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Extinct and endangered ('E&E') birds in the ornithological collection of the Museum of Zoology of Torino University, Italy

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SUMMARY.—The historical ornithological collection of the Museum of Zoology of Torino University, now hosted at the Museo Regionale di Scienze Naturali di Torino, Italy (MRSN), includes more than 21,000 bird specimens and 500 complete skeletons representing c.6,000 taxa. The IUCN Red List of threatened species lists 256 bird species as either extinct or endangered ('E&E') from throughout the world. To provide a list of those species that should receive special care, a well-established methodology was applied to produce a list of 12 extinct and 36 endangered species held in the MRSN collection. Some of them, particularly those from New Zealand, although it is unclear where they were acquired, are remarkable for being amongst the first bird specimens to have arrived in European museums.

Natural history museums play a fundamental role in disseminating knowledge and understanding of Earth's biodiversity. Specimens held in these collections have always had an important educational role, providing data concerning the biology, ecology and conservation of species. Moreover, they can represent records of inestimable value, e.g. the physical evidence of localities that have experienced drastic changes in environmental conditions over time. They are therefore invaluable to scientific studies, permitting comparative analyses as to how species have changed over time in terms of morphometrics, abundance and / or distribution. Furthermore, due to modern techniques of extraction and analysis of DNA fragments and stable isotopes, it is possible to undertake molecular studies even of very old specimens. These materials assume even greater importance in the case of extinct and endangered ('E&E') species, for which they are irreplaceable (Adams *et al.* 2003). Consequently, they must be kept with great care, using special precautions and protocols to optimise their use and conservation (Knox & Walters 1994, Adams *et al.* 2003). Moreover, Cooper & Steinheimer (2003) highlighted the importance of inventories of these specimens, to alert the scientific community to the existence of such materials.

Many important European natural history museums have already published catalogues of their 'E&E' bird species (Stresemann 1954, Jouanin 1962, Howes 1969, Benson 1972, Fisher 1981, Knox & Walters 1994, Boev 2003, Mlíkovský & Sutorová 2010, Mlíkovský 2012, Gouraud 2014). However, in Italy the situation is problematic, due partly to the lack of a national museum (Andreone *et al.* 2014). The existence of more than 70 natural history museums, some of international importance but managed by different institutions, has impeded the development of a unified catalogue. The first attempt to compile a list of extinct and rare birds involved those held in the museums of Milano, Genova and Firenze (Violani *et al.* 1984); a second effort was made under the umbrella of the project 'VerTex' (Vertebrata Extincta) to census specimens of 'E&E' vertebrates stored in Italian natural history museums (Nicolosi *et al.* 2013). Unfortunately, this project was discontinued in 2013 due to lack of funds. The most recent project, 'Extinction, stories of disasters and other

opportunities', funded by the Ministry of Education, University and Research, commenced in 2015 and remains in progress.

The present work, which forms part of the latter project, catalogues 'E&E' avian species in the collection of the Museum of Zoology of Torino University (MZUT AV), now hosted at the Museo Regionale di Scienze Naturali (MRSN, Torino, Italy). The historical collection contains more than 21,000 bird specimens and almost 500 complete skeletons, representing approximately 6,000 taxa. They are the result of collecting activities, exchanges, donations and purchases between the early 19th century and the second decade of the 20th century (Salvadori 1915, Tortonese 1957, Elter 1986).

Following the IUCN Red List of threatened species (BirdLife International 2018), the MZUT AV collection holds 259 threatened taxa (totalling 610 specimens), of which 12 are Extinct (EX), 39 Critically Endangered (CR), 56 Endangered (EN) and 152 Vulnerable (VU). As recommended by Adams *et al.* (2003), we applied a further selection to include only those species that meet specific quantitative criteria proposed by the IUCN Red List. Under the CR category we included only those species with small and fragmented ranges (B1 <100 km²) or small and declining populations (C <250 mature individuals), whereas in the categories EN and VU those species included are numerically rare in the wild (D1 <250 and D1 <1,000 mature individuals for EN and VU, respectively). Under these criteria, threatened taxa in the MZUT AV collection number 20 CR, two EN and six VU.

In the CR category, we added two additional species that meet criteria A2—Magenta Petrel *Pterodroma magentae* and Kakapo *Strigops habroptila*—because despite failing to meet the other criteria and having populations in recovery, they are both confined to single islands with tiny populations (BirdLife International 2018). Moreover, the Magenta Petrel specimen is the species' holotype.

Under EN, we also added three species that meet criteria B1 and C2: Tahiti Reed Warbler *Acrocephalus caffer*, Akiapolaau *Hemignathus wilsoni* and Grey-breasted Parakeet *Pyrrhura griseipectus*. The first two were included because they each have a very small population and distribution, being now rare, restricted to a single island and experiencing ongoing declines in range and habitat quality (BirdLife International 2018); the third because it is represented by type specimens.

Finally, we added three species that meet criteria D2 to the VU list: Stitchbird *Notiomystis cincta*, Trindade Petrel *Pterodroma arminjoniana* and Masatierra Petrel *P. defilippiana*. Although they each have a population larger than 1,000 individuals, their breeding ranges are very restricted and are therefore highly susceptible to stochastic events or human impacts (BirdLife International 2018). Moreover, specimens of both *Pterodroma* represent the species' type series.

Here we provide separate lists for 'E&E' species following the taxonomy and nomenclature of del Hoyo & Collar (2014, 2016). We also present, where possible, information on the provenance of specimens (exploratory voyages, trade and commerce, exchange with other scientific institutions) from original labels, manuscript catalogues in the museum's library, or the printed catalogue of the historical ornithological collection (Elter 1986).

