

Re-inventing the Ashmolean. Natural history and natural theology at Oxford in the 1820s to 1850s

ARTHUR MACGREGOR and ABIGAIL HEADON

Ashmolean Museum, Oxford OX1 2PH.

ABSTRACT: During the period of the successive keeperships of John Shute Duncan (1823-1829) and his brother Philip Bury Duncan (1829-1854), the collections of the Ashmolean Museum at Oxford were comprehensively redisplayed as a physical exposition of the doctrines of natural theology, specifically as propounded by William Paley. The displays assembled by the Duncans, overwhelmingly dominated by natural history specimens, were swept away with the opening of the University's new Natural Science Museum and with them went almost all recollection of an extraordinary chapter in museum history. From largely unpublished records in the Ashmolean, the Duncans' achievement is here reconstructed. The primary evidence is provided by contemporary reports prepared for the Visitors of the Museum and by surviving texts from the Duncans' museum labels. Additional perspectives are provided by an extensive body of correspondence from the collectors, explorers and others who contributed specimens to the new displays: their texts illuminate aspects of contemporary preoccupations with classification, broader research priorities, and problems associated with collecting, preserving and transporting specimens, as well as shedding light on individual exhibits which they contributed to the Museum. These correspondents include a number of significant figures in the nineteenth century history of natural history, including Andrew Bloxam, N. A. Vigors and William Burchell.

KEY WORDS: Ashmolean Museum – Andrew Bloxam – J. S. Duncan – P. B. Duncan – William Paley – history of collecting

INTRODUCTION

Founded in 1683 as a premier expression of the “new philosophy”, the Ashmolean Museum at Oxford saw its status as a repository of scientific collections gradually eroded in the course of the following century and a half. Originally conceived as a unified institution combining the museum collection itself with facilities for teaching “the history of nature” and with an experimental laboratory where medico-chemical instruction was carried out (MacGregor 1983; MacGregor and Turner 1986; Ovenell 1986), the “Musaeum” later saw a progressive dislocation of its constituent elements. The expected benefaction from Ashmole that would have secured the chair of chemistry, first occupied in parallel with the keepership of the Ashmolean by Dr Robert Plot (keeper 1683–1691), was never to materialize; as a result, the professorship lapsed under Plot's successor and henceforth the duties of the personnel involved in the chemical lectures and in natural history instruction at the Ashmolean were largely distinct from those appointed as keepers of the repository (Simcock, 1984). Although some occupants of the keeper's post managed to maintain a link between the Ashmolean's functions as repository and as teaching centre (for example, John Whiteside (1714–1729), who established courses in experimental philosophy in the Ashmolean's school of natural history) and others (most notably William Huddesford, 1755–1772) made positive efforts to maintain order in the collections and to preserve for them a purposeful academic role, the history of the museum displays at this period is largely one of decline. The triumvirate

of keepers who successively saw in the early years of the nineteenth century showed no promise of improvement: William Lloyd (1795–1815) was judged “a retired, quiet (not to say idle) gentleman, having no pretensions to science or scholarship”¹; Thomas Dunbar (1815–1822) was similarly dismissed as “being (like his predecessor) rather indolent and unscientific” and as making “no effort to improve what he found in so neglected a state”¹; William Philipps (1822–1823) lasted less than a year in the post, during which time he was described as “not having the heart to cleanse the Augean institution”¹.

This, then, was the museum to which John Shute Duncan was appointed as keeper in 1823.² On his arrival in Oxford in the following year, he found “that cabinets for those objects which were liable to injury through time were wholly wanting, and that the apartment dedicated to the exhibition of them had become much dilapidated” (Anonymous, 1836). The measures put into operation by John Duncan and consolidated by his brother, Philip Bury Duncan, who succeeded him as keeper in 1829,³ with a view to bringing a new scientific identity and purpose to the Ashmolean collections, form the basis of the following account.

The evidence is taken from the printed catalogues produced as a result of their joint efforts (Anonymous, 1826, 1836) and, more particularly, from hitherto unpublished papers in the Museum’s archives. Chief among these are two reports to the Museum’s governing body, the Visitors, prepared by the brothers in 1825 and 1833 respectively and reproduced here as Appendices 1 and 2; a collection of manuscript texts compiled as drafts for labels for the displays which they installed⁴; and a bound volume of letters entitled “Correspondence, chiefly Mr Duncan’s”⁵, covering the period 1823 to 1846. The letters in question, in fact, relate to both the Duncan brothers: some two thirds of them are addressed to or otherwise concern the elder John Duncan and the remainder his younger brother Philip.

By the time Philip Duncan handed over the keepership to his successor in 1854, the character and the disposition of the Ashmolean collections had been utterly transformed; the displays were by then overwhelmingly dominated by natural history specimens, presented in a uniquely programmatic manner as a physical exposition of the doctrines of “natural theology” as propounded by William Paley (1743–1805), Archdeacon of Carlisle. Six years later, the opening of Oxford’s Natural Science Museum (today the Oxford University Museum of Natural History) brought about the dismantling of these carefully contrived displays as the natural history specimens were entirely transferred from the Ashmolean. In their new home the specimens were exhibited according to quite different criteria and with the subsequent realignment of the remaining Ashmolean collections on an essentially antiquarian course an important chapter in the development of museum display was not only closed but was largely forgotten.⁶

In the following paper an attempt is made to restore the Duncan brothers to the prominence they deserve in the history of natural history and to capture something of the ambitious programme they evolved for the museum over which they presided successively for more than 30 years.

THE BACKGROUND TO THE DUNCAN ERA

Certain steps towards the reshaping of the Ashmolean’s collections had already been taken by the time John Duncan took up his appointment. The most far-reaching of these concerned the mineralogical and palaeontological collections, whose historical importance

was considerable. Plot himself, author of pioneering natural histories of Oxfordshire and of Staffordshire, had contributed material to this part of the collection and under his keepership Martin Lister had donated (along with other rarities) a cabinet of shells and fossils which had been described in his *Historiæ animalium angliæ* (1678). Of even greater importance, perhaps, were the additions made under Plot's successor, Edward Lhwyd (keeper 1691–1707). Lhwyd arranged and catalogued the Plot and Lister collections and contributed many specimens collected by himself, initially in the environs of Oxford and later further afield. The specimens described in his own *Lithophylacii britannici ichnographia* (1699) came to form the most extensive part of the Ashmolean's collections and were augmented in subsequent years by many gifts sent by Lhwyd during his extended travels in Cornwall, Wales and Scotland.

In the decades following Lhwyd's death in post, the importance of these collections proved of little value in ensuring their wellbeing. Perhaps the nadir of the Ashmolean's fortunes fell under the keepership of Dr George Huddesford (keeper 1732–1755), who contributed nothing to it personally but who "... put in a scholar for 5£. who made a perquisite of shewing the curiosities, which lay in the utmost confusion. Lhwyd's fossils were tumbled out of their papers, and nobody regarded or understood them till his catalogue of them was republished by Mr. Huddesford the late librarian, son of Dr. Huddesford."⁷ Following the positive attentions they received under William Huddesford, who succeeded his father in office, the integrity of the Museum's mineral and fossil collections was threatened from a more benign but ultimately more destructive quarter. In 1813 William Buckland (1784–1856) was elected the University's first professor of mineralogy and was provided with accommodation in the Ashmolean basement, furnished with cabinets for his teaching collections. All the Museum's early collections of fossils seem to have been transferred to Buckland's care at this time, while the early catalogues are annotated in such a way as to suggest that many of the semi-precious stones were also placed in "the new mineral cabinets".⁸ Buckland himself added copiously to the extent and the value of the teaching collection under his care, but in a sense it was already lost to the Museum as inherited by the Duncans. This separation was given definitive expression in 1830 when Buckland was provided with new accommodation for himself and his collections in the neighbouring Clarendon Building. The minerals and fossils were to remain there until transferred to the University's new Natural Science Museum in 1858.

As to the zoological collections, fewer additions are recorded after the arrival of the founding collection,⁹ but they too had suffered over the years, so that Duncan found on his arrival that "the skins of animals collected by the Tradescants [whose cabinet of curiosities had formed the basis of the Ashmolean's founding collection] had fallen into total decay" (Anonymous, 1836: preface). Much of this decay, it should be said, was probably beyond the capacities of the best-intentioned curators to arrest. The early collections had been formed at a time when techniques of preservation and taxidermy were in their infancy and it should come as no surprise that the natural processes of decay, reinforced, no doubt, by infestations of pests whose increase could scarcely have been controlled by methods then in existence, took their inevitable toll.¹⁰ Ashmole's carefully drafted statutes had indeed envisaged this inevitability, decreeing "That as any particular grows old & perishing, the Keeper may remove it into one of the Closets, or other Repository; & some other to be substituted."¹¹ The demise of the Museum's most famous specimen, the stuffed dodo, which had to be removed from exhibition in 1755, is well known, even if the circumstances were widely misinterpreted until Ovenell (1992) set the record straight. The same author notes that in that year "most of the

birds, and birds' eggs, and all the insects except those preserved in jars" were removed from display.¹² By the time of John Duncan's keepership, he could claim in 1825 (only his second year in office), that as then constituted "The whole Collection of Birds (with exception of a very few which appear to be lent) has been given by the present Keeper his Brother & friends"; such reptiles and fishes as the Museum possessed, on the other hand, were "for the most part the remains of Tradescant's Collection" (Appendix 1).¹³

Duncan was perfectly open in making manifest his primary interest in building on the collection of zoological specimens. He kept what he considered most valuable from the early collections, but did not shrink from discarding material judged to be no longer serviceable. Having rationalized the collections, he set about rebuilding the Museum's holdings in this area. In a literal sense, the Duncan brothers can be said to have comprehensively refounded the zoological collections.

REDEFINING THE NATURAL HISTORY COLLECTIONS

Little in the Duncan brothers' early experience of museums can have prompted them towards the ambitiously didactic scheme for which they were to be responsible. In his preface to the Ashmolean *Catalogue*, Philip Duncan conveniently lists the institutions that had made the greatest impact on their youthful years (Anon., 1836: iii):

The largest private collections in Museums, which have been made and exhibited to the public of late days, have been those of Sir Ashton Lever, (the delight of my younger years,) which displayed a larger assemblage of the works of nature than had ever been before seen in England, and more extensive probably than any previous to that in the Museum of the Zoological Society. William Hunter's, which is now at Glasgow, was formed between 1770 and 1800, and the not less celebrated Museum of John Hunter now at the College of Surgeons, Lincoln's Inn Fields. Donovan exhibited in his Museum, about thirty years ago, a very interesting collection of specimens of British zoology; Sowerby of minerals and insects; Brookes of the skeletons of animals; and Bullock of the most brilliant specimens of birds, shells, and animals of South America. The Linnæan Society Museum now boasts of a very choice collection of the stuffed animals of New Holland. The India House, of those found in our dominions in the East Indies; and, lastly, the Zoological Society Museum promises fair to eclipse them all by more copious funds, and a combination of active zeal, talent, and industry for the accumulation and arrangement of zoological specimens from every quarter of the globe.

The Duncan brothers' primary inspiration, however, came not from earlier museum displays but from the tracts of perhaps the most influential apologist of his day for the doctrines of natural theology, William Paley. In England, the roots of this movement can be traced back to the writings of Francis Bacon; it was vigorously propagated by several champions among the founders of the Royal Society, most notably Bishop John Wilkins (1614–1672), whose influential *Essay towards a real character* was published in 1668, while in the following century William Derham (1657–1735) made the greatest impact with his *Physico-theology* of 1713 and *Astro-theology* of 1715. The common thread that runs through all of these works and which forms the distinguishing characteristic of the natural theology movement is a preoccupation with "evidences" of God as revealed in nature. Adherents have been characterized as believing that God revealed himself in the Creation as well as in Revelation – a doctrine which at times attracted criticism from the ultra-orthodox who detected in it an excessive preoccupation with reason at the expense of unquestioning faith.¹⁴ Paley's own works were widely read and are judged among the most influential scientific works of the first half of the nineteenth century,¹⁵ so it is natural

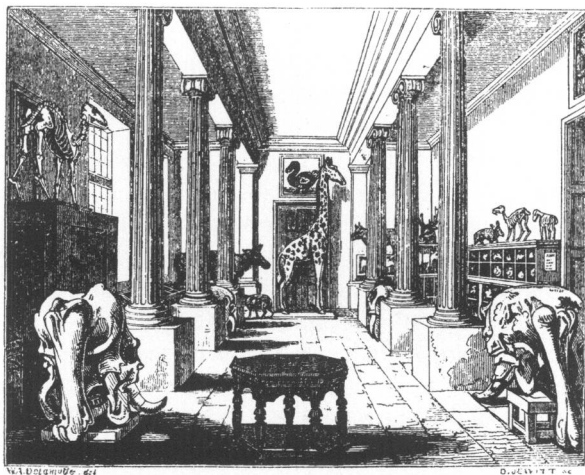
that in their allegiance to Paleyan doctrine the Duncan brothers did not find themselves alone in Oxford.¹⁶ Even before John Duncan took up the keepership there were, it seems, moves afoot that aimed to realign the Ashmolean collections according to these principles. Although their details are unknown, it appears that these initiatives had emerged from the circle of scholars closely associated with the Museum whose work was also heavily imbued with the doctrines of natural theology. Principal among these was John Kidd (1775–1851), Regius Professor of medicine and a Visitor of the Museum,¹⁷ who had recently introduced a course of lectures on comparative anatomy illustrative of Paley, and William Buckland, the professor of mineralogy already mentioned.¹⁸ At any rate, Duncan records that on his appointment the Vice-Chancellor had sent him an outline plan for the rearrangement of the Museum, together with costed estimates, on which his opinion was sought. Although this document has not survived, we can agree with Ovenell (1986: 190–191) that it must have corresponded closely with the programme of refurbishment that Duncan immediately threw into operation without waiting for the formal sanction of the Visitors.

With regard to the furnishings, hot-air stoves of iron with closed flues replaced the open coal fires that had wrought so much damage to the collection. “New Cabinets covering entirely each end of the Museum” were installed at a cost of £172; glazed cases for “Rarities formerly uncovered & unarranged”¹⁹ were acquired for a further £25, and existing cases were repaired and refurbished; the cabinets were painted and varnished where appropriate and their contents identified by legends applied in gold paint; the name of every specimen was to be “conspicuously affixed” (Anonymous, 1836: vii). The costs, totalling some £370, were initially borne by Duncan himself, and in applying to the Visitors for reimbursement of his expenditure he suggested that anything they might allow him beyond this sum would be considered “as in furtherance of a project to improve the Collection & introduce a little taste for Natural History, & to attempt a slight & very general illustration of Paley & Cuvier”.²⁰

Following the appointment of Philip Duncan and the subsequent removal in 1830 of the professors of mineralogy and experimental philosophy to the Clarendon Building (see above), more radical plans emerged for the rearrangement of the collections so recently displayed by his brother. Philip Duncan’s plan (see Appendix 2) involved taking down the timber partitions that divided up much of the ground floor into offices or lecture rooms and turning it over to the display of the animals of Cuvier’s first class, while the upper room would be given over to birds, reptiles, fish, insects, and crustaceans. He foresaw that further cabinets would be added to the upper floor in the course of time, but already the floor was beginning to sag under the weight of exhibits; the problem was addressed by inserting eight load-bearing cast iron pillars on the ground floor. The frontispiece to the 1836 *Catalogue* of the Museum shows this chamber after these reforms and alterations had been implemented (Figure 1).

In their successive strategies for arranging the exhibits, both the Duncans displayed a firm adherence to Paley’s brand of natural theology. John Duncan had earlier made plain his sympathies through the publication of his own *Botano-theology*, which opens with a declaration of Paley’s manifesto that the most desirable train of thought “is that which regards the phenomena of nature with a constant reference to a supreme intelligent Author” (J. S. Duncan, 1825: title page). The degree to which Old Testament chronology and doctrine retained a defining hold on Duncan’s orthodox perception of Creation is striking (J. S. Duncan, 1825: 3–4):

A
CATALOGUE
OF THE
ASHMOLEAN MUSEUM,
DESCRIPTIVE OF
THE ZOOLOGICAL SPECIMENS,
ANTIQUITIES, COINS,
AND
MISCELLANEOUS CURIOSITIES.



OXFORD,
PRINTED BY S. COLLINGWOOD.
MDCCCXXXVI.

