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The Department of Zoology and the Hunterian Zoology Museum

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ABSTRACT

An account is given of The Hunterian zoology collections, focusing on their history, development, management, care and uses in teaching, research and exhibition from John Graham Kerr's time, in the early 1900s, to the present day. Over their 260-year existence, these collections have been housed in two cities and five different premises, and their curation and care has variously been shared between the Department of Zoology (formerly, in the 19th century, Natural History) and The Hunterian. John Graham Kerr passionately believed in the utility of museum specimens to support teaching in natural history. To this end, he ensured that a fine museum gallery with beautifully laid-out informative displays was a central feature of the new Zoology Building when it opened in 1923. One hundred years later, the profile of, access to, and use of the zoology collections are flourishing and the Zoology Museum retains its position as a valued teaching, learning and social space for Zoology, the wider university, and the public audience.

INTRODUCTION

The zoological collections of the University of Glasgow have a 260-year history and, since the arrival of the foundation collection in Glasgow in 1807, at various times have been in the care of the Hunterian Museum and/or the Department of Zoology. In brief, the collections have their origin with William Hunter (1718–1783), the London-based Scottish anatomist and doctor. He bequeathed them to the University of Glasgow and for much of the 19th century they were housed in the original Hunterian Museum at the University's previous site in High Street. With the University's move to Gilmorehill in the 1870s, they were rehoused in the grand halls of the Gilbert Scott building. Finally, in 1923, they were moved to the newly built Department of Zoology with its elegant museum hall where the zoology displays remain today. In 2007, some zoological displays were re-introduced to the Main Gallery of the Hunterian Museum. In 2016, the great majority of the collections were moved to a newly developed facility with modern storage and access at the Kelvin Hall, adjacent to the University campus.

William Hunter and his collections have been the subject of several recent publications (Brock, 1980; Bynum & Porter, 1985; Keppie, 2007; Hancock *et al.*, 2015; Campbell *et al.*, 2018) and so will be dealt with relatively briefly here. As this essay is intended to be part of the Zoology Building's centenary celebrations, it will focus more on the great contribution of John Graham Kerr (JGK) to the collections and fate of the museum to the present day. Collections are the *raison d'être* for a museum, and so a short account of the collections is provided first.

Superscript numbers in the text refer to notes in the Appendix. Unless stated otherwise, all of the images were either taken by the author or are from the Zoology Museum's archive and were probably taken by past departmental photographers. Older photographs taken by T. & R. Annan & Sons are so labelled.

THE ZOOLOGY COLLECTIONS

William Hunter's zoology collections housed in his private dwelling in London contained (as far as is known) around 7,600 pinned insects, more than 8,000 mollusc shells and, perhaps numbering in the low thousands, assorted other invertebrates and vertebrates from fish to mammals (including a stuffed adult elephant!). Today (2024) it is estimated that the Zoology collection numbers in excess of 600,000 specimens or specimen lots, representing all animal phyla, though 85% of that total comprises insect specimens. All forms of preservation are present – skins, bones, teeth, mounts, mollusc shells, pinned insects, other dry invertebrates, wet-preserved specimens, models, replicas, teaching charts, birds' nests and other animal artefacts, microscope slides, scanning electron microscope (SEM) stubs, frozen specimens and art works. The geographical spread is worldwide including, like many other museums, material from the colonial era, which is the subject of ongoing interdisciplinary investigations.

After their arrival in Glasgow, the Hunter collections were added to by donation, purchase, bequest and field work. It is standard museum practice (with legal implications) to record additions to the collections, usually in an accessions register[1]. However, very little on acquisitions was recorded over most of the nineteenth century, there being scant records for the whole museum for 1807–1820, almost nothing recorded for zoology between 1821–1878 and then from 1879–1899, midway through the era of the two John Youngs (see below), things pick up considerably with 405 recorded accessions of which 35% contain zoological objects, some of considerable importance.

The collections grew significantly through the late 19th

into the first half of the 20th century. The sale of private museums from the Victorian boom in scientific collecting enriched the holdings of many public museums at this time. Staff, students, alumni, professional contacts and local naturalists all donated specimens originating from field work, expeditions, surveys or research projects. Glasgow's citizens travelled widely and worked in many parts of the world and sent specimens home. Academic staff used their personal networks to acquire specific specimens. For example, JGK bartered some of his precious lungfish for various desirables such as rare caecilian embryonic material from Professor Brauer[2] in Germany, and deep-sea animals from the *Valdivia* expedition[3]. He received corals from the Smithsonian Museum's Thomas Wayland Vaughan[4], a leading coral scholar of the day, in return for photographs of the famous Ellis and Solander[5] corals found in Hunter's collection. The commercial supply of specimens flourished in response to the demand for professionally made, high quality preparations of all kinds for teaching and exhibition. Biological supply houses arose across Europe and in the U.S.A., such as Rowland Ward[6] and Gerrards[7] in London, Frič[8] in Prague, the Naples Marine Station[9] and Ward's of Rochester in New York[10], each becoming famous in their own right. All these suppliers are well represented in the Hunterian collections. Taxidermy was at its height in terms of spread and popularity. In Glasgow alone there were several taxidermy firms at this time, the most prestigious of which was Charles Kirk[11], supplying vertebrate mounts to private and public clients, including the Zoology Museum.

The flow of specimens into the museum, excepting entomology, reduced a great deal after World War 2 until the 1970s. However, many hundreds of accessions have been made since then. Some notable acquisitions include the comparative dentistry collection from the University Dental School (1994); specimens collected during University expeditions, especially those to Trinidad and Tobago led by Professor Roger Downie and ongoing since 1987 (arthropods, marine life, amphibians, reptiles); deep sea fish from the Porcupine Abyssal Plain research collection made by Zoology staff member Dr David Bailey and his PhD student Roseanne Milligan (2012); the Colley (2012) and Hammond (2014) private mollusc shell collections both with good quality modern data; Clyde Sea Area marine life, burrow casts and corals rehomed after the closure of the University Marine Biological Station Millport (2014); and from 1992 The National Nest Reference Collection[12], a research collection of British birds' nests initiated and assembled by Professor Michael Hansell as part of his life-long studies on animal building behaviour. This is an ongoing collecting programme, sourced from a network of U.K. ornithologists, for the museum.

THE ENTOMOLOGY COLLECTIONS

The entomological collections merit special attention. The number of described species of Insecta makes it the largest taxon in the animal kingdom[13]. Due to their popularity with collectors and as study organisms in the University and beyond, in addition to the size of the taxon, they are the largest group of organisms in the Zoology collections, amounting to an estimate of around half a million specimens. Most of the collection is pinned insects stored in drawers and boxes. There are also fluid-preserved specimens, microscope slide mounts, insect nests and artefacts, models, teaching charts and art. It is a scientifically important collection added to, curated by, researched and published on by in-house experts and their external collaborators. It attracts visiting researchers, and many loans are made to specialists across the world.

The first luminary to work on the collection was Johann Christian Fabricius (1745-1808), the Danish entomologist and pupil of Linnaeus, who was invited by William Hunter in the late 1760s to curate his collection. Hunter himself had no entomological expertise but amassed a superb collection with the help of Fabricius who described over 10,000 new species, of which several hundred type specimens are in Hunter's collection.

After the collection came to Glasgow, it languished throughout the 19th century largely ignored and endured what is now referred to as "benign neglect". Apart from the Graham Kerr incident described below, the Hunter insect collection, rather against the odds, survived into the 20th century relatively intact from pest damage, physical deterioration or human interference.