Some of the species mentioned herein, especially those from New Zealand, are remarkable as they represent among the first specimens of their species to arrive in Europe and, although their origin is uncertain, they evidence the fact that many travellers and scientists, including John Gould, sold or exchanged part of their materials to specialised dealers as Gustav Adolph Frank of Amsterdam (Jansen & Mije 2015).

Extinct species

CASUARIIDAE

KING ISLAND EMU *Dromaius minor*¹

Dromæus minor Spencer, 1906

MZUT AV2661; mount; unsexed juvenile; Australia, no date (but evidently December 1802); from Nicolas Baudin's expedition, exchanged with Muséum national d'Histoire naturelle, Paris.

Remarks.—The Torino museum came into possession of a 'very young' *Dromaius* sometime between 1819 and 1822 (Salvadori 1915); in the old manuscript catalogue it was marked no. 2816 and accompanied by the following note: 'young specimen coming from Péron's voyage aux Terres Australes'. In Salvadori's (1915) index, the Torino specimen, doubtfully identified as *D. ater*, is also listed as 'cotype?' but in the main text this hypothesis is not mentioned. Two decades earlier, Salvadori (1895), perhaps due to doubts concerning the identity of the Torino specimen, had written that *Dromaius ater* was 'only known from the single stuffed specimen and the skeleton in the Paris Museum'. In Elter (1986), the specimen is quoted as a syntype, but this is definitely not the case.

Jouanin (1959) believed that the Torino specimen was prepared in Paris in 1804, but did not know how it reached Italy. The *Le Géographe*, on which the young naturalist F. Péron had travelled, brought to France, in addition to three live 'emus', the remains of five other specimens, collected on both King Island and Kangaroo Island ('Cinq dépouilles provenant les unes de l'île King, les autres de l'île des Kangourous'), one of which should be the young *Dromaius* in Torino (Jouanin 1959). Hume & Walters (2012) treated this specimen in their chapter on *D. ater* but noted that its provenance is uncertain: it could also be from Kangaroo Island and would then be attributable to *D. baudinianus* Parker, 1984. Nevertheless, Jansen (2017) treated MZUT AV2661 as a *D. minor* and listed it among those specimens taken on King Island during the period 8–27 December 1802.

COLUMBIDAE

PASSENGER PIGEON *Ectopistes migratorius*

Columba migratoria Linnaeus, 1766

MZUT AV8743; mount; adult male; 'North America', no date; from L. de Gréaux in 1876.

MZUT AV15372; mount; adult female; USA, Pennsylvania, Philadelphia, 22 March 1823; donated by G. Deabbate in 1823.

MZUT AV15373; mount; unsexed juvenile; USA, Pennsylvania, Philadelphia; donated by G. Deabbate in 1823.

Remarks.—Laurent de Gréaux was a natural history dealer from Marseille (France), a member of the Société d'Histoire naturelle de Toulouse from 1874 (Anon. 1876) and a corresponding member of the Société d'Étude des Sciences Naturelles de Nîmes (Anon. 1877). He purchased the holotype of Josephine's Lorikeet *Charmosyna josephinae* in London, then sold it to Count Ercole Turati of Milano (Finsch 1872). Gaspere Deabbate was the General Consul of the Kingdom of Sardinia to the USA during 1820–27.

¹ The name *Dromaius ater* Vieillot, 1817, previously applied to this species, is a synonym of *Casuarius novaehollandiae* Latham, 1790 (Dickinson & Remsen, 2013: 6, footnote 16).

ALCIDAE

GREAT AUK *Pinguinus impennis*

Alca impennis Linnaeus, 1758

MZUT AV16261; mount; unsexed adult; Iceland, no date; from H. Vogt in 1832.

Remarks.—Giuseppe Gené (1800–47), Director of the Zoological Museum of Torino in 1831–47, purchased this specimen from a ‘Mr. Vogt’ in 1832 (Salvadori 1915). It is noteworthy that Fatio (1868a) cited a specimen of *P. impennis* present in Neuchâtel museum (Switzerland), purchased in Mannheim (Germany) in 1832, by the same dealer Henri (= Heinrich) Vogt. This supports the hypothesis of Symington (2015) under which Vogt may have obtained several skins of *P. impennis* from what is now the Zoological Museum of the University of Copenhagen. The Great Auk in Torino is listed as no. 55 in Fuller (1999), wherein he stated that it seems reasonable to suppose that this specimen is one of 24 birds taken on Eldey (Iceland) in 1831.

Even the specimen at the Museo Civico di Zoologia Roma came from the Copenhagen museum (in 1832), but its arrival in Italy was rather tortuous (Arrigoni degli Oddi 1914, Marangoni & Gippoliti 2011). Furthermore, Fatio (1868b) reported three other specimens in the museums of Firenze, Milano and Torino, as well as an incomplete skeleton in Firenze. Violani *et al.* (1984) mentioned a second specimen housed in Milano, but not the skeleton in Firenze.

STRIGIDAE

LAUGHING OWL *Sceloglaux albifacies*

Athene albifacies G. R. Gray, 1845

MZUT AV16891; mount; unsexed adult; New Zealand, no date; purchased in Milano by G. Gené for MZUT in September 1844.

Remarks.—On an old label, the specimen is identified as *Athene novae zelandiae* (now Morepork *Ninox novaeseelandiae*), but this is easily explained because, at the time of purchase, *A. albifacies* was undescribed.

There is no reliable information as to how this specimen arrived in Europe. The only date we found in the manuscript catalogues (September 1844) clearly refers to the purchase by Prof. Giuseppe Gené for MZUT. The same date is linked to four other specimens from New Zealand purchased by Gené for MZUT, of New Zealand Falcon *Falco novaeseelandiae*, New Zealand Kaka *Nestor meridionalis* and South Island Piopio *Turnagra capensis* (see below).

