

APPENDIX
TO THE
ANNUAL REPORT.

MEMOIRS.

THE REV. WILLIAM BUCKLAND, D.D., F.R.S., F.G.S., &c., Dean of Westminster, and Reader in Mineralogy and Geology in the University of Oxford, was born at Axminster, in the county of Devon, in the year 1784. He received his early education at Tiverton School, whence he was removed to St. Mary's College, Winchester, and thence to Oxford in 1801, where he was elected to a scholarship on the Exeter Foundation of Corpus Christi College. He took his degree of B.A. in 1805, just before the institution of the system of classical honours. In the second, or third year of his residence at Oxford, he took his first lessons in Geology from Mr. Broderip (the late Magistrate of the Westminster Police Court), then of Oriel College, and first studied the oolite formation and the green sand in the Vale of Pewsey. In the interval between obtaining the degrees of Bachelor and Master of Arts, he attended the lectures of Dr. Kidd, on Mineralogy and Chemistry, and of Sir C. Pegge, on Anatomy. Of these lectures he made copious notes. During the vacations of his early years at Oxford, he paid frequent visits to Lyme Regis, where he first met Sir H. De la Bêche, who was collecting fossils at that place. In the summer of 1808, he made his first geological tour, alone, on horseback, from Oxford across the chalk downs of Berks, Wilts, and Dorset, to Corfe Castle, in the Isle of Purbeck. In 1809, he explored, also alone, a large part of South Devon, examining minutely the formations, and collecting specimens of the geology of the district. In 1810, he made a tour in the centre and north of England, exploring the, then unknown, extent of the various strata, and colouring the results on Carey's large Map of England. In the spring of 1811, he visited Kent and Sussex, along with the

Rev. W. Conybeare. Later in the same year, he again crossed England, by another route, into Scotland, returning from Inverness to Port Patrick, and from Dublin to North Wales. In the years 1812-15, he made extensive tours, with Mr. Greenough, collecting materials for the Geological Map of England. Thus, in early years, he showed a decided predilection for the study of geology; and it was during these journeys, that he laid the foundation of that extensive collection of the remains of the larger fossil mammalia, and other animals, from caves and subterranean localities in England and on the Continent, and of specimens of minerals, which he has bequeathed to the University of Oxford, and are now preserved in the Clarendon Museum. For forty years, Dean Buckland spared neither expense, time, nor trouble, in procuring and arranging specimens to render this collection complete, and worthy of the University. His travels were undertaken with this object, and his great desire was to make the collection the means of advancing the science which it was intended to illustrate. In 1815, he presented to the Geological Society, in conjunction with his old friend Dr. Conybeare, the present Dean of Llandaff, his first important paper, "On the Coasts of the North of Ireland,"¹ the result of a personal inspection, in 1813, of about fifty miles of coast. From 1812 to 1824, he rode on horseback, once, or twice, in each year, from Oxford to Axminster, in Devon, frequently visiting, on his way, the Rev. J. Townsend, of Pewsey, and the Rev. B. Richardson of Farleigh Castle, the first fellow-labourer of Dr. W. Smith.

Having acquired reputation for scientific attainments in geology, in 1814, he was appointed Reader in Mineralogy, on the resignation of Dr. Kidd, the successor of Sir C. Pegge. In 1815, he published the first comparative table of the strata of England and of those of the Continent, as arranged by Werner. In 1816, he visited Germany, accompanied by Mr. Greenough and the Rev. W. Conybeare, and proceeded with the former through Silesia, to Poland, Austria, and the North of Italy. He took this opportunity of enlarging his comparative tables, and of visiting Werner and other of the principal German geologists. In 1820, he again travelled in Germany and Bohemia, with Mr. Greenough and Count Breüner, of Vienna, and returned by way of Switzerland. In 1818, he obtained an endowment from the Crown, for a new office of Reader in Geology, and from that time down to the year 1849, when he was taken ill, he gave annually one course of lectures on Mineralogy, and one course on Geology. This appointment he continued to hold, after being made Dean of Westminster; and whether his class was small, or large, he invariably took great pains in preparing the lectures, generally writing fresh notes for

