of British plants, and his "English Flora," consisting of four volumes octavo. Dr. Smith had the honour of giving instruction in botany to Queen Charlotte and the princesses at Frogmore. On the 28th of July, 1814, he presented to the Prince Regent a set of the transactions of the Linnæan Society, and received, on the recommendation of Lord Sidmouth, the honour of knighthood. Sir James Smith's contributions to the Linnæan Society have been very numerous. To that body he presented the library and collections of the celebrated Swedish naturalist. "He was," we are told, "a man of deep religious convictions: regularly he might have been seen in his place in the Octagon Chapel in Norwich. In 1796 he had returned to his native city full of information, rich in fame, and loaded with honorary titles. Yet he came, unspoiled by honours, and uncorrupted by travel, to sit down among the friends of his youth, willing to give and to receive pleasure from the most simple and attainable objects." This eminent man died on the 15th March, 1828. A memoir of his life was published by Lady Smith in 1833, in two volumes.

Towards the close of 1865, and within a few weeks of each other, died two very distinguished natives of Norwich, Sir William Jackson Hooker, the Director of the Royal Gardens at Kew, and Dr. John Lindley, Professor of Botany at University College, London. Of Lindley we shall first speak. The son of a nurseryman settled at Catton, near Norwich, he was educated at the Norwich Grammar School, under Dr. Valpy. Appointed in 1822 Garden Assistant Secretary to the Horticultural Society, he became sole Assistant Secretary in 1826, and in one form or another, throughout the whole of his working life, he remained connected with that society, and devoted himself with all his energy to the formation and development of the gardens at Chiswick. In 1829 he was made Professor of Botany in University College, an appointment he held for upwards of thirty years. Exact, clear, and impressive, as a lecturer he excelled in the lucid exposition of his subject, aided as he was by a faculty of copious illustration. Dr. Lindley was one of the most prominent advocates of the new or natural as opposed to the Linnæan system of botany. His Introduction to the Natural System appeared in 1830, it passed through a second edition in 1836, and subsequently took the form of "The Vegetable Kingdom," a third edition of which was published in 1853. In the preface to this work, dated 1845, the author says, "Fifteen years have sufficed to render the once popular but superficial and useless system of Linnæus a mere matter of history."

It was with special reference to his "Vegetable Kingdom," and other valuable writings on botany and horticulture, that the Royal Medal of the Royal Society was awarded to Dr. Lindley in 1857, of which learned body he had been since 1828 a distinguished member. He discharged the arduous duties of a juror of the Great Exhibition in 1851, and in that of 1862, much against the wish of his family, he undertook the charge of the Colonial Department; but the effort was too great, and from the effects of his exertions he never afterwards recovered. On the 1st of November, 1865, Dr. Lindley was carried off by apoplexy, in his sixty-seventh year.

William J. Hooker early showed a love for natural history, becoming the discoverer of a rare moss, which he took to Sir James E. Smith; he received from that botanist the bias which determined the direction of his studies. Hooker was the earliest scientific friend of Lindley. He introduced the unknown Norwich



youth to Sir Joseph Banks in 1819, and so commenced Lindley's successful scientific career.

In the spring of 1809, Sir Joseph Banks proposed to Hooker that he should spend the summer in Iceland. This he did, and to Banks, then president of the Royal Society, the "Journal of a Tour in Iceland" is dedicated by the author. In a sojourn for nine months on the continent, Hooker made the acquaintance of the principal botanists of Europe, with whom he maintained scientific intercourse and correspondence until the day of his death.