It is noteworthy that in the Museo Civico di Storia Naturale di Milano (Violani *et al.* 1984) there are two specimens of extinct New Zealand taxa, Norfolk Island Pigeon *Hemiphaga novaeseelandiae spadicea* and *Turnagra capensis*, also purchased in 1844, from the dealers L. Bonomi and L. Colombo, respectively. We believe that one of them could have sold the specimens now in Torino to Gené.

Percy William Earl (1811–46) was an itinerant British collector who worked in New Zealand in 1843–45 and sold an important collection of birds to the British Museum (Natural History), London (Scofield *et al.* 2013). The holotype of *Athene albifacies* ‘formed part of Mr. Percy Earl’s collection’ purchased by the British Museum presumably in late 1844 and registered in early 1845, while Gray was editing the bird volume of *The zoology of the Erebus & Terror expedition*. For this reason, Gray (1845) choose to describe in this volume several new taxa collected by Earl, causing confusion among many subsequent authors as to the provenance of his collections. If the date of purchase by MZUT from Gené (September 1844) is correct, this specimen may have been the first of this species to reach Europe, as it predated the arrival of Earl’s in London (Scofield *et al.* 2013).

Finally, we note that the date of description, 1844, reported universally (e.g., Peters 1940, Worthy 2010, Dickinson & Remsen 2013, del Hoyo & Collar 2014), should be corrected to 1845, based on the clarifications proffered by Mathews (1938). Unfortunately, due to a *lapsus*, Mathews referred to *Athene albifrons*, instead of *A. albifacies*: this error evidently induced subsequent authors to ignore Mathews' paper when dating the original description by G. R. Gray.

PSITTACIDAE

CAROLINA PARAKEET *Conuropsis carolinensis*

Psittacus carolinensis Linnaeus, 1758

MZUT AV11205; mount; unsexed adult; southern USA, no date; from Salvin in 1892, formerly in Elliott Coues' private collection.

Remarks.—During his stay at the British Museum (Natural History), London, to catalogue their parrots, Tommaso Salvadori received a personal gift from Osbert Salvin (1835–95) of a *C. carolinensis* that originally formed part of the Elliott Coues collection. Subsequently, Salvadori donated it to MZUT.

PARADISE PARROT *Psephotellus pulcherrimus*

Platycercus pulcherrimus Gould, 1845

MZUT AV7798; previously mounted; adult male; Australia, no date; purchased from L. de Gréaux, in 1870.

ORIOLIDAE

SOUTH ISLAND PIOPIO *Turnagra capensis*

Tanagra capensis Sparrman, 1787

MZUT AV2962; previously mounted; unsexed adult; New Zealand, no date; purchased by F. Defilippi for MZUT, in 1846.

MZUT AV4244; previously mounted; unsexed adult; New Zealand, no date; purchased in Milano by G. Gené for MZUT, in September 1844.

Remarks.—Filippo Defilippi (1814–67) succeeded G. Gené as head of the Zoological Museum of Torino, of which he was director in 1848–67. It is probable that at least MZUT AV4244 has the same provenance as one of two specimens in the Museo Civico di Storia Naturale di Milano (no. 12968, unsexed, mounted, from 'Nov. Zealand'). Based on a manuscript catalogue produced by Defilippi, we know that it was purchased from L. Colombo in 1844 (Violani *et al.* 1984).

MONARCHIDAE

NUKU HIVA MONARCH *Pomarea nukuhiuae*

Pomarea mendozae nukuhiuae Murphy & Mathews, 1928

MZUT AV2953; previously mounted; adult female; Tahiti (*sic*); from a Mr Colombi, in 1846.

Remarks.—Originally labelled as Tahiti Monarch *P. nigra*, MZUT AV2953 is undoubtedly a female *P. m. nukuhiuae* (A. Cibois pers. comm.). See below for another specimen labelled as *P. nigra*. In MZUT there are 125 specimens from 'Colombi', mostly received in 1845–46; the labels of some indicate that Colombi was from Brest (Brittany, France), but we know nothing more about him.

CALLAEIDAE

HUIA *Heteralocha acutirostris*

Neomorpha acutirostris Gould, 1837

MZUT AV13749; mount; adult male; New Zealand, no date; from G. A. Frank, in 1847.

MZUT AV14030; mount; adult female; New Zealand, no date; from G. A. Frank, in 1847.

Remarks.—Salvadori (1915) only mentioned specimen no. 547 (MZUT AV13749), specifying that Torino museum purchased it in 1847 from Gustav Adolph Frank (1808–80), a dealer in natural history items and books in Amsterdam. Elter (1986) reported both specimens.

FRINGILLIDAE

KONA GROSBEAK *Chloridops kona*

Chloridops kona S. B. Wilson, 1888

MZUT AV11660; mount; adult male; USA, Hawaii, 'Kona district', slopes of Mauna Loa Volcano at 1,200 m, September 1892; collected by R. C. L. Perkins, and donated by Alfred Newton in 1901 or 1903.

Remarks.—Salvadori (1915) reported that in 1901 or 1903, due to the interest of his friend Alfred Newton, the Torino museum received a gift of seven specimens (actually eight) collected in the 'Sandwich Islands'. All of these were collected by Robert Cyril Layton Perkins (1866–1955) of Cambridge University during an expedition to Hawaii financed by the Royal Society of London and the British Association for the Advancement of Science. MZUT AV11660 was taken during the first period that Perkins spent in Hawaii, between March 1892 and September 1894 (Perkins 1893, Liebherr & Polhemus 1997). Torino is not listed among those institutions that hold specimens of this species; moreover, the collection date of MZUT AV11660 (September 1892) coincides with that of the last specimen known (Hume & Walters 2012).

