

A re-evaluation of the pre-1948 Korean breeding avifauna: correcting a ‘founder effect’ in perceptions

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O. L. Austin published *The birds of Korea*, the first comprehensive review of the Korean peninsula’s avifauna, in 1948. Its findings have been accepted almost uncritically by subsequent workers, yet four major factors led Austin to underestimate the species richness of the Korean breeding avifauna by at least 30–50%: the country was still under-explored during the breeding season; Austin did not use several key written and specimen sources; he often rejected others’ statements of Korean breeding; and he took the attitude with most species that if it lacked evidence (acceptable to him) of breeding in Korea, it must be considered a non-breeding visitor. Data from around Austin’s review period show that 43 species he considered not to breed (of which for 27 he directly disparaged others’ statements of breeding) were summer residents, and most were proven breeders; many others have been found since. A more balanced treatment would have understood that absence of evidence is not evidence of absence, left the status of these (and many other) species open, and called for further data. The result is that subsequent confirmation of breeding has led to the false impression that such species have colonised Korea since Austin’s time. His restricted fieldwork and poor collation of existing sources limited his authority to make assertive rejections. Austin was disproportionately disdainful of Japanese and Korean sources. Aside from his attitude-driven diminution of the perceived Korean breeding avifauna, Austin made multiple other classes of error. Future commentators on the status of Korean birds should review surviving written and specimen data independently, rather than trust in Austin’s review and the subsequent works perpetuating his cultural biases.

INTRODUCTION

‘I have considered as summer residents those species which occur regularly in the territory in June, July and August, whether or not there is evidence of nesting. In most cases the summer resident doubtless breeds in the area, but mere presence during the nesting season is not proof of breeding, and many forms have been assumed to do so by previous authors which future investigation may prove do not. Hence, while the use of this category implies that a bird breeds in Korea, I have tried in each case to indicate what, if any, nesting proof is available. In many instances it is appallingly meagre.’

So wrote Austin (1948: 5–6) in his seminal review of the avifauna of Korea. Such caution in a status baseline is admirable, and the review’s conclusions have been accepted almost uncritically by subsequent authors, including major reviews for southern (Gore and Won Pyong-Oh 1971, Park Jin-Young 2002) and northern (Tomek 1999, 2002) provinces of Korea.

As Austin (1948: 6–27) remarked in his ‘Historical Sketch’, most of Korea remained ‘*terra incognita* to occidental naturalists’ until the 1880s, and even the next couple of decades hosted few surveys. The formal Japanese annexation of Korea in 1910 brought Japanese ornithologists to the country. Won Hong Koo, almost alone among Koreans, started collecting in 1920. He wrote successive Korean checklists, and remained active until his death (on 3 October 1970; Gore and Won Pyong-Oh 1971). Few westerners were ornithologically active in Korea during 1910–1945, e.g. D. J. Cumming (1933) and S. Bergman (Duckworth and Frisk in prep.). In all, as Austin himself wrote, his avifauna was constructed from fragmentary material, especially as (see below) he had no direct access to Won Hong Koo or his collection, only to his checklists written in 1932 and 1934.

A surprising number of species purportedly colonised Korea after 1950, as portrayed in Gore and Won Pyong-Oh (1971), Tomek (1999, 2002) and/or Park Jin-Young (2002). These authors drew their conclusions using Austin’s baseline. Our reference to Austin’s own pre-

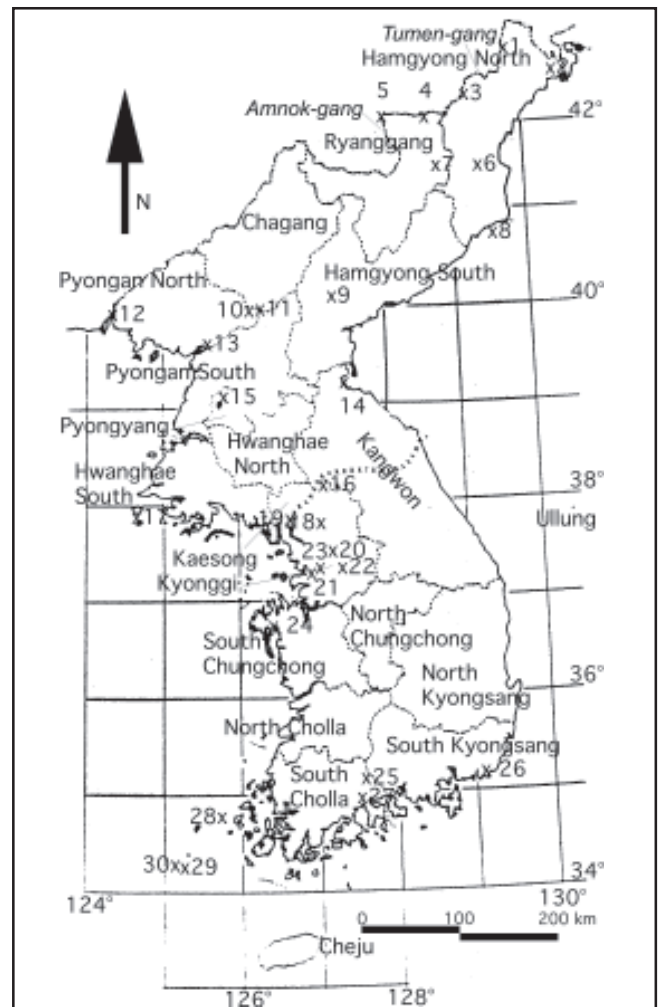


Figure 1. Korea, showing province names and localities mentioned in the text: 1: Shinten, 2: Manpo, 3: Muson, 4: Nongsadong, 5: Paekdusan, 6: Chuul-gang, 7: Engan, 8: Nan-Do, 9: Gekatsuri, 10: Hyangsan, 11: Myohyang mountains, 12: Ryongampho, 13: Anju, 14: Wonsan, 15: Pyongyang, 16: Kimhwa, 17: Paengnyong island, 18: Kwangnung national arboretum, 19: Imjin-gang, 20: Seoul, 21: Wasong Reservoir, 22: Inchon, 23: Suwon, 24: Seosan City, 25: Chiri-san, 26: Pusan, 27: Suncheon, 28: Chilbal Island, 29: Taeuksan, 30: Taegukul Island.

1948 sources soon revealed records contrary to Austin's conclusions and a tendency for him to make weakly supported, yet assertive, statements of seasonal absence.