¹ *Vide* Trans. Geol. Soc., vol. iii.

every course, and sparing no expense in obtaining new, or interesting specimens to illustrate any particular subject. His geological lectures were characterised by such clearness and comprehensiveness, accompanied by aptness of illustration, that they were attended with marked success. When he first commenced his lectures, Geology, as a science, was, almost, in its infancy; and much of its vigorous advancement in subsequent years is due to the interest excited among thinking minds, by Dr. Buckland's Oxford lectures.

In the same year, 1818, Dr. Buckland was elected a Fellow of the Royal Society. In 1820, he delivered, before the University of Oxford, a lecture, which was afterwards published, under the title of "*Vindiciæ Geologicæ; or, the Connexion of Geology with Religion Explained.*" The object of this lecture was to show, that the study of geology, so far from being irreligious, or atheistic in its consequences, had a tendency to confirm the evidences of natural religion, and that the facts developed by it were consistent with the accounts of the Creation and the Deluge, as recorded in the Book of Genesis. In 1822, Dr. Buckland communicated to the Royal Society an "Account of an assemblage of fossil teeth and bones of elephants, rhinosceroses, hippopotami, bears, tigers, hyænas, and sixteen other kinds of animals, discovered in a cave at Kirkdale, Yorkshire."¹ For this publication the Society awarded him their highest honour—the Copley Medal. This Paper was made the foundation of a treatise, published in 1823, entitled "*Reliquiæ Diluvianæ; or, Observations on Organic Remains attesting the Action of a Universal Deluge,*" a work which proved of essential service, not only in the promotion of geological science, but in reconciling its study to many persons who viewed it with suspicion, as adverse to religion. In 1824, he was elected President of the Geological Society, of which he was one of the earliest members, having joined it in 1813.

In the following year, Dr. Buckland vacated his fellowship, by accepting, from his College, the living of Stoke Charity, near Whitechurch, Hants; and soon after he was promoted to a canonry in the cathedral of Christ Church, and married Mary, the eldest daughter of Mr. Benjamin Morland, of Sheepstead-house, Abingdon. In 1826 and 1827, he again explored parts of France, Germany, Austria, and Switzerland, and he was the first English geologist, who examined, with attention, the Val del Bove, on the eastern side of Mount Etna. In the southern portion of the Ardennes, three formations were recognised by Messrs. Buckland and Greenough, occupying the same geological position as in England and Wales, between the carboniferous deposits and the older slaty rocks. He

¹ *Vide Phil. Trans. for 1822.*

also recognised the, comparatively, late geological date of the great upward movement of the Alps,¹ and declared that some of the highly-inclined rocks were contemporaneous with the lias and oolite of this country. The bone caverns of Lunel and the Grotte d'Ozelles,² furnished many specimens for the Museum. From 1825 to 1830, he laid before the Geological Society, many Papers relating to continental geology, as well as researches among the fossils of Portland, Lyme Regis, and the Mendips, the Isle of Wight, the Isle of Purbeck, and the coast of Weymouth, and on coprolites and fossil sepia; all evidencing his skill as a geologist and palæontologist. In 1832, he presided over the second meeting of the British Association, which was held in Oxford. On this occasion, he gave a lecture on the Geology of the neighbourhood of Oxford, when he enforced the importance of the application of a knowledge of geology to agricultural improvement; pointed out many defects in the ordinary system of drainage, which could be remedied by a knowledge of the structure of the strata; and adverted to the possibility of reclaiming the peat bogs of Ireland. He also gave a lecture "On the Fossil Remains of the Megatherium," recently imported into England from South America; and commented on a scale of geological colours, which had been adopted by the Board of Ordnance. About this time, he was selected by the special Trustees, under the will of the late Earl of Bridgewater, to write one of a series of eight treatises, "On the Power, Wisdom, and Goodness of God, as manifested in the Creation." The branch assigned to him was "Geology and Mineralogy, considered with reference to Natural Theology." The discovery of new facts by the inductive process pursued by geologists had materially advanced the progress of geological science in the few preceding years, and, modifying in this work the previous diluvial theory, Dr. Buckland brought the weight of his authority to support the views now generally received upon the subject. In the same year he, conjointly with the Rev. Dr. Conybeare, communicated to the Geological Society a valuable memoir, "Description of the South-Western Coal District of England,"³ which has stood the test of more than thirty years, and, being published separately, is still consulted by scientific men, as a standard work.