Figure 1. Title-page of the first printed *Catalogue* of the Ashmolean Museum (Anonymous, 1836). The engraved illustration shows the newly installed display of the zoological collections on the ground floor, following removal of the original timber partitions and insertion of cast iron columns to support the upper floor.

That instruction which subordinate creatures continue to derive from the mysterious principle of instinct, the parents of Mankind (as we learn from Moses) received by miraculous means ... by fully intelligible communication from all perfect spiritual authority. The extent of this communication cannot be guessed, because, 1656 years after the creation, the existing generations were swept from the face of the earth, with the exception of one family. To this family of Noah many of the arts of ordinary life must have been known, and an extensive knowledge of animals and plants must have been miraculously communicated. From this family undoubtedly all the knowledge of the nations, to the days of Moses, descended by tradition, the communication of parents to children. But much important truth appears to have been veiled in mysterious characters and allegories, and much obscured in ambiguities of language. ...

In essence the purpose of the new displays was to contribute to the unravelling of these “mysterious characters and allegories”; by the application of systematic principles of arrangement, the Ashmolean collections would form a three-dimensional exposition of natural history not merely as the work of an omnipotent Creator but also as a text which, accurately interrogated, was capable of revealing unquestionable evidence of divine workmanship.²¹ Atheistic misinterpretation of the evidence presented by nature was to be tackled head-on in the displays, with detailed refutations drawn verbatim from Paley’s texts. By 1836, when the first *Catalogue* was published, Philip Duncan was able to state in a historical introduction that, thanks to the work of his elder brother (Anonymous, p. vi):

The arrangement which he has made of the various specimens of natural history, according to the plan of Dr. Paley’s *Natural Theology*, has given an exalted interest to the collection, such as no exhibition of the kind has hitherto displayed.

The manifest programme for the display is made plain in a manuscript volume surviving in the Ashmolean entitled “Paleyian Museum”,²² seemingly in the hand of Philip Duncan but certainly following closely the work of his brother and containing drafts for the labels (or “tablets”) which were to accompany the exhibits, interspersed with notes of items intended to illustrate the text and contribute to the display. A note in pencil inside the front cover reveals the Keeper’s initial plan: “The catalogue to be cut up into Tablets to be hung by the Cases containing extracts from Paley & numbered lists of specimens”²²; although Philip Duncan was later to declare himself satisfied that the process of redisplaying the collections had been completed (see p. 382), the volume evidently remained intact and some of the proposed texts signalled in its pages were never compiled, so that his tactics must have been revised along the way. The volume opens with a manifesto (which may not itself have been intended as a label):

Object

1. To familiarise the eye to those relations of all natural objects which form the basis of Paley’s argument: to form a mental habit of associating the perception of natural phenomena with the conviction that they are media of divine manifestation: & by such association to enhance the dignity of every branch of Natural Science.
2. To exhibit in succession according to the order of time – Antique relicks &c.²²

The first page then continues with a further exposition, designated “Tablet 1” and evidently intended to serve as an introduction to the whole exhibit:

Paleyian Museum

It is the object of Paley in his *Natural Theology* to point out in the plainest manner the most remarkable instances of design, i.e. of power directed by Intelligence to good ends, in the works of the Divine Creator. All the works of God & all his laws which regulate their various modes of being are included in the term Nature.²²

In “Press I. Stones. Minerals” the disquisition is opened with the distinction drawn by Paley between “unorganized & organized objects”, illustrated both in his *Natural theology* (Paley, 1802. See Figure 2 (from 1823 edition) and Appendix 3) and in the museum display itself by comparing a stone with a complex machine – in the first instance a watch and in the second (no doubt for greater visual impact) a clock displayed under a glass bell in order to reveal its workings:

The name of Stone is usually applied to certain hard earthy substances distinguished from metals, salts, bitumen, sulphur &c.

But all minerals are alike distinguished from vegetables by the absence of internal motion; & by incapability of growth, which requires an assimilation of other substances to their own. They are distinguished from animals by the same deficiency & by their incapability of self motion.

Minerals are often found combined in regular forms which designate the chemical differences of their particles.²²

Here the display was to show “Regular Chrystals ... Earthes, Metals &c”, accompanied by explanatory lists. The text continues with the statement that “The particles of these divided by pounding or grinding, & in a dry state, have no tendency to reunite & to reassume such or any regular forms.” Vegetables and animals, on the other hand, “when Organization is destroyed are reducible to dust, exactly similar to that of minerals, destitute of all power to reunite or tendency to rearrangement.” These characteristics were to be illustrated respectively by “Sand & powdered minerals in Hour glass & Phials” and by “Decayed animal matter. Ammonia. Phosphorus. Gluten. Lime”.²²

Then, illustrated by “A Clock under a glass Bell, Exhibiting the Mechanism”, comes the “organized body”, in which:

Several minerals are here arranged so as to produce a useful effect.

The use may be understood by one who has never before seen a watch or clock, because the motion of the Hand which indicates the Hour may be shown to accord exactly with the motion of the shadow of the Gnomon round the circle of a Dial.

The motion of a clock or watch is readily shewn to be necessarily derived from human force: for such force is requisite to wind up the Spring or the weight.

A very slight knowledge of art must lead any one to a conviction that the steel Spring the brass box the chain the fusee the wheels the balance or pendulum the escapement the enamelled plate the Indexes &c are wrought by man’s power & skill from inert minerals.

It is obvious that all these parts have a successive reference one to another, all to the production of a useful end: the measurement of time.

It cannot be doubted that the power & skill which could make the parts capable of such adjustment could adjust them & did adjust them since the end is manifestly useful to man.

Idiocy alone could doubt whether such a machine might or might not be the production of an intelligent & skillful contriver.

An Idiot only could believe that the dust of the ore which lies motionless on the shelf or the mass of the metal could have assumed of itself such arrangement so manifestly fitted for such purpose, or that the dust of decayed animals the Lime &c. could of itself unite and form Eyes & ears & hands & veins arteries bowels a stomach a heart & a brain; & assume by accident those relations of earth to the rest which conduce to the well being of living creatures: & that the motionless hard inanimate powder could by such self arrangement of particles all destitute of self motive power produce life sense appetite affection imagination judgement will &c. “This is Atheism! for every indication of contrivance, every manifestation of design which exists in the watch (or clock) exists in the works of Nature, with the difference on the side of nature of being greater & more, & that in a degree which exceeds all computation.”²²

A pencilled note (rubbed out), following the latter quotation, suggests that “Perhaps an orrery might be procured indicating by clockwork the motion of the Planets”. This suggestion was to form instead the basis of Tablet XII (see below).



W. Field, del.

J.R. Scott, sculp.

*"The Machine which we are inspecting, demonstrates,
by its construction, contrivance and design".*

Chap. 2. State of the argument.

Figure 2. Engraving from Paley's *Natural theology* (1823 edition) illustrating one of the most telling images from his text (see Appendix 3) as utilized by the Duncan brothers: the found watch, "by its construction, contrivance and design", demonstrates the necessity of an "intelligent & skillful contriver", to them an inescapable conclusion which, by analogy, they extended to illustrate evidence of divine agency in the development of animate organisms.

Tablet II, entitled “The Eye, Ear &c”, opens as Tablet I closed, with a Paleyian quotation:

“The contrivances of nature surpass the contrivances of art in number & variety & still more in complexity subtlety & curiosity of the mechanism. Yet they are not less evidently mechanical, not less evidently contrivances, not less evidently accommodated to their end or suited to their office than are the most perfect productions of human ingenuity – compare a single thing with a single thing: an eye for example with a telescope.”

The laws of Optics require that the rays of light in passing from water into the eye should be refracted by a more convex surface than when it passes out of air into the eye. Accordingly we find that the eye of a fish, in that part of it called the crystalline lens is much rounder than the eye of terrestrial animals.”

“What could a mathematical instrument maker have done more to show his knowledge of his principle his application of that knowledge, his suiting of his means to his end – to testify counsel choice consideration purpose.”²²

Accompanying notes suggest that models of different lenses of the eyes of “Fish & land animals in glass or crystal” would appear here, along with a “Mechanical Eye” which might “shew the disposition of the coats Pupil & Retina” and a wax model would “shew the situation of the Muscles & Optic nerve &c.”²³ A drawn section of a double microscope would complement these exhibits. Another Paleyian analogy, provided by the telescope (see Appendix 3 and Figure 3) is here pressed into service.

In order to observe objects at different distances with an optical instrument the distance of the glasses must be changed & adjusted by the hand or by a screw. It is found that by the action of certain muscles A. B. C. D. call[ed] the straight muscles – three changes are produced in the eye at the same time all severally contributing to it’s adjustment for the contemplation of a near object. The cornea or outermost coat of the eye is rendered more round & prominent: the crystalline lens underneath is pushed forward: & the axis of vision, as the depth of the Eye is called, is elongated.”

The habits of Birds render it equally necessary that they should have a distinct vision of very near & very distant minute objects. Their eyes are provided accordingly with peculiar organs – 1 a flexible hoop which “confining the action of the muscles increases the lateral pressure by which the axis is elongated for the view of near objects 2 – an additional muscle called the marsapium to draw, on occasion, the crystalline lens back & to fit the same eye for the viewing very distant objects.

Note. 1 The bony socket or case which so steadily holds together this marvellous machine – 2 The Lid which protects & wipes its surface, 3 the pipes which bring a fluid to moisten & cleanse & to draw off any superfluity thro’ the nose. “Can any pipe or outlet for carrying off the waste liquor from a dye-house or a distillery be more mechanical than this is? It is easily perceived that the eye must want moisture, but could the want generate the gland which produces the tear, or bore the hole by which it is discharged, a hole through a bone?”

Birds & some quadrupeds have a peculiar organ called the nictitating membrane. “It is connected by a tendon or thread with a muscle in the back part of the eye. This tendon or thread tho’ strong is so fine as not to obstruct the sight even when it passes across it. The muscle has a peculiar & marvellous mechanism. It passes thro a loop formed by another muscle & is there inflected, as if it were round a pulley. It makes an angle in order to have greater length in less compass – it passes, not round a fixed pivot, but round the loop of another muscle. The contraction of both assists the designed action.”²²

Notes here call for a model or drawing of a cassowary’s eye and then, in anticipation of the next section, a “Description of the Ear”, for a model of the ear and its parts, showing:

1 The external ear (the concha) calculated like an ear trumpet to collect the pulses of air. 2 A tube which leads into the head. 3 A thin membrane like the skin of a drum stretched across the passage on a bony rim. 4 A chain of four moveable & infinitely curious bones forming a communication between the membranous drum & interior recesses of the skull. 5 Cavities similar in shape & form to wind instruments of music, being spiral or portions of circles. 6 The Eustachian tube like the hole in a drum to let the air pass freely as the drum vibrates. 7 Radiated muscle of the Elephant’s ear – Supposed by Sir E. Home to be designed to bring the membrane of the Drum into unison with different sounds. This muscle cannot act unless the membrane be stretched in a due state of tightness by the muscles of the malleus. How simple the mechanism how great the variety of manifest effects!²²

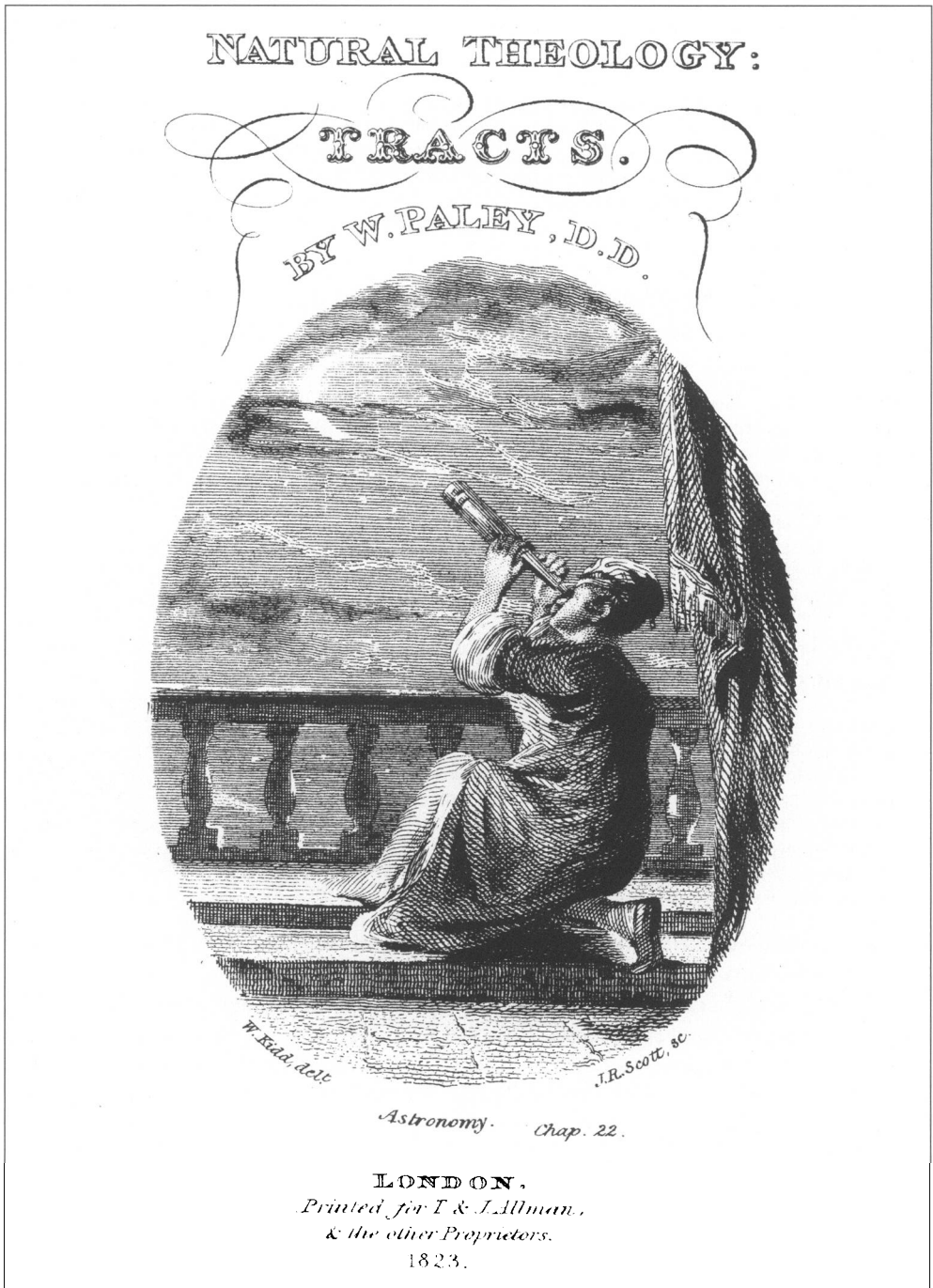


Figure 3. Title-page of Paley's *Natural theology* (1823 edition). The same principles involved in the design of the telescope, illustrated here, being manifest in more complex form in the eye, provided further proof to Paley of the agency of a divine creator (see Appendix 3), which the Duncans enthusiastically adopted into the polemic of their museum display.

The organs of taste and smell were to be exhibited in the form of wax models, accompanied by a further Paleyian tract:

“It is only by the display of contrivance that the Existence, the agency the wisdom of the Deity could be testified to rational creatures. This is the scale by which we ascend to all the knowledge of our Creator which we possess, so far as it depends upon the phænomena of the works of nature. Take away this & you take away every subject of observation & ground of reasoning. Whatever is done, God could have done without the intervention of instruments or means; but it is in the construction of instruments in the choice & adaptation of means that a creative intelligence is seen. It is this which constitutes the order & beauty of the Universe.”²²

“Human & Other Skeletons” were addressed in similar style on Tablet III, accompanied by a demonstration of the workings of the spine:

“Can the joints & pivots of the most complicated machine ever invented exhibit a construction more artificial than that wh[ic]h is seen in the vertebræ of the human neck. Two things were to be done. The head was to have the power of bending forward & backward of turning to the right & left. The head is united to the uppermost of the vertebræ by a hinge joint. This admits of all vertical motions: for a horizontal rotation a mechanism resembling a tenon & mortice is found in the two bones immediately below the hinge.” Thus when we nod the head we use the hinge joint when we turn the head around the tenon & mortice.