Hence, here we re-evaluate the pre-1948 Korean breeding avifauna, using the same geographical scope as Austin, i.e. the entire peninsula and adjacent islands, excluding the more distant Cheju (formerly Quelpart) and Ullung (formerly Dagelet) islands. The focus is on breeding-season assessments because it was with these, rather than passage and winter status, that Austin most frequently disputed previous assertions. Moreover, breeding status is of fundamental conservation concern. Changes in breeding range are often more readily detected than in population size, and so constitute among the best indicators of species conservation status. Unjustifiably strong statements of historical breeding absence compared with current presence invite erroneous conclusions over range extensions, thereby warping understanding and, potentially, conservation priorities. Furthermore, interest has intensified in assessing range changes in relation to global climatic trends (Crick 2004).

Taxonomy and nomenclature follow Inskipp *et al.* (1996). Site names in Korea follow Tomek (1999, 2002) for northern provinces, and Park Young-Han *et al.* (2000) for southern provinces. Figure 1 shows the location of all Korean provinces and those sites referred to in the text. Citations within direct quotations of Austin have been omitted. Unqualified references to 'Won' refer to Won Hong Koo, not to his son Won Pyong-Oh, whose work post-dated Austin. Scientific names are given in the text only for species not in Appendix 1. The following non-standard abbreviations are used: AMNH, American Museum of Natural History, New York, U.S.A.; FMNH, Field Museum, Chicago, U.S.A.; MVZ, Museum of Vertebrate Zoology, Berkeley, California, U.S.A.; NHM, the Natural History Museum, Britain (formerly BMNH); NRM, Swedish Museum of Natural History (Naturhistoriska Riksmuseet), Stockholm, Sweden; ZISP, Zoological Institute of St Petersburg, Russia.

SOURCES REVIEWED

Several key early collections of Korean birds were destroyed by earthquakes and the effects of war (Austin 1948), so the present re-assessment relies heavily on written material covering Austin's period (up to 1948) or directly afterwards. To compare his status assessments with more recent information is less instructive because of the possibility of genuine status changes over time.

Three contemporary sources not covered by Austin permit direct triangulation of his conclusions. Aleksander Yankovskii (in Tomek 1999, 2002) documented birds extensively through Korea's northern provinces in summer 1897; Austin made no mention of his trip. Secondly, Sten Bergman collected assiduously in north and central Korea from early 1935 to mid 1936. Austin knew he had collected bird skins, but did not obtain any details; nor did he read two notes (Bergman 1935a, 1935b) that contain more factual bird information than does the travelogue he did read (Bergman 1938). Duckworth and Frisk (in prep.) review Bergman's skins and unpublished written notes. Thirdly, Austin's friend L. R. Wolfe (1950) observed birds during February 1947–December 1948. Although citing Wolfe (1950), Gore and Won Pyong-Oh

(1971) included his breeding results only patchily, and subsequent authors often miss his findings. Some of Wolfe's (1950) information refutes Austin's assertions, yet Wolfe did not flag this; indeed, he stated that 'the presently known ornithology of Korea has been admirably summed up in Dr Austin's recent publication'.

Three sources from soon after Austin's review period allow more cautious inference of bird status in the period. None covers all Korea, reflecting political partition in 1953. Won Hong Koo collected c.5,000 bird skins from many sites across northern Korea during the 1950s and 1960s, leading to *The birds of Korea* (Won Hong Koo 1963–1965); Tomek (1999, 2002) presented, from book and collection, dates and locations for every specimen and observation. Some individual data are questionable (Tomek 1999), but species-level conclusions are evidently sound because few are contrary to other relevant information. In southern Korea, Gore and Won Pyong-Oh (1971) presented status conclusions but not all individual records (so inferences and assumptions cannot all be distinguished from facts), apparently covering 1950s–1960s collections (including, presumably, the c.4,000 skins collected by C. M. Fennell during 1947–1966 and stored at MVZ). Of Austin (1948), they stated that 'much new information has come to light which changes the status of many species' but they did not review pre-1948 primary sources thoroughly. Park Jin-Young (2002) expanded available detail on 1950s–1960s status through reviewing specimens in collections in Korea's southern provinces, material in databased overseas collections (Park Jin-Young verbally 2006), and published sources (of which few pre-dated Austin).

Mauersberger (1981: 15) is apparently the only author so far to express explicit concern at Austin's reliability. He sought, unsuccessfully, Austin's working notes, hoping to illuminate some of the latter's stranger conclusions. His incorporation of Bergman's (1935a, 1935b) data for some species re-documented the breeding that Austin had denied, but Tomek (1999, 2002), while including Mauersberger's own data, omitted Bergman's and thereby effectively reburied them.

The present review is not comprehensive. During the 1910–1945 Japanese occupation of Korea, most ornithological work was published in Japanese, which we cannot read. Won Hong Koo's (1963–1965) Korean-language country avifauna is available only through Tomek (1999, 2002). Information in Korean literature covering the southern provinces is extracted, almost exclusively, from Park Jin-Young (2002). However, we think it unlikely that fuller incorporation of Korean- and Japanese-language sources would weaken, rather than strengthen, our conclusions.

SPECIES AUSTIN INCORRECTLY REJECTED AS KOREAN BREEDERS

This section treats the 43 species which Austin stated or implied did not breed or regularly spend the summer in Korea, for which evidence of summer residency is contemporary with Austin's review period. For 27 species Austin rejected evidence or opinion of other people; for the other 16, he had failed to register the relevant evidence. For most land-birds, mid June–early August records are taken as breeding-season presence. This is conservative:

nowadays, many species' main passage ends within May (personal observations). For most smaller species, records of non-breeders far from the breeding range during the breeding season are exceptional; but for waterbirds, raptors and some others, non-breeders occur far from breeding grounds through the summer, so even multiple mid-summer records are only, at best, weakly indicative of breeding. For species with pre-1948 breeding evidence confined to breeding-season presence, firmer subsequent information is given, particularly from the 1950s. Information from the 1970s and later is included for pre-1948 assessments that are not conclusive, but rarely otherwise: the present work does not attempt to circumscribe each species' current Korean breeding range. As well as the 43 species below, 19 species now known or strongly suspected to breed in Korea lack either strong pre-1948 indications of breeding or reason to invoke subsequent colonisation, and ten species seem to have colonised since the 1940s (Appendix 1, Category 5 and its footnote).

