

Belatedly hatching ornithology collections at the National Museum of Ireland

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For the first time, summary details are presented for the ornithological collections of the National Museum of Ireland (Natural History) (NMINH). To date, new cataloguing efforts in collaboration with University College Dublin have documented close to 10,000 non-passerine bird skins and taxidermy mounts.

Introduction

The Natural History Museum in Dublin is well known internationally as an intact example of a Victorian-style cabinet museum (O’Riordan, 1976; Gould, 1994). Founded in 1792, the zoological collections grew rapidly since their inception, soon demanding their installation in a dedicated building in 1857. Twenty years later, in 1877, stewardship of the Museum was transferred from the Royal Dublin Society (RDS) to the State. Through to the present day, the zoological collections of the National Museum of Ireland have continued to increase, expanding recently into an additional off-site collections storage building (which includes housing for the bulk of the ornithological collections). Although the bird collections in Dublin are on a par in their size to other collections in European capitals (e.g. Brussels, Copenhagen), NMINH has long suffered from shocking under-staffing by comparison. In Dublin, there are at present six scientific staff, including a public-education assistant (a relative high compared with some historical trends; O’Riordan, 1976). There has never been a dedicated ornithological curator in Dublin, nor has any in-house publication ever previously been completed on the NMINH’s bird collection.

Collections-based Biology in Dublin (CoBiD) was initiated in 2003 as a new partnership with University College Dublin (UCD), with the aim of pooling resources and developing educational and research opportunities for Irish students in the Museum. This effort to combine untapped education and research opportunities for students in the museum also provides, as a by-product, potential for essential curatorial labour (for example, in collections databasing). Through including students in the day-to-day workings of NMINH as part of their essential training as zoologists, the research-basis of the museum can gain from both inputs of specimens and curatorial labour. A useable database of NMINH holdings of birds, for example, generated by students under the

supervision of a collections manager, was proposed an excellent test case for our educational model.

At the outset of this project, the precise size of the ornithology collection was not known. Estimates varied, ranging between 6,000 and 10,000 total skins. Indeed, prior to the start of the CoBiD programme, individual reference numbers were not used by the Museum for individual zoological specimens. A little limited information was known about the history and collections of a few major donors (see below), and some partial records were available for mounted specimens that had historically been removed from exhibition. We emphasise that the bird skin collection in Dublin has been housed in the same cabinets since the turn of the 20th century.

In its first year of operation, CoBiD has completed the initial process of inventorying, digitally cataloguing, updating nomenclature and re-labelling 10,000 non-passerine bird skins and taxidermy mounts held in the National Museum of Ireland. Particular interest has been paid to specimens of historical interest, and species and taxa that represent species threatened with extinction (*sensu* IUCN, 2003). Disseminating this inventory information will dramatically improve the potential for this important collection to be employed as a research tool by ornithologists, and provide new resources to promote the conservation of vulnerable taxa. At this point, we present summary information regarding the contents and highlights identified to date of the NMINH non-passerine collection and our directions for continued work. The content we have outlined should be regarded as indicative of minimum content of the NMINH. We do not discuss name-bearing or referred specimens in this paper - because of the length of neglect, the status of type material in the Dublin collection is not understood at present; this represents an exciting area for future research.

Ornithological collections in Dublin

Prior to work on the non-passerine catalogue, the skin collections in Dublin were organised according to the classic British Museum checklist compiled by R. Bowdler Sharpe (Sharpe, 1899-1900). Housed within the main collection, bird skins representing a number of major historical collections (Ball, Gould, Hewitt; see below) as well as taxonomic groups have been incorporated over the years. Specifically, the NMINH ornithological collections comprise about 10,000 study skins and mounted specimens representing upwards of 600 genera (*sensu* del Hoyo et al., 1992-2002; fig. 1). With a collection of this extent and history, naturally complete knowledge is elusive. Particularly as the vast majority of specimens were labelled with 19th-century nomenclature, there are certainly additional taxa that are not yet recognised in the collection, an intriguing prospect for research ornithologists.