Possessed of independent means, having married and settled at Halesworth in Suffolk, his house became the rendezvous of British and foreign botanists. There he commenced the formation of that great Herbarium, now located at Kew, and the finest in the world. Professor of Botany at Glasgow from 1820 to 1841, in the latter year Sir William Hooker (who had been knighted by William IV in 1836) was appointed director of the Royal Gardens at Kew. For making these gardens the head-quarters of botanical science for England, and, indeed, for the empire, for raising them to their present high position, and for throwing them open to the public, the nation is mainly indebted to the administrative and scientific capacity of Sir William Hooker. The history of the Kew Gardens furnishes, indeed, the best tribute to his rare personal qualities and scientific merits. Here, however, we cannot enter upon this inviting subject, nor upon any notice of Sir William's botanical writings and varied labours. Let it suffice to transfer to our pages the following description of the appearance and habits of the late director at Kew. "Sir William was in person tall, athletic, and active, in features remarkably good-looking, animated, and cheerful; his conversation had the charm of intellectual cultivation and refinement, and he had a ready power of conveying clear information. As a scientific correspondent he was unrivalled, promptly answering every letter with his own hand, encouraging those who first addressed him, and stimulating those who flagged. Indeed, he was wont to attribute his success in the creation of the National Gardens and the accompanying museums, to his habit of thanking every contributor at once, answering all their questions at whatever trouble, naming the plants they sent, and applying personally to residents in every part of the world for such plants or their products as he desired to have in the gardens."

A name which requires a passing notice in connection with the meeting of the British Association at Norwich, is that of John Taylor, born there in 1779. This gentleman devoted his attention to the operations and processes followed in mining. His aim was to elevate the art, and to place it on a scientific basis. To his earnest and judicious representations, although he had no active share in the matter, the establishment of the present school of mines may be traced. Of the various societies to which Mr. Taylor belonged, the British Association has been the most indebted to his useful co-operation, both scientific and administrative. He was present at its birth, and the first meeting of its Council was held in his house; he was its first treasurer, and held office till September, 1861, when the infirmities of age constrained him to retire; on which occasion the Council joined in a cordial expression of respect for his character, and gratitude for his long and valued services to the cause of science. Mr. Taylor died in London in April, 1863.

Edward Stanley, before rector of Alderley, Cheshire, was Bishop of Norwich from 1837 till 1849. That he deserves a place in our enumeration of the scientific

celebrities of the city, will be evident from the following extract from a biographical memoir by his son, Dean Stanley:—

"Of all the branches of science, natural history was that to which he was most inclined. His quick eye enabled him readily to observe, and his methodical habits accurately to register, the phenomena of the animal creation, and thus to acquire, without interfering with graver pursuits, a very considerable knowledge of ornithology, entomology, and mineralogy. Ornithology in particular became his favourite study, and it was a constant source of amusement and interest to him, in his parish walks and rides, to notice the flight and habits of birds, to collect remarkable specimens of their organisation, and to gather from his parishioners stories of any peculiarities which they had themselves noticed. The result of these observations he embodied in 1836 in two small volumes, published by the Society for Promoting Christian Knowledge, and entitled "A Familiar History of Birds, their Nature, Habits, and Instincts."

Bishop Stanley's work has gone through several editions. It is written in a most interesting style. We do not know any book so well suited to create on the part of the young a taste for the study of birds, and an observant eye for their peculiarities and habits.

Some notice in our sketch is due to the late Samuel Woodward, the author of "The History and Antiquities of Norwich Castle," a work published in 1847, and edited by his son, Mr. Bernard B. Woodward, librarian to Her Majesty the Queen. Another member of this talented family, who attained the highest position as a conchologist, was the late Samuel P. Woodward, an officer of the British Museum, author of a treatise on recent and fossil shells, published under the title of a "Manual of Mollusca." This gentleman, on account of his scientific merits, twice received the proceeds of the Wollaston Fund from the Geological Society of London.

#### A GLANCE AT THE COUNTY OF NORFOLK.

WITH the exceptions of Yorkshire, Lincolnshire, and Devonshire, Norfolk is the largest county in England, comprising an area of more than two thousand square miles. In an agricultural point of view it has long been foremost among English counties; and it owes its pre-eminence in this respect in part to improved systems of cultivation, said to have been borrowed originally from the Flemings, but still more to the practice of granting long leases to farmers, a practice in which Mr. Coke (the late Lord Leicester) led the way, and which, while it proved highly conducive to his own interests, gained for him the title of a benefactor to his country.