MANDARIN DUCK *Aix galericulata*

Austin called Mandarin a 'not uncommon transient in Korea', commenting that Won Hong Koo's statement that it nests in North Pyongan province 'has not been credited by subsequent authors, for there is no breeding evidence'. He overlooked Bergman's (1935a) documented breeding around Engan, as did Tomek (1999), who required further evidence to consider it a breeder in northern Korea. Bergman found several pairs at Engan and saw the species in the Myohyang mountains in mid June 1936 (Duckworth and Frisk in prep.); it was confirmed breeding there in 2000–2003 (personal observations). Gore and Won Pyong-Oh (1971) accepted it as a 'rare resident' (implying breeding) in southern Korea, from where Park Jin-Young (2002) traced recent summer records from four southern provinces after 1970, including proof of breeding.

MALLARD *Anas platyrhynchos*

Taczanowski (1888) wrote that Mallards nested in small numbers in Korea, but Austin stated that this view had 'been disregarded by subsequent authors as unverified, and [is] perhaps referable to the Spot-billed Duck'. However, he was unaware that Yankovskii (in Tomek 1999) had observed small flocks of young Mallards around Paekdu-san in August 1897, as did Tomek (1984) on 4 June 1980.

HARLEQUIN DUCK *Histrionicus histrionicus*

Tracing Korean records only between October and April, Austin categorised Harlequin as a winter visitor. He did not read Bergman's (1935a) statement that it bred around Engan; Bergman (1938) was not explicit about breeding, but his records from inland mountains in late May–early June clearly signal this possibility. Tomek (1999) also overlooked this record, but traced three other summer interior records (May 1960, June 1959 and July 1957 or 1958), implying that Harlequin is (or at least was) a regular breeder, although Tomek (also unaware of Bergman's data) herself did not accept this.

RED-BREASTED MERGANSER *Mergus serrator*

Yankovskii identified Red-breasted Mergansers at two sites in the Tumen catchment in June and August 1897, with two more sites from early September 1897 in the

Amnok catchment (Tomek 1999). There seems to be no subsequent indication of Korean over-summering, and it is perhaps odd that Yankovskii did not find Scaly-sided Merganser, which was found at one of his sites (Musan) in April 1912, and is now known to breed in this region (e.g. BirdLife International 2001). Yankovskii's identification perhaps warrants review, but ZISP, where some of Yankovskii's skins are housed (Tomek 1999: 6), holds no specimens from Yankovskii's trip of either this species or Scaly-sided Merganser (V. Vysotsky *in litt.* 2006). Austin completely overlooked these records and made no reference to the possibility of Korean breeding for either species.

HODGSON'S HAWK CUCKOO *Hierococcyx fugax*

Austin wrote that 'this cuckoo seems to be an uncommon migrant in spring in the northwest corner of [North Pyongan province]... Yamashina comments "it is not yet certain that they breed in Korea, but according to the collection dates, there is no doubt that they do so." This conclusion seems a bit far-fetched, however, and the 1942 Hand-List Committee was not convinced of its breeding'. No indication was given as to why it would be 'far-fetched', and as Austin was not in Korea during this species's breeding season, he could not reasonably form an opinion based on personal experience. This species is very difficult to see on its breeding grounds (personal observations), so if the song is not known, it easily escapes detection. Yamashina's conclusion was evidently sound: there are past Korean records from 21 June 1897 (Tomek 1999; not known to Austin) and (listed by Austin), 27 July 1917 and June 1917. More recent surveys found the species a common summer resident in the Myohyang mountains during 2001–2003, singing from mid May to at least early July in each year (personal observations), having also been recorded there on 5 June 1956, late May 1980 and mid June 1983 (Tomek 1984: 22, 1999); Park Jin-Young (2002) traced recent summer records from five southern provinces, and it is fairly common and vocal through the breeding season in forest areas around Seoul, but apparently less numerous southward (personal observations).

COLLARED SCOPS OWL *Otus bakkamoena*

Austin noted that 'Yamashina and Won both say [Collared Scops Owl] breeds in Korea, but the 1942 Hand-List disagrees. Indeed, the evidence suggests that it breeds north of the Korean peninsula, for Orii's experience in collecting so large a series...in so short a time can be interpreted as nothing but a mass migratory movement'. This may be so; but passage through an area does not exclude the species from breeding there as well. Although Austin traced only three specimens between April and September (from 'May', 3 and 10 May), within a few years there were specimens from 9 June 1954, 15 July 1956 and 17 June 1960 (Tomek 1999), all implying breeding in northern Korea. In southern Korea, Gore and Won Pyong-Oh (1971) considered it to be an 'uncommon summer visitor' (as well as passage migrant and winter visitor) by implication to much or all of Korea, but according to records in Park Jin-Young (2002), this may have been based largely or only on presence during the breeding season in areas excluded by Austin's review (e.g. Ullung Island). It seems it was overlooked in the breeding season before Austin's time, although Deignan (1950: 191) took it to be a Korean breeder.

URAL OWL *Strix uralensis*

Austin asserted that 'The Ural Owl is a rare visitor to Korea. Though Won says it breeds there, there is no proof'. A specimen he traced from 29 May 1912 from Nongsadong, Paekdu-san massif (see itinerary in Allen and Andrews 1913) is now supported in season by June 1963 and August 1989 records from the same region, as well as one in March 1936 (Tomek 1999, Duckworth and Frisk in prep.). It is not a 'rare visitor': at Myohyang it was frequently found during 2001–2003, singing at least during March–July and in October (personal observations). Breeding may even be widespread in Korea: summer residency is suggested by a breeding-season record from North Hwanghae province in 1979 (MKN and KUT 1987: 11) and dates of 5 March 1927 and 3 April 1928 (Kyonggi province; Austin 1948) compared with timing of regular song in Myohyang. There are also several very recent reports, supported by photographs, of breeding in, for example, southern Kangwon Province, posted on various internet sites without full supporting details. Siberian populations show some autumn and winter wandering (Cramp 1985), and more data are needed for firm conclusion of status south of Myohyang.

NORTHERN HAWK OWL *Surnia ulula*

Had Austin read Bergman (1935a, 1938) carefully, he would have noted that Northern Hawk Owl bred around Engan (and Bergman suspected breeding at a second site; Duckworth and Frisk in prep.), but instead he called it a 'straggler', knowing of only one (January) record. Despite further evidence through two specimens on 12 May 1965 and Won Hong Koo's clear statement of breeding, Tomek (1999), who did not read Bergman either, cautioned against 'assignment of the Hawk Owl among the breeding birds'. Gore and Won Pyong-Oh (1971: 420) had stated that it was a 'rare resident [of the Paekdu-san area]...breeding has not, however, been proved'. There seem to be no subsequent Korean records, and whether this owl is, or was, a regular breeder is unclear, because it is highly eruptive and may breed well south of its usual range in years when numbers are high (Cramp 1985).