In the process of databasing this collection, catalogue data were transcribed directly from specimen labels, with every effort to preserve data integrity. Under the over-arching goal of improving the accessibility to the collection, contemporary nomenclature was employed where it was possible for non-experts to do this with clarity. Where species names were found to be obviously transferred to a different genus, current genera (*sensu* del Hoyo et al., 1992-2002) were used in producing a new, updated label. Where nomenclature was obscured, the original labelled name is noted in the catalogue, to ensure that information is readily available (of course, specimens retain all of their historic

field and museum labels). However, these do not constitute identifications. At this stage, the taxa recognised in the Dublin collection are dependent on their initial, 19th-century identification.

The largest proportion of acquisitions to the bird collection occurred in the late 1800s, particularly during the influence of Prof. Valentine Ball as Director of the Institutions of Science and Art, Dublin, which included NMINH. Ball had returned to Dublin from a long period working for the Geological Survey of India (see Ball, 1872), and provided the Museum with many valuable collections from his travels, including more than 800 skins of non-passerine birds, as well as a large number and variety of other specimens. Other significant additions to the Museum from Irish collectors include the collections of Hewitt, and R.M. Barrington, as well as a junior Barrington who donated a large collection of herbarium-style presentations of wings and legs (this latter collection has not yet been catalogued, but must contain over 500 such sheets).

In addition, primarily found among the taxidermy mounts, there are small number of specimens collected by John Gould, including several trogons, caprimulgiforms, and around 25 hummingbirds in a tree display. There are also single specimens of each of nine other families (Alcedinidae, Dromadidae, Falconidae, Jacanidae, Phasianidae, Phalacrocoracidae, Podicipedidae, Psittacidae, and Rallidae).

Of the total number of specimens, taxidermy mounts - either on exhibition (ca. 3000) or in storage (970) - represent 32% of the museum's collection, while the remainder takes the form of study skins. Frequently in the collection, groups with few examples are dominated by mounted specimens (e.g. Phoenicopteriformes, Sphenisciformes). This trend is attributable to the historical priority of the Museum to acquire material for exhibit, as well as trends for collectors to commission taxidermists to preserve rarities (Morris, 1993).

At the family level (*sensu* del Hoyo et al., 1992-2002), the coverage of the NMINH collection is remarkable for an accumulation of its age - out of 103 non-passerine families, only two are missing from our catalogue. This degree of completeness is also mirrored in the coverage at the sub-family level. Interestingly, 5% of the collection *in toto* consists of juvenile material, distributed across most orders.

At the genus level, coverage is still high, with 16 (of 26) orders represented by more than 70% of their extant genera (fig. 1). In addition, a number of notable extinct taxa are represented by skeletal material (i.e., the Palaeognathae *Aepyornis* and *Dinornis*; in Columbiformes, *Pezophaps* and *Raphus*).

In the remainder of this section, we present brief systematic notes regarding the composition of the Dublin collection (fig. 1). The holdings include a relatively large number of extinct, currently endangered and extirpated or 'lost' birds (Hudson, 1894; IUCN, 2003). A few highlights are mentioned to convey the scope and particular strengths of the collection, without attempting to be definitive.

Struthioniformes and **Tinamiformes** Relatively little material is housed in Dublin that is representative of the basal-most avian clade Palaeognathae (i.e., Struthioniformes, Tinamiformes). There are few palaeognath skins in the NMINH with the exception of physically smaller taxa (Tinamidae; six genera), including specimens of *Apteryx oweni* Gould, 1847, the endangered Little Spotted Kiwi. The larger extant taxa are notable by their absence, although a single skin of *Casuarius casuarius* (Linnaeus, 1758), the Southern Cassowary, is present. However, the remainder of extant and some extinct ratite genera are present as taxidermy mounts and skeletons.