Nothing much was added to the collection in the 19th century – for example, between 1879 and 1898 there are only ten records for insects, all of which appear trivial. Robert Staig[14] joined the Zoology staff in 1903 as a teaching assistant and eventually became lecturer in charge of the entomology section and curator of the insect collections. There were monumental additions of the T. Bishop (1923) and the J.J.F.X. King (mid-1920s–1933) collections, each numbering in the hundreds of thousands. Several hundred other accessions are recorded throughout the twentieth century. In JGK's and Edward Hindle's time, donations in economic entomology, such as mosquitoes from Frederik Vincent Theobald (1868-1930)[15] and African pests from Alexander Cuthbertson (1901-1942)[16], were particularly useful acquisitions. Scientifically important additions by Zoology staff members, in the second half of the century, include Coleoptera from Roy Crowson[17] and insects of agricultural importance from Alex Hill[18] and Ron Dobson[19] and their associates and students. The collection continues to attract significant donations. For example, in recent years, the Pasteur collection of African butterflies (2005), the R.R. Moore collection of beetles from the Isle of Raasay (2017), the depositions by Dom Collins from his ongoing British Thysanoptera (Thrips) research, and the Highland insects collected by Brian Morrison, fisheries entomologist and former student (2023).

After Robert Staig's retirement in 1940, no specialist curator was appointed to replace him, though a number of dedicated entomologists joined the departmental staff

as researchers and teachers. Anthony Downes[20] worked with the collections after his appointment as lecturer in 1947. Roy Crowson was appointed in 1949 as lecturer in taxonomy and worked on and with the collections. Around the same time, Agricultural Zoology was developed as a departmental specialism and the staff were entomologists who researched and taught using the collections and cared for them *inter alia*. The Zoology Department provided some general technical help for routine collections maintenance such as adding pesticide (mothballs) to the collection. Research students and short-term contract staff also added to and looked after the collection in the absence of a dedicated curator.

In 1997, after the advent of Heritage Lottery Funding (HLF), a grant was secured to fund a two-year project (The Zoology Insects Project - ZIP) for an expert entomology curator to re-organise the over-crowded insect collections into new storage cabinets in additional space allocated by the Department. Included in the project was the creation of new public/teaching displays on insects – a serious lack in the existing provision. E.G. Hancock was appointed to the post in October that year. This was the most significant curatorial development in the insect collections since JGK's time and in recognition of the need, the project achievement and the opportunities generated, after the end of the project, the Hunterian established the entomology curatorial post. This was occupied until 2015 by Geoff Hancock who was succeeded by Jeanne Robinson, the current curator. The use, size, significance and international profile of the entomological collections continue to grow through the investment in these expert curators.

EARLY HISTORY – 18th AND 19th CENTURIES

William Hunter from Long Calderwood, East Kilbride entered the University of Glasgow as a young boy of fourteen to study for a degree in theology; he was the third son of a prosperous merchant farming family and the Church was seen as a suitable career for such a boy. However, he was "not suited" to these studies and left the University without a degree, becoming apprenticed to the doctor, William Cullen (1710–1790)[21], who was physician to the Duke of Hamilton. Cullen went on to a stellar career of his own, and William, utilising contacts in the Scottish medical network in London, served the rest of his apprenticeship there with distinguished physicians of the day. He set up a private anatomy school and medical practice specialising as a man-midwife. In time, as his professional reputation grew, he built up sufficient funds to indulge his passion for collecting which was a prestige activity amongst the educated and wealthy. His original specimens were those that served him in his teaching - anatomical and pathological preparations including comparative anatomy specimens. He had a discerning eye, money (though he was a shrewd negotiator) and high standards - his collection was wide ranging in arts, science and humanities, and was admired by his peers. He collected animal and plant specimens. The fate of his herbarium may be dealt with swiftly: it was last mentioned in the early 19th century and has not been seen since.

Hunter bequeathed his collections to his *alma mater* along with funds to build a museum to house them. He granted his nephew, the pathologist Matthew Baillie (1761-1823), the use of them for up to 30 years after his death. Hunter died in 1783, Baillie retired in 1800, the collections were shipped to Glasgow in 1805 and the Hunterian Museum opened in 1807. Hunter had instructed his trustees to draw up catalogues of all parts of his collection – for biological specimens, this was only carried out for the shells and the insects. Hunter himself wrote only a catalogue of his medical preparations. In 1813, John Laskey, an English antiquarian, natural historian and soldier stationed in Scotland wrote *A General Account of the Hunterian Museum, Glasgow*, which was published by John Smith & Sons. Though not a *catalogue raisonné*, this is a singularly important work in understanding the contents of Hunter's museum not long after his death. Room by room, and paying considerable attention to the natural history material, Laskey listed specimens and featured items that particularly attracted his attention or interested him - he was a conchologist so the shells get rather more coverage than other items. The brevity of some entries is frustrating to the modern reader. For example, he writes of "an immense quantity of reptiles…", or, concerning the unfortunate herbarium, "…many thousands of plants all uniformly spread on paper and in good order…"[22]. One must ask: what were they and what happened to them?

King George III created the Regius chair of Natural History at the University of Glasgow[23] with the intention of providing a curator for Hunter's collection. Hunter moved in Royal circles as he was obstetrician to Queen Charlotte; in addition, the king himself was a keen collector. Muirhead Lockhart, the first appointee, was the University Librarian who was tasked with organising the removal of Hunter's collection to Glasgow. Along with the collection, Hunter had left funds to build a home for them and architect William Stark's (1770–1813) fine "Temple to the Muses" was erected adjacent to the Old College buildings at the former site of the University at High Street in Glasgow (Fig. 1).

Fig. 1. A view of the Hunterian Museum, library and common hall, Old College 1828. Steel engraving by Joseph Swan, printed in black and hand-coloured. GLAHA:17688, ©The Hunterian, University of Glasgow.

The new museum was opened in 1807 and initially attracted considerable attention and admiration. Coutts (1909) and Keppie (2007) describe in some detail the challenges of running the museum in the middle–late 19th century, enduring issues such as external and internal politics, lack of funding, declining building fabric and maintenance, and overcrowding, combined with inadequate staffing and management. The four individuals who held the Regius chair of Natural History throughout that century all had other duties in addition to their museum responsibilities, the latter fulfilled partly according to personal academic interest - for example, in natural history, Henry Darwin Rogers (1808–1866) and Professor John Young (1835-1902) were more concerned with geology. Confusingly, overlapping with Regius Professor John Young, another John Young (1823-1900), a man of more humble origins, was appointed under-keeper in 1859. He was a hard-working, talented curator and eventually was awarded an LLD by the University in 1893 in recognition of his services. Clark (2008) provides short biographical accounts of both men. Mr John Young devoted himself to the museum collections, especially geology, but also curated the zoology collections. Examples of his work, particularly his distinctive labels are found in the zoology collections today on diverse specimens such as bones, mammal skins, shells, echinoderms and microscope slides.

For some decades, the University had been contemplating a move from the crowded, ageing, increasingly dilapidated buildings and the polluted town centre to the greener spaces of the west end. Land at Gilmorehill was purchased, the site in the town was sold to a railway company, and the leading English architect George Gilbert Scott (1811-1878) was appointed. By 1866, preparatory works had started on the grand neo-Gothic building that today bears Scott's name (Haynes, 2015). The Hunterian was allocated impressive halls along the north-east front of the building. The collections were packed up and moved in early 1870 (Keppie, 2007). Little information is available specifically on the move of the zoology material. However, there is a charming watercolour by Jemima Blackburn[24] that depicts a number of the taxidermied animals including a polar bear, tiger and giraffe and some mounted skeletons loaded onto horse-drawn flatbed carts, ready for hauling up to the new premises. The operation was overseen by a man in a top hat, whom Keppie thinks is likely to be Mr John Young. Natural History occupied most of the main gallery and it took several years for all the collections to be installed and become accessible.

Some photographs from the 1890s show serried ranks of stuffed mammals and skeletons lined up on the museum floor, with glass showcases housing smaller specimens, and antlers mounted on the walls (Fig. 2).