LITTLE OWL *Athene noctua*

Austin wrote that 'so far as can be determined, Won had no other data [than three winter specimens] on the species...but in a later paper he says that the species is rare, but breeds in Korea. Kuroda says 'rare in Korea, but a permanent resident surely by the date of the specimen,' which is as unwarranted by the evidence as Won's breeding statement...from the record this species is a straggler, but further investigation may show it to be of fairly regular occurrence as a winter visitor'. Bergman found an active nest on 9 June 1936 at Ryongampho and collected a well-grown nestling (Duckworth and Frisk in prep.). Five of 13 northern Korean dates in Tomek (1999) were from June (1949, 1960, 1962), July (1959) or August (1954), so regular Korean breeding during Austin's review period is a reasonable assumption, and Gore and Won Pyong-Oh (1971) called it 'resident in north Korea'.

COMMON SANDPIPER *Actitis hypoleucos*

Austin's statement of Common Sandpiper, that 'Taczanowski (1888) was partly in error when he wrote "small numbers in summer; nest near Seoul..."', for the bird has never been known to breed in Korea', was itself

in error: Bergman (1935b) reported it nesting along the Chuul river in 1935; he had various other breeding-season sightings and in late June 1936, he considered it to be obviously breeding at Myohyang (Duckworth and Frisk in prep.). Austin cited without comment an AMNH specimen from the northern highlands on 12 June 1912. Gore and Won Pyong-Oh (1971: 39, 78) gave the first breeding record for southern Korea as 1969, while describing the species as a rare summer visitor, and Tomek (1999), who traced many June and July records from the 1950s and 1960s in the northern highlands, hence erroneously concluded that the species had colonised Korea after 1948, despite a further breeding-season record she cited from Yankovskii on 21 June 1897.

LONG-BILLED PLOVER *Charadrius placidus*

Austin, tracing no Long-billed Plover records in May–July, concluded that it 'seems to be a not uncommon spring and autumn transient', despite his citing Won Hong Koo's statement that it bred and Kuroda's that it probably did so. Tomek (1999) presented records from 30 July 1954, 3 April 1956, 3 June 1960, and 18 and 26 July 1897, and accepted it as probably breeding; the proof she desired is supplied through Bergman's observation of several birds, clearly breeding, at Myohyang on 23 June 1936 (Duckworth and Frisk in prep.). In southern Korea, Gore and Won Pyong-Oh (1971) did not consider it to nest, but nowadays it does so widely (Park Jin-Young 2002). Anecdotal accounts indicate that it was breeding in at least one area of Kyonggi province by the 1960s or earlier (Shim Kyu-Sik verbally 2008). It seems probable that the species has long been under-reported in Korea. Season-based assumptions of breeding status are risky, because Long-billed Plover breeds early (at least in the southern provinces): it is highly territorial in February and March, pairs within March (e.g. copulation seen at Suncheon on 13 March 1997), and lays eggs in April (when it is very inconspicuous); young often disperse as early as June, when summer rains flood out river-bed breeding sites (personal observations). Also in Japan, it starts nesting in mid-March (Brazil 1991). Hence, the records that Austin traced from five provinces in March–April might also involve breeders.

KENTISH PLOVER *Charadrius alexandrinus*

Describing Kentish Plover as a 'not uncommon spring and autumn transient', Austin listed records from all months between March and September (and from January). Even though Gore and Won Pyong-Oh (1971) followed Austin and called it solely a non-breeding visitor, Kentish Plover breeds in at least the southern provinces. Records in Park Jin-Young (2002) of Kentish Plover collected in Seoul on 20 May 1910 and on 3 and 20 June 1913, and in Kyonggi province on 4 July 1957, 23 July 1958 and 6 June 1965, all indicate that it has summered in Korea for many decades. Young were recorded as early as 5 May near Seoul (Long *et al.* 1988), but April records cannot be assigned on date alone to likely breeders: spring migration peaks only in late April (Long *et al.* 1988, Moores 1999a).

NORTHERN LAPWING *Vanellus vanellus*

Austin called Northern Lapwing 'an uncommon spring and autumn transient', overlooking Yankovskii's records (in Tomek 1999) from two Tumen river sites during 28

May–11 June 1897. Tomek (1999) accepted the species as a Korean breeder, reflecting references in Yankovskii's notes to pairs of birds in river valleys and on open plains and cultivated fields (T. Tomek *in litt.* 2007). Failed (or non-) breeders do not consort as pairs (Cramp and Simmons 1982). There seem to be no subsequent breeding-season records.

OSPREY *Pandion haliaetus*

Austin did not locate Yankovskii's Osprey records (in Tomek 1999) from three northern highland sites during 22 June–20 July 1897, demonstrating summer residence; he assessed it as a rare passage migrant. There seem to be no subsequent breeding-season records.

BLACK KITE *Milvus migrans*

Austin quoted Won's statement that Black Kite 'is common and breeds', cited late May and mid July sight-records from Japanese observers, and wrote that 'Kobayashi and Ishizawa include Korea in its breeding range', yet concluded that 'However, there is no evidence that the species breeds in Korea, nor does the 1942 Japanese Hand-List consider that it does so'. In addition, he did not cite various previous opinions in sources from which he quoted widely elsewhere: 'a constant resident at Söul, where it is very numerous' (Campbell 1892); very common throughout the year (Taczanowski 1888); and 'the common kite of Seoul' (Cumming 1935); and he knew that Jouy collected a male in Seoul on 19 June 1883 (Clark 1910). He was not aware that in the Chuul valley it was seen from time to time in summer by Bergman (1935b), who had little doubt that it bred in Korea (Duckworth and Frisk *in prep.*), still less that a chick was collected in Wonsan on 19 June 1900 (Tomek 1999). While Austin was publishing his conclusions, Wolfe (1950) was finding several nests around Seoul, describing the kite as 'a comparatively common breeder in all of the central area...equally at home either in the city streets or on the uninhabited hills'; Fennell (1952) described it as a 'common permanent resident' around Seoul (if not Pusan; but his precise localities do not include those where today the bird occurs most regularly: personal observations); and Prentice (1952) called it 'very common', occurring 'right in the [city centres] of Seoul and Inchon' in 1951–1952. This species is thus a Korean breeder of long standing, but by 1971, Gore and Won Pyong-Oh (1971: 83, 161) stated only that it was 'a familiar sight over Seoul and around towns and villages in the lowlands from mid-October until early April. Large numbers [up to 270] gather together over the capital prior to going to roost. It breeds commonly on Cheju-do but is rare on the mainland in summer...on the mainland scattered pairs breed throughout the [southern provinces]'. This summation suggests that breeding kites were already much decreased, and Park Jin-Young (2002) detailed a subsequent reduction throughout the southern provinces in the number of wintering and migrant Black Kites away from the south coast (and, outside the review area, the loss of breeding birds from Cheju Island). Nowadays in southern Korea the species is only recorded regularly in the south-east (Park Jin-Young 2002, Moores and Moores 2002), where winter roosts of up to 200 form in Pusan, and also as a passage migrant, especially on offshore islands along the west coast, most regularly in October (personal observations). When nesting was proven along the Korean

mainland south coast in 1999–2000, the species was described as a recent addition to the breeding avifauna (Park Jin-Young 2002, Moores and Moores 2002), but these breeders are, conversely, the last remnants of a formerly strong population (or, at best, a recolonisation).