KAUAI AKIALOA *Akialoa stejnegeri*

Hemignathus stejnegeri S. B. Wilson, 1889

MZUT AV11657; mount; adult male; USA, Hawaii, Kaua'i Island, 1900; collected by R. C. L. Perkins.

Remarks.—In the MZUT manuscript catalogue, AV11657 is named *Hemignathus procerus*. According to Olson & James (1995) the name *Hemignathus stejnegeri* S. B. Wilson, 1889, has priority over *H. procerus* Cabanis, 1890; the dating of Wilson's work (1889) is confirmed by Evenhuis (2003) and Dickinson (2011). However, in Dickinson & Christidis (2014) the description of *stejnegeri* is dated as 1890. The Torino museum was not listed among those institutions that possess specimens of the species (Hume & Walters 2012).

KAKAWAHIE *Paroreomyza flammea*

Loxops flammea S. B. Wilson, 1890

MZUT AV11654; mount; female; USA, Hawaii, Moloka'i Island, 1900; collected by R. C. L. Perkins.

Remarks.—Torino was not listed among those museums that possess specimens of the species (Hume & Walters 2012).

Threatened species

COLUMBIDAE

SILVERY PIGEON *Columba argentina* CR

Columba argentina Bonaparte, 1857

MZUT AV11391; previously mounted; adult male; Indonesia, Mentawai, Sioban (Sipora Island), 17 July 1894; from the Elio Modigliani collection (no. 244).

Remarks.—The original label reads *Columba grisea* (G. R. Gray), collection no. 244, letter 'A' and 'Oban' as collecting locality. This specimen was cited as *C. grisea* in Salvadori (1894) along with six other specimens collected on 17, 19 and 25 July 1894. *Carpophaga grisea* G. R. Gray, 1844 (not *Columba grisea* Bonnaterre) is a *nomen nudum*; see Peters (1937). Elio Modigliani (1860–1932), anthropologist and zoologist, made three expeditions to Indonesia. During his last journey to the Mentawai Islands, he collected 211 specimens of 34 taxa, some of which were donated to MZUT (Salvadori 1894, Mazzotti 2011).

TOOTH-BILLED PIGEON *Didunculus strigirostris* CR

Gnathodon strigirostris Jardine, 1845

MZUT AV19159; mount; adult female; Samoan Islands, no date; purchased from J. C. Godeffroy in 1870.

Remarks.—On 18 February 1870 the MZUT purchased a collection of 62 birds from Johann Cesar Godeffroy of Hamburg (Germany). In addition to the skin of specimen MZUT AV19159, the skeleton was also preserved (Salvadori 1915).

TROCHILIDAE

JUAN FERNANDEZ FIRECROWN *Sephanoides fernandensis* CR

Trochilus fernandensis P. P. King, 1831

MZUT AV8146; mount; immature male; Chile, Juan Fernández Island, November 1864; donated by the Museo Nacional de Historia Natural, Santiago.

MZUT AV19938; mount; adult male; adult; Chile, Juan Fernandez Island, December 1864; donated by Museo Nacional de Historia Natural, Santiago.

MZUT AV19761; mount; adult female; Chile, Juan Fernandez Island, October 1869; exchange with Museo di Storia Naturale e del Territorio, Università di Pisa (Italy).

Remarks.—MZUT AV8146 and AV19938 were obtained during the circumnavigation voyage by the Italian warship *Magenta*. On 6 October 1867, Enrico H. Giglioli visited the Museo Nacional de Historia Natural, Santiago, where its Director Rodolfo Armando Philippi and his assistant L. Landbeck presented him with numerous Chilean specimens of mammals and birds, including these two hummingbirds (Giglioli 1876). MZUT AV19761 was collected by Carlo Regnoli (1838–73), an Italian physician, paleontologist and archaeologist (Anon. 1873, Natale *et al.* 2006). The MZUT collection contains 40 specimens from the Regnoli collection, mainly from Peru and Chile.

BLACK-BREASTED PUFFLEG *Eriocnemis nigrivestis* CR

Trochilus nigrivestis Bourcier & Mulsant, 1852

MZUT AV2551; skin; adult male; Ecuador, Gualea (north-west of Quito), July 1897; collected by E. Festa.

MZUT AV2552; skin; adult male; Ecuador, Nanegal (north-west of Quito), June 1897; collected by E. Festa.

MZUT AV2553; skin; adult female; Ecuador, Nanegal (north-west of Quito), June 1897; collected by E. Festa.

MZUT AV11571; skin; adult male; Ecuador, Nanegal (north-west of Quito), June 1897; collected by E. Festa.

MZUT AV11572; skin; adult female; Ecuador, Nanegal (north-west of Quito), June 1897; collected by E. Festa.

Remarks.—Enrico Festa (1868–1939) was an Italian naturalist and explorer. He worked at the Royal Zoological Museum of Torino University, initially as an assistant and then as honorary deputy manager. During 1895–99 he visited Panama, Colombia and Ecuador where he collected zoological material, including birds that were studied in collaboration with Tommaso Salvadori (Arcangeli 1940, Mazzotti 2011).

OTIDAE

GREAT INDIAN BUSTARD *Ardeotis nigriceps* CR

Otis nigriceps Vigors, 1831

MZUT AV4785; mount; adult male; 'Bengal' (India or Bangladesh), October 1845; purchased from G. A. Frank.

MZUT AV4786; mount; adult female; 'Bengal' (India or Bangladesh), October 1845; purchased from G. A. Frank.