In 1888, the University of Glasgow received much of the Zoology content (Reilly & Sutcliffe, 2014) of the recently defunct Andersonian Museum, part of Anderson's College, a rival institution set up in the early

Fig. 2. View of main gallery of the Hunterian Museum in the Gilbert Scott Building from the 1890s, showing many zoological specimens. (Photo: T. & R. Annan & Sons, Glasgow)

19th century by John Anderson (1726-1796), former professor at Glasgow. Anderson's College eventually became the University of Strathclyde. Though no list of what was transferred appears to have been made, it was an important and useful addition to the collections, and Mr John Young diligently labelled the specimens, providing modern curators with the only means to provenance this accession. Mr John Young LLD died in 1900 after a period of illness. Professor John Young died not long after, in 1902, having demitted office some time before due to ill health.

THE 20th CENTURY: JOHN GRAHAM KERR AND THE ZOOLOGY MUSEUM

Into this scenario came Edinburgh-born John Graham Kerr, a young energetic Cambridge-trained zoologist and, amongst his many interests, a museum enthusiast. He was appointed to the Regius chair of Natural History in 1902: the chair was split into Zoology and Geology in 1903 and his title changed to Regius Professor of Zoology, which included, after some further administrative changes, the *ex officio* role of Honorary Keeper of the Zoology Collections only. He was a true believer in the use of museums for teaching and research - his personal research on embryology, development and evolution was carried out on lungfish and related material collected in the field by him and his associates, and preserved in the museum.

The Department of Natural History was accommodated in rooms on the ground floor (and basement) of north-east front of the Gilbert Scott building. The Hunterian Museum, housing the zoology collections, was conveniently situated on the floor above. Clearly there was not what might be termed today a hand-over process, nor does it appear there was much in the way of staff in the Department of Natural History. Graham Kerr leapt into action on a number of fronts: on a pre-visit to Glasgow before he formally took up his Regius post, he was less than impressed with the conditions he found in his new Department, recording in his memoir:

"There was, of course, no zoological laboratory. The

eastern half of the lower hall of the Hunterian Museum - known in later years as the Hunter Hall - had been used for what little practical work had been done, but it had no scientific equipment. Its floor was littered with geological debris: its entry was by wooden steps through one of the windows." (see *Gallery of Memories*, this volume, p. 25).

He also spotted a derelict cabinet piled up in the Quadrangle apparently for disposal – on closer inspection he found pinned and labelled insects in eight drawers, subsequently established to be part of William Hunter's prestigious insect collection. He issued instructions for their rescue and safe keeping. He had to start teaching the large undergraduate classes of medical students straight away (see *Gallery of Memories*, this volume, p. 25) and had spent the month before he started on the Isle of Arran writing his lectures. He used museum specimens in his teaching but soon declared there had to be a proper teaching museum:

"While the main teaching of the courses in Zoology had to be carried out in lecture room and laboratory, a necessary supplement was a museum for the display of specimens of importance, other than those studied in the laboratory. A teaching museum had to be created." (see *Gallery of Memories*, this volume, p. 26).

He acknowledged it would take "much money and much skilled labour", both in short supply, but said that creating a teaching museum was "the most fascinating part of my work in Glasgow". (see *Gallery of Memories*, this volume, p. 26).

One of his first tasks, in 1904, unsurprisingly given the incomplete record keeping he inherited, was to create a new accession register. He started off listing the many professional preparations acquired for teaching, which he purchased from the leading biological supply houses of the time. Then he listed the existing collections already in the Hunterian or at least those that had survived his weeding out of decayed specimens.[25] (see *Gallery of Memories*, this volume, p. 26). Kerr (1906) published a paper where he listed new accessions – a humpback whale foetus presented by the Governor of Newfoundland; specimens of the copepod *Penella*, parasitic on whales; hair balls from the uterus of a fur seal; a specimen of the hemichordate *Cephalodiscus nigrescens* collected on the Discovery voyage and described in 1905 by Ray Lankester; the horseshoe worm *Phoronis australis*; leptocephalus larvae of eels; tsetse flies *Glossina palpalis*, recently identified as an intermediate host of trypanosomiasis. This was indeed an eclectic selection, taxonomically and geographically, including new species and discoveries, from a variety of distinguished donors and scientists. Later, Kerr (1910) published the proceedings of a talk to and a visit by the Glasgow Naturalists to the Museum. In the first half of the paper, he opined on the function and presentation of a University museum of Zoology and in the second half he turned to the type specimens from Hunter's collection he had located in the collection - an incomplete list of the Fabrician insect types, 20 specimens of Ellis and Solander coral[26] and the Ellis crinoid[27]. He acknowledged that much work needed to be done with this material and wrote that the function of his paper was to once again draw expert attention to it.

JGK was a man of strong views clearly expressed and his opinions on museums were no exception. He was opposed to overcrowded displays with many specimens jammed in with no labelling or focus - one good specimen accompanied by a concise informative label would serve its purposes much better. Bad quality, decayed specimens giving a poor impression should be disposed of and, if feasible, replaced with good examples of their species. University museums were for teaching, and perhaps showing a wider range of taxa of zoological importance, rather than more flamboyant specimens (often now called "charismatic megafauna") - that job was better left to the magnificent municipal museum at Kelvingrove. Labels should be letter press in gold leaf on matt black paper. Lighting should be adequate but not so bright as to fade specimens; daylight should be excluded or controlled. Showcases should be purpose-built with specimens easily viewable, and designed to keep out dust and pests. A modern curator could agree with much of this.

As ever in museums, money was an issue. In 1904, JGK estimated £3,665 was needed to get the Zoology Museum in order. He was able to extract a promise of a grant of £1,000 (of the £3,665 needed) on a matched funding basis between the University and the Bellahouston Trustees to develop the museum. The money appears to have materialised in 1907 and JGK had to eke it out over five years, reporting it all spent in the 1911-1912 Museum annual report. Though £1,000 in 1907 is the equivalent of the not inconsiderable sum of approximately £100,220 in 2024, the zoology collections had almost a century of neglect to remediate. However, further sums were not forthcoming and JGK chided the University authorities in the 1913 annual report for their failures and prompting the release of another tranche of funding for the Hunterian, including £500 specifically for Zoology.

With the limited resources available, JGK did his utmost to better utilise the existing arrangements with the Hunterian collections – he had electric lighting installed in 1909, enabling work during the winter, and in the period 1907–1912 arranged for the purchase of cases to improve display of some of the specimens. However, his master plan from the time he arrived was to have a brand-new department built for Zoology, the key features of which would be a capacious lecture theatre, a large teaching laboratory and a fine museum hall (Haynes, 2013). By 1914, JGK had agreement from the University authorities that a new building would be commissioned but the outbreak of World War 1 halted all development. The project was picked up again after the war and the leading Glasgow architect John James Burnet (1857-1938) was engaged to design the new building. By 1921 plans were agreed and work began. Classical in style and said to be inspired by the Roman Baths of Caracalla, the beautifully proportioned

museum gallery featured a central sunken well, surrounded by a colonnade on three sides, supporting a cleverly shaded glass roof. There were collection storage rooms in the basement and a curator's office along the corridor leading into the museum.

The building was open by October 1923 when JGK delivered his first lecture in the new lecture theatre, and in December, the grand Rectorial dinner that featured a famous controversial speech by the Rector, Lord Birkenhead[28] was held in the empty Zoology Museum. Transferring collections safely is a time-consuming and laborious process and the gallery exhibits were not fully installed till at least 1924. In the annual report for 1922-23 JGK notes that whilst the museum's primary function is the teaching of university students, it can also serve to instruct the public and to that end the University Court have agreed that it may be opened from 3-5 p.m. on Saturday afternoons from Winter Session 1925-1926. (Fig. 3.)