WHITE-TAILED SEA EAGLE *Haliaeetus albicilla*

Austin did not trace the White-tailed Sea Eagle records by Yankovskii (in Tomek 1999) from six northern highland sites during 7 June–2 August (and at another site on 24 May) 1897 (Tomek dated one site as '1987' in error); instead, he called it a winter visitor, listing records only for November–March. Breeding was recently confirmed on Taehuksan Island (Park Jin-Young 2002), and this raptor, which was eradicated from much of its western range during the nineteenth and early twentieth centuries (Cramp and Simmons 1979), may already have been much reduced, and hence largely overlooked, in Korea by the start of the twentieth century.

NORTHERN GOSHAWK *Accipiter gentilis*

Austin called this goshawk 'an uncommon winter visitor to Korea. I have been unable to verify Kuroda's August record, which was taken from unspecified sources...If valid, it must have been a straggler, possibly wounded or a sexually undeveloped bird, unable to make the northward trek in springtime': a bold statement for a country so under-explored and a species that often breeds at such low density (Cramp and Simmons 1979) that without specific searching it is readily overlooked. Austin missed Yankovskii's (in Tomek 1999) record from Ryanggang province in mid July 1897, and the conclusive evidence of Bergman (in Duckworth and Frisk *in prep.*), who documented the Korean practice of robbing every Goshawk nest found so that the young could be trained for falconry, and expressed concern over the consequent rarity, by the 1930s, of breeding Goshawks in Korea. This was a practice of very long standing: according to two Korean government diplomatic handbooks, the *T'ongmun 'gwanji* (1720, and ten subsequent editions) and the *Chungjong kyorinji* (1802 and 1865), nearly 60 hawks annually were exported to Japan, but by 1800, the Japanese had requested that the value of the hawks be converted into rice and cotton, and that was received instead (Lewis 2003; J. B. Lewis *in litt.* 2008). There are scenes of Koguryo people hunting Common Pheasants with hawks, reportedly identifiable as Northern Goshawk, in the mural of Anak Tomb No. 1 and others of this period in Korea (Korean Central News Agency press release, 10 May 2008). Anak Tomb No. 1 was constructed some time within the 4th–6th centuries AD, although we have not confirmed that specific scenes are contemporary.

GREY-FACED BUZZARD *Butastur indicus*

Austin rebuffed Yamashina's statement that this raptor 'is not known to breed in Korea, but I think they probably do' with 'a conclusion not shared by anybody else on record', calling the species 'a not uncommon spring and autumn transient and an occasional winter resident', despite listing specimens collected in June and July 1909 in Kyonggi province. In 1948, Wolfe (1950) found three breeding pairs in Kyonggi province, the only breeding evidence for the southern provinces presented by Gore and Won Pyong-Oh (1971). Juveniles in South Pyongan province on 7 July 1961 and in Ryanggang province on 20

July 1962 (Tomek 1999) imply a wide Korean breeding distribution. The few actual records reflect its typical secrecy near nest sites (Mikhailov and Shibnev 1998). There seem to be few recent indications of breeding in Korea; Park Jin-Young (2002) listed only two recent mid-summer records. This mirrors dramatic declines in the Russian Far East and Japan (Mikhailov and Shibnev 1998, Kawakami and Higuchi 2003).

COMMON BUZZARD *Buteo buteo*

Austin called this raptor 'a common winter resident', stating that Won found it 'common and breeding' and that 'Yamashina says "breeding range extends to Korea"', but concluding that 'The 1942 Hand-List makes no mention of its breeding in Korea, and indeed, there is no evidence that it does so'. There apparently remains no specific detail of breeding, and this buzzard is only a winter visitor to central and southern Korea (e.g. Gore and Won Pyong-Oh 1971, Tomek 1999, Park Jin-Young 2002, personal observations). Sight-records and specimens from Ryanggang and North Hamgyong provinces in June–August 1958–1988, from various sources (Tomek 1999), imply regular over-summering at the least.

COMMON KESTREL *Falco tinnunculus*

Austin described Common Kestrel as 'a common migrant throughout, and a common winter resident in the south and central regions'. He did not discuss the possibility of breeding, despite listing a 27 June 1930 specimen and quoting Taczanowski (1888), who called it 'resident', having earlier (Taczanowski 1887: 598) recorded it for June and July (as well as in winter) in the Seoul area; Clark (1910) also assumed that it bred in Korea. Four specimens collected in Kyonggi province on 20 May 1934, held in FMNH, apparently remained unpublished until Park Jin-Young (2002). Bergman (1935b) saw the occasional bird around the Chuul river valley in summer 1935; he collected the species in both June and July and found a nest there on 28 June 1935 containing large nestlings (Duckworth and Frisk in prep.). Simultaneously with Austin's publication in 1948, Wolfe (1950) found at least five breeding pairs around Seoul; and in 1954, Macfarlane (1963) found them breeding along the river Imjin. Notwithstanding, some authors (e.g. Tomek 1999) have stated that Kestrels began breeding in Korea only during the mid 20th century. Although Tomek (1999) traced only three Pyongyang records before 1980 (1 January 1954, December 1954, 8 January 1958) but many since, this does not imply a change in status: it coincides with the arrival in northern Korea of European observers accustomed to identifying raptors in the field, and may also reflect behavioural change. Nesting Kestrels were 'sly and wary around their nesting site' (Wolfe 1950), but today in at least Pyongyang and Hyangsan they are very noisy and confiding on town and rural buildings' roofs and upper storeys (personal observations). Wolfe (1950) concluded that breeding Kestrels were overlooked in Korea; he did not conjecture recent colonisation.