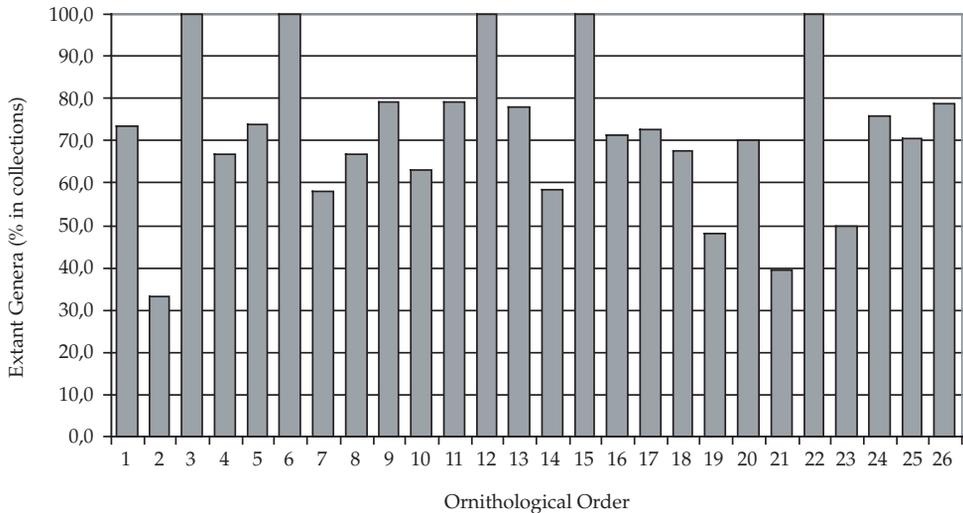


Fig. 1. Percentage of recognised extant genera (*sensu* del Hoyo et al., 1992-2002) identified in the NMINH collections, for all non-passerine orders:

1 'Palaeognaths' (11/15)	10 Falconiformes (51/81)	19 Strigiformes (13/27)
2 Sphenisciformes (2/6)	11 Galliformes (61/77)	20 Caprimulgiformes (14/20)
3 Gaviiformes (1/1)	12 Opisthocomiformes (1/1)	21 Apodiformes (48/122)
4 Podicipediformes (4/6)	13 Charadriiformes (78/100)	22 Coliiformes (2/2)
5 Procellariiformes (17/23)	14 Gruiformes (35/60)	23 Trogoniformes (4/8)
6 Pelecaniformes (6/6)	15 Pterocliiformes (2/2)	24 Coraciiformes (38/50)
7 Ciconiiformes (22/38)	16 Columbiformes (30/42)	25 Galbuliformes (12/17)
8 Phoenicopteriformes (2/3)	17 Psittaciformes (61/84)	26 Piciformes (41/52)
9 Anseriformes (34/43)	18 Cuculiformes (23/34)	

Sphenisciformes Representation of this family is sparse and localised within the skin collection. Just two out of six spheniscid genera are present in the NMINH collection (five penguin skins in three species and four additional species in taxidermy mounts).

Gaviiformes and **Podicipediformes** Divers (loons) and grebes are not very well represented in the Dublin collections in terms of sheer numbers of specimens. The one genus of Gaviidae and four of the six Podicipedidae genera are in the skin collections. Both families are, however, well represented at the species level.

Procellariiformes and **Pelecaniformes** The large assemblage of totipalmate swimming birds comprises a large proportion of the NMINH skin collection. All families of Pelecaniformes are represented, although some by just a few specimens. Fregatidae, for example, comprises just two specimens, both taxidermy mounts, but both of *Fregata aquila* (Linnaeus, 1758), the rare Ascension Frigatebird, one being a juvenile. Phaethontidae, Anhingidae, Pelecanidae and Sulidae are all known from multiple specimens - Phaethontidae and Anhingidae all species; Pelecanidae, four specimens (two skins and two mounts), one the endangered *Pelecanus crispus* Bruch, 1832, the Dalmatian Pelican; Sulidae, three species within the single genus. The Phalacrocoracidae (cormorants) are well represented including several records of *Phalacrocorax colensoi* Buller, 1888, the

rare Auckland Shag, other southern species including one *Phalacrocorax melanoleucos* (Vieillot, 1817), the Little Pied Cormorant, presented by John Gould, as well as northern European species.

Coverage of Procellariiformes is also comprehensive: Diomedidae, two species of *Diomedea*, but no representatives of the monotypic *Phoebastria*; all 21 albatross species are now recognised as globally threatened (IUCN, 2003). In the Procellariidae, nine out of 12 recognised genera are represented, including material of the critically endangered subspecies *Pterodroma hasitata caribbaea* Carte, 1886, the Black-capped Petrel. Some authorities still consider *caribbaea* to be a distinct species, the Jamaican Petrel, which is regarded as 'extinct or near extinct'; Hydrobatidae, six of eight genera comprising both subfamilies; only one specimen of Pelecanoididae.