The history of Norfolk, on which we can here but barely touch, is replete with interest. Anciently it formed a part of the dominions of the Iceni, who were allies of the Romans in the time of Claudius, but rose in arms against Ostorius, who subdued them. A more terrible rising followed under Boadicea, whose calamitous defeat led to their entire submission. The relics of Roman rule throughout the county, such as the sites of towns, castles, stations, and fortifications, are abundant, and are the chief sources of interest to the antiquary. There are also many traces of Roman and other ancient roads, as the Jedder, or Pedder's Way, Stone Street, the Ikarild Street, and others which figure in the maps of the old Itineraries. There is good reason to believe that the Saxons obtained a



settlement on parts of the Norfolk coast even before the overthrow of the Roman empire. After the | than those to the shrine of St. Thomas à Beckett. Among the pilgrims were several kings and queens of England



WALSINGHAM ABBEY.

conquest of England by the Saxons and their kindred tribes, Norfolk, Suffolk, and parts of some adjacent counties were formed into the kingdom of East Anglia, which became consolidated into a monarchy about A.D. 571, when Uffa is the first who is spoken of as king. Of the Saxon era the remains are as numerous in Norfolk as in any part of the country, while of the Danes who followed in the career of invasion and conquest, the chief characteristics still observable are found in the terminations of the names of places, as *by, hoe, sted*, common alike in Denmark as in Norfolk.

But we must cut short our historic survey, and direct the reader's attention to some few of the objects of interest which will probably be made the subjects of investigation by men of science during the present month. First among these comes Walsingham, a name familiar to curious readers in connection with the famous work of Sir Thomas Browne, entitled "Hydriotaphia; or, Urn Burial," a work which owed its existence to a discovery made more than two hundred years ago. In a field at Walsingham were dug up between forty and fifty urns containing the remains of human bones and other relics; burnt substances were found on the same spot, and hence it was conjectured that this was the *Ustrina*, or place of burning, where the Druidical sacrifices were made. On this subject the author discourses—his reflections on death, oblivion, and immortality being probably unsurpassed in English literature. At Walsingham (in the hundred of North Greenhoe), consisting of Great and Little Walsingham, adjoining each other, are the remains of a monastery founded in the reign of William the Conqueror, which once contained the shrine of "Our Lady of Walsingham," to which shrine pilgrimages were even more frequent

and foreigners of note. The monks persuaded the people that the Milky Way in the heavens was a