Subsequently to this he read many papers before the Geological Society, most of which appeared from time to time in the "Transactions." He also contributed to several scientific journals, articles on various special subjects; and the Agassiz Catalogue contains a list of sixty-six memoirs and essays by Dr. Buckland, spread over

¹ *Vide* Annals of Philosophy. New Series, I., iv., 450.

² *Vide* Trans. Geol. Soc., vol. i.

³ *Vide* Trans. Geol. Soc., 2nd Series, vol. i.

the whole period of his life in Oxford, from the year 1813, giving the results of many years of study of the geological and mineral structure of the earth.

In 1845, Dr. Buckland was preferred by the late Sir Robert Peel to the Deanery of Westminster, vacated by the promotion of Dr. Samuel Wilberforce to the Bishopric of Oxford. In his new capacity Dean Buckland was worthy of all praise, for having set an example to other cathedral bodies, in facilitating the admission of the public, to view the monuments and other objects of historic interest contained in the Abbey Church—for the numerous and judicious alterations he suggested and caused to be effected in the Abbey and its precincts;—the better administration of the funds, and the complete remodelling of the buildings and the government of St. Peter's College, Westminster. He was a most zealous sanitary Reformer, in which capacity he had to encounter the usual opposition from the advocates of "letting matters alone." But opposition only excited his ardour and insured the ultimate success which he enjoyed in proportion to the difficulties he had encountered. He was, however, sensibly affected when the breaking out of a fever in the precincts of Westminster was ascribed to his sanitary reforms,—a most unfounded charge, which recoiled on those who had promulgated it, for the purpose of arresting the useful career of this energetic and good man.

He exerted himself actively in the improvement of the supply of pure water to the Metropolis, and examined the questions of obtaining it from the Thames and other rivers, and from wells sunk into the chalk.

Dr. Buckland became a Fellow of the Royal Society, in 1818, and was a member of the Council from 1827 to 1849. He was also, as has been previously stated, a Fellow of the Geological Society, and likewise of the Linnean, Zoological and Geographical Societies. In 1842, he was elected an Honorary Member of the Institution of Civil Engineers;—and there is scarcely a Natural History, or Philosophical Society of any importance, either in Europe, or the United States, which did not similarly strive to do him honour.

In 1847, he was appointed a Trustee of the British Museum, and for two years took the greatest interest, in arranging and increasing the geological collection there. At the first foundation of the Museum of Practical Geology, he laboured diligently, in conjunction with his old friend the late Sir Henry De la Bèche.

He was much attached to agricultural pursuits, watching, with great interest, the development of the introduction of new manures, the application of chemical science, and the adaptation of mechanical contrivances to farming. He was a regular visitor at the annual meetings of the Royal Agricultural Society, and took

every opportunity of enforcing his views among the farmers, with whom he was a great favourite.

From the period of his adopting Oxford as his residence, he took an active interest in promoting all measures for improving and beautifying the City. In 1818, with the aid of the late Dr. Kidd, Dr. Bliss, Mr. Hickman, Alderman Sadler, and other influential men, he succeeded in establishing the works for lighting the University and City with gas, at that time a novelty. His friend the late Mr. A. Manby, undertook the construction of the apparatus at the Horsely Ironworks, and it was in a great degree owing to the support and scientific counsel of Dr. Buckland, who was the Chairman of the Company, a post which he retained for a long period of years, that this early attempt was so eminently successful, and that the Company has continued to flourish to the present time.