Ciconiiformes The large grouping of ciconiiform waterbirds, whether truly monophyletic, is nevertheless comprehensively represented in the Dublin collection, with the notable exception of the Shoebill Stork (Balaenicipitidae). All families and subfamilies of herons (Ardeidae) are present with just five of the 17 genera of these birds not included. There are 20 skins and additional skeletal material of ibises and spoonbills (Threskiornithidae) are noted within four of the 13 recognised genera in both subfamilies. This material includes a specimen of *Nipponia nippon* (Temminck, 1835), the very rare Japanese Crested Ibis. Seven specimens of the monotypic species *Scopus* (Scopidae) and just six skins of Ciconiidae complete the coverage of this order at present.

Phoenicopteriformes This small order is represented in the NMINH by mounted specimens only (comprising two species in different genera). Interestingly, one boasts a collection locality in Ireland, and all may have been kept domestically.

Anseriformes The NMINH Anseriformes have been examined particularly thoroughly as they form the basis of a special conservation project since a number of rare and extinct taxa within this clade were already known within the collection. Three extinct or critically endangered species are represented in the taxidermy collections - one drake of *Camptorhynchus labradorius* (Gmelin, 1789), the Labrador Duck, one *Mergus australis* Hombron & Jacquinot 1841, the Auckland Merganser, captured in 1901 (the last record of the species is from 1902), and a mount of the critically endangered *Anas aucklandica nesiotis* (Fleming, 1935), the Flightless Brown Teal. There are also two study skins of *Rhodonessa caryophyllacea* (Latham, 1790), the extinct Pink-headed Duck, including one juvenile. This collection also contains specimens of at least eight globally threatened species, including several from Asia. Notable study skins include multiple specimens of *Anser erythropus* (Linnaeus, 1758), the Lesser White-fronted Goose, *Aythya baeri* (Radde, 1863), Baer's Pochard, and *Anas formosa* Georgi, 1775, the Baikal Teal.

Other than Anatidae - *in toto*, 32 of the 41 genera are present including a single specimen of the enigmatic Magpie Goose (*Anseranas*) - just two specimens of Anhimidae are represented in the NMINH collections (a skin of one genus and a mount of the other).

Falconiformes The Dublin collection of these birds is extremely large, several hundred skins including all families. These taxa are prominent, however, because in general this collection is limited by size and large birds (except in this order) are generally absent. Of particular interest is the collection of Hewitt, donated in 1966. It includes more than 150 skins of birds of prey collected in the 1940s. These birds were primarily captured in Africa with a number also from South America, particularly Chile. At the time of writing, a substantial number of these specimens remain unidentified. In general, holdings of

these birds are certainly of wide interest, including specimens of *Haliaeetus albicilla* (Linnaeus, 1758), the vulnerable White-tailed Sea-eagle from Ireland and *Falco naumanni* Fleischer 1818, the Lesser Kestrel from Africa (this latter part of the Hewitt collection).

At the family level, holdings are relatively comprehensive: three out of five genera of New World Vultures (Cathartidae) including *Vultur gryphus* Linnaeus, 1758, the Andean Condor (from the Hewitt collection); the single species of *Pandion* (Pandionidae) from a range of localities in Australia, North America and Africa; probably more than 38 of the 64 accipitrid genera (Accipitridae); eight out of ten true falcons (Falconidae); and a single mounted specimen of *Sagittarius*, the African Secretarybird (Sagittariidae).

Galliformes Just like their close relatives, the Anseriformes, landfowl form a comprehensive collection in Dublin having excellent representation at the genus level; only one or two genera are missing from each family of these birds. For example, five of the seven living genera of megapodes (Megapodiidae) are present including the vulnerable *Macrocephalon maleo* Muller, 1846, the Maleo, alongside six out of 11 genera of cracids (Cracidae). There are 314 pheasant skins (Phasianidae; not including mounts) - highlights include several endangered phasianid species from the Himalayan Mountains, such as *Arborophila rufipectus* Boulton 1932, the Sichuan Hill-partridge, *Tragopan melanocephalus* (Gray, 1829), the Western Tragopan, *Syrnaticus ellioti* (Swinhoe, 1872), Elliot's Pheasant and *Crossoptilum mantchuricum* Swinhoe, 1863, the Brown Eared-pheasant. New and Old World quail are well represented (24 skins in six out of nine and six skins in three out of four genera, respectively), with one *Dendrortyx barbatus* Gould, 1846, the Bearded Tree-quail, from Mexico. The Grouse (Tetraonidae; 59 skins in six out of seven genera) and a single Turkey (Meleagrididae) make up the remainder of this collection.