An equally remarkable provision for rotatory movement is found in the bones of the forearm. Above, toward the elbow, a tubercle of the radius plays into a socket of the ulna; while below toward the wrist, the radius provides the socket & the ulna the tubercle. The facility of movement thus given is best proved by the rapid motions of the hands of jugglers & in no small degree by those of musical performers.²²

In the last of the completed labels, Tablet IV, an examination of musculature was designed to complement the foregoing skeletal display:

Keill²⁴ has reckoned up in the human body four hundred & forty six muscles, dissectible & describable & has assigned a use to every one of the number.

B[isho]p Wilkins has observed from Galen that there are at least ten several qualifications to be attended to in each particular muscle 1 it's proper figure 2 its proportionate magnitude 3 its fulcrum or support 4 its point of action 5 its collocation or relation of it's two ends 6 its place in the frame 7 the position of the whole muscle with relation to other muscles &c 8 the introduction of blood vessels 9 of nerves 10 of lymphatics. “How are things including so many adjustments to be made; or when made, how are they to be put together without intelligence?”²²

The text concludes with a note that “A Press might be occupied with a detailed display of comparative muscular anatomy.”

The following four tablets never got beyond the form of headings, accompanied by the appropriate chapter numbers in Book II of the *Natural theology* (Paley, 1802) from which their texts were to be derived: Tablet V “Blood Vessels” (chapter 10); Tablet VI “Digestive Organs &c” (chapters 10 and 11); Tablet VII “Comparative Anatomy” (chapters 12 and 13), in which “Differences relating to peculiarities of condition” would be treated; Tablet VIII “Prospective Contrivances” (chapter 14).

Tablet IX, “Zoology Relations & Compensations”, relating to Paley’s chapters 15 to 20, includes a list of intended exhibits arranged according to the system of Linnaeus and including in some instances the numbers contained within each class.²⁵ Accompanying notes assess the numbers of cabinets that might be required and anticipate that a number of casts and preparations of larger animals might be displayed out of the cases.

Tablet X, “Botany” referring to Paley’s chapter 20, lists 25 classes of plants and names their various orders according to the system of Linnaeus, together with a note that the display was intended to include “Wax specimens of Classes on 6 Shelves 6 on each Shelf

& 2 Shelves of Dissected Stems & Roots".²⁶

The final text, Tablet XI, "Astronomy" was also to have been based on Paley (chapter 22) but comprises only the heading "Orrery", together with a note that the intended text would run from "'Enormous globes, held by nothing, confined by nothing, are turned into free & boundless space &c.'" to the end of the chapter".²² To an extraordinary degree, these drafts allow a remarkably full reconstruction to be made of both the overall programme and much of the detailed arrangement of the displays as installed by the Duncans.

In chronological terms, the next window on to the Duncans' achievement at the Ashmolean to which historians have had recourse has generally been provided by the 1836 *Catalogue of the Ashmolean Museum* (Anonymous, 1836), essentially the work of Philip Duncan, with the antiquarian section seemingly prepared by his under-keeper, William Kirtland. A noteworthy omission from almost every previous review of the Ashmolean's history is a 51-page *Introduction to the Catalogue of the Ashmolean Museum*, published a decade earlier under the keepership of John Duncan (Anonymous, 1826).²⁷ The 1826 *Introduction* includes, in addition to the text, a number of fold-out comparative tables. The first of these, titled, respectively, "Pennant's Method", "Lacepède's Classification of Mammalia" and "Lacepède's Classification of Birds", summarize what were considered some of the most important systems published to date, while the remaining tables evidently were drawn up by the author himself and clearly reflect the arrangement adopted in the Ashmolean's displays. The first table, titled "Mammalia - Animals with Paps and Nipples", concludes with a footnote: "N.B. This arrangement is experimental, requiring the confirmation of further observation. Remarks of Naturalists who may visit the Museum will be thankfully received. A book to receive such remarks will be produced when required" (Anonymous, 1826).

This volume, however, evidently remained an introduction without an exposition, until Philip Duncan remedied that situation with what is effectively a completely new catalogue in 1836. That text opens with its own introductory essay on the "History and arrangement of the Ashmolean Museum" but curiously omits all reference to the already published *Introduction*.

Even as it stands, the 1826 *Introduction* represents a considerable achievement on the part of John Duncan. It sets out not only the entire philosophical structure that would underpin the displays for the remainder of the first half of the nineteenth century but also establishes the primary divisions by which the collections were to be characterized: "1st. Ancient Relics ...; 2dly, Arms of different nations; 3dly, Dresses and Implements of half-civilized nations; 4thly, Rarities ...; 5thly, Pictures; 6thly, Books, manuscript and printed; 7thly, Specimens illustrative of zoological arrangement – collected with a hope of continually exciting a remembrance of the pious works of Derham and of Paley" (Anonymous, 1826: 5–6).

Despite their place at the end of the list, the zoological collections were already earmarked as the most important component. Later (Anonymous, 1826: 7) the author expounds his guiding principles and articulates a number of themes by which they were to be illustrated: "In the arrangement of a Museum, a manifest end should govern the disposition of every part; for example, the promotion of useful knowledge, or its direction to the glory of God." This, he suggests, with respect to natural science, is the leading object of Ray, Derham, and Paley, and if the *Natural theology* of the latter were to be regarded as an arrangement of specimens referring to this end, the cabinet would include a number of important sub-divisions. There follows a list of headings corresponding to those allotted to the "tablets" discussed above.

In terms of natural history, the 1836 *Catalogue* is not only a significant monument in itself to the industry of the Duncan brothers: it also reveals the overwhelming extent to which the zoological collections had been reconstituted under their regime. Ovenell (1996: 205) has calculated that of over 2,600 zoological specimens listed in the text, fewer than 120 can be traced to the original collections. To mention only the largest influxes of bird specimens, major contributions came from the Revd Dr Charles George Perceval in 1825 (over 100 British specimens); from Major Stacy (57 specimens from Bengal) and from Dr George Such (over 100 miscellaneous birds) in 1829; from the East India Company in 1830 (78 Indian specimens) and from the Revd C. Kuper (169 British, Continental and South American birds).²⁸

Insights into the sources of some of these exhibits, the purposes to which they were deployed and the problems attendant on their collection, preservation and transportation to Oxford are provided in the section which follows, based on a collection of hitherto unpublished correspondence that complements the sources already discussed.

By 1840, when he published his *Essays and miscellanea*, Philip Duncan evidently felt that the greater part of his work on reconstructing the collections was done, for in that text he wrote: “Nothing more now remains to be done in the Museum than to prepare and place the donations which may arrive, or the new articles which may be purchased, according to the present order and arrangement, and to give an accurate catalogue of all it contains” (P. B. Duncan, 1840: 395).

In the decades immediately prior to the unleashing of the Darwinian controversy it is striking that, for all their zeal in reforming the collections, the Duncans saw themselves as involved in a highly conservative exercise aimed primarily at buttressing traditional academic as well as spiritual values. Their aim with respect to natural history was clearly stated: certainly they aimed “to advance the progress of their Science”, but equally important was their aim to “give due glory to the Cultivation of Antient Learning which visitors ignorant of our Academical studies their tendency their aims & their proper result have often rashly calumniously & maliciously attempted to decry” (see Appendix 1).

“CORRESPONDENCE, CHIEFLY MR DUNCAN’S”

With regard to the natural history specimens themselves, much is revealed of the Duncan brothers’ industry in expanding the collections from the published *Catalogue* of 1836, in which their massive contribution is made plain: in his introduction to the volume Philip Duncan was able to state with confidence that the Museum possessed by that time “a well-arranged collection of many of the genera in every department of zoology, with some beautiful and rare species included in every genus” (Anonymous, 1836: vi).

Flesh is put on the bare bones of some of the catalogue entries by a series of letters surviving in the Ashmolean Museum, now bound in a volume entitled “Correspondence, Chiefly Mr Duncan’s”.²⁹ Of the 100 letters contained in this volume, some 70 (dating from 1823 to 1829) are either addressed to or closely concern John Duncan, while the remainder (dating from 1830 to 1846) relate to his brother Philip. During both regimes some of the correspondents address themselves to William Kirtland, the assistant keeper, who joined the Museum c. 1805 and remained in office until some years after Philip Duncan’s retirement; he died in 1864 (Ovenell, 1986: 191, 213). An alphabetical list of correspondents is given in Table 1. Together these letters cast light on the circle of acquaintances on whom the Duncans

Table 1. Letters contained in the volume "Correspondence, Chiefly Mr Duncan's" (Ashmolean Museum, AMS 15).

Letter #	Date	From	To
1	5 April 1790	Principal of St. Mary's Hall	Provost of Worcester College
2	[]	Miss Rosamina [?] Nowell	J. S. Duncan
3	1 September [1824]	Andrew Bloxam, Rugby	J. S. Duncan
4	21 December 1823	Henry Brown, Amesbury	J. S. Duncan
5	23 February 1824	Joshua Brookes, Theatre of Anatomy, Blenheim Street, London	J. S. Duncan
6	27 February []	Charles Courtenay, Buckland House	J. S. Duncan
7	1 March 1824	Bishop Christopher Lipscomb, North Leach	J. S. Duncan
8	9 April 1824	William Burchell, Fulham	J. S. Duncan
9	25 May 1824	Noel Th. Sullivan [?], Balliol College	J. S. Duncan
10	4 June 1824	James Paxton, Queen Street, Oxford	J. S. Duncan
11	4 June 1824	James Dallaway, Leatherhead	J. S. Duncan
12	21 August 1824	Capt. Lord Byron, Gloucester Place, Portman Square, London	[J. S. Duncan]
13	25 October 1824	[] Sherrard, Camberwell	J. S. Duncan
14	27 September 1824	Revd C. Annesley, All Souls	Viscountess Scolmouth [?]
15	12 November 1824	S.P. Pratt, Mount Beacon	J. S. Duncan
16	6 December 1824	William Burchell, Fulham	J. S. Duncan
17	13 December 1824	Andrew Bloxam, Rio de Janeiro	J.B. Duncan [<i>sic</i>]
18	18 December 1824	J. Byron [?], Trinity College	Revd N.S. Wall, St Giles, Oxford
19	21 [December 1824?]	James Wilson, 10 St George's Place	J. S. Duncan
20	9 February 1825	Andrew Bloxam, Valparaiso	J. S. Duncan
21	18 March 1825	Mr Wilkinson	William Kirtland
22	18 March 1825	P.A.[?] Scott, Cape of Good Hope	J. S. Duncan
23	27 March 1825	W.C. Trevelyan, Wallington, Newcastle on Tyne	J. S. Duncan
24	12 April 1825	J. Duncan	J. S. Duncan
25	5 May 1825	William Bullock, 119 Sloane Street, London	J. S. Duncan
26	[] May 1825	n/a	n/a
27	22 June 1825	George Lyon, 90 Great Portland Street, London	J. S. Duncan
28	30 July 1825	N.A. Vigors, Chelsea	E. P. Duncan [<i>sic</i>]
29	4 July 1825	W. Hamper, Birmingham	William Kirtland
30	23 July 1825	S.P. Pratt, Bath	J. S. Duncan
31	31 August 1825	Charles George Perceval	J. S. Duncan
32	9 September 1825	n/a	n/a
33	13 October 1825	Charles George Perceval	J. S. Duncan
34	15 October 1825	N.A. Vigors, Chelsea	J. S. Duncan
35	12 August 1825	N.A. Vigors, Chelsea	J. S. Duncan
36	Monday []	Miss Morland, Hampstead	J. S. Duncan
37	29 December 1825	J.H.F. Moody	J. S. Duncan
38	8 December 1825	Henry Wise, St Clements, Oxford	J. S. Duncan
39	12 May 1826	Capt. Lord Byron	[?] J. S. Duncan
40	January 1826	Dr Sims, 37 Wimpole Street, London	J. S. Duncan
41	15 August 1826	John Brickenden Frowd, Corpus Christi College	[J. S. Duncan]
42	6 September 1826	W.J. Burchell, Rio de Janeiro	J. S. Duncan
43	9 September 1826	John Lyon, 90 Portland St., London	J. S. Duncan
44	15 September 1826	William Swaindon	J. S. Duncan
45	14 September 1827 [with extract of letter from Charles Telfair, Mauritius, 12 November 1826]	Robert Barclay, Buryhill	J. S. Duncan

46	20 November 1826	Mr Prentice?, Abbey House	J. S. Duncan
47	[]	[]	William Buckland
48	5 February 1827	S.P. Pratt	J. S. Duncan
49	7 February 1827	John Bishop, Gloucester	[J. S. Duncan]
50	9 February 1827	Frank Harding, Baraset, Stratford on Avon	J. S. Duncan
51	17 April 1827	Frank Harding, Baraset, Stratford on Avon	J. S. Duncan
52	21 May 1827	Robert Barclay, Buryhill, Dorking	J. S. Duncan
53	11 June 1827	Robert Barclay, Buryhill, Dorking	J. S. Duncan
54	15 June 1827	E. Lipscomb, HMS <i>Isis</i> , Chatham	J. S. Duncan
55	14 August 1827	Capt. H.F. De Lisle, London	J. S. Duncan
56	19 October 1827	Mr Pennato, Faringdon House	J. S. Duncan
57	23 October 1827	Charles Telfair, Beau Marquier, Mauritius	J. S. Duncan
58	17 April 1828	Dr Pratington, Bewdley	J. S. Duncan
59	30 May 1828	Lieutenant N.J. Cole, HMS <i>Onyx</i> , Portsmouth	J. S. Duncan
60	4 July 1828	Alex R.L. Dallas, Yardley Vicarage, Herts.	J. S. Duncan
61	23 January 1829	George T. Fox, Durham	[J. S. Duncan]
62	[] 1829	[Major Stacy]	[J. S. Duncan]
63	3 February 1832	D.G. Stacy, New College	William Kirtland
64	26 November 1829	Dr George Such, 11 Margaret St., Cavendish Sq., London	J. S. Duncan
65	24 June 1829	John F. South, 12 St Thomas St.	J. S. Duncan
66	[] 1829	Sir Richard Colt Hoare, Stourhead	[J. S. Duncan]
67	13 September 1829	Bishop J.M. Turner, Rio de Janeiro	J.S Duncan
68	10 July 1829	J.C. Dale, Glanville Wootton, Sherborne, Dorset	J. S. Duncan
69	9 August 1829	J.C. Dale, Glanville Wootton, Sherborne, Dorset	J. S. Duncan
70	1 March 1830	Mr Watts, University College	P. B. Duncan
71	28 December 1830	Thomas Horsfield, Library, East India Company	J. S. Duncan
72	31 March 1831	Revd C. Thuyer	William Kirtland
73	1831	Mr Tupper, Christ Church	[P. B. Duncan]
74	23 March []	Mr [?] Wright, 17 Panton Square, London	P. B. Duncan
75	26 November 1834	Revd P. Wood, Broadwater Rectory, Worthing	J. S. & P. B. Duncan
76	9 February 1833	n/a	Ashmolean Society
77	15 December 1834	H. Jenkins, Troedyr aur [?]	William Kirtland
78	[]	C. Roukes, Bengal Civil Service	n/a
79	22 December 1836	Josiah Forshall, British Museum	P. B. Duncan
80	3 February 1837	Henry Ellis, British Museum	P. B. Duncan
81	4 December []	John Murray, Albermarle Street, London	[P. B. Duncan]
82	16 February 1837	William Yarrell, Zoological Society, 28 Leicester Square, London	P. B. Duncan
83	13 February 1837	Charles R. Vaughan, All Souls	William Kirtland
84	12 January 1838	[] Cottrell Dormer, Rousham	William Kirtland
85	17 June 1837	P.J. Fermunds, Leiden	P. B. Duncan
86	7 November 1837	Treasurer's Office, Middle Temple	P. B. Duncan
87	6 July 1838	J. White	[]
88	30 August []	William Buckland	William Kirtland
89	12 June 1838	Joseph Hunter, 30 Torrington Square	P. B. Duncan
90	2 July 1838	John George Children, British Museum	P. B. Duncan
91	12 October 1838	Samuel Birch, British Museum	P. B. Duncan
92	5 January 1839	Everard Home, Ham	S.P. Rigaud
93	20 November 1845	Simon Brumel, Musée Royal d'histoire naturelle, Brussels	P. B. Duncan
94	12 January 1847	Secretary to Duke of Marlborough, Blenheim Palace	P. B. Duncan
95	3 November	Duke of Marlborough [?], Blenheim Palace	[P. B. Duncan]
96	9 October 1846	Edward Shortland	[]
97	26 October 1846	J. Warburton, Islington	[P. B. Duncan]
98	11 December 1840	Richard Owen, 6 Park Cottages, Park Village East	William Buckland
99	5 November 1846	Richard Owen, Royal College of Surgeons	P. B. Duncan
100	30 August 1844	Mr Wilson	William Kirtland

relied for their specimens, on aspects of the problems of classification which preoccupied naturalists of the day, on the difficulties they encountered in preserving and transporting their specimens, and on perceptions of the specimens themselves, providing insights into complex collection-histories that are scarcely hinted at in the text of the catalogue.