He advised numerous local improvements in the buildings of the University and in the streets of the City, and up to within a comparatively recent period took an active interest in promoting all ameliorations of the sewerage and water supply of the City.

Any attempt to notice all the publications of Dean Buckland, or the numerous investigations he engaged in, would extend this sketch far beyond the usual limits; his special studies have been well noticed in the Report of the Royal Society in December, 1856, and it is hoped that a memoir worthy of such a subject may be given to the world by one of his eminent fellow-labourers in the field of geological research. It is from one of the phalanx of talent that was wont to assemble at the meetings of the Geological Society, that the memoir of Buckland should proceed, so as to bring forward vividly all the useful public labours, the well-directed scientific researches, and the anecdotes of the social life of this amiable and worthy man. It has been well said that he was "strong in mind and strong in body; working hard and setting others to work; gathering and giving knowledge; a patient student, a powerful teacher, a friendly associate; a valiant soldier for geology, in the days when she was weak, and an honoured leader in the hour of triumph." The correctness of this description must be evident to all who remember those evenings when Kidd, Conybeare, Smith, Sedgwick, Lyell, Murchison, Phillips, Owen, Daubeny, De la Bèche, Forbes, and others met to do battle for and against some proposition; it was then the well-known steady, firm and determined step of Buckland was looked for, and from the never-absent blue bag, specimens after specimens were drawn to enforce his arguments. Many of those lips are now hushed whose fiery eloquence warmed the latent spark in their hearers, and brought forth present fruits of their labours; but the remembrance of those evenings must ever live.

To the Institution of Civil Engineers Dean Buckland was specially devoted; he looked upon the labours of its Members as inseparable from geological research, and he rarely missed the reading of any paper of importance, taking an active part in the discussion, and whenever his personal aid or influence could be useful, it was most cheerfully given.

The same qualities which pervaded his public career governed his private life, and he was never so happy as when he was surrounded by his family and friends, by whom he was equally admired and loved. His kindness was unbounded; and when his useful career was arrested, his absence was felt as that of the intimate friend and companion of all. He suffered for some years from a diseased state of the bones at the base of the skull, which led to the partial impairment of his mental faculties. During his illness he was most carefully watched by his excellent and amiable wife, and by his eldest son, Assistant-Surgeon to the Second Regiment of Life Guards, and on the 15th of August 1856, he was taken from his family and a large circle of friends, by whom his memory will ever be cherished, with the most vivid feelings of affection.

MR. MICHAEL ANDREWS BORTHWICK was born at Dunbar, in East Lothian, on the 30th of October, 1810. He received the rudiments of his education under Mr. White, of Dunbar, then a man of considerable reputation as a country teacher, and under whom he made rapid progress. He afterwards completed his studies at the Academy of the ancient burgh of Ayr, at that time, and still, one of the most famous provincial seminaries of Scotland. The Rev. Dr. Memes, a well-known scholar, author, and man of science, was Rector, and took a deep interest in his young pupil, whose constant and indefatigable exertions for learning very soon eclipsed all the other scholars, many of them of a much greater age. Dr. Memes recently assured an old and intimate friend, with pride, that he was astonished at the perfection his former pupil had attained in so short a period. He devoted much attention to mathematics, but he was chiefly distinguished in English composition, and in his knowledge of History and Geography. His memory on almost all subjects was most minute and comprehensive.

The following testimonial from Dr. Memes was given to him on quitting the academy:—

“It is with more than ordinary satisfaction that I discharge, not merely an official duty, but a highly pleasing service, in granting this public attestation in favour of the amiable disposition, persevering industry, and superior talents and acquirements of my