EURASIAN HOBBY *Falco subbuteo*

Historical evidence for Hobby as a Korean breeder rests on Bergman, who (Bergman 1935b) made incidental reference to Hobby in summer 1935 from the Chuul valley. He was personally convinced of its breeding there, seeing it repeatedly during June, and collecting it as late as 19 June

1935 (Duckworth and Frisk in prep.). Neither Austin nor Tomek (1999) traced records from any pre-1948 dates suggestive of breeding, but in 1960–1961 there were two records in mid June and one in early July (Tomek 1999). By the 1980s it was demonstrably not a rare breeder in northern Korea, being a regular nester in, for example, central Pyongyang (Fiebig 1993). Contrasting her treatment with some other species, Tomek (1999) did not invoke a recent status change. No historical breeding-season records were traced from southern Korea by Park Jin-Young (2002) and as late as 1971 it was still described as only a 'regular passage migrant' (Gore and Won Pyong-Oh 1971). It is unclear whether breeders have become more common or simply more recorded during recent decades.

PEREGRINE FALCON *Falco peregrinus*

Austin assessed Peregrine as 'an uncommon, irregular visitor to Korea', reporting that Won's statement of breeding on high Korean mountains 'has been disallowed by subsequent authors'. He also followed Yamashina's caution over a purported clutch of four eggs from southern Korea, collected on 26 March by Kobayashi and Ishizawa. Wolfe (1950), however, who was sent a clutch of Peregrine eggs from Kobayashi, collected on Chilbal Island on 2 April 1937, and examined a second clutch retained by Kobayashi, stated that 'I have examined both sets and there is no doubt as to their identity'. Peregrine remains regular throughout the breeding season on Chilbal and adjacent islands today, as well as breeding at numerous other sites in the southern provinces (personal observations), bearing out Gore and Won Pyong-Oh (1971) who called it an 'uncommon summer resident' in southern Korea. Neff (1956) documented a 1953 nest on Nan-Do island, although Tomek (1999), overlooking this, hesitated to accept Peregrine as a breeder; the only seasonally relevant records she traced from before the 1980s were two July records from the 1930s.

JAPANESE PARADISE-FLYCATCHER

Terpsiphone atrocaudata

Austin considered this bird 'a rare transient of irregular occurrence in southern Korea...Of dubious identity are two sets of nests and eggs in the LiWong collection', and left without discussion records from 10–12 June and on 15 July. He was not aware that Bergman had observed both sexes in forest outside Seoul on 12–13 July 1936 (Duckworth and Frisk in prep.). By the early 1960s the species was proven to breed in central Korea in both South Pyongan province and Kaesong city (Tomek 2002), and it was stated to be 'an uncommon summer visitor throughout [southern] Korea' by Gore and Won Pyong-Oh (1971). This assessment was presumably based largely on the five records of birds collected during summer in three provinces during 1948–1971, as listed by Park Jin-Young (2002), who also gave post-1971 records in June–August from the same three provinces (Kyonggi, Kangwon and South Kyongsang) and from South Cholla, where breeding in June 2000 was detailed. Explicit confirmation of breeding (away from Cheju, which lies outside the review area), has been rare (Park Jin-Young 2002) but this does not imply that it happens only irregularly.

SCALY THRUSH *Zoothera dauma*

Austin opined that 'Won says [Scaly Thrush] is uncommon, but that it breeds, in which both Yamashina

and the 1942 Hand-List concur. But in view of the specimen record, and the paucity of any other information, the species can only be regarded as a transient'. A more balanced appraisal would have terminated with '...can only be regarded as of uncertain status'. A few breeding-season records from northern Korea during the 1950s–early 1960s included a nest with eggs (Tomek 2002), while birds collected on 19 June 1957 in Seoul and on 3 June 1957 and 10 July 1964 at Kwangnung National Arboretum (Park Jin-Young 2002) no doubt helped lead Gore and Won Pyong-Oh (1971) to call it a 'common summer visitor; breeds in montane and submontane forests throughout [southern] Korea'. Presumably, the general secrecy of this bird when breeding accounts for the paucity of past summer records: if its song is not known it is readily overlooked (personal observations).

GREY-BACKED THRUSH *Turdus hortulorum*

Austin cited Grey-backed Thrush records, as well as many from passage seasons, from 22 June 1933 and 'June', yet called it a 'not uncommon transient'. Within a decade of his publication there were several further June–August records from northern Korea, including a photograph of a nest (Tomek 2002). Breeding was apparently not proven in southern Korea until 1965, at Kwangnung National Arboretum (Gore and Won Pyong-Oh 1971, Won Pyong-Oh 1981, Park Jin-Young 2002).

PALE THRUSH *Turdus pallidus*

A 21 July 1934 Pale Thrush specimen from South Pyongan province by Won was banished from discussion by Austin's calling this thrush 'an uncommon spring and autumn transient...all [sic] the specimen records, except those of Uchida from [South Cholla province], are during the spring migration'. Fennell (1957) published a nest in 1957 (near Pusan) as the first Korean breeding record; in subsequent decades it was recorded sparingly in summer (Gore and Won Pyong-Oh 1971, Tomek 2002). The 1934 record suggests that it was overlooked previously; in Korean hill forests, where it is today a common breeder, it can be very difficult to see (personal observations).

GREY-STREAKED FLYCATCHER *Muscicapa griseisticta*

Bergman collected a fresh juvenile (identified at the time as a Dark-sided Flycatcher) on 6 August 1935 at Nongsadong (Duckworth and Frisk in prep.), but no other data suggestive of Korean breeding were available by 1948. In the 1950s specimens were collected in northern Korea on eight June–July dates from five localities (three close to Nongsadong); one was a juvenile and a nest was also collected (Tomek 2002).

DARK-SIDED FLYCATCHER *Muscicapa sibirica*

Austin wrote that 'there are no data in the literature other than the above [none within 11 June–9 September], yet the 1942 Hand-List says [Dark-sided Flycatcher] breeds in Korea, which is improbable'. Austin did not have Yankovskii's Ryanggang province record (in Tomek 2002) from 30 June 1897, and there were records in July or on 1 August from four northern highland sites in the 1950s, including several juvenile specimens (Tomek 2002).

ASIAN BROWN FLYCATCHER *Muscicapa dauurica*

Despite tracing records of Brown Flycatcher as late as 25 June, Austin called it (only) 'a common spring and autumn

transient. Won says it is common and breeds at Non[g]sadong...Yamashina also surmises that it breeds in Korea, a conclusion not followed by the 1942 Hand-List'. The multiple June–August specimens from many northern highland localities during the 1950s (Tomek 2002) vindicate Won's and Yamashina's views. Gore and Won Pyong-Oh (1971) suspected it nested even south of the Military Demarcation Line, although this was only recently proven, with the first record being of young juveniles seen on 29 June 1994 (Park Jin-Young 2002).