Fig. 3. The Zoology Museum in the 1930s. (Photo: T. & R. Annan & Sons, Glasgow)

Members of the Zoology staff assisted JGK in the development and curation of the Museum. Lecturer in Oceanography James Chumley[29] supervised the transfer of the collections to the new building, catalogued collections, and curated the marine invertebrate material; Robert Staig curated the growing entomology collections, prepared teaching displays, and also produced two volumes on some of the Fabrician type Coleoptera in the Hunter collection (Staig, 1931, 1940). Wilfred Agar[30] and George Carter[31] both followed in JGK's footsteps, undertaking expeditions to the Grand Chaco - Agar in 1908, Carter in 1928, and deposited fish, mammal and other specimens in the museum collection. Charles Parsons[32] represented the Zoology Museum at The Museums Association, a professional organisation for U.K. museums.

For the ten years preceding his retirement from the University and having achieved his aim of a new building to house the Department and a beautiful new teaching museum, JGK in his annual reports wrote mostly of achievements such as Staig's publications, the acquisition of important material, the routine running and maintenance of the museum and acknowledgements to colleagues for their contributions.

AFTER GRAHAM KERR

Graham Kerr demitted office in 1935, formally signing over his specimen collections, papers and books to the Museum and the University. Entomologist and parasitologist Edward Hindle (1886-1973)[33] succeeded him in the Regius Chair and led the Department through the World War 2 years. As in World War 1, the department was again depleted of staff and students called up for military service. Hindle kept the museum going, assisted by technician Mr C. Bain, running teaching and maintaining the collections. Hindle enhanced the data quality of the collection by arranging for parts of the Bishop and King entomology collections to be sent off to expert taxonomists in the British Museum Natural History (BMNH, now NHM) in London for identification and organisation – such sharing of expertise is a standard practice to this day. The museum collections were still growing: various accessions are recorded, including numerous golden hamster (*Mesocricetus auratus*) specimens. Hindle is credited with introducing the golden hamster to Europe from wild specimens caught in the Syrian desert, for use as laboratory (and subsequently pet) animals. In 1941, the Zoology building and the museum sustained blast damage from a bomb dropped on nearby Kelvin Way. The glass canopy museum roof was damaged and leaking but other than glass shards all over the floor, the museum displays were largely unaffected. In 1938-39, Hindle reports on the installation of the first live animal displays in the museum - several tanks of tropical fish; live displays were resumed in later years. In his time in Glasgow, Hindle was instrumental in the foundation of Glasgow Zoo and he departed in 1943 to follow his zoo interests and take up a post as director of the Zoological Society of London. In 1944 Sir Charles Maurice Yonge[34], an eminent marine biologist, was appointed to the Regius Chair and so became honorary keeper of the museum.

The Department and Museum were very much as JGK had left them. In his first annual report for year 1944-45 to the Court, Yonge commented the museum had been well maintained by the museum technician (Mr Bain) but was in a poor state of décor and needed painted, hardly surprising after blast damage in 1941. Anthony Downes returned from war service and resumed working through the Bishop Coleoptera collections, again dispatching them to experts for identification. Other parts of the collection also received attention – in 1949, Yonge mentions research queries or visits from eminent scientists Wilfred Le Gros Clark, Solly Zuckerman and Robert Broom, all anatomists/palaeontologists working on primate biology and evolution. There are few accessions recorded – generally the case in all of his annual reports to the Court over the period of his keepership (1944–1964). The important exception to this, however, is extensive field collecting in entomology and of some other arthropods by Drs Downes, Crowson (and Mrs Elizabeth Crowson

as a volunteer collecting and curating a collection of spiders) and the agricultural zoologists Drs Alex Hill and Ron Dobson.

By 1947, the post war increase in student numbers necessitated the southern end of the museum being converted to laboratory space, with the installation of benches and sinks to accommodate practicals for 500 first year arts and science students. By 1950 another area was cordoned off for advanced students (Fig. 4).

Fig. 4. The Zoology Museum around 1950 showing its conversion to a crowded teaching space. (Photo: Department of Zoology Archives/University of Glasgow)

Of these necessities (and Yonge had wryly commented that the Zoology building was designed "as though the needs of 1923 were those of eternity") the museum was cramped, its elegant Graham Kerr layout compromised and public access was not available in term time. However, collection work continued, particularly on entomology with Dr Downes reporting much research activity.

In 1948, a start was made on the first of the post-war modifications to the building, breaking through the thick stonework of part of the north wall that formed one side of the museum to create access for an extension to house the expansion of teaching and research in Agricultural Zoology. This building work occasioned much disruption and ingress of dirt to the museum but also resulted in the opening up of previously unusable areas of the basement and some of these were assigned as museum storage space, albeit of deeply inadequate standard. Roy Crowson had joined the staff in 1949 specifically to work with the museum collections *per se*, thereby, to Yonge's relief, freeing up other staff to deal with teaching the 500 students passing through the Department. In 1950 Charles Parsons, who had been an able depute to both Hindle and Yonge, died suddenly and Yonge acknowledged his care of and pride in the museum even though he had no official or honorary responsibilities there - he had been in effect the assistant curator.

The museum was finally painted, presumably recovering from its wartime state and the recent building work, and Yonge thought that JGK's characteristic black and gold labels were dark and outdated and needed replaced. Yonge mentioned preserved and labelled dissections by students, then a requirement of the Honours course, introduced by him but supervised by Dr Harry F. Steedman, a research technologist and internationally renowned expert in animal preservation who came to Glasgow with Yonge from Bristol University. Some of the dissections remain in the collection today and are of excellent quality, testimony to Steedman's influence (Fig. 5).

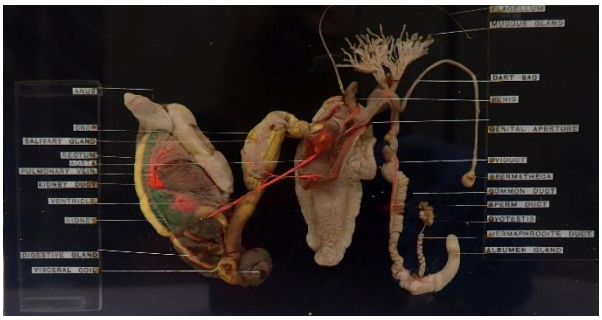

Fig. 5. Dissection of the garden snail, *Helix pomatia*, to show internal anatomy, by Honours student Miss N.M. Davidson, 1948. (Photo: Department of Zoology Archives/University of Glasgow)

In the mid-1950s, Yonge was exasperated by the lack of museum staff and overcrowding of teaching in the museum leading to its deterioration. His suggestion that the large teaching laboratory could be horizontally divided to create another floor was finally acted upon in 1957 creating much needed teaching and research space. The museum needed restoration after the student classes moved out and in 1959 with the help of a temporary technical assistant, Mrs MacAulay, the museum refurbishment was completed, to Yonge's satisfaction. JGK having died in 1957, memorial events took place in the department in 1959, including the unveiling of his portrait by Arthur Wells that presently hangs on the first-floor landing.

By 1961, public access was restored and a permanent part-time museum assistant Ellison Macartney was appointed. Most research activity was still focused on the entomology collections, though Dr W.M.A. De Smet of Louvain University in Belgium, who worked on the archaic fish *Polypterus,* came to study the specimens collected by J.S. Budgett[35] (which had been given to JGK) in the early 20th century. De Smet (1980) cited the Glasgow specimens.