PROCELLARIIDAE

TRINDADE PETREL *Pterodroma arminjoniana* VU

Æstrelata arminjoniana Giglioli & Salvadori, 1869

MZUT AV6687; mount; unsexed adult; Brazil, Trindade Island (20°31'S, 29°19'W), 23 January 1868; collected during the circumnavigation voyage by the warship *Magenta*.

MZUT AV6688; mount; unsexed adult; Brazil, Trindade Island, 23 January 1868; collected during the *Magenta* voyage.

MZUT AV6685; mount; unsexed adult; Brazil, Trindade Island, 23 January 1868; collected during the *Magenta* voyage.

MZUT AV6686; mount; unsexed adult; Brazil, Trindade Island, 23 January 1868; collected during the *Magenta* voyage.

Remarks.—MZUT AV6687 and AV6688 are syntypes of *Æstrelata arminjoniana* Giglioli & Salvadori, 1869; MZUT AV6685 and AV6686 are syntypes of *Æstrelata trinitatis* Giglioli & Salvadori, 1869, the dark morph of *Pterodroma arminjoniana* (cf. Hellmayr & Conover 1948).

MASATIERRA PETREL *Pterodroma defilippiana* VU

Æstrelata defilippiana Giglioli & Salvadori, 1869

MZUT AV18779; mount; unsexed adult; southern Pacific Ocean between Callao (Lima, Peru) and Valparaiso (Chile), 31 August 1867; collected during the *Magenta* voyage.

MZUT AV18780; mount; unsexed adult; southern Pacific Ocean between Callao (Lima, Peru) and Valparaiso (Chile); 31 August 1867; collected during the *Magenta* voyage.

Remarks.—These specimens are syntypes of *Æstrelata defilippiana* Giglioli & Salvadori, 1869. Giglioli (1876) stated that, after lunch on 31 August 1867, at c.26°S, 89°W, a boat was prepared for collecting pelagic birds, including these two specimens.

MAGENTA PETREL *Pterodroma magentae* CR

Æstrelata magentae Giglioli & Salvadori, 1869

MZUT AV6689; mount; unsexed adult; southern Pacific Ocean, 39°38'S, 125°58'W, 22 July 1867; collected during the *Magenta* voyage.

Remarks.—The holotype of *Æstrelata magentae* Giglioli & Salvadori, 1869, which species went unobserved for a century following its description (Crockett 1994, Imber *et al.* 1998). Although the population of *P. magentae* is slowly recovering, the species is restricted to a single colony of 150–200 individuals on the Chatham Islands, east of New Zealand (BirdLife International 2018). Specimens are very rare in museum collections: in addition to the holotype, Te Papa Tongarewa (Museum of New Zealand) holds an adult male and a juvenile (<https://collections.tepapa.govt.nz/topic/2802>) and the Canterbury Museum, New Zealand, a fourth specimen (Pacific Ocean, *ante* 1910), misidentified until 2008 as Tahiti Petrel *Pseudobulweria rostrata* (Lawrence *et al.* 2008).

THRESKIORNITHIDAE

NORTHERN BALD IBIS *Geronticus eremita* EN

Upupa eremita Linnaeus, 1758

MZUT AV19119; skin; adult male; Ethiopia, Shewa, Chelekleka (Chalalaka) Lake, 4 December 1879; from the O. Antinori collection (no. 1177).

MZUT AV19120; skin; adult female; adult; Ethiopia, Shewa, Chelekleka (Chalalaka) Lake, 14 December 1879; from the O. Antinori collection (no. 1186).

MZUT AV19121; skin; adult male; Ethiopia, Shewa, Entoto, 7 December 1885; from the V. Ragazzi collection (no. 387).

MZUT AV19122; skin; immature male; Ethiopia, Shewa, Entoto, 7 December 1885; from the V. Ragazzi collection (no. 386).

MZUT AV20607; mount; unsexed adult; Algeria, no date; from Parzudaki, in 1858.

Remarks.—Orazio Antinori (1811–82) and Vincenzo Ragazzi (1856–1929) provided a large number of specimens to the Torino museum: currently MRSN holds 980 Antinori and 702 Ragazzi specimens, of which 766 and 651, respectively, are from Ethiopia. Biographical information on these great Italian explorers can be found in Mazzotti (2011) and Mari & Ansaloni (2012).

MZUT AV20607, which was not mentioned by Elter (1986), was purchased from Parzudaki in 1858. Salvadori (1915) reported that in 1856–58 ‘Parzudaki’ sold numerous birds to Prof. Defilippi for the Torino museum. Charles & Emile Parzudaki were natural history dealers in Paris between c.1838 and 1866 (Gouraud *et al.* 2016).

FREGATIDAE

CHRISTMAS FRIGATEBIRD *Fregata andrewsi* CR

Fregata andrewsi Mathews, 1914

MZUT AV6097; mount; unsexed juvenile; Christmas Island, 24 April 1866; collected during the *Magenta* voyage.

Remarks.—On 24 April 1866, the Italian warship *Magenta* was at 10°44’S, 104°28’E, some c.35–40 nautical miles from Christmas Island in the Indian Ocean (Giglioli 1870, 1876). Giglioli originally identified the specimen as a juvenile Ascension Frigatebird *F. aquila* (Linnaeus, 1758) but it was re-identified as *F. andrewsi*, probably by Salvadori, after the species was described by Mathews (1914). Photographs and measurements of the bill and wing confirm the re-identification (I. A. W. McAllan pers. comm.).

RECURVIROSTRIDAE**BLACK STILT** *Himantopus novaezelandiae* CR*Himantopus novae-zelandiae* Gould, 1841

MZUT AV6940; previously mounted; adult male; New Zealand, no date; from O. Finsch, in 1869.