The correspondents

This collection of letters stems from numerous authors, writing from a variety of backgrounds: some are aristocrats or gentleman-collectors, some are naval officers whose travels have enabled them to collect specimens from distant shores, several are distinguished clerics, while a few are museum professionals from England or from continental Europe. The texts confirm the Duncans' reliance on a wide circle of collectors and travellers for the establishment of the natural history collections at the Ashmolean, and the correspondence bears testimony to their ability to inspire warm friendship and charity amongst those of their acquaintance: although most of the letters under consideration conclude with a formalized statement of goodwill, it is clear that both brothers were held in high regard by their correspondents.³⁰

Classification and display

The Duncans' admiration for William Paley's *Natural theology* has already been alluded to, and clearly it was an enthusiasm shared by many of their correspondents. Prominent among these is James Paxton (1786–1860), a surgeon and medical author based in London, who donated to the Museum in 1824 an anatomical model in wax illustrating the facial nerves.³¹ Like the Duncans, Paxton was a man of strong religious beliefs who, in 1826, published his own edition of Paley's *Natural theology*, with explanatory notes (Paxton, 1826). He represents perhaps the clearest example in the collection of a correspondent sharing the Duncans' approach to the natural sciences.

S. P. Pratt provides a further link to the concept of the "Paleyian Museum" to which the Duncans aspired. In a letter of 23 July 1825, he begins without an address or greeting, but with a classified list of animals and their descriptions:

Animals having testaceous coverings are divided into four classes viz.

Aunulata Sedentaria [...]; Cinisseda [...]; Conchissera [...]; Mollusca [...]

The Sedentary Aunulata are divided into four families viz.

Dorsalia [...]; Maldania [...]; Amphitritia [...]; Serpula [...]³²

At this point the list breaks off, and a letter to John Duncan begins:

My dear Sir, When I had written thus far for a rough sketch of a synopsis for the Museum, I felt doubtful how far I had adopted a good method. I have therefore thought it best to send it to you for your opinion. There seems to me some judgement necessary to determine how much of the history and character of the object which the synopsis notices should be alluded to – enough certainly to interest the observer and to excite his curiosity – but if this is carried too far, it may induce interest different than further examination which such a notice is intended to excite – also if the remarks are too extended they may not be read at all. Your experience will direct me, if you think that what I have attempted will be of any use to you.³²

From this letter it appears that Pratt had been asked to collaborate on the preparation of drafts for the museum labels discussed above; his wish to engage and to inform

the visitor without overwhelming him with information reveals a rather commendable pragmatism.

John Duncan's published works were known to some of the correspondents. Writing on 13 October 1825, the Revd Dr Charles George Perceval sends an acknowledgement to Duncan:

My dear Sir, I feel ashamed no sooner to have acknowledged the receipt of your obliging letter and the little book that accompanied it, for both of which I am much obliged. I have not yet read the little book which has employed your leisure hours so well, and am afraid it is beyond me for tho' I have been a Collector I am no Philosopher.³³

Evidently Perceval had been favoured with a copy of Duncan's *Botano-theology*, published that same year. Charles Telfair (1777?–1833), writing from Mauritius on 23 October 1827,³⁴ also thanks Duncan for the gift of a book, although the dating in this instance makes it unclear whether it was the same volume that Perceval had received or whether it was the 1826 *Introduction to the catalogue of the Ashmolean Museum*.

Another perspective on the debates exercising the natural science community at this time is given by three letters from Nicholas Aylward Vigors (1785–1840), whose undergraduate years had been spent at Trinity College, close by the Ashmolean. All three date from 1825, the year before Vigors was appointed secretary to the newly-established Zoological Society, and their principal theme concerns the arrangements that Vigors had made for Duncan to acquire birds from the Brazilian collections of Dr George Such; however, he also mentions his own collections and his personal views on classification. One letter, written on 15 October 1825, contains the following passage:

I should feel great delight not only in pointing out the valuable articles in Dr Such's collection, but in showing you my own collections, in Ornithology & Entomology, which have been formed on a plan similar to your own. It has been uniformly my object to procure types of form in preference to a multitude of species, with the view of ascertaining the great outlines of Nature, and thus to trace the wisdom of her plans, not merely in detail, but in a point of view not opened to us until lately, in the extensive affinities & combinations of all her works. With this object constantly before me, and by a singular good fortune in my opportunities of procuring specimens, I have in a comparatively short space of time brought together an illustrative series of materials, particularly in Ornithology, which I think would be highly interesting to you, as advancing those views which you so justly determine to be the legitimate end of Natural Science.³⁵

Another communication, written on 12 August 1825, reveals a trace of former disagreement between Vigors and John Duncan, in which, it appears, Vigors had proposed some revision of the tenets of the natural theology movement:

I wish much to have some conversation with you in respect to our new arrangements in Ornithology. I can explain these circumstances to which you allude in your letter as appearing anomalies, and I think you will find on the whole that our present mode of viewing nature will accord entirely with your views of illustrating "the wisdom" displayed "in the Creation".³⁶

While sharing similar views to the Duncans on classification systems, Vigors's concerns evidently were less theological than theirs.

Research objectives

It has been mentioned that many of the correspondents whose travels provided specimens of natural history for the Museum were privately funded. The lack of funding and frustration

at the absence of formal support for their researches are concerns voiced by several of the Duncans' correspondents.

One such, the Revd Dr John Mathias Turner, newly consecrated Bishop of Calcutta,³⁷ was taking the westward route to his see when he wrote from Rio de Janeiro on 13 September 1829. He complains that he lacks the skill to describe the natural wonders around him, and expresses a longing that more naturalists should travel outside Europe in their researches:

My dear Sir, I have consigned to your address by a ship bound to Liverpool a case containing what I am assured is a very good collection of the Butterflies and Insects found in Brazil. I am desirous to offer it to the Ashmolean Museum and I beg you to express on my behalf to the Vice Chancellor (if through him the offer should be made) an earnest hope that it may be accepted as an expression of respect and attachment to the University of Oxford.

You would pity me if you could see what a rich store of Animals, Vegetables and Minerals is found around me here while I am in the midst like a blind man in a gallery of pictures. I wonder your Naturalists stint yourselves to Europe while such a harvest of rarities remain to be verified on this side of the Atlantic. Tell Buckland that there are some very curious extraneous fossils in the Imperial Cabinet of which all that the Curator knows is that they come from a Sierra far inland. And tell him too that if he wishes to enlarge his knowledge of Granite he must come here; from low water mark to the summit of the highest peaks all is granite.³⁸

Perhaps the Bishop was unaware that at least one naturalist known to Duncan had indeed travelled in Brazil: William Burchell, writing on 6 September 1826 from Rio de Janeiro, expresses his desire that Oxford should support research in under-explored areas of the world:

I have often in my rambles thought of Oxford, and have felt a very ardent desire that it would constitute itself the great seat of the natural sciences, as it is of learning; for I know not where the rare objects of foreign countries could be better or more properly preserved, & rendered useful in enlarging the views of men. I would that it were in my power to convince every individual in the University that learning (I mean literature) being the first step towards opening the mind of civilized man, the second should be the study of the works of the Creation, by which it would be farther expanded, and warmed with the admiration of the beauty harmony & wisdom which it would there behold displayed. In this fine country I could be more useful in the public cause were I not restrained by the narrow limits of private means; but could not the University send out easily collectors into this & many other countries who would in a short time pour into Oxford more than ten Ashmoleans could contain: and could it not support a chair of Natural History? I would then not be found backward in offering my humble assistance; and should feel proud in contributing to so useful an establishment. ...

... I cannot help calling to mind the well organized & classical body of travellers once sent out by the University of Copenhagen to explore & examine Egypt & Arabia.³⁹ This has never been taken as an example, although worthy of being imitated. I wish my own country would attempt something of the kind with respect to some interesting regions of which we know little more than mere hasty geographical views.⁴⁰

Burchell, despite having the financial resources to travel in Africa and South America, was not so wealthy that he could acquire everything he would have wished for.⁴¹ This constraint is hinted at above, and is made more explicit in a letter written from Fulham on 9 April 1824, which also acknowledges the degree to which John Duncan himself regularly underwrote the costs of the work he instituted at the Ashmolean:

My dear Sir, I fear you have been thinking me very neglectful of your commission; but I assure you that such has been very far from the case, and I have in reality been, ever since I left Oxford, very solicitous to fulfill all your wishes, and could have done much more in the way of purchasing for your museum had I not perceived by your letters that the expense was likely ultimately to rest with you, and I consequently hesitated in proceeding to that extent which the funds of a public museum & the credit of a university would have authorized.⁴²

As well as experiencing, if not financial hardship, at least the need to keep a tight rein on his expenses, Burchell encountered another problem in having his specimens prepared for display. The obstacle took the form of another correspondent, the traveller and sometime museum-owner, William Bullock.⁴³ Burchell continues:

I have as yet made use only of £16.12.3 out of your £20, and shall want a letter from you mentioning if there is any particular object you wish purchased with the remainder: otherwise, I think it may be employed to advantage at Leadbeater's:⁴⁴ I put into his hands, about two months ago, to be stuffed, the skins of the leopard and ichneumon; but although he professed that he would get them ready immediately, and I very often called to inquire into the progress he made, I found much delay created by his being at that time very busily engaged in preparing some things for Bullock's Mexican exhibition, and as he pleaded that as he was urged by Mr Bullock to get his work finished as soon as possible, I found myself obliged to consent to this delay. I have paid his bill (which, to avoid double postage, I reserve till another opportunity of sending you) of which the particulars are – preserving the oriole 4 shillings, the Creeper 3 and 6, and the tanager 3s and 6d; besides 11 and 3d for two packing cases and other expenses. With respect to the monkey, he desires that it may be considered as a present to the Museum. So that it may fairly be said that he is not only reasonable in his charges, but that he is even liberal.

I beg also to be considered as a donor to the Ashmolean, of the leopard and ichneumon, two animals which were shot during my travels in Africa. I sent on a former occasion a few trifling things to exemplify some of the personal ornaments of the natives; but do not know whether they were packed up as I desired or whether they have been duly received: if they have not, I will make further enquiry at Corbett's.⁴⁵ He some time ago told me that he had never received his second packing case; and I promised to mention this to you when I wrote. I have paid his bills which amount to 10£ 10 shillings.

When I last saw Mr Brookes⁴⁶ about a month ago he told me that he had already prepared for you several zoological specimens.⁴²

The following letter was written, in agreement with Burchell's testimony, on 29 February 1824. The relationship between Brookes and John Duncan was evidently a professional one, with Duncan paying for Brookes's services:

Sir. In the first place I acknowledge receipt of a Draught for £10 and accordingly have given instructions for the skeleton of the Monkey to be made forthwith. A Porcine Deer, (*Cervus porcinus*,) and a Trumpeter, (*Prophia crepitans*,) having been offered to me recently dead, for two pounds, I purchased them on your account; and have given orders for their being made into skeletons: my operator will charge four Guineas for the Deer, (a Female,) without horns, but by no means a common species, and one pound for making a Skeleton of the Trumpeter, which forms a Genus of itself, in the Order Alectorides of Temminck.⁴⁷ And, as I remarked in my former Letter, these occurrences take place almost daily, therefore, I will thank you to say whether you wish for any rare animals that may be offered, or only particular subjects, which I shall be obliged to you to specify distinctly.⁴⁸

William Bullock, whose Mexican specimens had diverted Burchell's taxidermist from attending to the Oxford specimens, is also to be found among the Duncans' correspondents. He had established an immensely popular museum in London, which included in its displays artefacts brought by Captain Cook from the South Seas, and in 1822 he travelled around Mexico for six months, returning to open an exhibition on "Modern Mexico" – presumably the display referred to in Burchell's letter of 1824. Bullock himself wrote to John Duncan on 5 May 1829, offering to sell to the Ashmolean a model of an Egyptian temple by Thomas Deighton for 50 guineas, and a model of the "Temple of Karnack" for £60,⁴⁹ plus books on Egypt and on Mexican statues. He also refers to his imminent return to Mexico; perhaps he wished to dispose of some of his collection at this time in order to fund his travels.

There are other correspondents in this collection whose relationship with the Duncans is that of paid agent rather than wealthy donor, and more on these will be found below.

To conclude the present discussion, which began with complaints that Oxford placed insufficient importance on the natural sciences to fund appropriate research, a letter from P. A. Scott, writing on 18 March 1825 from the Cape of Good Hope, contains a blast of ill-feeling towards the University for *all* its failings towards its would-be benefactors including, it would seem, towards Duncan himself:

My dear Duncan, ... My great regard & affection for you & your excellent brother will force me to surmount the ill humour I am in with Alma Mater for her illiberal & ungenerous conduct to all her benefactors & to you in particular; & because you have wished it, but not because she deserves it, I have employed a person here to procure for you an Elephant's foot & leg to stick up in the Museum which however small will always redound to your high honor & excellent principles & goodness, as it must if the secret history be known, reflect everlasting disgrace on the University. To you therefore & not to her do I present this offering & do not I beseech you let my name appear as the contributor except it can be as an offering of friendship & esteem to John Shute Duncan.⁵⁰

Conceivably the elephant's thigh-bone depicted in the frontispiece of the 1836 *Catalogue* (Figure 1) may be Scott's specimen, but no independent evidence survives of the fulfilment of his promised donation.

Problems in collecting, preserving and transporting items

Another area of tribulation for contemporary naturalists which finds expression in this collection of correspondence is the danger and difficulty that attended the transfer of specimens from their original environment to the Museum. The pages of the Duncans' letter-book illustrate many of the problems besetting the traveller and collector with an interest in natural history in the early nineteenth century – episodes that are seldom recorded in formal publications such as the 1836 *Catalogue* and which are all too easily lost to historians.

Some of the Duncans' correspondents evidently had been commissioned to collect or purchase particular specimens for the Ashmolean, although the source of the money being spent is not always clear. An example of this kind of ambiguity can be found in a letter from Miss Morland, normally resident in Abingdon, who writes to John Duncan from Hampstead on her return from a visit to Paris in the autumn of 1825. In sending a pair of partridges with her letter, she apologizes that lack of time prevented her from finding them at a lower price.⁵¹ Although this seems to imply that she was spending Duncan's money on his behalf, the donors' register records these specimens as a gift to the Museum from Miss Morland.⁵² Whatever the true situation, there is no doubt that she was also looking out for specimens which the Museum might like to purchase, and that she had a good eye for a bargain:

... M. Bécœur⁵³ has a splendid Collection of Birds and Insects for sale, chiefly from Brazil & the French Colonies in South America, and he asks very moderate prices for them – a complete collection of Butterflies from Brazil & New Holland, consisting of 380 specimens, most beautifully preserved, M. Bécœur asks 700 francs for, and he would probably take less than that.⁵¹

Back in England, would-be purchasers of natural history specimens experienced their own problems. S. P. Pratt, writing on 5 February 1825, explains that, in London, demand for such specimens far outstripped supply:

I was disappointed that during my stay in Town I was unable to procure any of the desiderata for the Museum which you gave me a list of. Natural History is at present so fashionable a pursuit (to give it no higher

inducement) that every object of interest is immediately purchased, so that a person is constantly on the [illeg.] that mere charm will enable him to procure objects of any rarity. Some of the dealers told me that they had standing orders from several persons for every object new or rare.⁵⁴

The strong implication was that even an institution like the Ashmolean would have to look beyond the usual circle of suppliers for new acquisitions. This strategy was adopted by William Yarrell of the Zoological Society, as he explained to Philip Duncan in a letter of 16 February 1837:

Since I had the pleasure of receiving this book [the recently published *Catalogue: Anon.*, 1836] and your letter I have been hunting the shops of all the preservers of animals I am acquainted with in London in hopes that I might be the means of preserving your valuable life by obtaining a Porpoise for your museum. I regret to say that hitherto I have been unsuccessful and that was one reason why you had not heard from me last week. Some goodnatured fishermen who keep a look out for me at Billingsgate Market have promised to save me the first porpoise that makes its appearance there, and you shall be supplied by hook or by crook.⁵⁵

Preservation

Many of the Duncans' correspondents had travelled abroad with the aim of acquiring specimens of natural history for their own collections and for various museums. However, even when it was possible to capture, shoot or purchase specimens, the traveller in a tropical climate was faced with the problem of preserving them. D. G. Stacy, in a note from 1829 which accompanied a shipment of birds to be donated to the Museum, writes of these problems, which must have been most frustrating both for collector and recipient:

... More last words. Pray tear off this Bottom and send it to Kirtland at the Museum, that he may know that I have for the Museum an Ornithorynchus Paradoxus from New Holland in an excellent state of preservation and a head of a Rhinoceros, and d^o (very bad) of an Alligator, the two last from Bengal & the Alligator's head different from the one already in the Museum. I can either send them immediately or I can keep them 'till some Pheasants' Skins arrive, of which I am in almost daily Expectation. The last mentioned are I fear much injured by Insects, which had got into them before they reached Calcutta.⁵⁶

With regard to the problems faced by these travellers, the deepest insight is given by letters from Andrew Bloxam (1801–1878) who, in 1824, began a voyage to the Sandwich Islands as naturalist on board the *Blonde*, under Captain The Lord Byron.⁵⁷ The ship's primary mission was to transport to their homeland the bodies of the King and Queen of these islands, both of whom had died of measles in England (Jackson, 1885–1901: 726). Bloxam's letters to Duncan during this journey of discovery are revealing both of his character and of the obstacles he encountered; they paint a vivid picture of a young naturalist in a challenging situation, and merit consideration at some length.