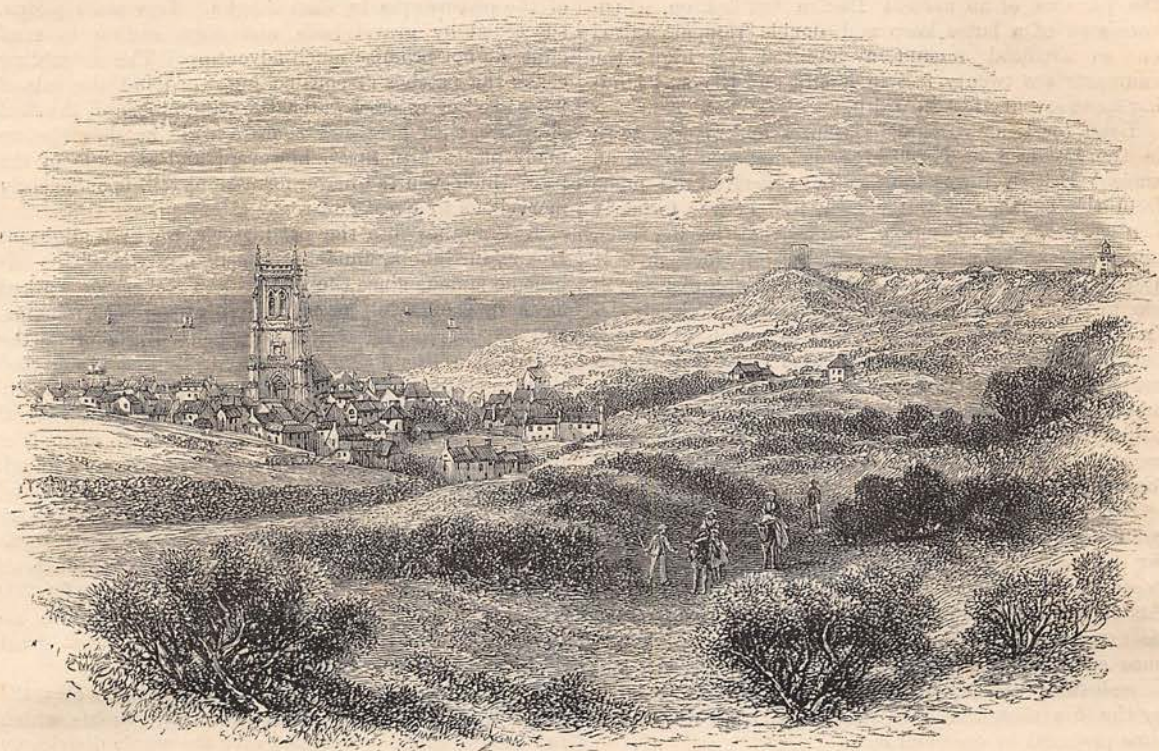


CAISTOR CASTLE.



miraculous indication of the road to this place, whence it came to be called by some "the Walsingham Way." The ruins of the old pile, which are very fine, are for the most part included in the pleasure-grounds of Walsingham Abbey, the seat of the Lee-Warner family.

(Shakespeare) about the middle of the fifteenth century. It was constructed chiefly of brick, and it is thought to be one of the oldest brick edifices in the kingdom. It stood two sieges during the wars of the Roses. The larger portion of it has long been levelled with the



CROMER.

Another ecclesiastical relic is Binham Priory (five miles south-east of Wells), founded by a nephew of the Conqueror for the Benedictines. The ruins are very considerable and most interesting, but are gradually mouldering away. Other monastic remains are those of Langley Abbey, of St. Bennet of Hulme, of Beeston Priory, of Flitcham Priory, of Brownholm Priory, and more that might be mentioned, the ruins of some of them containing rare examples of the early English style.

Castle Acre, in the hundred of Freebridge Lynn, is supposed, from the coins and tesseræ found there, to have been a Roman station. The castle was built by William Earl of Warren, or Warenne, and Surrey, and some fragments of it yet remain. The same earl founded a priory of Cluniac monks near the castle, and the remains of this religious house cover a considerable space of ground, the site of the monastery within the walled precinct having comprised originally nearly thirty acres. Castle Rising, also in the hundred of Freebridge Lynn, is a place of great antiquity, an old rhyme declaring it to have been a seaport town when Lynn was but a marsh. Tradition states that Alfred the Great built a castle here, but this tradition may have been based on the fact that the ruins of a castle built by William de Albin, some century or more after the Conquest, appear to enclose a fragment of some more ancient structure.

At Caistor, three miles from Yarmouth, stand the remains of Caistor Castle, which was built by Sir John Fastolf not to be confounded with the fat knight of

ground, but an embattled tower at the north-west corner, one hundred feet high, and the north and west walls, remain, their present proprietor using every means for their preservation.

Thetford, in the hundred of Shropham, Norfolk, and the hundred of Lackford, Suffolk, is a very ancient place. It was called Theodford by the Saxons, and evidently derives its name from the Thet river, which joins the Lesser Ouse near this spot. It is considered by antiquaries to be the site of the *Sitomagus* of the Romans, who held it in 435, and it is known to have been the metropolis of East Anglia. On this account, and from its nearness to the coast, it was frequently attacked by the Danes, who, after retaining possession of it for fifty years, destroyed it by fire in the ninth century. It was burned a second time by Sweyn, on his invasion of East Anglia in 1004, and six years later suffered a like calamity at the same hands, after a signal victory obtained by the Danes over the Saxons. In the reign of Canute, Thetford began to recover from the effects of these misfortunes, and in that of Edward the Confessor had nearly regained its former importance. It continued to prosper, and its prosperity is evidenced by the fact that in the reign of Edward III it contained twenty-four good streets, twenty churches, eight monasteries, and other religious foundations. The relics of antiquity now remaining consist chiefly of fragments of the nunnery founded in the reign of Canute by Urius, abbot of St. Edmund's, of which some of the walls, buttresses, and windows, with a fine arch and cell, are still visible. The conventual church has been converted into a barn.