Yonge encouraged some exploration of the large but neglected shell collections in the museum. Dr Peter Dance of the BMNH and Mr Fred Woodward (1939-2020) of Birmingham Museum (later depute Keeper of Natural History at Glasgow Museums), both experts in historic shell collections, came to examine the University material. In 1962, there was much excitement at the discovery of a specimen of a rare species, *Conus gloria-maris*, the glory of the sea cone shell (Dance and

Woodward, 1963). Indicated by its rarity (at that time only a handful of specimens were known in the world) and some historic documentation, this shell could only have originated in William Hunter's collection. The more important discovery here was the evidence gathered by Dance and Woodward that at least some of William Hunter's notable shell collection, previously feared lost or destroyed (Wilkins, 1955) was in fact still extant, if admixed with other later collections and lacking original labels.

Yonge retired in 1964 and in his final report he recommended that, with the freeing of space due to the removal of the first-year classes, the museum develop an area where students could sit, study and discuss aspects of Zoology. This came to pass at a later date and the museum has for many years been a vibrant and popular study space for students to work, learn and relax.

Professor David Newth[36], a developmental biologist, took up the Regius chair in 1964 and in the second half of the 1960s there were drastic internal modifications to the museum. Around 1966, the museum colonnade on the north side and north-west corner was walled off to form a museum store, an entomology room, a histology laboratory and a lecture theatre; the ever-leaking glass roof was removed, the museum roof covered over and a new laboratory built on top of it, this necessitating new arrangements for ventilation, heating and lighting in the museum. On the positive side, for entomology at least, the facilities were improved with equipment, library and some collections co-located in the new room and with limited space for visiting researchers to work. Dr Crowson continued to publish regularly and supervised two PhD theses on the collections during this period.

In the 1966-67 annual report Newth confirmed that the museum continued to have an important role in undergraduate teaching and also expressed a desire that the permanent displays be supplemented with occasional temporary displays to refresh interest in the collections. By 1970, the museum was preparing for the infill of the remaining colonnade (along the south wall and south-west corner) to form laboratory and office rooms for a new electrophysiology research unit. Yet again the museum was disrupted and more specimens were removed to storage in the profoundly unsuitable basement below the museum. In summer 1971, Newth wrote that "the past session has been a difficult one for the Zoology Museum" and reported problems particularly for the fragile insect collections with vibrations from the new ventilation system.

In the mid-1970s, two significant events happened that dramatically improved the prospects for the museum. In 1975, Dr David C. Houston[37], ornithologist and behavioural ecologist, joined the Zoology staff. Very keen on museums and collections, in the Graham Kerr manner, he volunteered, and David Newth gratefully accepted his offer, to take over the role of honorary assistant curator. By this stage, because of the long period of disruption and lack of resources over the preceding decade or more, there was a very real risk that the Zoology Museum would be lost to the University, and the remaining collections donated to the National Museum in Edinburgh – a fate that had earlier befallen most of the Edinburgh University Zoology Museum. It was decided that the future of the museum could only be protected if it was made to play a far more active role in the work of the Zoology Department. Zoology is such a wide-ranging subject that it was becoming difficult to find time in the busy teaching curriculum for classical animal kingdom coverage, and this was clearly a role the museum could fill. A self-teach course on the animal kingdom was developed, which after various revisions is still part of the teaching curriculum today. It covers the major phyla and is based on the excellent reference collections in the museum stores.

Abandoning the previous small-scale efforts on display refreshment, it was decided to embark on a major refurbishment of the permanent displays. David Houston developed and led on this critically important programme. Though permanent museum staffing at this point was better than in the past – Ellison Macartney was still in post as a part-time museum assistant and Mary Stewart had been appointed in 1976 as museum technician - such an undertaking was made possible only via dedicated additional staffing. This came in the form of short-term posts for graduates, funded through the Job Creation Programme (JCP) of the Manpower Services Commission[38]. Apart from covering staffing costs, the JCP also provided much-needed funds for materials and equipment, for example enabling the purchase of new showcases, always an expensive item. However, such funds only stretched so far and David Houston (pers.com.) gratefully recalls help from the University Estates and Buildings Department who supplied piles of bricks to build displays plinths! The display redevelopment required "re-discovery" and consideration of the specimens previously consigned to the dreadful conditions in the basement. Much of the taxidermy turned out to be still in excellent condition largely due to three factors – it was of the finest quality in the first place; it had been protected from pest damage by the application of arsenical soap to the inner surface of the skins - a standard preservation practice in taxidermy for many years; and, fortunately, it had been packed in robust purpose-designed storage crates. There were surprises exploring the many long-forgotten storage crates in the basement and a number of important specimens were re-found – including one of the very few intact eggs of the extinct giant elephant bird (*Aepyornis*) of Madagascar, purchased in JGK's time from Rowland Ward. Additional professional help and advice on specimens were sought and generously given from museum colleagues such as Dr Ian Lister, formerly curator of birds and mammals at the National Museum of Scotland, and Dick Hendry[39], formerly taxidermist at Glasgow City Museum at Kelvingrove. As well as returning many specimens to the displays, the remaining material in the basement was removed to storage in the attic space, which had the significant advantages of headroom, more stable temperatures and better lighting.

Live animal displays were also re-introduced at this time

- initially some weaver birds but subsequently (until 2020) tropical fish, spiders, scorpions, insects, reptiles, frogs and mammals including, in partnership with Chester Zoo, a breeding and re-release programme for harvest mice. Over these years, a number of Zoology technical staff and numerous volunteer students gave much appreciated help with the maintenance of the live animal displays.

These developments in teaching and displays were a new start for the museum and were accompanied by the first foray into data capture, again by JCP-funded staff, to prepare the study collections for computer cataloguing. Permanent staff changes occurred at the end of the 1970s with Ellison Macartney departing in 1977, Mary Stewart in 1979 and the appointment of Maggie Reilly in 1978, initially as part-time museum technician and then, in 1980 as full-time museum assistant (later titled curator). The technician role was lost for good at this point. In 2021, Maggie Reilly retired and Mike Rutherford was appointed curator of the Zoology and Anatomy collections[40].

The second significant change of the 1970s was the appointment in 1976 of Professor Frank Willett (1925-2006), anthropologist and archaeologist, as the first director[41] of the Hunterian Museum and Art Gallery, with the aim of bringing the diverse collections back under one leadership that would assume responsibility for the staff. The existing honorary curators became *ex officio* members of the Museum Committee (a committee or sub-committee of Court)[42]. The Zoology Museum had a strong presence and working life in the Zoology Department but gradually engaged with the new administrative arrangements to mutual satisfaction, the collections benefitting from professional museum practices and a collegial environment with fellow Hunterian staff. The Hunterian in turn benefitted from the skills, knowledge and talents of the zoologists who invested their time and dedication in the Zoology Museum.

By 1986, the refurbishment of the displays was accomplished with an updating of the invertebrates display and a complete re-painting and re-lamping of the gallery. Sir David Attenborough opened the refurbished gallery on the 29th of April 1986 and ten years of work was celebrated (Fig. 6).

Many externally funded temporary staff contributed to the achievement. In parallel, the often less visible but essential regular work of the museum – collection management (conservation, maintenance and cataloguing), university teaching, outreach and research activity continued. Especially important between 1982 and 1985 was some further grant-funded work on the Hunter insect collection by Dr James Flanagan who, following on from Robert Staig, worked on the Coleoptera mostly, meticulously researching and characterising 2,700 Hunter specimens.