Remarks.—Otto Finsch (1839–1917), the German ethnographer, naturalist and explorer, was curator or director of natural history museums in Leiden (the Netherlands) and Bremen (Germany) (Mearns & Mearns 1998). Finsch visited New Zealand only in 1881 and 1885, but he exchanged specimens with J. Haast in 1860; therefore, this specimen was not collected by Finsch himself, but probably came from one of these exchanges (P. Scofield pers. comm.).

SCOLOPACIDAE**ESKIMO CURLEW** *Numenius borealis* CR*Scolopax borealis* J. R. Forster, 1772

MZUT AV2904; previously mounted; adult female; 'South America', no date; from M. É. Moricand, in c.1832.

MZUT AV2951; previously mounted; unsexed immature?; 'South America', no date; from Dr R. Olivieri, in 1853.

MZUT AV9848; previously mounted; unsexed adult; Chile, western Patagonia, Jago Bay (Magellan Strait), 5 December 1867; collected during the *Magenta* voyage.

Remarks.—MZUT AV2951, labelled *Numenius minutus*, was re-identified as *N. borealis* by C. Pulcher (pers. comm.). In early December 1867 the Italian warship *Magenta* crossed the Strait of Magellan into the Atlantic Ocean. Jago Bay is located at c.52°33'S, 69°55'W (Giglioli 1876). Moïse Étienne Moricand (1779–1854) was a naturalist and museum administrator in the Museum d'histoire naturelle de Genève (Switzerland). We know nothing concerning Dr R. Olivieri.

SLENDER-BILLED CURLEW *Numenius tenuirostris* CR*Numenius tenuirostris* Vieillot, 1817

MZUT AV2900; mount; immature female; Italy, Piemonte, environs of Torino, 3 September 1828; from Mr Alason.

MZUT AV2901; mount; immature female; Italy, Piemonte, environs of Torino, 3 September 1828; from Mr Alason.

MZUT AV6521; previously mounted; immature female; Italy, Piemonte, 1868; purchased from Bonomi.

MZUT AV6522; previously mounted; immature male; Italy, Piemonte, 1868; purchased from Bonomi.

MZUT AV12247; mount; adult male; Italy, Toscana, San Rossore (Pisa), 1875; donated by H. M. Vittorio Emanuele III, in 1901.

MZUT AV12248; mount; adult female; Italy, Toscana, San Rossore (Pisa), 1875; donated by H. M. Vittorio Emanuele III, in 1901.

MZUT AV12249; mount; adult female; Italy, Piemonte, Villastellone (Torino), 1881; donated by H. M. Vittorio Emanuele III, in 1901.

MZUT AV19577; mount; unsexed adult; Italy, Toscana, no date (before 1877); donated by E. Sella, ex. Benvenuti.

Remarks.—Alason assisted F. A. Bonelli (1784–1830) to gather a rich collection of birds from the 'Sardinian States', donating to the museum numerous specimens from Piemonte, some of them rare or remarkable (Salvadori 1915).

The Bonomi family of Milano were known since the early 19th century for their trade in, and taxidermy of, animals, mainly birds, from all over the world. The first representative we are aware of was Carlo Francesco Bonomi, who in 1828 was awarded a gold medal for his business (Anon. 1828). Other taxidermists in the family, which Violani (2009) considered one of the main suppliers of Italian natural history museums, included Enrico, Pietro, Luigi and Clelia. Luigi Bonomi was the first taxidermist for MZUT; on his death, in 1883, his daughter Clelia was named second taxidermist (ASUT 2011).

Eugenio Sella (1820–82), cousin of the statesman Quintino, donated to the museum a series of 510 specimens of Italian birds in 1877 (Salvadori 1915).

In 1901 the King of Italy, Vittorio Emanuele III (1869–1947), donated a collection of 998 European birds, including those collected by Vittorio Emanuele II, the last King of Sardinia (1849–61) and the first King of Italy (1861–78).

ACCIPITRIDAE

SPANISH IMPERIAL EAGLE *Aquila adalberti* VU

Aquila adalberti C. L. Brehm, 1861

MZUT AV12533; mount; unsexed; Spain, no date; donated by H. M. Vittorio Emanuele III.

MZUT AV12867; mount; adult male; Spain; purchased from Verreaux in 1872.

Remarks.—The Maison Verreaux, established in 1803 at the Place des Vosges in Paris, was the earliest company dealing in natural history objects (Daszkiewicz 1997). It played an important role during the golden age of natural history collecting, with a catalogue offering thousands of birds, eggs and nests, as well as mammals, shells, reptiles, amphibians, insects, etc. In addition to its commercial reputation, it was known for promoting and financing collecting expeditions.

RUFOUS-TAILED HAWK *Buteo ventralis* VU

Buteo ventralis Gould, 1837

MZUT AV8177; mount; immature male; Chile, Punta Arenas, December 1864; donated by Museo Nacional de Historia Natural, Santiago.

Remarks.—This specimen was obtained during the circumnavigation of the Italian warship *Magenta* when, on 6 October 1867, Enrico H. Giglioli visited the Museo Nacional de Historia Natural, Santiago (Giglioli 1876).

ALCEDINIDAE

KOFIAU PARADISE-KINGFISHER *Tanysiptera ellioti* VU

Tanysiptera ellioti Sharpe, 1870

MZUT AV10056; previously mounted; adult female; Indonesia, West Papua, Kofiau Island, August 1875; collected by A. A. Bruijn and donated by G. Doria in 1882.