Of the priory or abbey founded by Roger Bigod for Cluniac monks, the gateway and part of the church alone remain. Of the monastery of St. Sepulchre, founded in 1109, the church has been converted into a barn. Of the other religious edifices no traces can be distinguished. At the eastern end of the town are the remains of an ancient Danish fortification, which consisted of a large keep and double rampart raised on an artificial mound a hundred feet high; the ramparts are twenty feet in height and the surrounding fosse seventy feet in width.

Lynn (or King's Lynn), a seaport and market town in the hundred of Freebridge, is supposed to be an ancient British town, and to have derived its name from the expanse of water near it. It was formerly *Len Episcopi*, or Bishop's Lynn, from having been under the jurisdiction of the Bishop of Norwich. It stands on the banks of the Great Ouse, at a distance of ten miles from the North Sea, and was anciently defended on the east side by a wall in which were nine bastions, and by a broad deep fosse crossed by draw-bridges leading to the principal gates. In the town and its environs are some interesting vestiges of religious edifices, among which is the hexagonal tower of a monastery, which serves as a landmark to vessels bound for the harbour.

Hunstanton is situate at the north-west point of the county, on the shore of the Wash. It is remarkable for the peculiar constitution of its cliffs, which are composed of different strata, two of them being of red chalk. About two miles north of the cliffs are the remains of an extensive forest submerged by the sea, and which once extended across the Wash as far as the coast of Lincolnshire: the fragments of horns and bones cast up by the tide show that this submerged tract was at one time pastured by deer and oxen.

Hunstanton has belonged for seven centuries or more to the L'Estrange family, whose mansion, dating from the end of the fifteenth century, is worthy of note. About thirteen miles from Hunstanton is Holkham Hall, the seat of Coke, Earl of Leicester; at the same distance in another direction, is Houghton Hall, built by the celebrated Sir Robert Walpole. Near this is the Wolferton Station, about a couple of miles from which is Sandringham, the Norfolk seat of the Prince and Princess of Wales.

Near the north-east limit of the county stands Cromer, in the Erpingham hundred. Near the site of Cromer formerly stood Shipden, a small town which was destroyed by the sea in the beginning of the fifteenth century. This neighbourhood is interesting from the fossil remains found on the coast, and for the general advance of the sea upon the land. Many dwellings have been destroyed in the memory of persons now living, and at very low tides large masses of mason work are visible.

Other places likely to present attractions to scientific persons are, Caistor near Norwich, Bramstone Pits, Thorpe chalk-pit, Hoxne and the flint-pits, and Burgh Castle; which last-named place, however, is not in Norfolk county, but just on the Suffolk border. At Castle Rising are the remains of the feudal fortress of Eleanor, the faithless queen of Edward II. Burgh Castle is one of the most ancient in the kingdom, having been erected in the reign of Claudius Cæsar. Its walls are more extensive than those of Richborough; they are nine feet in thickness, and are faced with flints interlacing the masonry. Many Roman coins and other articles of Roman use have been from time to time found within their enclosure.

## GEOLOGICAL EXCURSIONS IN NORFOLK.

THE proverbial excellence of Norfolk farms, and the yearly consignment of 50,000 turkeys and geese during Christmas week to the railway terminus in Bishopsgate Street, prepare and console us at once for the absence of the picturesque in East Anglia. Low chalk plains, succeeded by gravel beds, and often ending in mud cliffs, do not promise much adventure. The crumbling coast, the patches of soft-looking woodland, the inland "broads" of estuary water, the windmills, and the flint churches, with here and there a wide heath, make up many pleasant pictures, however; and the tale of the past, which even the newer formations tell, is sufficiently marvellous to arrest and repay attention.