Opisthocomiformes Hoatzins, certainly enigmatic, are represented by just a few specimens in Dublin, all of which are taxidermy mounts.

Gruiformes The large and cosmopolitan order Gruiformes is well represented by the holdings of NMINH. In general, coverage of these families in the skin collection is very good with the exception of the Mesitornithidae. One of the two genera of Turnicidae is present whereas within the Gruidae three out of four of the currently recognised genera are represented by a small number of specimens, including *Balaerica* (Crowned Crane), which is sometimes placed in its own family Balearicidae. Within the Aramidae, three specimens of the single species are present while coverage at this level in the Psophiidae (one mounted specimen of the monotypic genus) and Rallidae (16 of the 33 families) is somewhat less good. Of the less common families, Heliornithidae is represented by two of three genera in the collection (i.e. *Podica* and *Heliornis*; lacking the Asian genus *Heliopais*), Rhynochetidae (*Rhynochetos jubatus* Verreaux & Des Murs, 1860, the endangered Kagu) and Eurypygidae are known only from mounted specimens while the Cariamidae (one of two genera) includes mounts and skins of *Cariamna*. Finally the Otididae is represented in NMINH by eight of its 11 known genera which include several endangered species - *Sypheotides indica* (Miller, 1782), the Lesser Florican, *Houbaropsis bengalensis* (Gmelin, 1789), the Bengal Florican, and *Ardeotis nigriceps* (Vigors, 1831), the Great Indian Bustard.

Charadriiformes As one would expect from a collection located in the capital of an Atlantic island, coverage of this order (the largest and most speciose of the traditional non-passerine groupings) is very good at the genus level. Of special note, NMINH skin specimens include a substantial number of juvenile shorebirds in varying stages of devel-

opment and plumage. Coverage at the family level is as follows: Jacanidae – five of six extant genera, excluding the monotypic African *Microparra*; Rostratulidae – specimens of the single genus including excellent coverage with a number of specimens in all species and subspecies; Dromadidae – one mounted specimen of this monotypic family; Haematopodidae – five of the 11 species in this single genus; Ibidorhynchidae – three specimens of this monotypic family; Recurvirostridae – specimens cover all three genera; Burhinidae – specimens of both genera; Glareolidae – all six genera comprising 14 of the 17 species; Charadriidae – only five of the ten genera in two of three subfamilies (excluding the monotypic Pluvianellinae); Scolopacidae – 21 of the 24 genera in all six subfamilies, notably including the critically endangered *Numenius tenuirostris* Vieillot 1817, the Slender-billed Curlew, and *N. borealis* (Forster, 1772), the Eskimo Curlew which is considered extinct; Pedionomidae – two specimens of the monotypic genus; Thinocoridae – both genera comprising three of the four species; Chionidae – three specimens in one of the two species; Stercorariidae – specimens in both living genera, including five of seven species with a substantial number of specimens; Laridae – in four of the seven genera, excluding the monotypic genera *Leucophaeus*, *Rhodostethia*, and *Creagrus*; Sternidae – complete coverage at the genus level (nine of ten), excluding the Pacific *Procelsterna*; Rynchopidae – two of three species in the single genus; and finally, Alcidae – represented by eight of the 11 genera with generally very good coverage.

Pterocliiformes and **Columbiformes** Both genera of Pterocliiformes are present as are all of the recognised columbiform subfamilies (*in toto* 30 of the 43 extant genera). Good coverage of both Columbinae (Pigeons) and Treroninae (Fruit Doves) is notable, as is Gourinae (Crowned-pigeons). There is one specimen of the monotypic Otidiphaginae (Pheasant Pigeon) while the enigmatic and endangered genus *Didunculus* (the single Tooth-billed Pigeon species in the Didunculinae) is present both as a mounted specimen and as osteological material. Several specimens are present of *Ectopistes migratorius* (Linnaeus, 1766), the extinct Passenger Pigeon, (including one juvenile) as well as *Nesoenas mayeri* (Prevost 1843), the critically endangered Pink Pigeon from Mauritius and *Columba inornata* (Vigors, 1827), the endangered Plain Pigeon from Jamaica. Besides these, the collection also comprises a complete skeleton of *Pezophaps solitaria* (Gmelin, 1789), the Rodriguez Solitaire and composite skeletal material of *Raphus cucullatus* (Linnaeus, 1758), the Dodo.