The earliest reference to the voyage in the Duncans' letter-book is from Lord Byron to John Duncan, written on 21 August 1824:

Mr A. Bloxam is desirous of going in the *Blonde* to the Sandwich Isles as Mineralogist &c.. The Adm[ira]lty have no objections to his going without a salary but will give him the King's allowance, provided he can produce testimonials of his ability to fill that office.

Mr Bloxam has referred me to you, which gives me the more pleasure as I can assure the Adm[ira]lty that whatever testimony you bear towards Mr Bloxam's ability on the points of Geology Mineralogy &c. will be sufficient without further ones from Professor Buckland who I believe is absent from Oxford.

D[ea]r Sir, You are aware no doubt of the interesting Voyage I am about to commence, and under the Blessings of Providence I hope we shall prosper and be of some use to our Country by our surveys, as well as by promoting the good feelings of the Nations, also with the assistance of Mr A. Bloxam of adding somewhat to your Museum.⁵⁸

Bloxam had studied at Worcester College, and must have been well-respected by Duncan, for on 1 September of that same year he wrote with news of his imminent departure:

My Dear Sir, Your gratifying letter I have this morning received & altho' I am in the hurry of packing up for my going on board the *Blonde* at Woolwich on Saturday next, I cannot omit a post thanking you for your friendly wishes for my prosperous voyage. I hope to prove myself deserving of the character you have given of me to Lord Byron which has led to this desirable event. We are to take in our live stock at Portsmouth where the ship is expected to arrive about the 9th or 10th, & I fear we shall stay too few days there to allow of my receiving any further communication from you; if not, and there are any further instructions you could give me, directed to me, H.M.S. *Blonde*, Portsmouth, I shall have much pleasure in availing myself of them. Perhaps you will do me the favour to assure Mr Buckland when you see him how much I should have liked a few instructions from him had their been time for my obtaining such. I have procured as many things as my limited time & means would admit of, necessary for the preservation of skins of Birds, arsenical soap &c. also for the preserving of insects & other branches of natural history tho' could I have had more time I have no doubt that I should have been better prepared for this interesting voyage.⁵⁹

As this letter concludes with a rather pessimistic assessment of his own preparations for the trip, so the next one, written in Rio de Janeiro on 13 December 1824, continues in the same vein: conditions on board ship make it impossible to preserve specimens; Rio presents a disappointing surrounding for the naturalist; the local museum is badly arranged; and the tropical climate has made Bloxam ill and unable to leave the ship. It makes an exhausting read, and must have brought little cheer to its recipient:

My Dear Sir, As the *Aurora* frigate is about to return to England, I take the opportunity of sending you a few lines to tell you how I am getting on in this part of the world. I am sorry to say that hitherto I have been able to preserve no skins of birds or animals owing to the dampness of my cabin, which is situated in the worst place in the ship, being on the main deck & exactly in the middle of the vessel, so that when the decks are being washed, the water runs in on every side; & as the cabins are only temporary it is impossible to caulk them tight. Some few insects that I procured at Madeira I have been obliged to throw away. I cannot even preserve my clothes, books, or property of any kind. I have however a promise from Lord Byron who has been very kind to me of one of the Sandwicher's cabins when they leave us, which is both drier & more commodious.

The island of Madeira from the small portion that I saw of it is entirely composed of volcanic & primitive rocks but chiefly the former, in one of the gullies which run down from the mountains thro' the chief town Funchal, I observed only one small pebble of gneiss. Basalt & scoriated lava constituted the rest of the rounded stones & rocks in the ravine. I have procured several specimens from thence. The land about Rio is entirely primitive, consisting of granite of several varieties with a great deal of felspar intermixed. I found indeed many portions of the latter unmixed with any other substance. The immediate neighbourhood of Rio is at this time from its increasing population almost barren of birds & I find that it is a much cheaper & better method buying them already stuffed, which can be done at a low price, than staying at a hotel & going out with a gun in the morning or evening to procure them. I have commissioned a person here to procure me specimens of birds &c. to the amount of 20 dollars, which if the Admiralty will allow, I intend to present to our Museum. They are to be ready by the time we return back from the Sandwich islands. Every thing that I procure is by an order of the Admiralty to go there, but I hope duplicates of some parts of the collection will be allowed me.

There is a public museum here which is opened every Thursday. I was much disappointed with the collection of birds which considering the situation of the country ought to be particularly fine, both these & some of the insects are in bad order & badly arranged – in minerals & precious stones however the Museum is very rich, & they are arranged in good order. There are very few quadrupeds, & these badly prepared. The museum itself is in an excellent situation, & has plenty of room, & if properly attended to w[oul]d soon equal many in Europe. I have taken a few specimens of bird skins & insects with me to see how they will stand the voyage round the Cape. The heat of the climate has affected me a good deal. I have been confined to the ship during the whole of the last week by diarrhoea, which I believe is a common complaint of those who first enter a tropical climate. The heat is very oppressive on shore, but on board where we are exposed to the sea breeze we find it less so. I hope if the Almighty should preserve my life to be in England again in the summer of 1826 we shall spend Xmas day at St Catherines, a small island a few degrees to the South of Rio, from thence we go to Valparaiso, & from thence make a direct cruise to Owhyhee [Hawaii], we shall afterwards go to Otaheite [Tahiti], then return along the Western coast of S. America trucking at the different ports on our way. I have endeavoured to procure some minerals here but have been unsuccessful, specimens of precious stones in the rough state are here as dear as they are in England otherwise I should have purchased some.⁶⁰

The final word from Bloxam in this collection is a letter written in Valparaiso, Chile, on 9 February 1825. This episode of what has now assumed the dimensions of a saga includes a failed attempt to catch an albatross, a disappointed and over-literal reaction to Bloxam's expectations of Valparaiso, a general absence of interesting wild-life or geological phenomena, and conditions that are still too hot to support intensive periods of fieldwork:

My Dear & Kind Sir, From the interest you have taken in my voyage, you will I am sure like to receive a few lines from me, from this place, where we arrived on the 4th of February being 35 days from the island of St Catherines [Santa Catharina] which we left on the 1st of January. We have had one of the most delightful passages, that any ship perhaps ever had round Cape Horn, the wind being fair the whole way, & without any thing like a hard breeze of wind, we passed within sight of Staten land, which abounded with peaks covered with snow. We did not see Cape Horn, as we were never nearer to it than 140 miles. The greatest southern latitude was 58.55 & the greatest depression of the Thermometer only 39°, seven degrees above the freezing point. The general range of it was from 40 to 45°. We saw numbers of the albatross, but we were unfortunate enough as not to catch any tho' we attempted with baited hooks. Their expanse of wing is very great, some being as much as sixteen or eighteen feet, the generality of those we saw was about 14 or 15 feet. They are rather a slow bird, being obliged to settle in the water to take their food. We saw two vessels on our passage round the Cape but they were at too great a distance to communicate with. I have been greatly disappointed in my expectations respecting the place where we are now anchored supposing it to be, as it is called, the Vale of Paradise. Nothing but black granite rocks rising almost immediately from the shore, leaving but a narrow space for the houses almost all of which are built close along the beach & extend in one continued street for about two miles along the bottom of the bay. The earth is tinged with a red color along the hills, which latter are intersected by numerous ravines running down to the shore, called in this country Quebrada's, in there there is the greatest vegetation which consists however of nothing but stunted shrubs, scarcely a tree being to be seen in any place. No birds, shells or insects are to be procured here, & this I conjectured from the first appearance of the place, so that my time will be rather unprofitably spent. I expected to have seen the Lama here, but understand it is almost entirely confined to Peru. Horses & Mules are used for travelling, Bullocks for conveying merchandise & goods in heavy clumsy waggons into the country. Asses are also common here, the only truly wild animal about here is a small species of grey fox. A small brown lizard is also found, but in no great numbers. The weather, being the commencement of the autumn, is extremely hot, & I have found it very fatiguing walking with my gun & climbing up the ravines & hills, particularly as there are so few birds. I have hitherto only met with a species of bunting of a slate color throughout, a small long tailed [illeg.] & a species of blackbird or thrush. There are numbers of the Colymbus or Diver in the bay, but I have been unsuccessful in killing any yet as they are too quick ... I have hitherto had but few opportunities of collecting any [letter damaged]. I was much deceived in my expectation on this point at the island of St Catherine's when I procured nothing but a few common shells, specimens of granite & quartz rocks, & a few birds. ... ⁶¹

The letter concludes with the information that the *Blonde* would shortly be arriving at the Galapagos Islands, where he expects to find 'some shells and land tortoises with which the islands abound'. Tantalizingly, we cannot tell whether his expectations of the Galapagos were fulfilled, and whether Charles Darwin, whose voyage around South America and the Galapagos took place within a decade of Bloxam's journey, knew of the trials faced by his predecessor. Although it would be unfair to judge Bloxam's reactions to his journey from these personal letters, it is perhaps not a surprise to learn that on his return to England in 1826 he took holy orders and settled in Leicestershire, continuing his interest in natural history but undertaking no further major excursions (Jackson, 1885–1901: 726)

Transportation

Once specimens had been collected and preserved, they had to be transported to the Ashmolean, and this was not always an easy task. Vigors, in his letter of 12 August 1825,

reveals a drama in which four bird specimens were lost in transit:

I do not lose a moment in answering your letter which I received on my return to town last night, in order that you may take some measures for the recovery of the four specimens of Ramphastidae, which I am sorry to find are so unaccountably missing. They were enclosed in a brown paper parcel, directed to you, at New College, and were left by me at the Coach Office of the Angel Inn as I passed thro' Oxford on Saturday 30th July. I had only time to remain in Oxford while the Horses of the Coach in which I travelled were changing, or I should have conveyed the parcel myself to New College. But the Bookkeeper at the Office assured me that he would immediately send it to you. At the moment I arrived in Oxford, I met accidentally my friend Mr Cartwright, one of the Fellows of Trinity College, to whom I shewed the parcel, and applied for information how I should have it conveyed to you: and he recommended me to leave it, as I have mentioned above at the Coach Office, as the surest mode of your receiving it. I did not book it unfortunately, as upon my offering to do so the bookkeeper at once refused to take the money and taking up the parcel said how willingly he would take care you should immediately receive it. Under those assurances I felt convinced that there could be no delay or mistake.

I feel pretty certain that my letter to you was enclosed in the parcel. There was also a letter from me to Dr Macbride of Magdalen Hall, which I had requested of you to forward to him. From your receiving the letter without the parcel I apprehend some strange conduct respecting the latter. But perhaps you may yet have the matter cleared up by applying at the office. The birds enclosed in the parcel were the Ramphastos dicoloris & R. Aracarie of Linnaeus and two species lately described on the Continent, one of them of a bright golden colour, and unknown in England until introduced by Dr Such.⁶²

These birds evidently were eventually recovered, for they are later recorded in the register of donations.⁶³

Another instance of objects going astray, or at least being thought to be lost, occurs in letters from the friends and family of Captain George Francis Lyon (1795–1832). Lyon undertook a voyage into the Arctic regions off the north-east coast of North America between 1821 and 1823, and in 1824 attempted a return to this region, which was less successful due to adverse weather (see Lyon, 1824). These voyages yielded anthropological and natural specimens for the Ashmolean, the first consignment of which was sent via James Wilson on 21 December 1824:

I have taken the liberty of sending to you by the Coach a small parcel, which you may perhaps think worthy of an obscure corner in the Ashmolean Museum. It consists of a book containing a few specimens of moss, grass and a few flowering plants brought by Captn. Lyon from Izbolik, also of the spear head with its case, used by the Esquimaux in killing the seal, walrus & other animals. They were given by Captn. Lyon to my brother, who learning from me of the great improvement carrying on in the Ashmolean Collection under your guidance, desired me, if they were likely to be acceptable, to convey to you the trifling specimens which I have just mentioned.⁶⁴

On 22 June 1825, Lyon himself writes directly to John Duncan with donations for the Museum, items to be given to Dr Kidd, and a gift for his friend J. B. Frowd (c.1786–1865) of Corpus Christi College:

My dear Sir, I have selected some Eskimaux things which may, at all counts, fill a shelf of your Museum, if they should fail of amusing your visitors ... The bottles containing fish &c. you will oblige me by sending to Dr. Kidd, and the prepared seal skin to Frowde for a floor cloth for his Tilbury (when he keeps one).

I lament that my contributions should be so few, & so uninteresting, but as I have been supplying my friends for many months, I have grown poor in Eskimaux treasures.⁶⁵

In 1825 Lyon set out on another voyage, this time to Mexico, and the next letter referring to him is from his friend Frowd, written on 15 August 1826:

I have this morning received a letter from Mrs Lyon informing me that her Son has sent to England the upper half of an ancient Indian Idol of Stone which tho' rude in form and grotesque in appearance he deems

sufficiently curious to offer to the Oxford Museum.

This female Divinity Mrs Lyon says was found whilst making a survey of the River Panuco on the Mexican Coast at a town or village of the same name, and its removal to the Boat required the aid of three or four men to accomplish – its date is prior to the Conquest.

Supposing the University to be willing to accept it, I must beg you to understand the Present is incomplete in itself (my friend Lyon being not rich), and that a duty, of no great amount, will be demanded. I conclude the Lady is either not yet unshipped or at the Custom-house.

As soon as you shall have decided on this weighty matter I shall be glad to hear, as Mrs Lyon waits for my answer. ...⁶⁶

Although this particular account of the delivery of an artefact from abroad ends happily,⁶⁷ Lyon's own experience was less fortunate: his ship was wrecked at Holyhead on his return journey in January 1827, and in the disaster almost all his papers and collections were lost. He also returned to the devastating news of his wife's death, which had taken place four months earlier (Laughton, 1885–1901: 345–346).