1. Plunging into the pre-historic, we first alight at Hoxne, in Suffolk, amidst mammalian gravel. This has become famous since the Abbeville discovery of worked flints in the gravel, associated with mammoth remains, and of presumably contemporaneous origin with the latter. On this being announced, it was recollected that in 1801 a similar discovery had been made at Hoxne, and registered in the proceedings of the Royal Society. Explorations were resumed, and more flint implements and bones of bygone mammals were found. The localities where this has occurred in France and England are now numerous. They are all in the valley gravels of the very latest geological period. In India similar tools have been found in consolidated beds of a kind of gravel, all along the eastern coast for 300 miles from Madras southward. Man must have inhabited or occupied the land before the last great physical changes of level in both east and west.

2. Our next excursion will be to the boulder-clay, the great drift formation of sand, stones, and rubble, which has been dragged or dropped over the whole district by glaciers and coast ice during a very long period antecedent to the mammalian gravels. It may be well studied at Happisburg, or at Cromer, or on the Suffolk coast. The lower portion is usually a dark tough clay, with fragments of all kinds of rock in it, and their fossils. It is a drag net. The explorer may collect bits of the Scottish mountains, of the Grampians, of the Cheviots, of the coal-grits, and abundant oolitic fossils, which have been forced along by the great tyrant. Occasionally there are in it sandy beds with Arctic shells, showing periods of repose. The dark cliffs south of Lowestoft, the bright yellow cliffs at Gorleston, the ruined rusty cliffs south of Cromer, the fine cornlands spread over the whole inland, are principally boulder clay, with a thin capping of alluvial recent gravel and occasional nests of the thicker mammalian gravel, and its accompaniment the brick earth.

3. At Mundesley is a post-glacial deposit, formed in a hollow of the marine drift, which will doubtless attract tourists. A valley has been worn in this, and layers of gravel, sand, and peat successively deposited in the hollow by the action of fresh water.

4. Wherever the traveller lights on the coast, from Gorleston to Weybourne, he may notice at intervals dark patches below high-water mark of dirty-looking decayed stuff. This is a land surface "Forest-bed" which preceded the glacial period. The slightest observation will show the existence of hazel-nuts, roots of trees and ferns, decayed wood, fir-cones, and wings of insects. More careful research brings to light bones and horns of animals. The remains of two kinds of elephant, of the rhinoceros, hippopotamus, walrus, narwhal, whale; of the yew, sloe, the water-lily, prove that this was the beach of a low swampy territory, with



a deep sea lying off, whence were washed up the relics of marine creatures to meet the land spoils of a district abounding in game and shelter. We have shells of fresh-water ponds, forms of beautiful plants from the marshes, the beaver and deer abundant.

5. But the speciality of Norwich is its *crag*—a provincial name for gravel, but now a geological term for a mass of sand, shells, clay, and broken fragments, extending from Northern Germany to East Anglia, assigned to the *Pleistocene* period of Sir Charles Lyall, *i.e.*, to the latest tertiary, when the organic life was nearly altogether like that of the present day. The uppermost *crag*, the Norwich *crag* proper, may be seen on the banks of the Yare, below the city. It is sand and gravel mixed with sea shells. The surface of the chalk on which it lies is perforated by the drills of the pholas, the same as now found in the blocks of chalk on the shore: the creature's shells are still in the bore-holes. The shelly deposit contains 85 per cent. of present sea shells. They are principally forms of marine life indicating a lower temperature than now prevails off the coast. But the marvel is to see what kind of bones have been drifted from adjacent land on to this old beach. They tell of mammoths and of an assemblage of creatures of African aspect, though adapted to colder climates. Three species of elephant, a hippopotamus and rhinoceros, once camped on these grounds, together with horse, bear, wolf, elk, a quantity of small deer, and other creatures. About half of these belong to species now extinct. The Norwich *crag* may be seen at Cromer, rising from the beach, and gradually ascending in the cliffs towards Weybourn. It is a very local deposit.