Psittaciformes Both of the living families of these birds are present as either skins or mounts in the Dublin collection, including all six genera of Cacatuidae and greater than 70% of extant psittacid genera. This part of the skin collection is, however, heavily biased towards Australian taxa. Represented material of particular interest include *Pezoporus wallicus* (Kerr, 1792), the Ground Parrot; *Psitttrichas fulgidus* (Lesson, 1830), the Vulturine Parrot; a large collection of Hanging Parakeet skins (*Loriculus* spp.), as well as a good accumulation of material of the critically endangered Kakapo (*Strigops*). A number of other species under threat are represented, including among others, a juvenile specimen of the critically endangered *Cyanorhamphus malherbi* Souance 1857, Malherbe's Parakeet; its vulnerable congener *C. unicolor* (Lear, 1831), the Antipodes Parakeet; and several species of endangered Lorikeets, particularly in *Charmosyna*. There are also specimens of two extinct species - *Psephotus pulcherrimus* (Gould, 1845), the Paradise Parrot (extinct since 1927); and multiple records of the better-known *Conuropsis carolinensis* (Linnaeus, 1758), the Carolina Parakeet.

Cuculiformes Within the cuckoos, coverage is good in terms of numbers of specimens as both the currently recognised families are represented (Musophagidae, three of six extant genera; Cuculidae, 20 out of 28 extant genera), but somewhat sparse at the species level. The collection includes a single male skin of *Neomorphus radiolus* Sclater & Salvin 1878, the endangered Banded Ground-cuckoo.

Strigiformes Skins and mounts are present representing both families within this order (Tytonidae, two of two genera; Strigidae, 11 of 25 genera within all three recognised subfamilies), including a large series of skins of *Tyto alba* (Scopoli, 1769) from Ireland and abroad. In the Strigidae, the collection also includes one skin of *Athene blewitti* Hume, 1873, the critically endangered Indian Forest Owllet that was collected in Karial, India, by Valentine Ball.

Caprimulgiformes and **Apodiformes** These relatively speciose and closely related orders enjoy good coverage in the Dublin collection. Almost all genera of caprimulgiforms are present with the exception of some New World taxa; all genera of Steatorniithidae, Aegothelidae, Podargidae and Nyctibiidae are present, for example, while nine out of the 15 recognised genera of Caprimulgidae are present.

Of the three extant families of Apodiformes coverage is fair - Apodidae is represented by 12 out of 19 genera (including scant specimens of the primitive American swifts, Cypseloidinae) and Hemiprocnidae by skins of the single extant genus, including several of each of the four extant species. Within the hummingbirds, Trochilidae (53 of the 102 genera), there is good coverage from northern South and Central America although the Hermit subfamily (Phaethornithinae) is represented by only two of its six genera. The mounted collection in Dublin is of interest because it includes several Victorian hummingbird tree displays, one with approximately 30 specimens donated by John Gould. Much of this taxidermy material remains unidentified. The skin collection includes a pair of the Juan Fernandez Firecrown, a critically endangered species from the Juan Fernandez Islands, plus one male specimen of its extinct sub-species *Sephanoides fernandensis leyboldi* (Gould, 1870).

Coliiformes The species poor order of mousebirds is represented by a very small collection in Dublin, only four specimens across three species. Holdings do, however, include both subfamilies with two specimens of *Urocolius* (often placed in its own family, Urocoliididae).

Trogoniformes Like Coliiformes, the Dublin holdings of these birds are limited; four genera among the three subfamilies are represented, but notably including African, Asian, and American trogons. Among them are skins of the vulnerable *Pharomachrus mocinno* de la Llave 1832, the Resplendent Quetzal.