The donations

This account of the Duncans' correspondence may conclude with some mention of the great variety of specimens they received from their correspondents. These ranged from small birds to much larger mammals, and perhaps the expense of shipping and difficulties of preservation explain why so many of the latter were delivered dismembered, rather than as entire carcasses. P.A. Scott's proposed donation of an elephant's foot and leg has been mentioned already; this was complemented by a letter written a few weeks later by J. Duncan, "Aged 92", who offered John Duncan an elephant's head:

I have within these few days received from Ceylon a Head wholly divested of flesh & Integuments of the Cingalian elephant, which is discriminated from the other species by the smallness of its Tusk & perhaps (but I have no book of authority at hand) by other Distinctions. This Head with its Teeth & Tusks is perfect, & my Correspondent informs me that both Tusks are rarely so. I meant to have made a present of this Head, to the Anatomical Collection at Surgeon's Hall in Lincoln's Inn Fields but finding that there is a specimen already there I cannot either more usefully to the publick, or more agreeable to myself dispose of it as a Gift, to the Ashmolean Museum, fortunately under your Management.⁶⁸

Other exotic or unwieldy specimens given to the Ashmolean during this period include a platypus from Miss Nowell,⁶⁹ a dolphin's head from S. P. Pratt,⁷⁰ an alligator from the Bishop of Jamaica,⁷¹ a buffalo's head from Captain H. F. De Lisle,⁷² a sawfish from Mr Pennato,⁷³ the head of an Indian black bear from Mr Wright,⁷⁴ and, finally, an ant-hill and an ants' nest from, respectively, Lieutenant N. J. Cole and J. Warburton.⁷⁵ Most of these correspondents seem to be offering their gifts without reference to any previously-expressed wish from the Duncans that they should obtain them; one writer expresses the hope that his offerings may be found useful in another realm, if they are not needed in the Museum:

Revd. P. Wood of Broadwater, Worthing, presents his comp[li]ments to Messrs P. & J. Duncan, & sends them a pair of South American Ducks, from Buenos Ayers, Mr W. not having seen any like them in the Oxford Museum, in the place allotted for the aquatic birds. Mr W. has had the need of them for 30 years – should the Museum already possess them, or, their character of animals, be deemed not worthy of a station in it, Mr W. recommends them to the table of Messrs Duncan, where they will be found excellent. Mr W. regrets he cannot send any of their Eggs with them – which are all but black in colour – this not being the proper season.⁷⁶

In addition to these donations, the letter-book contains sequences of letters on two

specific species, one – the dodo – of long association with the Ashmolean and the other, more arcane – a mermaid – which seems ultimately to have escaped inclusion in the collections. These two subjects find a common link in Charles Telfair, a naturalist and surgeon living on the island of Mauritius, who corresponded with John Duncan via his friend Robert Barclay of Buryhill, Surrey.⁷⁷ Barclay wrote to John Duncan on 14 September 1827, with an extract from a letter he had received from Telfair dating from 12 November of the previous year. Telfair begins by explaining that further research in the region of “Mombaz” [Mombassa] is now impossible, for political reasons, before going on to describe the creature in detail:

I send you also for Mr Duncan a Snake preserved in spirits taken at Mombaz by Lt. Emery the last British Governor in that port in East Africa. It is a great loss to science and to humanity to give up this British possession ... Lt. Emery will shew you and Mr Duncan the skeleton of a Mermaid which he caught at Mombaz. I do not know if this species of Lemantine [?] is described. The bones appear complete & require only to be cleaned & set up. In a former part of my letter I mentioned that I was promised the arm of a mermaid which I send for your acceptance since which I have received the specimen much more perfect & extensive than I had reason to hope for. In fact I have got the head complete and two arms including the shoulder blades – with the hands & fingers perfect. I have been examining this specimen with great care and find it different in some respects from any that are yet described. The arm in this specimen must have been protruded and not concealed under the skin as a fin. The nostrils are very curiously formed & seem to possess an organ I have not met in others – for a more extensive expansion of the olfactory nerve probably. It differs from the Trichechus of Linnæus in having no incisors – and in the nature of its arms & claws or rather hands. The formation also of the upper & anterior surface of the lower jaw is most extraordinary – enabling the animal to lay hold of its food with great strength and power. It differs also from the Dugong of Sir Stamford Ruffles [*sic*] – by the number of its grinders & the want of incisors.⁷⁸

It differs also decidedly from the Siren or Rytina by the form of the mouth & the number of Grinders.

These are all the members of this family that we have any description of here – therefore I think it not impossible that this may be a new species – at all events you [will] be able to determine the question by the aid of your scientific friends – & particularly Mr Duncan.⁷⁹

A further letter from Telfair, written directly to John Duncan on 23 October 1827, describes the capture of the animal, and the lack of eye-witnesses to its behaviour:

Our specimens must in general be small, as we have no large animals in these islands or Madagascar. The specimen of the head and upper extremities of the mermaid which I sent belonged to an individual which was killed near Mombaz on the East coast of Africa – it was in the water when taken – & with the head and shoulders out – exhibiting the mammal very large – but no drawing was taken & the British establishment on that island being now withdrawn, I fear that we may not for some time be able to learn much more about its habitat. There is no person at present here who saw the mermaid alive – but I shall not neglect any opportunity of enquiring on the subject & informing you of the result.⁸⁰

The animal in question is evidently not a mythical, quasi-human creature, despite Telfair’s use of the words “hands” and “fingers” in his letters, and yet the words “mermaid” and “siren” are highly evocative of a scientific view in which there was still a desire to discover ancient and mysterious beasts.

The dodo, a creature scarcely less shrouded in mystery at the time, whose very existence had begun to be questioned by certain scholars⁸¹ and which had yet to be brought to general attention by *Alice’s adventures in Wonderland* (Carroll, 1865), figures in a sequence of letters in the collection, running from 5 February 1827 to 11 December 1840. The whole specimen once owned by the Ashmolean is also mentioned in the introduction to the *Catalogue*, although without reference to its unfortunate earlier demise (Anonymous, 1836: 4–5):

The head of the dodo, or dodar, is the sole specimen existing of a bird larger than a swan; presented probably by Mr. Thomas Herbert to Tradescant; and brought by him from the island of Mauritius, where only it is reported to have been ever seen, and where it certainly does not now exist.

The letters reveal that the Duncans were well-connected to other museums, not only in England, but also throughout Europe. Philip Duncan was prepared to share his privileged access to the remains of the dodo with his colleagues in other centres of learning, and even sent casts of the head to other institutions, including the Natural History Museum in Leiden, as recorded in a letter of 17 June 1837 from P. J. Fermunds:

I received a few days ago, by the care of Professor Vrolik of Amsterdam, your kind note, accompanied by a cast of the Dodo's head, and an account of the original. In addressing you my respectful thanks, I must state that this present was a very welcome one for the establishment placed under my direction.⁸²

Duncan's openness yielded a reward from the British Museum in the form of a cast of a dodo's foot, given in return for a cast of the head, as recorded in a letter from George Children, Assistant Keeper in the Department of Natural History, of 2 July 1828. Children alludes to the tight budgetary constraints placed upon his institution, which appear to have been more restricting than those encountered by the Duncans (although, as has been shown, the Duncans gained what flexibility they had by being prepared to use their own financial resources in the search for new acquisitions and museum furnishings):

By direction of the Trustees of the British Museum I have the pleasure of forwarding to you a cast of the foot of the Dodo – which they wish you to receive, as an equivalent in exchange for the cast of the head of the same kind you were so good as to send us some time since. The Trustees hope you will not think it uncourteous that they have recourse to this mode of supplying you with the cast, nor an ill return for your liberal, free gift, but they are so entirely responsible to the Treasury for every shilling they expend, that they have no power, without the express sanction of Government, to make any present whatever – and they fear that dissatisfaction might be expressed by other establishments, were it to appear that they have exceeded their strict rules in favour of your's.⁸³

Another gift received on this theme was a watercolour of the dodo, executed by the Duchess of Marlborough and sent by an employee at Blenheim along with an extract from an article on the subject:

The Duke & Duchess of Marlborough having become much interested in the curious question re the Existence or non-Existence of the Dodo (especially since Brown Hammel wrote to the Duke to ask about the picture of it at Blenheim) have directed me to send you the accompanying Parcel for deposit among your Papers on the subject at the Museum containing 1st an extract from a work⁸⁴ to which the Duke had access when he was in Ireland & 2nd a very beautiful copy of the Dodo as drawn & coloured in the above Document from the hand of her Grace of Marlborough & is only one of many proofs of the Duchess's talents in this art as in all sorts of Drawing & Design.⁸⁵

This illustration survives today in the Ashmolean Museum, signed 'C. A. Marlborough',⁸⁶ it is, in fact, a copy taken from the *Gleanings of natural history* by George Edwards (1758–1764: vol. 1, pl. 294). Both the Duke and the Duchess seem to have been interested in issues of natural history, for these donations were followed by the further gift of a "Vegetable Caterpillar" from New Zealand, accompanied by a learned account of the creature (the caterpillar of a moth of Linnaeus's genus *Sphinx*) by the New Zealand-based scholar, Edward Shortland (1812–1893).⁸⁷

THE STATUS OF THE ANTIQUARIAN COLLECTIONS UNDER THE DUNCANS

Apart from the zoological collections (and the minerals and fossils which had already been lost to the Museum), the bulk of the Ashmolean's collections comprised "relics of

antiquity”, which were intended to be arranged “in the order of time”, together with “some specimens of curious art of uncivilized as well as refined nations”. Some of the latter originated in the Tradescant collection, forming the bulk of Ashmole’s founding gift (see MacGregor, 1983); otherwise the most important additions had been specimens collected on Captain Cook’s Pacific voyage in 1772–1775 and donated to the Museum in 1776 by Johann Reinhold Forster. But the circle of acquaintances and admirers that served the Duncans so well in expanding the zoological collections embraced also a number of benefactors who sent ethnological material. Several naval men feature here as they did in the supply of zoological specimens: Captain The Lord Byron sent items from the Sandwich Islands in 1826 in gratitude for Duncan’s role in the recruitment of Andrew Bloxam as geologist and mineralogist for his expedition; Captain George Lyon and Lieutenant Francis Harding contributed Eskimo material in 1825 and 1827 respectively,⁸⁸ while Captain H. F. De Lisle, who sent zoological specimens from South Africa, included a number of ethnological items in the same consignment.⁸⁹

Archaeological material generally had a low profile throughout this period. Philip Duncan made no attempt to disguise the fact that he saw all man-made objects as mere distractions in a museum aiming at the advancement of science. In his report of 1833 (Appendix 2) he was insistent on the importance of “the total separation of works of art from those of nature”, proposing that Buckland’s former study on the ground floor should be turned over to the display of “artificial productions”, effectively to isolate them from the more important natural collections; he made no bones of envisaging the visitor “omitting the works of art or reserving them to the last” on a tour of the displays whose primary interest was overwhelmingly dominated by natural history. None the less, the donation by Sir Richard Colt Hoare in 1828 of an important body of Anglo-Saxon antiquities excavated in Kent in the 1780s by the Revd James Douglas represents the founding of this branch of the Ashmolean’s collections and remains of prime importance today (MacGregor and Bolick, 1993: 5–8).

Most of the paintings in the museums’s collection seem to have spent much of the period of the Duncan regime in storage: John Duncan evidently considered them an encumbrance, “still more foreign [than the artificial objects] to the purposes of a Museum, especially in a town where a distinct collection already exists”.⁹⁰

Although the paintings and the antiquarian collections did have a place in the organizational scheme developed by the Duncans (see p. 405), the sense of purpose and application that characterized their treatment of the *naturalia* was wholly lacking when it came to items of material culture. The universal programme embraced by the Ashmolean during the earliest years of its existence was finally extinguished under the Duncans’ regime.

THE END OF NATURAL HISTORY AT THE ASHMOLEAN

During the period reviewed in this account, irresistible pressures for a change in attitude towards the status of natural history teaching within the universities had mounted. At Oxford several of the figures already mentioned, including Buckland and Kidd, were at the forefront of this movement that ultimately found an effective champion in Henry Wentworth Acland (1815–1900). Under his guidance the new Natural Science Museum was established and the foundations laid for the teaching of natural history which were to serve well into the twentieth century.

The Duncan brothers too must be said to have occupied a significant place in the nineteenth-century history of natural history in Oxford. It may be conceded that their literary output represented only minor milestones in the progress of the subject, but – characteristically, perhaps – historians have tended to overlook their most original contribution to the movement, composed as it was not of written works but of physical specimens, arranged in an extended didactic display that for over a quarter of a century made its own unique contribution to university and public education.

ACKNOWLEDGEMENTS

The authors are glad to acknowledge their debt for constructive comments on their text to Mr Jeremy Coote, Dr Roger Moorey, Ms Jane Pickering and Ms Kathie Way.

NOTES

¹ These assessments, in *Recollections of Oxford* by G. V. Cox (1868: 77–78), have been judged by Ovenell (1986: 176–184) to be unnecessarily harsh; while he finds redeeming evidence of administrative activity on the part of Dunbar in particular, the positive impact on the publicly displayed collections of all those mentioned here must none the less be said to have been negligible. At the opening of the Duncan era, the Ashmolean remained “a rubbishy, neglected place, where a Deputy Curator sat, apparently for the sole purpose of looking after the sixpences charged per head for admission to the curiosities” (Cox, 1868: 78).

² J. S. Duncan (1769–1844), son of the Revd John Duncan, rector of South Warnborough, Hampshire, had held a Fellowship at New College and had practised at the Bar (admitted to Lincoln’s Inn, 17 May 1791) before his election to the keepership of the Ashmolean at the age of fifty-four. He resigned in 1829 on the occasion of his marriage.

³ The career of P. B. Duncan (1772–1864) had mirrored that of his elder brother, with a Fellowship at New College followed by a career at the Bar (admitted to Lincoln’s Inn, 21 April 1795) before returning to Oxford.

⁴ Ashmolean Museum, AMS 24.

⁵ Ashmolean Museum, AMS 15.

⁶ We should acknowledge, however, the account of the Duncan era given by Ovenell in his ever-percipient history of the Ashmolean (1986: chapters 12–13).

⁷ Gough (1780: vol. 2, p. 134n). For the later history of the loss and partial recovery of the Lhwyd collections see Jahn (1966).

⁸ Ashmolean Museum, AMS 12, *passim*. This and other early catalogues of the Ashmolean are currently being prepared for publication: see MacGregor and White (in press).

⁹ In 1689, for example, Nicholas Roberts of St David’s, Pembrokeshire, gave a collection of stuffed birds of the Arctic regions: see Ashmolean Museum, AMS 2: *sub anno* 1689.

¹⁰ Even the mineral collections suffered decay in the sulphurous, smoke-laden atmosphere of the Museum, heated at that time by coal fires: William Huddesford had to report to William Borlase (1695–1772), one of his most valued benefactors, firstly that the mundics he had sent were proving “so perishable a treasure” and later that they were entirely “gone to decay in spite of varnish and every other care” (see MacGregor and Turner, 1986: 655n).

¹¹ Ashmolean Museum, AMS 1: 2.

¹² Ovenell (1986: 142–143) makes the point that concerted attempts were made to preserve at least the less perishable parts of such specimens – the beaks, legs and claws – and their details were duly noted in the catalogue according to statutory requirement.

¹³ The numbers of specimens contributed by the Duncans themselves were indeed significant. John Duncan in particular is recorded as the source of specimens in successive parts of the catalogue as follows: mammalia 54; parts of mammals 50; birds 289; reptiles 8; and fishes 10. For Philip Duncan the corresponding numbers are mammalia 17; parts of mammals 0; birds 33; reptiles 1; and fishes 1.

¹⁴ See the chapter ‘The rise and fall of natural theology’, in Knight (1972: 47–62).

¹⁵ See Knight (1972: 55–56, 223). In his *Autobiography*, Charles Darwin admits himself to have been in his youth an admirer of Paley, claiming of the latter’s *Evidences of christianity* that as an undergraduate he could have

... written out the whole of the Evidences with perfect correctness, but not of course in the clear language of Paley. The logic of this book, and as I may add of his Natural Theology gave me as much delight as did Euclid. The careful study of these works, without attempting to learn any part by rote, was the only part of the Academical Course which as I then felt and as I still believe, was of the least use to me in the education of my mind. I did not at that time trouble myself about Paley’s premises; and taking these on trust I was charmed and convinced by the long line of argumentation.

Later in life, of course, Darwin was to reject the theological basis of Paley’s view of nature:

The old argument from design in nature, as given by Paley, which formerly seemed to me so conclusive, fails, now that the law of natural selection has been discovered. We can no longer argue that, for instance, the beautiful hinge of a bivalve shell must have been made by an intelligent being, like the hinge of a door by man. There seems to be no more design in the variability of organic beings and in the action of natural selection, than in the course which the wind blows. Everything in nature is the result of fixed laws. (De Beer, 1974: 32–33, 50–51).

¹⁶ Dr P. R. S. Mooney (personal communication) has observed that the adoption of Paley’s text as a philosophical model seems singularly apposite in conservative, High Anglican Oxford, while in Cambridge at this period a more forward-looking pattern was being set by the example of scholars such as J. S. Henslow, whose association with the youthful Darwin was to prove so fruitful: see Barlow (1967).