SIBERIAN RUBYTHROAT *Luscinia calliope*

Austin's citation of a record from 30 June 1914 sits uneasily with his national status assessment, in total: 'The Rubythroat is an uncommon transient in Korea'. Despite citing Bergman (1938) for some other species, he did not present that source's rubythroat breeding record from Gekatsuri in summer 1935. The 1950s–1960s gave several July–August records, with breeding again proven in 1951 (Tomek 2002), and there are recent midsummer records from Kangwon province, whence came the June 1914 record (Park Jin-Young 2002, Choi Hui-Yeong 2004). Evidently the species is, and long has been, a locally common breeder in the northern and central highlands (Duckworth 2006).

ORANGE-FLANKED BUSH ROBIN *Tarsiger cyanurus*

Not being aware of Yankovskii's records from three far northern sites during 20 June–15 July 1897 (in Tomek 2002), Austin called this species 'a common spring and autumn transient...a few winter'. Numerous records during the 1950s showed this bird to be a common summer resident in the northern highlands (Tomek 2002), and this is probably still so: in 2001–2003 it was a common high-altitude breeder at Myohyang (personal observations).

WHITE-CHEEKED STARLING *Sturnus cineraceus*

Despite tracing three June, one July and two August dates, Austin asserted that this starling 'is a common spring and autumn transient...There is no definite record of the species' breeding in Korea, and though Yamashina (1933) lists Korea as part of its breeding range, the 1942 Hand-List gives it as just occurring. While some of the June and August specimen records of adults are suggestive and tempting, there is no evidence that it nests south of Manchuria. No subsequent authority has given credence to Y. Kuroda and Miyakoda's (1919) statement that it 'occasionally nests in the eaves of big buildings in Seoul'. This latter statement was probably sound: Wolfe (1950) found it to be a scarce breeder, in Seoul, in 1948, and Bergman found it nesting at Shinten in 1935 (Duckworth and Frisk in prep.). Tomek (2002) found various other breeding-season records from Austin's review period (28 May, 12 June and 7 July 1897 [three different sites]; 15 July and 20 August 1929; and 3 May 1941), as well as six records between 30 May and August in the late 1940s–1950s, and very many summer records from the 1960s and later. To the southern provinces, Gore and Won Pyong-Oh (1971) considered it a 'common summer visitor', although Park Jin-Young (2002) traced no summer specimen from before 1975 (16 June), and listed the first summer flock of over 100 as late as July 1987. It is now a conspicuous breeder in towns and farmland,

abundant in some areas (e.g. Pyongyang; Fiebig 1995). Whilst it has become more common as a Korean breeder since Austin's time, it was evidently nesting at least from the nineteenth century.

EURASIAN TREECREEPER *Certhia familiaris*

Despite citing records from 2 June 1912 and July 1917, Austin considered the Treecreeper 'a not uncommon transient throughout Korea' and did not discuss the possibility of breeding. Tomek (2002) traced several other 1950s records from June–August, including a July 1959 juvenile, although Park Jin-Young (2002) listed no breeding-season records from the southern provinces before 1982, when ten were seen between May and September on Chiri-san.

WINTER WREN *Troglodytes troglodytes*

Tracing no specimen between 26 April and 21 October, Austin stated that 'Southern Korea is unquestionably only its wintering ground. While it may possibly breed in secluded high mountain valleys in Korea, it seems improbable', despite then citing a sight record for 25 May 1931, and the opinions of Taczanowski (1888) and Campbell (1892) that Winter Wren was resident. He concluded with 'Won says it is common and that it breeds, to which Yamashina and the 1942 Hand-List agree, but the evidence does not support the claim' and then ironically endorsed Cumming's (1933) statement that the Korean birds probably breed in Siberia. During the 1950s–1960s the many breeding-season records throughout Korean mountains showed it to be a widespread summer resident (Gore and Won Pyong-Oh 1971, Tomek 2002). Bergman's observations in summer 1935 in the far-northern hills (Duckworth and Frisk in prep.), and a Chagang province specimen overlooked by Austin from well before his defined autumn migration season (6 September 1897; Yankovskii in Tomek 2002) are, surprisingly, the only other summer records in his review period.

GOLDCREST *Regulus regulus*

Austin traced no Goldcrest specimen or sight record between 8 May and 24 September and stated that 'Won says it...breeds in Korea, in which observation he is not joined by the 1942 Hand-List, though there is a questionable set of eggs and nest in the LiWong Museum'. Tomek (1999) left a specimen from 5 July 1966 (Ryanggang province) in limbo: she felt unhappy to consider Goldcrest as a Korean breeding bird, based upon the distance to the nearest known breeding area, but she did not cite breeding in Heilongjiang province, northeast China (Cheng 1987), and it is a locally common breeder further south in Japan (Brazil 1991). Bergman (in Duckworth and Frisk in prep.) also wondered about Korean breeding, but the first detailed proof did not come until summer 2002, when Goldcrest was found on every visit to the highest-altitude (Wonman–Piro) area of Myohyang (personal observations): single singing males on 10–11 June and 1–5 July 2002; two birds on 12 June, 26 and 28 August 2002, with at least one juvenile on the last date. These records, from two localities within the high altitude old-growth spruce *Picea*-dominated forest just below the treeline, were in typical far-eastern breeding habitat: Russian taiga breeding birds are often in spruce (Cramp 1992) with Japanese ones in 'dense coniferous

forests...in the mountains' (Brazil 1991). It is more likely that it was overlooked through its narrow breeding-season habitat use, rather than that these Myohyang birds were recent colonists.