Remarks.—This specimen is one of the two females referred to by ‘d-e’ in Salvadori (1880: 448). It was donated to the museum by Giacomo Doria (1840–1913) (Salvadori 1915), the founder of the Museo Civico di Storia Naturale ‘Giacomo Doria’, Genova (Italy), and was collected by Antoine Augustus Bruijn (1842–90), a Dutch navy officer, naturalist and trader in natural items from the Dutch East Indies. He and his men collected many birds in the Moluccas and West Papua. Parts of these collections were donated to the Genova museum, where they were studied by Tommaso Salvadori, who in exchange acquired many duplicates for MZUT.

GABULIDAE

THREE-TOED JACAMAR *Jacamaralcyon tridactyla* VU

Galbula tridactyla Vieillot, 1817

MZUT AV1080; previously mounted; unsexed adult; 'South America'; donated by Dr Ricord in 1843.

MZUT AV15057; previously mounted; unsexed adult; 'South America'; no date.

Remarks.—Alexandre Ricord (1798–1876) was a surgeon who devoted his life to natural history. He travelled in tropical America between 1826 and 1834, collecting many zoological specimens. Salvadori (1915) reported that in 1843 Dr Ricord sent an interesting series of birds from various locations, including Brazil, Cuba and Haiti.

STRIGOPIDAE

KAKAPO *Strigops habroptila* CR

Strigops habroptilus G. R. Gray, 1845

MZUT AV1068; mount; unsexed specimen; New Zealand, South Island, July 1851; purchased from G. A. Frank.

PSITTACIDAE

PUERTO RICAN AMAZON *Amazona vittata* CR

Psittacus vittatus Boddaert, 1783

MZUT AV1939; previously mounted; adult female; 'Santo Domingo', but captive; donated by Mrs Bongioanni in April 1822.

MZUT AV9448; previously mounted; unsexed adult; captive; from the Royal Zoological Garden of Torino, in 1879.

Remarks.—MZUT AV1939 cannot be from Santo Domingo (i.e. the Dominican Republic), because *A. vittata* is confined to Puerto Rico. We have been unable to discover anything about Mrs Bongioanni.

YELLOW-FACED PARROTLET *Forpus xanthops* VU

Psittacula xanthops Salvin, 1895

MZUT AV5759; skin; adult male; Peru, Huamachuco, Viña Marañón, 5,000 ft., 1 March 1895; from Berlepsch, ex. O. T. Baron collection.

Remarks.—This specimen, donated by Hans Berlepsch (1850–1915), originally formed part of the collection of Oskar Theodore Baron (1847–1926), a German engineer who travelled in northern Peru. The type series, also collected by Baron in the previous year (March 1894), is from the same locality (Salvin 1895).

GREY-BREASTED PARAKEET *Pyrrhura griseipectus* EN

Pyrrhura griseipectus Salvadori, 1900

MZUT AV10583; previously mounted; unsexed; no locality; 1888; donated by Count Peracca.

MZUT AV10584; previously mounted; unsexed; no locality; 1888; donated by Count Peracca.

Remarks.—These specimens are syntypes; their locality is unknown, but Salvadori suspected they came from 'Guiana', although the species is now known to be endemic to north-east Brazil. They had been kept in captivity by Count Peracca (Salvadori 1900), assistant at the Institute of Zoology of the Torino University.

SPIX'S MACAW *Cyanopsitta spixii* CR (PEW)

Sittace spixii Wagler, 1832

MZUT AV14581; previously mounted; immature male; Brazil, Bahia, 1858; purchased from Parzudaki.

YELLOW-EARED PARROT *Ognorhynchus icterotis* EN

Conurus icterotis Massena & Souancé, 1854

MZUT AV7786; previously mounted; unsexed (or female?) adult; Colombia ('Nouvelle Grenade'), Bogotá, 1868?; purchased from Mr De Gréaux.

Remarks.—The label that was attached to the base mentions Bogotá (Colombia); the old label: 1868, *Psittacara icterotis*, [...] Brasil [deleted], Nuova Granata, L. 150, 205/1870, «on n'en connaît que 2 exemplaires 1 à Londres 1 à M. Turati, aucun autre Musée ne le possède [sic]».

De Gréaux was not entirely correct, but he was right to believe that the species was very rare in European collections: a few years earlier, Finsch (1867) was aware of just three, all from 'Neu-Granada', in the British Museum (arguably the holotype, cf. Salvadori 1891, Warren 1966), in Bremen and in the Museum Heineanum, the last the type of *Gnathosittaca heinei* Cabanis.

ORANGE-BELLIED PARROT *Neophema chrysogaster* CR

Psittacus chrysogaster Latham, 1790

MZUT AV1893; previously mounted; adult female; Australia, no date; purchased by F. A. Bonelli in 1820.

Remarks.—The label attached to the base of the wooden stand is inscribed '*Neophema chrysogastra* (Lath.)? New Holland' and the manuscript catalogue '*Euphema aurantia*, Gould?'. Salvadori (1891) described genus *Neophema* and stated that *N. chrysogastra* and *N. aurantia* were synonyms. The pedestal label was probably written by Salvadori himself, who was evidently unsure of the specimen's identification.

RED-THROATED LORIKEET *Charmosyna amabilis* CR

Trichoglossus (Glossopsitta) amabilis E. P. Ramsay, 1875

MZUT AV11219; previously mounted; adult male; Fiji Islands, January 1889; from Hans Berlepsch, ex. C. Ribbe.

Remarks.—Salvadori (1915) reported that in December 1891 Count Berlepsch of Gmunden (Austria) sent 36 birds from various locations to the Torino museum in an exchange. Carl Ribbe (1860–1934) was a German explorer, entomologist and dealer in insects.