¹⁷ From the readership in chemistry Kidd had been elected Aldrichian Professor of chemistry in 1803, at which point he inherited premises in the Ashmolean basement; he lectured there on mineralogy and geology, as well as on chemistry. In 1822 he was appointed Regius Professor of medicine.

¹⁸ In 1813 Buckland was elected the first professor of mineralogy and in 1818 professor of geology.

¹⁹ Ashmolean Museum, AMS 42. The invoices and receipts preserved (uncalendared) in this file relate to the whole of the Duncan era; they give many useful insights into the refurbishment of the Museum and the enlargement of the collections during this period.

²⁰ Ashmolean Museum, AMS 42.

²¹ Convinced that fundamental and self-evident truths would be revealed to the museum visitor, J. S. Duncan (1825: 4–5) declared: “... it is impossible to contemplate the expanse of nature, from which alone all the wonders of art and science are to be drawn. without perceiving, throughout every portion of the great book of creation, divisions and subdivisions wonderfully balanced and harmonized, the autograph of the mighty Author, the proclamation of superior to inferior intelligence ...”. Elsewhere Duncan acknowledges the work of his contemporaries in pursuing a similar path within their own fields, anticipating further developments in comparative anatomy from “the industry, the sagacity, and the piety of Dr. Kidd” and in botany from “the cautious analysis of Dr. Williams, our excellent Botanical Professor”, while “the anatomy of the great globe itself is surveyed by the indefatigable and luminous professor Buckland, who, like Moses, brings, with a shining face, the divine truth displayed on his tablets of stone from the mountain ...” (Duncan, 1825: 7).

²² Ashmolean Museum, AMS 24. P. B. Duncan’s historical introduction to the 1836 *Catalogue* quotes at length and almost verbatim from a number of passages from the label texts reproduced here, prefaced by the statement that “He [i.e. J. S. Duncan] thus very clearly explains the plan of his arrangement of the contents of the Museum” (Anon, 1836: vi–vii).

²³ Gunther (1925: 193) mentions a payment in the Christ Church accounts for 1820 towards “Kidd’s model of the eye”: it may be that the Duncans had in mind to commission another version of their friend’s device.

²⁴ The reference here is to James Keill (1673–1719): see his *Anatomy of the humane body*, where a “table of the muscles” concludes by stating that there are “in all 426 Single Muscles in the Body” (Keill, 1698: 286).

²⁵ Ashmolean Museum, AMS 24. We are grateful to Ms Kathie Way for advice on this list, which she found to correspond with the 13th edition of Linnaeus (1767).

²⁶ Ashmolean Museum, AMS 24. Dr Charles Nelson kindly identified the Linnaean source of this list.

²⁷ The volume itself bears no date of publication but is ascribed in the British Library catalogue to 1826; this is the date attributed to it also by Gunther (1935: 331), who records of it that “no more was published”. Curiously the Bodleian Library copy seems to have escaped accurate recording at the time of its acquisition and is catalogued merely as “n. pl., c. 1830”. Its authorship, however, must surely be given to John Duncan and the earlier

date is doubtless correct. It is now comparatively scarce: no copy survives in the Ashmolean itself (and hitherto all awareness of its existence had been lost there); we were fortunate to happen across a copy in the library of the Linnean Society. Since the authorship of this volume by John Duncan, like that of the 1836 *Catalogue* of the Museum by his brother Philip, is unacknowledged on the respective title pages or in bibliographical sources published since that time, we have decided to continue to refer to them here as “Anonymous”.

²⁸ Ashmolean Museum, AMS 3: 16–19; AMS 15: letters 62, 64, 71, 72. The bill for “Expences in removing Mr Percevals Birds from Calverton Bucks to the Museum” still survives (AMS 42) and hints at the complexities of the operation: “Paid for Hire of Horses, Turnpikes &c £3 4s. 6d.; for Boxes & Matting & Cords 15s.; Mr Percevals Servant & Groom 7s. 6d.; Breakfasts Dinners Beds &c £1 19s. 6d.”.

²⁹ Ashmolean Museum, AMS 15. The letters, which have been numbered in pencil from 1 to 100, are nearly all personally addressed, with a named correspondent and recipient, although the collection is interspersed with a few un-addressed lists of donations and descriptions of artefacts (see Table 1).

³⁰ Bishop Howley’s often-quoted remark with reference to the Duncans, “I question whether any two men, with the same means, have ever done the same amount of good” (quoted by Anon., 1864: 125) is brought to mind by the warmth of sentiment expressed by many of the correspondents.

³¹ Ashmolean Museum, AMS 15: letter 10.

³² Ashmolean Museum, AMS 15: letter 30.

³³ Ashmolean Museum, AMS 15: letter 33.

³⁴ Ashmolean Museum, AMS 15: letter 57.

³⁵ Ashmolean Museum, AMS 15: letter 35.

³⁶ Ashmolean Museum, AMS 15: letter 34.

³⁷ Bishop Turner must have had little time to spend in Brazil: he was consecrated at Lambeth on 17 June 1829 and arrived in India on 10 December of that year. Letters from Turner surviving in the archives of the Lambeth Palace Library include one from Rio de Janeiro, dated (like that in the Ashmolean) 13 September and one from Cape Town, dated 17 October; a further letter written on board HMS *Pallas*, dated 12 November, was also posted at Cape Town. (We are grateful to Alexandrina Buchanan, Assistant Archivist at Lambeth, for this information). Turner died in Calcutta on 6 July 1831.

³⁸ Ashmolean Museum, AMS 15: letter 67.

³⁹ See Niebuhr (1773). In the decades following the Napoleonic Wars it is perhaps unsurprising that the French mission to Egypt of 1798–1801 receives no acknowledgement here.

⁴⁰ Ashmolean Museum, AMS 15: letter 42.

⁴¹ See Pickering (1998) for more information on Burchell’s travels.

⁴² Ashmolean Museum, AMS 15: letter 8.

⁴³ William Bullock (fl. 1795–1840), a Fellow of the Linnean and Wernerian Societies, was the successful proprietor of the Egyptian Hall in Piccadilly where he installed his London Museum of Natural History, said to be the first in the country in which specimens were displayed according to habitat groups (Altick, 1978: 235–52). The collection was dispersed in 1819 (an annotated edition of the sale catalogue was later published in facsimile: see Bullock, 1979), following which miscellaneous exhibitions were held on the premises, including that mounted in 1824 with material brought back by Bullock from the Mexican expedition referred to in this text.

⁴⁴ Leadbeater’s was one of the earliest taxidermy companies to operate on a commercial scale. It was established at 19 Brewer Street in Soho in the early 1800s and flourished throughout the remainder of the century: see Frost (1987: 38–40). A number of specimens supplied by the company are detailed in receipts (signed “B. Leadbeater”) surviving at the Ashmolean (AMS 42).

⁴⁵ Corbett’s seems hitherto to have escaped notice in works dealing with the history of taxidermy and of natural history collecting. A number of receipts surviving at the Ashmolean (AMS 42) locate the premises at 61 Piccadilly; all are signed “B. Corbett”.

⁴⁶ The latter reference is to Joshua Brookes (1761–1833), an anatomist who founded a museum in Great Marlborough Street estimated as “second only to that of John Hunter”, whose pupil Brookes had been. His work on developing methods of preservation for zoological specimens earned him election to the Royal Society. Ultimately he is said to have been forced to retire in 1826, “owing to ill-health brought on by constant presence in the atmosphere of the dissecting-room” (Bettany, 1885–1901: 1343–1344; see also Altick, 1978: 27).

⁴⁷ The reference is to Coenraad Jacob Temminck (1778–1858), the renowned Dutch ornithologist, collector and writer on natural history.

⁴⁸ Ashmolean Museum, AMS 15: letter 5.

⁴⁹ Ashmolean Museum, AMS 15: letter 25.

⁵⁰ Ashmolean Museum, AMS 15: letter 22.

⁵¹ Ashmolean Museum, AMS 15: letter 36.

⁵² Ashmolean Museum, AMS 3: 9.

⁵³ Perhaps this was a descendant of the celebrated taxidermist Jean-Baptiste Bécœur (1718–1777) whose experiments with methods of preservations and display of birds are treated by Faber (1977).

⁵⁴ Ashmolean Museum, AMS 15: letter 48.

⁵⁵ Ashmolean Museum, AMS 15: letter 82.

⁵⁶ Ashmolean Museum, AMS 15: letter 63. D. G. Stacy was doubtless acting on behalf of Major Stacy, described as “of Calcutta” in the Museum’s *Catalogue*, where he is recorded as a prolific donor (Anon., 1836: *passim*). Major Stacy may be identical with the Lieutenant-Colonel L. R. Stacy of the 43rd Regiment, Native Infantry, recorded as serving in Afghanistan in 1841 (Anonymous, 1841: 114).

⁵⁷ This was not George, Lord Byron, the poet (1788–1824), but his cousin and heir: see Marshall (1829: 375). Byron’s Bay in the Sandwich Islands was so named in honour of his visit on board the *Blonde* (Ellis, 1853: vol. 4, p. 336). For accounts of the voyage see Byron (1826) and Bloxam (1925).

⁵⁸ Ashmolean Museum, AMS 15: letter 12.

⁵⁹ Ashmolean Museum, AMS 15: letter 3.

⁶⁰ Ashmolean Museum, AMS 15: letter 17.

⁶¹ Ashmolean Museum, AMS 15: letter 20. See further Bloxham (1925: 92–93).

⁶² Ashmolean Museum, AMS 15: letter 35.

⁶³ Ashmolean Museum, AMS 3: 20.

⁶⁴ Ashmolean Museum, AMS 15: letter 19.

⁶⁵ Ashmolean Museum, AMS 15: letter 27.

⁶⁶ Ashmolean Museum, AMS 15: letter 41.

⁶⁷ Ashmolean Museum, AMS 15: letter 43 is from Lyon’s brother, John Lyon, written on 9 September 1826 and requesting confirmation that the idol has arrived safely – it had been sent to the Ashmolean on one of Pickford’s boats. It must have survived the journey, for it appears (with Kirtland’s verbatim transcription of its origins and appearance) in the *Catalogue* (Anonymous, 1836: 147, no. 502a).

⁶⁸ Ashmolean Museum, AMS 15: letter 24.

⁶⁹ Ashmolean Museum, AMS 15: letter 2.

⁷⁰ Ashmolean Museum, AMS 15: letter 48.

⁷¹ Ashmolean Museum, AMS 15: letter 54.

⁷² Ashmolean Museum, AMS 15: letter 55.

⁷³ Ashmolean Museum, AMS 15: letter 56.

⁷⁴ Ashmolean Museum, AMS 15: letter 74.

⁷⁵ Ashmolean Museum, AMS 15: letters 59 and 97.

⁷⁶ Ashmolean Museum, AMS 15: letter 75.

⁷⁷ Both men were thanked (for their work on the dodo in particular) in the introduction to the *Catalogue* (Anonymous, 1836: 5): “We are obliged to Mr. Barclay of Bury-Hill, Surrey, and to his very intelligent correspondent Mr. Telfair, for an accurate investigation of the island of Mauritius, which leaves no doubt of the former existence and present local extirpation of the whole genus.” John Duncan also acknowledges “C. Telfair, Esq. of Port Louis, in the Mauritius, a naturalist of great research” for enquiries carried out on his behalf in preparing a paper in defence of the dodo (Duncan, 1828: 566: see further Note 81, below).

⁷⁸ Our colleague Jane Pickering points out that the “mermaid” was indeed likely to have been a dugong (*Dugong dugon*), the lack of incisors enabling it to be identified as a female of the species.

⁷⁹ Ashmolean Museum, AMS 15: letter 45.

⁸⁰ Ashmolean Museum, AMS 15: letter 57.

⁸¹ John Duncan was moved by this crisis of credibility to publish a spirited defence of the dodo (J. S.

Duncan, 1828), quoting at length from early accounts of the bird, from several authors who cast doubt on its existence as a separate species and from others who entertained hopes that it might yet be rediscovered in the South Seas

⁸² Ashmolean Museum, AMS 15: letter 85.

⁸³ Ashmolean Museum, AMS 15: letter 90.

⁸⁴ The accompanying hand-written text is taken from Edwards (1758–1764: vol. 1, pp 179–181).

⁸⁵ Ashmolean Museum, AMS 15: letter 94.

⁸⁶ Department of Western Art, no. 1961.12. The initials C. A. identify its author as Duchess Charlotte Augusta, the second wife of George Spencer-Churchill, 6th Duke of Marlborough. Charlotte Augusta, daughter of the 4th Viscount Ashbrook, married the Duke in 1846 and died in 1850. We are grateful to Mr John Forster, Education Officer at Blenheim Palace, for this information, and to Dr Jon Whiteley for locating the Duchess's painting.

⁸⁷ Ashmolean Museum, AMS 15: letter 96.

⁸⁸ Ashmolean Museum, AMS 15: letters 27, 50, 51.

⁸⁹ Ashmolean Museum, AMS 15: letter 55.

⁹⁰ See Appendix I. Duncan's reference is to the picture gallery in the Bodleian Library. The University Galleries (with which the Ashmolean was to merge institutionally in 1908) were founded later, in 1845. At the end of his 1833 report (Appendix 2), John Duncan shows himself to be quite sanguine at the prospect of removing any displaced works of art "to the uppermost little study", an action that would effectively have removed them altogether from public accessibility.

⁹¹ Ashmolean Museum, AMS 44 (12).

⁹² Ashmolean Museum, AMS 44 (10).

REFERENCES

- ALTICK, R.D., 1978 *The shows of London*. Cambridge (Massachusetts) and London: Belknap Press.
- ANONYMOUS [J. S. DUNCAN], 1826 *Introduction to the catalogue of the Ashmolean Museum*. Oxford: Ashmolean Museum.
- ANONYMOUS [P. B. DUNCAN], 1836 *A catalogue of the Ashmolean Museum, descriptive of the zoological specimens, antiquities, coins, and miscellaneous curiosities*. Oxford: Ashmolean Museum.
- ANONYMOUS, 1841 *The Army List of Her Majesty's Forces serving under the Bengal Presidency, Bengal and Agra annual guide and gazetteer for 1841*, vol. 2. Calcutta: Rushton & Co.
- ANONYMOUS, 1864 P. B. Duncan, Esq., D.C.L., *Gentleman's magazine*, new series, 16: 122–126.
- BARLOW, N. (editor), 1967 *Darwin and Henslow: the growth of an idea. Letters 1831–1860*. London: John Murray.
- BETTANY, G. T., 1885–1901 Joshua Brookes (1761–1833). *Dictionary of national biography*, vol. 2, pp 1343–1344. Oxford: OUP.
- BLOXAM, A., 1925 *Diary of Andrew Bloxam, naturalist of the "Blonde" ... 1824–25*. Honolulu: Bernice P. Bishop Museum.
- BULLOCK, W., 1979 *Sale catalogue of the Bullock Museum, 1819. A facsimile reprint with manuscript prices and buyers' names*. London: Johnson and Hewett.
- BYRON, Lord, 1826 *Voyage of HMS Blonde to the Sandwich Islands, in the years 1824–1825*. London: John Murray.
- CARROLL, L. [C. L. Dodgson], 1865. *Alice's adventures in Wonderland*. London: Macmillan & Co.
- COX, G. V., 1868 *Recollections of Oxford*. London: MacMillan.
- DE BEER, G. (editor), 1974 *Charles Darwin, Thomas Henry Huxley: autobiographies*. London: OUP.
- DERHAM, W., 1713 *Physico-theology, or a demonstration of the being and attributes of God, from his works of creation*. London: W. Innys.
- DERHAM, W., 1715 *Astro-theology, or a demonstration of the being and attributes of God, from a survey of the heavens*. London: W. & J. Innys.
- DUNCAN, J. S., 1825 *Botano-theology*. Oxford: J. Parker.