Not long after the completion of the new displays, in February 1988, disaster struck with a fire in the

Fig. 6. The Zoology Museum after its rebirth in 1986 also showing the spaces behind the colonnade cut off to form offices, laboratories and stores. (Photo: Department of Zoology Archives/University of Glasgow)

Physiology Laboratory, which sat on the museum roof – detailed elsewhere in this volume (see Phillips, 2024). It was a horrifying event and the laboratory was completed destroyed. Thanks to the rapid deployment of Glasgow City Fire Brigade, the fire did not spread down into the museum, where there was a real risk that the burning roof timbers would fall into the museum well and destroy the whole building. But the vast amount of water used to douse the blaze resulted in the museum suffering extensive flooding. Remarkably very few specimens were destroyed and damage was limited, the latter largely due to the helpful and understanding practice of the fire officer in charge and his crew. As soon as safe access could be established, willing staff and student volunteers were allowed into the museum to remove vulnerable specimens to a safe place. However, the fabric of the museum was ruined and décor, flooring, lighting, graphics, showcases, exhibition stands and a few taxidermy mounts needed repair or replacement (Fig. 7).

Fig. 7. The Zoology Museum after the Department fire of 1988. (Photo: Department of Zoology Archives/University of Glasgow)

This was a blow so soon after completion of a long-

awaited refurbishment. When the insurance matters were settled, funds were released to employ two external staff, John Harrison[43] and Lyn Collins, to remake the displays and provide for a modest upgrade of some of the 1970s makeshift museum stands to more professional exhibition plinths. The displays were re-launched in April 1990 by former Zoology student, Lady Marion Kerr Fraser, wife of the University Principal, Sir William Kerr Fraser. In 1994, after administrative changes in the Faculty of Science, the building was named to honour John Graham Kerr and a commemorative exhibition created.

Significant advances were made with collection management in the 1990s. In 1991, additional space at the back of the museum was made available for collection storage, which would allow the overcrowded osteology and the fluid-preserved collections to be stored separately, which is approved practice. A Pilgrim Trust grant was obtained to provide for fit-out of the new store and a project officer - Ann Nicol[44] - was appointed to carry out conservation and maintenance, catalogue and move the collections. In 1993, the Hunterian introduced its first online computer catalogue, INCA, developed by the Hunterian geology curator Dr John Faithfull, for all the collections, thereby bringing new technology to data management as specimens were gradually added to the database. Hunterian geology staff members Camilla Nicol and Jeff Liston helped with data capture and entry for vertebrate collections. In later years and as digital technologies advanced, the Hunterian adopted the KE EMu collections management system.

The end of the 1990s and the start of the new millenium brought considerable further involvement of the zoology staff in exhibition projects at the main Hunterian in the Gilbert Scott Building. “The Animal Construction Co.” exhibition and education programme on animal architecture was the Hunterian’s contribution to the U.K. City of Architecture and Design award conferred on Glasgow in 1999. The exhibition was co-curated by Professor Michael Hansell whose research collections were now being deposited in the museum. A handbook catalogue (Hansell *et al.*, 1999) accompanied the exhibition. Several other temporary exhibitions with zoology content followed, such as “Stubbs and the Hunters” (art show, 2004), “This Unrivalled Collection” (mixed collections, 2013) and an international travelling exhibition and catalogue to celebrate William Hunter’s Tercentenary “William Hunter and the Anatomy of the Modern Museum” (Campbell *et al.*, 2018). A complete refurbishment of the permanent exhibits in the main Hunterian galleries, to celebrate the bicentenary of the Hunterian Museum in Glasgow, was opened in 2007 and included new displays on zoology. It was accompanied by an international conference and then a publication with contributions from all staff (Hancock *et al.*, 2015). Alongside this work for the wider museum, the regular work of the Zoology Museum continued apace with increased student use both internally and from other Higher Education Institutions (HEIs) in Glasgow: Glasgow School of Art, University of Strathclyde, University of the West of Scotland and various colleges brought their students either for zoology classes or for art and design drawing.

Zoology staff entomologists continued to contribute to the collections. Dr Ron Dobson, who retired in 1986, deposited his personal collections in the museum and continued to work on curating British Coleoptera. In 1999, Dr Roy Crowson, still working on the collections and productive to the end of his long life, passed away. In 2006, a Leverhulme award provided funding for further work on William Hunter’s collection. Dr Starr Douglas, a cultural geographer and historian, and Georgie Broadsmith Brown, an entomologist, were employed in the project titled “An Analysis of William Hunter’s Insect Cabinet in a Scientific and Cultural Context” from which several research papers were published (e.g. Douglas *et al.*, 2007; Hancock *et al.*, 2008). An unexpected entomological highlight in 2009 was the loan of a beetle, *Lissopterus quadrinotatus*, collected by Charles Darwin, to the Palazzo delle Esposizioni in Rome as part of their Darwin 1809-2009 exhibition. It is the only Darwin specimen in the zoology collections and had been discovered a few years earlier in the Bishop Collection during routine curation. Also in 2009, the Zoology Museum welcomed Cathy Fielder[45], the first of two recipients of a Natural Talent Traineeship run by The Conservation Volunteers. This scheme aimed to train young taxonomists in specific taxa to mitigate the loss or lack of such skills (Horsley & McFarlane, 2017). Cathy Fielder specialised in Hymenoptera and the second appointee, Moya Burns[46] worked on saproxylic beetles.

From the mid-1990s, national benchmarking and standards programmes, such as National Audit, Accreditation[47], Significance and Recognition[48] were introduced for British museums. It is critically important to participate in these schemes not least for eligibility for external funding. Complex data research and collation by all staff were required for the entire museum to inform the submissions. The information gained in these processes greatly added to the internal understanding of the collections, enhanced profile and presence, and resulted in The Hunterian achieving and maintaining Accreditation, being recognised as a museum of National Significance (the first of these awards given) and gaining access to additional grant funding.

In 2008, significant change was yet again under consideration for The Hunterian. A University committee led by the Secretary of Court was tasked with exploring the future of The Hunterian with a particular focus on collections access and storage. The collections had grown in all disciplines, and storage facilities were full or overcrowded, of poor quality and scattered around the campus and beyond. The proposal emerging from the committee was that a new storage and access facility be developed at the nearby Kelvin Hall, in collaboration with Glasgow Life and National Libraries of Scotland (NLS). Glasgow Life own the venue and had collections of their own to re-store and the Edinburgh-based NLS were looking west for a home for their

moving image archive and digital collections.

University funding along with Heritage Lottery Funding (HLF) and other grants provided for the development of a portion of the westernmost third of the building as The Hunterian Collections Study Centre. A large central store with controlled environmental conditions and kitted out with modern mobile shelving houses the collections. Study rooms, offices, laboratories, student spaces and a lecture theatre are also provided. Following the project development years, the zoology collections were inventoried, packed, moved over and installed in this new facility between 2014 and 2016. The Kelvin Hall Centre is a step-change in the quality of storage provision and management for the zoology collections (Fig. 8).

Fig. 8. Zoology collection storage in the Hunterian at Kelvin Hall.

The Scottish Government's First Minister Nicola Sturgeon came to open formally The Hunterian at the Kelvin Hall in November 2016.

At present, some of the more regularly used teaching collections remain in the Graham Kerr Building alongside the Zoology displays, the latter much as they were following the 1990 refurbishment, but for the addition of the eye-catching insect display in 1999 (Fig. 9).

Extensive renovation of fabric and display content is required once again, though the recent introduction of intervention labels, e.g. small labels applied to the exterior of the display cases, screen-based communications or the use of mobile phone apps such as Bloomberg Connects, allows for some updated

Fig. 9. The Zoology Museum around 2000, showing the post-fire restoration and the new "Insects" display.

scientific information to be presented. University teaching remains a constant for the Zoology Museum – it is one of its most important activities as instituted by JGK. The permanent displays are intended to function as a 3-D snapshot of the animal kingdom, giving an insight into biodiversity and evolution. There are over 1.5 million recognised animal species and over 600,000 animal specimens in the zoology collections. As only a tiny fraction of this diversity can ever be on show in the museum, in JGK's tradition, key species or the best specimens are selected for display. Students can use these displays at any time either informally or as part of taught classes. Special demonstration classes using material brought out from the store are laid out in teaching laboratories or the museum itself and have covered topics from comparative dentition and parasitology to amphibian reproductive adaptations, food security and coral diversity (Fig. 10).