6. The next *crag* is of wider range. It lies below the Norwich or mammalian *crag*. It is named red, or Suffolk *crag*, and is that which is so well seen in the cliffs at Walton and Felixstowe. It is a most tempting deposit for collectors. No hammer is needed, nor any scraping or washing of fossils. The shells are, save as to colour (and in some cases there are traces of this), as well preserved as in a cabinet, a little iron-stained, but wonderfully delicate in their beauty. One, the *crag* spindle shell, *fusus contrarius*, is sure to attract attention, as it uniformly has its opening on the reverse side, so that our modern whelk-eaters would have to extract the fish in a left-handed manner, had they still been presentable on the hand-barrow of the costermonger. Teeth of sharks, and ear-bones of whales, are among the common spoils of the *crag*. There are 240 species of mollusca found. About fifty of these are travellers rolled in a fossil state from previous formations, and of shells proper to the deposit, about fifty-seven per cent. are of recent well-known species. It is excellent occupation for the seaside, to collect and sort out the *crag* shells, dividing off the casuals, and then ascertaining the character of the true parishioners. The reader will easily credit the statement that this is safer work now than it would once have been, for among other creatures whose bones we handle is a great shark, computed to be sixty-five feet in length, with a jaw-gape three feet by four.

7. To see the lowest *crag*, the Coralline, we must visit Woodbridge and spend an afternoon between the rivers Alde and Stour. It is a mass of sand and shells, sometimes hardening into building stone. The greater number of the shell-animals are still to be found in our seas. There are proofs of a gradual refrigeration of temperature from the base of the *crag*s up to the boulder-clay.

At the base of each formation of *crag* there lies a bone bed—a quantity of broken animal remains, con-

taining phosphatic matter. The late Professor Henslow first noticed this material in 1843, and indicated it as a source for manure. From that time there has been a continuous resort to these bone beds for "coprolite," as it is called. It is used, like guano, for manure, and is now well known as a source of wealth and an article of manufacture and use. The geologist may sigh as he sees the heaps of fish teeth and bones daily consumed by the manure mill, but he has his compensation in boiled beef and turnips, to say nothing of wheat and clover.

8. The London clay, underlying the *crag*, will hardly afford interest enough in this county for an excursion. Its classic hunting-ground, for turtle and cinnamon-groves, is at Sheppey, in the mouth of the Thames.

9. The underlying chalk is the prevalent subsoil of the county. It is the upper chalk, with large flints and layers of flint, whence arises the characteristic flint architecture of East Anglian churches, and especially the squared flint of the towers, as at Southwold. The chalk rises into cliffs at Cromer, and is singularly furrowed and worn into pinnacles, surrounded by the upper clays, as though it had formed a furrowed coastline like that of the Needles, and then had become the bottom of the sea by tranquil subsidence, and been covered with sand and mud by gentle degrees.

10. On the edge of the county, towards the north-west, the lower cretaceous formations crop up. At the northern end of a ridge lies one of the favourite localities of the fen-folk, and one of the notabilities of cretaceous geology—Hunstanton, with its cliffs of red chalk. How the white chalk, the soft ocean-floor of the great limestone sea, became discoloured by iron-rust; how it is preceded by red clays, containing lower cretaceous fossils; and how interesting the whole deposit is—are topics which may well elicit the investigation of the assembled *savans* and of their numerous camp-followers.

S. R. P.

MOTHER'S WORK;  
OR, THE EDUCATION OF THE HEART.  
CHAPTER III.—TRUTH AND JUSTICE.

I HAVE classed together truth and justice as elements of character. It is difficult to separate them so as to bring either under notice as a distinct quality, because truth is justice in speech, and justice is truth in action. They are also found together. Where there exists a strict regard for truth, there will be a strict regard for justice; and where justice is faithfully maintained, there will be truth. It will equally be found that laxity or carelessness about one, will manifest itself, as occasion may serve, in carelessness about the other.

Simply considered, nothing can be more positive than truth; but when carried out into action, truthfulness consists in guarding against falsehood. It is only speaking of and dealing with things as they are, and that under all inducements to speak of and deal with them as they are not. Justice also is the acting out of that which is strictly due and right, under all temptations to do otherwise.

The temptations which operate against both these methods of doing simply right, arise out of selfishness—that first principle of our common nature. It is not likely that any one would speak falsely rather than truly, unless in the first instance it should be to gain something which is desired, or to escape from something which is disliked or feared; although when the habit of being false has become established, it is an undoubted fact that persons do sometimes grow to prefer