- DUNCAN, J. S., 1828 A summary review of the authorities on which naturalists are justified in believing that the Dodo, *Didus ineptus*, Linn., was a bird existing in the Isle of France, or the neighbouring islands, until a recent period. *Zoological journal* 3: 554–566.
- DUNCAN, J. S., 1831 *Analogies of organized beings*. Oxford: S. Collingwood.
- DUNCAN, P. B., 1840 *Essays and miscellanea*. Oxford: Thomas Combe.
- EDWARDS, G., 1758–1764 *Gleanings of natural history*. London: printed privately.
- ELLIS, W., 1853 *Polynesian researches ... in the Society and Sandwich Islands*. London: Bohn.
- FROST, C., 1987 *A history of British taxidermy*. Lavenham: printed privately.
- FARBER, P. L., 1977 The development of taxidermy and the history of ornithology. *Isis* 68: 550–566.
- GOUGH, R., 1780 *Anecdotes of British topography*. 2nd edition. London: T. Payne & Son.
- GUNTHER, R. T., 1935 *Early science in Oxford* 3. Oxford: Oxford Historical Society.
- JACKSON, B. D., 1885–1901 Andrew Bloxam (1801–1878). *Dictionary of national biography*, vol. 2, p. 726. Oxford: OUP.
- JAHN, M.E., 1966 The Old Ashmolean Museum and the Lhwyd collection. *Journal of the Society for the Bibliography of Natural History* 4: 244–248.
- KEILL, J., 1698. *The anatomy of the humane body abridged*. London: William Keblewhite.
- KNIGHT, D. M., 1972 *Natural science books in English 1600–1900*. London: Batsford.
- LAUGHTON, J. K., 1885–1901 George Francis Lyon (1795–1832). *Dictionary of national biography*, vol. 12, pp 345–346. Oxford: OUP.
- LHWYD, E., 1699 *Lithophylacii britannici ichnographia*. London: M.C.
- LINNAEUS, C., 1767 *Systema naturæ*, 13th edition (edited by J. F. Gmelin). Leipzig: Georgius Emanuel Beer.
- LISTER, M., 1678 *Historiæ animalium angliaë*. London: John Martyn.
- LYON, G. F., 1824 *The private journal of Captain G. F. Lyon, of H.M.S. Hecla*. London: John Murray.
- MACGREGOR, A., 1983 *Tradescant's rarities. Essays on the foundation of the Ashmolean Museum, 1683, with a catalogue of the surviving early collections*. Oxford: Clarendon Press.
- MACGREGOR, A., 1997 The Ashmolean Museum, in BROCK, M. G. and CURTHOYS, M. C., *The history of the University of Oxford*, vol. 6 part 1, pp 598–610. Oxford: Clarendon Press.
- MACGREGOR, A. and BOLICK, E., 1993 *Ashmolean Museum: a summary catalogue of the Anglo-Saxon collections (non-ferrous metals)*. British Archaeological Reports, British Series 230. Oxford: BAR.
- MACGREGOR, A., MENDONÇA, M. and WHITE, J., in press. *Ashmolean Museum: manuscript catalogues of the early museum collections 1683–1886*. Oxford: BAR.
- MACGREGOR, A. and TURNER, A. J., 1986 The Ashmolean Museum, in SUTHERLAND, L. S. and MITCHELL, L. G. (editors), *The history of the University of Oxford*, vol. 5, pp 639–658. Oxford: Clarendon Press.
- MARSHALL, J., 1829. *Royal Naval biography*. Supplement, part 3. London: Longman.
- NIEBUHR, C., 1773 *Description de l'arabie d'après les observations et recherches faites dans le pays même*. Copenhagen, Möller.
- OVENELL, R. F., 1986 *The Ashmolean Museum 1683–1894*. Oxford: Clarendon Press.
- OVENELL, R. F., 1992 The Tradescant dodo. *Archives of natural history* 19: 145–152.
- PALEY, W., 1802 *Natural theology: or evidences of the existence and attributes of the Deity, collected from the appearances of nature*. London: Faulder.
- PAXTON, J., 1826 *Natural theology ... by William Paley, illustrated by a series of plates and explanatory notes, by James Paxton*. Oxford: J. Vincent.
- PICKERING, J., 1998 William John Burchell's travels in Brazil, 1825–1830, with details of the surviving mammal and bird collections. *Archives of natural history* 25: 237–265.
- SIMCOCK, A. V., 1984 *The Ashmolean Museum and Oxford science 1683–1983*. Oxford: Museum of the History of Science.
- WILKINS, J., 1668 *An essay towards a real character, and a philosophical language*. London: Gellibrand and Martyn.

APPENDIX 1: Report of the State of the Museum Catalogues &c

A report prepared for the Visitors by J. S. Duncan, 30 May 1825¹

The Keeper of the Ashmolean Museum having in the course of the last year fully examined into the State of the miscellaneous matters committed to their charge is now enabled to state to the Trustees that which the shortness of time during which he had occupied the office & the peculiar difficulty attending the repairs of the Ceiling & prevented him from detailing at their last visit.

The Contents of the Museum as originally arranged by Dr Plot appear in the Old Catalogues which were made in distinct Books for the convenience of Scrutiny supposed to have been annually made by the Trustees.

These Contents were 1st Printed Books & MSS of Ashmole Dugdale Wood Lister Aubrey. Of all these the Printed Catalogue is correct.

2^{dly}. Antiquities. Coins, principally from Ashmole. The Collection was never complete either of Greek & Roman or British &c, nor were the specimens excellent. They are however generally safe. The few which are missing, appear to have been deficient many years, by notices made at former visitations. To these numerous additions have been lately made, which appear now under the Glass of the Eastern Table. A selection from the drawers has been made of those Coins which appeared best suited for Exhibition & notice has been left in the several drawers of those removed. An arranged list has been prepared of all under the Glass. These appear to have been early allotted for inspection to the Vice Chancellor.

Armour – Idols – Vases – Marbles & miscellaneous antiquities were assigned for inspection to the Dean of Christ Church.

The best of these have been selected for exhibition. Many, such as wood of the True Cross, & other Toys have been long ago noticed as lost. A Catalogue of the Objects under the Glass of the Northern Table might supersede the old Register which contained a list of much trumpery.

Bows & Arrows & other weapons & implements of barbarous Nations, with Otaheitean Dresses appear not to have been entered in the Old Catalogues.

Natural History, allotted to the inspection of the Principal of Brazen Nose. All the Skins of Tradescant's Museum have long ago perished except that of the Manis or Scaly Lizard & one or two Armadillos. The Bones & Horns remain & all appear in the Eastern Cabinet with a Collection of Beasts arranged according to the System of Cuvier presented by the Keeper now at the Museum or his friends.

The South Side of the Museum is covered with large Cabinets intended to augment the Collection of Natural objects. The whole Collection of Birds (with exception of a very few which appear to be lent) has been given by the present Keeper his Brother & friends.

The Reptiles & Fishes are for the most part the remains of Tradescant's Collection. New Catalogues of all these are correctly written out by the Under Keeper, and these new Catalogues may supersede the necessity of reference in future to the Old Catalogues.

Of the Insects the greater part have been presented too lately to have allowed time for the preparation of a Catalogue which without arrangement would be valueless & the collection is as yet too scanty for arrangement.

Great Additions have been made to the Old Collection of Shells, but too recently for arrangement. Many have been purchased by the Keeper many presented by Ladies, amongst whom Miss Morland of Abingdon & Miss Pugh of Weymouth must be named as most liberal & truly Scientific Benefactors.

The Materia Medica is assigned for inspection to the Regius Professor of Medecine. Of this almost the whole has long ago perished, the little that remains not being worthy of notice.

The shells of Lister's Collection were found to be destitute of numbers referring to the Catalogue; & Conchology since the writings of Lamarck has been so extended, that modern Science requires great additions & a new arrangement & Catalogue. This, it is hoped, will be effected in the course of the present Summer.

The Fossils & Minerals have been wholly blended with the Noble Collection formed & daily extending under the superintendance of Mr Buckland. His Catalogues when completed will effectually supersede the meagre & unscientific lists which were formerly subjected to the numeration of the Proctors.

Finally the Keeper begs leave to recommend to the Trustees that the Printed Catalogues of the Books & MSS be the guide in future to this Department, & the Catalogues on the Table to all the rest of the Museum under the care of the Keeper (the coins only excepted).

The Antiquities are arranged for exhibition as nearly as possible in the order of time.

The Natural History has been arranged with a double purpose of illustrating the Natural Theology of Paley & the Natural Philosophy of Cuvier to whose researches & reasoning & inestimable additions are continually made by the labours & Sagacity of Physiologists: by none more successfully than by the present Regius Professor of Medecine who from the long neglected, & perhaps never hitherto rightly appreciated stores of ancient science, from Aristotle the great master of arrangements, brings light which concentrated with that of New Discovery cannot fail to dispel much of the obscurity which has hitherto over shadowed the history of human knowledge

to advance the progress of their Science & give due glory to the Cultivation of Antient Learning which visitors ignorant of our Academical studies their tendency their aims & their proper result have often rashly calumniously & maliciously attempted to decry.

APPENDIX 2: Proposed arrangement of the Ashmolean Museum

A report prepared for the Visitors by P. B. Duncan, 1833⁹²

Since men seem to have discovered that Museums instead of being mere storehouses of rarities may be applied to much higher purposes such as the development of those principles wh[ic]h regulate the system of nature, and since this is effected in great measure by the method in wh[ic]h the objects in a museum are arranged, such an arrangement becomes a matter of equal importance and difficulty. And this difficulty is greatly increased by various circumstances connected with a building already erected, wh[ic]h are sometimes so insurmountable as to compel us in spite of ourselves to make our love of system yield to expedience. In the case of the Ashmolean Museum however an arrangement might be effected with but small sacrifice of either.

The most important point in rearranging the Museum is the total separation of works of art from those of nature. Artificial productions not only distract the attention from the consideration of natural objects by interfering with & concealing them, but are themselves of very secondary importance in a Museum wh[ic]h aims at the advancement of science. If therefore the door facing the Theatre were opened and the cross partition next it taken down, the first floor of the Museum would consist of a greater room and a lesser. The larger area would contain the Mammalia, placed around the walls, and in the central space might be placed the Giraffe, (Zebra?), bones of the Cetacea, and skulls of various mammalia placed in glazed cabinets. A large arched opening made into the smaller room would preclude the necessity of two attendants on the first floor. In this inner room might be deposited all the antiquities and works of art (except those at present on the staircase), including the loadstone, coins, dresses of various nations etc. etc. Thus the visitor at his first entrance w[oul]d be able to give his undivided attention to the first class of the Animal Kingdom, and then omitting the works of art or reserving them to the last, would proceed to the great room up stairs, where the next class, – that of birds would attract his notice. The birds might commence in the right hand opposite corner, and proceed regularly round till they reached the corresponding corner on the left hand (where they now terminate). The two next classes of Reptiles and Fish might be disposed in the spaces between the windows, where they would follow regularly upon the birds. The new Cabinet containing the foreign insects might be placed under the most right hand window. Thence the spectator would pass to the area of the room where the old insect cabinet with the glazed top might stand in the place of the present coin cabinet, & might be appropriated to the next ensuing class of Crustacea. The shells might remain where they are, only in the reversed order, so as to follow immediately upon the Crustacea. The additional room gained by the removal of the antiquities &c opposite the shells, would serve for additional shells when procured, also for bottles containing mollusca &c. and for the Asteriæ, Corals, Madreporæ &c wh[ic]h form the conclusion of the series. The collection of skulls & skeletons of birds might remain in their present situation.

The above plan would probably allow sufficient space to the several departments to last for some years to come, when very much additional room might be gained by opening skylights in the roof of the large room and closing the side windows either altogether or as high as the cross divisions, wh[ic]h is as high as birds can be well seen. The middle of the room might be occupied with four transverse walls (so to speak) of bird cases placed back to back, about 8 or 9 feet high, corresponding to the spaces between the windows, and leaving about 1½ yard on each side for passing. Thus the upstairs room w[oul]d be entirely devoted to birds, & perhaps reptiles & fish, while the invertebrate orders might be placed in the smaller of the two rooms below, or the partition might be removed altogether leaving a room equal in size to that above. Cabinets might be prepared to receive the artificial objects, along the whole of the staircase as they now are on part of it, as well as in the space underneath the staircase. The main question is what to do with the pictures, wh[ic]h are still more foreign to the purposes of a Museum, especially in a town where a distinct collection already exists. At present they cover a great deal of space wh[ic]h might be usefully employed; but even should they be retained they might be much more condensed, and a good many might be hung round the great room in the space between the top of the cabinets and the ceiling. Should not sufficient space however be gained for the works of art, the uppermost little study might be cleared for their reception.

APPENDIX 3: Passages from William Paley's *Natural theology* (1802)

Volume 2, chapter 1

In crossing a heath, suppose I pitched my foot against a *stone*, and were asked how the stone came to be there, I might possibly answer, that, for anything I knew to the contrary, it had lain there for ever; nor would it, perhaps, be

very easy to show the absurdity of this answer. But suppose I had found a *watch* upon the ground, and it should be inquired how the watch happened to be in that place, I should hardly think of the answer which I had before given – that, for anything I knew, the watch might have always been there. Yet why should not this answer serve for the watch as well as for the stone? why is it not as admissible in the second case as in the first? For this reason and for no other, viz., that, when we come to inspect the watch, we perceive (what we could not discover in the stone) that its several parts are framed and put together for a purpose, e.g. that they are so formed and adjusted as to produce motion, and that motion so regulated as to point out the hour of the day ... This mechanism being observed ... the inference, we think, is inevitable, that the watch must have had a maker: that there must have existed, at some time, and at some place or other, an artificer or artificers who formed it for the purpose which we find it actually to answer; who comprehended its construction, and designed its use ...

Volume 2, chapter 2

Suppose, in the next place, that the person who found the watch should, after some time, discover that, in addition to all the properties which he had hitherto observed in it, it possessed the unexpected property of producing, in the course of its movement, another watch like itself (the thing is conceivable); that it contained within it a mechanism, a system of parts, a mould, for instance, or a complex adjustment of lathes, files, and other tools, evidently and separately calculated for this purpose; let us inquire what effect ought such a discovery to have upon his former conclusion.

I. The first effect would be to increase his admiration of the contrivance, and his conviction of the consummate skill of the contriver ...

II. He would reflect, that though the watch before him were, *in some sense*, the maker of the watch which was fabricated in the course of its movements, yet it was in a very different sense from that in which a carpenter, for instance is the maker of a chair – the author of its contrivance, the cause of the relation of its parts to their use ...

III. Though it be now no longer probable that the individual watch which our observer had found was made immediately by the hand of an artificer, yet doth not this alteration in anywise affect the inference, that an artificer had been originally employed and concerned in the production ...

IV. Nor is anything gained by running the difficulty further back, *i.e.*, by supposing the watch before us to have been produced from another watch, that from a former, and so on indefinitely ...

V. Our observer would further also reflect, that the maker of the watch before him was, in truth and reality, the maker of every watch produced from it ...

The conclusion which the *first* examination of the watch, of its works, construction and movement, suggested, was, that it must have had, for the cause and author of that construction, an artificer who understood its mechanism and designed its use. This conclusion is invincible. A *second* examination presents us with a new discovery. The watch is found, in the course of its movement, to produce another watch, similar to itself ... What effect would this discovery have, or ought it to have, upon our former inference? What, as hath already been said, but to increase, beyond measure, our admiration of the skill which had been employed in the formation of such a machine? Or shall it, instead of this, all at one turn us round to an opposite conclusion, viz., that no art or skill whatever has been concerned in the business, although all other evidences of art and skill remain as they were, and this last and supreme piece of art be now added to the rest? Can this be maintained without absurdity? Yet this is atheism.

Volume 2, chapter 3

This is atheism: for every indication of contrivance, every manifestation of design, which existed in the watch, exists in the works of nature; with the difference, on the side of nature, of being greater and more, and that in a degree which exceeds all computation ...

I know no better method of introducing so large a subject, than that of comparing a single thing with a single thing: an eye, for example, with a telescope. As far as the examination of the instrument goes, there is precisely the same proof that the eye was made for vision, as there is that the telescope was made for assisting it. They are made upon the same principles; both being adjusted to the laws by which the transmission and refraction of rays of light are regulated. I speak not of the origin of the laws themselves; but such laws being fixed, the construction in both cases is adapted to them. For instance; these laws require, in order to produce the same effect, that the rays of light, in passing from water into the eye, should be refracted by a more convex surface than when it passes out of air into the eye. Accordingly, we find that the eye of a fish, in that part of it called the crystalline lens, is much rounder than the eyes of terrestrial animals. What plainer manifestation of design can there be than this difference? What could a mathematical instrument maker have done more to show his knowledge of his principle, his application of that knowledge, his suiting of his means to his end ... ?