Fig. 10. Zoology junior Honours students, mid-1990s, in a demonstration class in the Zoology Museum.

In recent years, and with a rise in interdisciplinary studies, the zoology collections have also been of use in teaching and research beyond zoology in subject areas such as environmental art, literature, human geography, museum studies, technical art history and history of science. Honours, Masters and PhD research projects are routinely offered or supported.

Public access to the Zoology Museum varied over time dictated by departmental needs, but from the late 1970s

the museum has been open to the general public for drop-in visits on weekdays from 9 a.m. to 5 p.m. However, universities have been undertaking more active engagement with the wider community and their various audiences for many decades now and the Zoology Museum has been involved in numerous outreach programmes. One of the most significant running from the late 1970s to the mid-1990s was the Primary School Project developed by Zoology staff, with the support of the Zoology Museum and in collaboration with Strathclyde Regional Council Education Department, the education authority at that time. Volunteer undergraduate students (mostly first and second years) were allocated to primary schools across the region to teach biology to children. The students were supported with information, lesson plans on set topics, advice and specimen kits from the museum (themes such as Flight, Snakes, Birds, Animal Skeletons, and Insects were offered). Several visits could be made to the school by the student team and the last session of the programme was to bring the children into the museum for a visit and conduct a special activity there. Live animals, carefully selected and usually from the museum displays, supplemented the excitement. The project worked well for the children, teachers and the education authority; the students gained confidence and perhaps having attracted those who were considering a teaching career helped guide their choices, and the museum served a wider community. Assorted education programmes, often dependant on soft funding, for children from toddlers to S6 school students, came and went over time. The Zoology Museum also developed activities for all ages to enhance special exhibitions and programmes run by the main Hunterian Museum. Zoology staff and collections support student recruitment by hosting Campus Days and contributing to the University "Widening Participation" service including the present "Into University" programme. In recent years, the Zoology Museum has been participating in city-wide programmes such as the Glasgow Science Festival and Doors Open Days.

CONCLUDING REMARKS

The zoology collections at the Kelvin Hall Centre are now housed in the best quality storage they have ever had. Access to and cataloguing of the collections is supported by the Hunterian specialist Collections Management team. The Zoology Museum - at the physical heart of the Graham Kerr Building - is a much loved and well-used space by students, staff and visitors. In addition, use of museum staff expertise and the collections in teaching is increasing, productive and mutually supportive relationships with zoology staff are thriving, numbers of public visitors have increased, and research use of the collections is also flourishing and diversifying in multidisciplinary ways. Ambitions for the future include the modernisation of the teaching displays in the Zoology Museum and expanded open access to specimen data through upload to the online aggregator GBIF (the Global Biodiversity Information Facility)[49].

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APPENDIX

Notes

Sources cited in these notes are included in REFERENCES (above).

1. Data standards for accession records, catalogues, labels and other forms of information (whether paper or digital) relating to museum objects, are a large sub-genre of museum practice. Depending on circumstances records are not always made consistently by museums. Even if records are kept, they can go missing or be destroyed. Aside from legal considerations, lack or loss of specimen data can seriously diminish a specimen's scientific utility. For biological material, key information on place and date of capture are especially important as well as the name of the person who gathered the material. Habitat data are also important.
2. Professor August Bernhard Brauer (1863–1917); German zoologist, mainly known as an ichthyologist, was Director of the Berlin Natural History Museum. In 1894–95, he went on expedition to the Seychelles and subsequently carried out pioneering morphological and embryological studies on Gymnophiona (caecilians), the legless amphibians.
3. The German Deep Sea Expedition (*Deutsche Tiefsee-Expedition*), also named after the vessel SS *Valdivia*, was a government-funded expedition tasked with exploring the deep ocean below 500 fathoms. It was led by marine biologist Professor Carl Chun and operated from 1898–1899.
4. Thomas Wayland Vaughan (1870–1952) was an oceanographer and geologist who worked for the United States Geological Survey, the Smithsonian Museum and eventually became director of the Scripps Institute.
5. Scleractinian corals including type and figured specimens described by leading 18th century naturalists John Ellis (1714–1776) and Daniel Solander (1733–1782) (Ellis & Solander, 1786). Some of the specimens were collected on the Endeavour voyage of Captain James Cook.
6. Rowland Ward of London was the most famous firm of British taxidermists over the Victorian period and into the 20th century. See Morris (2003) for a full account of the Wards' life and business.
7. In the U.K., second only to Rowland Ward, Gerrards of London, in business from the mid-19th to the 20th century prepared and sold taxidermy, skulls and skeletons to private individuals, museums, universities and other educational establishments. See Morris (2004) for a full account of the Gerrards' life and business.
8. Václav Frič (?1839–1916) was a Czech naturalist and natural history dealer with a specimen supply business based in Prague. Amongst much else, the company produced fine, wet-preserved preparations such as the beautiful delicate cartilaginous skeletons of sharks or the life cycles of insects and amphibians. See Reiling & Spunarová (2005).
9. The marine station in the Bay of Naples was privately founded in 1872 by the German zoologist Anton Dohrn (1840–1909) and was the first zoological research station in the world. It offered bench space and excellent facilities to visiting scientists, and there was a public aquarium. Fees gained from both plus the sale of preserved specimens and publications funded the running of the station. Latterly named in his honour, the Stazione Zoologica Anton Dohrn was taken over as a national institution by the Italian Government in 1982 and continues its research into many aspects of zoology.
10. Henry Augustus Ward (1834–1906); a naturalist, geologist and collector who worked with Louis Agassiz. He founded Ward's Natural Science in Rochester, New York, which prepared and sold specimens to universities and museums around the world.
11. Charles Kirk (1872–1922) was trained in taxidermy at Rowland Ward's in London. He returned to Scotland and set up shop in Sauchiehall Street, Glasgow. It was the biggest and best-known taxidermy studio in Scotland. Kirk was a skilled preparator, artist, photographer and field naturalist.
12. For further info see Reilly & Russell (2008).
13. The Catalogue of Life website provides statistics: of the 1,510,453 formally described species of the kingdom Animalia recognised in 2024, 973,103 are insects – approximately 75% of all known animal species. https://www.catalogueoflife.org/data/taxon/N Accessed 5th February 2024.
14. Robert Arnot Staig. See *Gallery of Memories*, note 87.
15. Frederik Vincent Theobald (1868-1930); English entomologist who specialised in the taxonomy of mosquitoes just after their role in the transmission of malaria was discovered, writing a foundational five-volume work, *A Monograph of the Culicidae or Mosquitoes* between 1901 and 1910. Worked at the British Museum.
16. Alexander Cuthbertson (1901-1942) was a Scottish dipterist who specialised in crane-flies. He worked in Zimbabwe as an economic entomologist.
17. Roy Albert Crowson. See Downie (2024), note 22.
18. Alexander R. Hill (1909–2006) was appointed to a lectureship in 1949 (retired 1984) and was tasked with developing and delivering degree courses in the newly established Agricultural Zoology specialism of the Department of Zoology. He was an entomologist specialising in insect-borne (particularly aphid) diseases of plants. He also worked on the hemipteran *Anthocoris* and carried out insect survey work on the Scottish SSSI The Black Wood of Rannoch. Specimens from all of this work are deposited in the Hunterian collections.
19. Ronald M. Dobson (1929–2019) was appointed lecturer in Agricultural Zoology in 1959 (retired 1995). He was an entomologist specialising in beetle and fly pests of crops and stored products. Later in his career he studied mites. He also published on the natural history of the Scottish Islands. He deposited much of his teaching, field and research collections in the zoology museum and volunteered as an honorary curator.
20. John Anthony Downes. See Downie (2024), note 14.