Coraciiformes The 'catch-all' taxonomic grouping of Coraciiformes is well represented at the family and subfamily level in NMINH. All genera of Todidae (but only three specimens), Meropidae, Coraciidae, Leptosomidae (only three specimens) and Phoeniculidae are present but in relatively low numbers. This is also the case for the Upupidae, but the Dublin collection of these birds is larger, comprising more than 30 records across a wide distribution range, including Ireland. The Alcedinidae are represented by 15 of the 17 genera across all three of its subfamilies. However, the Brachypteraciidae only comprise one of the three extant genera in a single mounted specimen of the vulnerable *Brachypteracias leptosomus* (Lesson, 1833) from Madagascar. The Bucerotidae are known from slightly more than half of its extant genera in both subfamilies; the Ground-hornbills (Bucorvinae) are represented by only a single species in taxidermy.

Galbuliformes and **Piciformes** These birds, sometimes grouped together in 'Pici' or a slightly expanded Piciformes, have a patchy distribution throughout the Dublin collection. Within the latter order, while Galbulidae is not well known (just two of the five extant genera), the *Bucconidae* enjoy excellent coverage (ten out of 12 of the extant genera, with the exception of its two monotypic genera). Coverage within the Piciformes is moderate - all of the subfamilies of *Capitonidae*, for example, are represented (ten out of 14 genera) with the exception of the aberrant American taxon *Semnornis*. Within the *Picidae* coverage is also very good, more than 90% of the genera are seen in the collection on the basis of more than 350 specimens (excluding only three of the monotypic genera). Five of the six extant genera of *Ramphastidae* are included (although much of this material is mounted) alongside just one species of *Indicatoridae*, *Indicator minor* Stephens, 1815.

Conclusions

This collection is not the estate of a small provincial museum. Although the NMINH naturally has a remit focussed on the heritage of Ireland, in fact the collection stands as an important international resource. The conclusion of this project has seen a significant jump in our estimation of the Museum's holdings - the 10,000 non-passerine skins and mounts in the catalogued holdings is a larger figure than the original estimate for the total size of the ornithological collections. The scope and scale of this cataloguing project, achieved in one year, entirely through part-time efforts and primarily from students, stands to demonstrate the successful application of a hands-on learning experience for mutually beneficial ends.

As a next stage, cataloguing efforts will continue in the osteological collection, fluid-preserved collection, and passerine skin collections. Indeed, small portions of the passerine collection have already been catalogued to fulfil specific requests from researchers, and it may be that the project will proceed in conjunction with research requirements rather than any more systematic order. Given the scattered nature of passerine literature and its speciose character, we do not anticipate any gains in speed during this the second half of the cataloguing process, and it is a prospect we approach with some caution.

There is not currently a curator for ornithology in the NMINH, nor will there be one appointed in the foreseeable future. However, to ensure long-term viability, collections must be used, and cited, for research applications. All of the efforts of CoBiD are designed to educate students in the use of resources for specimen-based research, but with the additional goal of further disseminating information about this under-used collection to the scientific community.

As the output of this project, catalogues of NMINH holdings discussed above are available electronically through <http://www.ucd.ie/zoology/museum/>. Archival copies of collection documentation are also readily available by contacting the museum. As this work is ongoing, we request the help of the ornithological community to locate published references (notes, citations, enquiries, speculations) regarding specimens held in the National Museum of Ireland (formerly the Royal Dublin Society Museum from 1792-1877). Anyone with knowledge of citations is asked to please refer this information via our contacts.

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References

- Ball, V., 1872. Notes on a collection of birds made in the Andamans by Asst. Surgeon G.E. Dobson M.B. during the months of April and May.— *J. Asiatic Soc. Bengal* 41: 273-290.
- del Hoyo, J., A. Elliott & J. Sargatal (eds), 1992-2002. Handbook of the birds of the world. Vol. 1-7.— Barcelona.
- Gould, S.J., 1994. Cabinet museums revisited.— *Nat. Hist.* 16: 12-20.
- Hudson, W.H., 1894. Lost British birds.— *Soc. Prot. Birds, Pamphlet* 14, 32 pp. Croydon, England.
- IUCN, 2003. 2003 IUCN Red List of Threatened Species.— <http://www.redlist.org/> Downloaded June 2003 - April 2004.
- Morris, P.A., 1993. An historical review of bird taxidermy in Britain.— *Arch. Nat. Hist.* 20: 241-255.
- O'Riordan, C.E., 1976. The Natural History Museum, Dublin.— Dublin.
- Sharpe, R.B., 1899-1900. A Handlist of the Genera and Species of Birds. Vol. 1 & 2.— London.

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