TYRANNIDAE

KINGLET CALYPTURA *Calyptura cristata* CR

Pardalotus cristatus Vieillot, 1818

MZUT AV16101; previously mounted; unsexed adult; Brazil, no date.

Remarks.—Hume & Walters (2012) considered *C. cristata* to be Possibly Extinct, but BirdLife International (2018) continue to treat the species as Critically Endangered, with its population estimated at fewer than <50 mature individuals.

MONARCHIDAE

TAHITI MONARCH *Pomarea nigra* CR

Muscicapa nigra Sparrman, 1786

MZUT AV2950; previously mounted; male; (Tahiti?); from Colombi, in 1846.

Remarks.—As the specimen's provenance is uncertain, it might be referable to one of the races of Marquesas Monarch *Pomarea mendozae*, i.e. *P. m. mendozae* (from Hiva Oa and Tahuata Island, Extinct) or *P. m. motanensis* (from Mohotani Island, Endangered).

CORVIDAE

JAVAN GREEN MAGPIE *Cissa thalassina* CR

Kitta thalassina Temminck, 1826

MZUT AV17214; previously mounted; unsexed; Indonesia, Java, no date; donated by the Marquis of Breme, in 1847.

Remarks.—Ferdinando Arborio Gattinara di Breme (1807–69), an Italian entomologist, ornithologist, painter and politician, donated his ornithological collection to King Vittorio Emanuele II. Initially housed in Venaria, at La Mandria, the collection was subsequently transferred to Moncalieri Castle; in 1901 King Vittorio Emanuele III donated the birds to Torino and Roma museums (Salvadori 1902, Maschietti *et al.* 1988, Marangoni & Gippoliti 2011).

CALLAEIDAE

SOUTH ISLAND KOKAKO *Callaeas cinereus* CR

Glaucopis cinerea J. F. Gmelin, 1788

MZUT AV3585; previously mounted; unsexed; New Zealand, no date; purchased by A. Caffer in Rio de Janeiro in 1839.

MZUT AV16330; previously mounted; unsexed; New Zealand, 1843.

Remarks.—Hume & Walters (2012) treated this species as extinct. In 1839–40 Antonio Caffer, assistant to the Royal Zoological Museum of Torino, embarked on the frigate *Regina* for a journey around the globe. A storm near the Falkland Islands seriously damaged the ship, which was forced to return first to Rio de Janeiro, Brazil, where Caffer purchased about 2,400 zoological specimens, and then to Genova (Mottin & Casolino 1999).

NOTIOMYSTIDAE

STITCHBIRD *Notiomystis cincta* VU

Meliphaga cincta du Bus de Gisignies, 1839

MZUT AV4818; previously mounted; unsexed; New Zealand, no date; purchased from G. A. Frank, in 1847.

MZUT AV17281; previously mounted; unsexed; New Zealand, no date; purchased from G. A. Frank, in 1847.

ACROCEPHALIDAE

TAHITI REED WARBLER *Acrocephalus caffer* EN

Sitta caffa Sparrman, 1786

MZUT AV2946; skin; unsexed; French Polynesia, Society Islands, Tahiti, no date; from Colombi, in 1846.

MZUT AV15751; skin; unsexed; French Polynesia, Society Islands, Tahiti, no date; from Colombi, in 1846.

PYCNONOTIDAE**MAURITIUS BULBUL** *Hypsipetes olivaceus* VU*H[ypsi]petes]. olivacea* Jardine & Selby, 1837

MZUT AV6261; previously mounted; adult male; Mauritius, 1867; purchased from Verreaux.

MZUT AV6269; previously mounted; female; Mauritius, 1867; purchased from Verreaux.

Remarks.—These specimens were previously identified as Reunion Bulbul *H. borbonicus*, but their mensural data and collecting locality clearly indicate *H. olivaceus*.

STURNIDAE**BLACK-WINGED MYNA** *Acridotheres melanopterus* CR*Gracula melanoptera* Daudin, 1800MZUT AV18071; skin; unsexed; Indonesia, Java, Tangerang River, 24 March 1867; collected during the *Magenta* voyage.MZUT AV18072; skin; unsexed; Indonesia, Java, Tangerang River, 24 March 1867; collected during the *Magenta* voyage.MZUT AV18073; skin; unsexed; Indonesia, Java, Tangerang River, 24 March 1867; collected during the *Magenta* voyage.

Remarks.—The occurrence of this species near the Tangerang River (Jakarta) is mentioned by Giglioli (1876).

JAVAN PIED STARLING *Gracupica jalla* CR*Pastor jalla* Horsfield, 1821MZUT AV5904; skin; unsexed; Indonesia, 'Purmeran' Island (northern Java), 5 March 1867; collected during the *Magenta* voyage.MZUT AV5905; skin; unsexed; Indonesia, 'Purmeran' Island (northern Java), 5 March 1867; collected during the *Magenta* voyage.

Remarks.—The species' presence on Pulo Purmeran, near Ornuist Island, off Jakarta, which had a naval base to repair and equip ships, is mentioned by Giglioli (1876).

FRINGILLIDAE**AKIAPOLAAU** *Hemignathus wilsoni* EN*Heterorhynchus wilsoni* Rothschild, 1893

MZUT AV11656; mount; male; USA, Hawaii, 1900; collected by R. C. L. Perkins.

AKOHEKOHE *Palmeria dolei* CR*Himatione dolei* S. B. Wilson, 1891

MZUT AV11653; mount; adult male; USA, Hawaii, Moloka'i Island (4,000–5,000 ft.), 22 September 1893; collected by R. C. L. Perkins.

Remarks.—The species still occurs on Maui in the Hawaiian Islands, but is extinct on Moloka'i, where the last record was in 1907 (BirdLife International 2018).

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