21. William Cullen (1710-1790) - physician, chemist and teacher - was a towering figure in the Scottish Enlightenment and the development of medicine and science in Scotland and beyond. He held academic posts at Glasgow and Edinburgh Universities and was president of the Royal Colleges in both cities. He was doctor to the king, various aristocrats and leading public figures of the day, and trained many doctors who in turn were of huge importance in the history of medicine.
22. See Laskey (1813; reptiles p. 22; herbarium p. 30).
23. Appointments to this chair since its inception:
    Regius Chair of Natural History:
    Lockhart Muirhead MA LLD (1807)
    William Couper MA MD (1829)
    Henry Darwin Rogers MA LLD (1857)
    John Young MD (1866)
    Regius Chair of Zoology:
    Sir John Graham Kerr MA LLD FRS FRSE (1902)
    Edward Hindle MA PhD DSc FRS (1935)
    Sir Charles Maurice Yonge CBE PhD DSc FRS (1944)
    David Richmond Newth BSc PhD FRSE (1965)
    Keith Vickerman PhD DSc FRSE FRS (1984)
    Chair vacant 1998–2012
    Patricia Monaghan BSc PhD FRSE FRS (2013)
24. Jemima Wedderburn Blackburn (1823–1909) was from a notable Scottish family and had married Hugh Blackburn, the Professor of Mathematics at the University. She was a talented and prolific artist who often painted natural subjects especially birds. Her 1870 watercolour "Moving the Contents of the Old College Museum" remains (in 2024) in the ownership of the Blackburn family. With their kind permission it is reproduced as the cover of Keppie (2007) and as an illustration in Hancock *et al.* (2015).
25. Kerr and his successor Yonge, in their annual museum reports to Court, refer to disposal of decayed specimens but no lists seem to have been kept, further complicating modern curatorial attempts to track specimen provenance.
26. See Campbell *et al.* (2018; pp. 376-380).
27. See Campbell *et al.* (2018; p.381).
28. Frederick Edwin Smith, 1st Earl of Birkenhead (1872-1930); controversial British Conservative and Unionist politician and lawyer. The speech was entitled "Idealism in International Politics".
29. James Chumley (1886–1948) joined the Department around 1916 (?) initially as a teaching fellow then later becoming lecturer in oceanography. As well as his teaching duties at Glasgow, Chumley worked on faunistic records for the Clyde Sea Area publication in 1918 of the valuable *Fauna of the Clyde Sea Area*.
30. Wilfred Eade Agar (1882-1951) joined the Department in Glasgow in 1904 as a demonstrator. As well as teaching, at Graham Kerr's suggestion he took up a study of the development of the cranial anatomy of lungfish utilising material collected by Kerr on his expeditions to the Paraguayan Chaco. In 1914, the culmination of several years work, he published important papers describing cellular mechanisms in spermatogenesis. In 1919, he left Scotland to take up the Chair of Zoology at the University of Melbourne.
31. George Stuart Carter (1893–1969) was appointed to a lectureship in 1923 and undertook general teaching duties. He worked at the Millport Marine Station and produced a series of papers on reproduction in echinoderms. He was a keen evolutionist, deeply interested in the adaptive pressures on animals living in tropical swamps and published several papers on this subject. He left Glasgow in 1930 to take up a post at Cambridge University.
32. Charles Wynford Parsons (1901–1950), a vertebrate zoologist from Cambridge University, was appointed to an assistant lectureship in 1926. His research interests were in the morphology of fish, and bird embryology. Parsons was a popular teacher in charge of the medical classes and a capable administrator, involved in running the Department especially in the World War 2 years.
33. Edward Hindle (1886-1973) was an English zoologist educated in Bradford, London, Berkeley California and Cambridge. He worked in the field of medical entomology and specifically the arthropod transmission of disease. His principal researches were on leishmaniasis, yellow fever and spirochaetosis.
34. Charles Maurice Yonge (1889–1986) was one of the most influential marine biologists of the 20th century. Educated at Oxford, Edinburgh and Cambridge, initially he worked on marine bivalves particularly oysters. He led the famous 1928–29 Great Barrier Reef (GBR) Expedition. In 1933 he was appointed Professor of Zoology at the University of Bristol and thence to the Regius Chair at Glasgow. He produced many scientific publications and also wrote for the public audience: his 1949 book *The Sea Shore* is a classic and has remained in print. A side note to the GBR expedition - one of the expedition team was Professor Thomas A. Stephenson, marine biologist and talented artist who painted animals and landscapes from the expedition. A gallery in London mounted an exhibition of Stephenson paintings, half a dozen of which Yonge purchased for the Zoology Department in 1963. The paintings were hung around the Department for many years and are now accessioned into the art collections at the Hunterian.
35. John Samuel Budgett (1872-1904); Trinity College Cambridge zoology graduate and friend of John Graham Kerr. Accompanied Kerr on the second Gran Chaco expedition in 1896 where he worked on amphibians. Subsequently worked on the African bichir fish *Polypterus* to determine its evolutionary affinities. Contracted malaria whilst on field work and died young.

36. David Richmond Newth. See Downie (2024), note 39.
37. David C. Houston joined the lecturing staff in Zoology in 1975 and retired 2005. His research interests included feeding and digestion in birds and mammals, the ecology and conservation of vultures, and physiological aspects of ecology. Has wide interests in zoos and museums.
38. The Manpower Services Commission (MSC) was a non-departmental public body in the Department of Employment created in 1973, under the Conservative government led by Edward Heath. Its remit was to coordinate employment and training services at a time of rising unemployment in the U.K. The Job Creation Programme within the MCS was intended to address specifically youth and graduate employment. Many U.K. museums benefitted from this scheme where the government offered funding to potential employers, subject to conditions, to take on trainee staff, many of whom went on to successful careers in the museum and heritage sector.
39. Dick Hendry (1942-2015); see his obituary at https://winners.taxidermy.org.uk/influential-members/past/dick-hendry/ Accessed 17th June 2024.
40. In 2000, the Zoology curator role was adjusted to accommodate a measure of management and care of the anatomy and pathology collections. This was formalised into a 0.2 FTE portion of the Zoology post in 2021.
41. Directors of the Hunterian Museum:
    Professor Frank Willett (1976-1990)
    Professor Macolm McLeod (1990-1999)
    Mr Alf Hatton (1999-2001)
    Dr Evelyn Silber (2001-2006)
    Mr Ewen Smith (2006-2010)
    Dr David Gaimster (2010-2017)
    Mr Steph Scholten (2017-present)
42. Governance arrangements for the Hunterian have changed over time. The Regius Chairs or Heads of Department of cognate disciplines now sit on the Hunterian Academic Advisory Board.
43. John Harrison subsequently worked at the Powell-Cotton Museum in Kent, later becoming a freelance museum consultant in the U.S.A.
44. Ann Nicol works as a freelance consultant across a wide variety of U.K. heritage organisations.
45. Cathy Horsley (neé Fielder) now works as a conservation officer for the U.K. charity the Bumblebee Conservation Trust.
46. Moya Burns went on to a PhD at Oxford University and now is associate professor in Ecology and Environmental Science at the University of Leicester.
47. Information on this scheme is available from Museums and Galleries Scotland, the government body responsible for Scotland's museum sector (https://www.museumsgalleriesscotland.org.uk/museum-accreditation/).
48. Information on this scheme is available form Museums and Galleries Scotland, the government body responsible for Scotland's museum sector (https://www.museumsgalleriesscotland.org.uk/recognition/).
49. The Global Biodiversity Information Facility (GBIF) is an international network and data infrastructure funded by the world's governments and aimed at providing anyone, anywhere, open access to data about all types of life on Earth (https://www.gbif.org/).