BROWN-EARED BULBUL *Ixos amaurotis*

Austin's statement that 'I found bulbuls...at Seoul every time I went there between December and April, and encountered it...around Suwon from January until the end of April' has no direct value in assessing the species's summer status: he left Korea on 3 May. He nonetheless asserted that it was a 'not uncommon winter visitor to the southern half of Korea,' based on his own fieldwork, the Korean specimens known to him (all from four southern provinces, all but one during October–April), and on Taczanowski (1887, 1888), who found the species common in the Seoul area in winter 1886–1887, but absent the following winter. He listed a summer-time sight record (25 May 1931, North Chungchong province), with no comment, and neither he nor Park Jin-Young (2002) were aware that Bergman (in Duckworth and Frisk in prep.) had observed this bulbul outside Seoul on 12–13 July 1936. Fennell (1952) found it common in summer in Pusan right through his stay (March–October 1948), while there were June, July and August specimens from South Pyongan province in 1952–1954 (Tomek 2002). The first summer-time bulbul collected in the southern provinces listed by Park Jin-Young (2002) came in 1953, from North Kyongsang province. Macfarlane (1963) still considered it a winter visitor (late September–late April) to his study site at the Imjin river near Seoul in 1954. Even though Park Jin-Young (2002) noted no summer-time specimen from Kyonggi province until 1963, nor from Kangwon and South Kyongsang provinces until 1966, by 1961 Won Pyong-Oh (1961: 87–88) had already described the species as a 'permanent resident in [southern] Korea', conceding that there were 'no exact data on the breeding of this bird in Korea', but reporting eight specimens collected during July–September (seven from Kwangnung national arboretum and one from South Kyongsang province). A decade later Gore and Won Pyong-Oh (1971) categorised the species as a common resident and winter visitor to the southern provinces. In sum, Brown-eared Bulbul was summering at least locally in the mainland southern provinces in the 1930s, becoming more widespread in the 1950s–1960s, and is now common all year in Korea south of c.40°N, including the cities of Pyongyang and Seoul (Fiebig 1995, Park Jin-Young 2002, Tomek 2002). Its urban occurrence, conspicuousness to eye and ear, and the evident familiarity of some historical observers with the species, suggest a genuine major range expansion on the Korean mainland.

WHITE-BROWED CHINESE WARBLER

Rhopophilus pekinensis

Austin wrote that 'Chinese Babbler is a rare visitor to Korea, of uncertain status. Won states that it is common and breeds, but the Japanese have not accepted his opinion', despite then giving four June–July specimen dates. Several further records from May–July in the 1950s–1960s convinced Tomek (2002) that it is a 'rare breeding species', while Gore and Won Pyong-Oh (1971) wrote that 'there are a number of recent summer records and it is known to breed in north Korea, but breeding still has to be proved [in southern Korea]'.

THICK-BILLED WARBLER *Acrocephalus aedon*

Being unaware of the fledgling collected by Bergman on 2 August 1935 at Nongsadong (Duckworth and Frisk in prep.), Austin (1948) did not even discuss the possibility of Thick-billed Warbler breeding in Korea. Tomek (2002) thought it might breed, solely through a specimen dated 13 June 1955; but this is little later than known passage dates (Duckworth 2006). There has apparently been no evidence of breeding in Korea since Bergman's; Tomek (2002) suspected that it may be at best peripheral.

PALLAS'S LEAF WARBLER *Phylloscopus proregulus*

Austin assessed this warbler as a passage migrant: he traced no records between 25 May and 13 September. He knew of neither Yankovskii's (in Tomek 2002) Ryanggang province record from 30 June 1897, or Bergman's (1935a) description of a nest from Engan. Many further June–August records in the 1950s–1960s (Tomek 2002) indicate that the species breeds widely in the northern highlands.

GREY WAGTAIL *Motacilla cinerea*

Austin called Grey Wagtail 'a common spring and autumn transient', grudgingly conceding that 'it is doubtfully a summer resident in the north'; but Bergman (1935b) had already observed fledged young along the Chuul river; he found it at several sites in midsummer (Duckworth and Frisk in prep.). Also unknown to Austin, a nest was found near Wonsan on 9 May 1903 (Sweet *et al.* 2007), and Yankovskii (in Tomek 2002) recorded the species in Ryanggang province on 8 June and 6–8 August 1897. Austin's disparagement of Korean breeding is baffling: he cited a June record from Seoul (Taczanowski 1887), Taczanowski's (1888) comment that it 'nests', Campbell's (1892) assessment as a 'summer visitor', and stated 'Y. Kuroda and Miyakoda give its season in Seoul as from early April to late October, adding "nest not yet found, but we often see young with yellow at the base of the bill, so they seem to nest near by".' Within a few years of Austin's statement, breeding, or at least summer presence, was recorded in central Korea by Fennell (1952) and Macfarlane (1963), and June and July records came from many northern sites in the 1950s (Tomek 2002); it is a common breeder across the country (Gore and Won Pyong-Oh 1971, Tomek 2002).

COMMON ROSEFINCH *Carpodacus erythrinus*

This rosefinch was omitted entirely from Austin's book, despite several breeding-season records: Yankovskii and Won Hong Koo (in Tomek 2002) recorded it on 3 July 1897 and 8 August 1939 respectively from the northern highlands, while Bergman collected many specimens and was sure that it bred at both Engan and Gekatsuri in 1935 (Duckworth and Frisk in prep.). Many breeding-season records came from various northern highland localities in the 1950s–1960s (Tomek 2002).

PALLAS'S ROSEFINCH *Carpodacus roseus*

Austin called Pallas's Rosefinch an 'irregular winter visitor', although the 11 May 1918 date he cited from North Hamgyong province is weeks after spring passage through inland central Korea ends (early April; personal observations). Tomek (2002) traced subsequent records from 15 June 1960, 5 June 1980 (omitted from Tomek 1984 but reconfirmed by T. Tomek *in litt.* 2006), and 29

June and 1 July 1983, but still hesitated to call it a Korean breeder. Breeding remains unproven but plausible; the species is undoubtedly regular in midsummer.

TRISTRAM'S BUNTING *Emberiza tristrami*

Austin assessed this bunting as 'a spring and autumn transient', tracing no records within 31 May to 13 September. He was unaware of Yankovskii's (in Tomek 2002) records from two Ryanggang province sites during 30 June–11 July 1897. Numerous further records during June–August in the 1950s–1960s (Tomek 2002) revealed a wide breeding distribution across Korea's northern highlands.

DISCUSSION

The scale and strength of the unjustified rejections of Korean breeding status

A good review draws conclusions only where the evidence merits them; Austin discarded the necessary caution with the 43 species discussed above. For 27 of them, he knew of records that should have led him, if he felt unable to accept others' testimony that they bred in Korea, at least to leave unresolved whether or not they did so. Instead, he made unambiguous, often strongly-worded, exclusions (a slight margin of doubt conceded for two species) of Korean breeding or even summer residence. Breeding-season records for several species (e.g. Northern Goshawk) were parried with contrived excuses, while for others (e.g. Grey-backed and Pale Thrushes) the records were, although listed in the data section, simply ignored in the discussion. For the other 16 species, Austin did not search carefully enough to find the data that contradict his conclusions. For those species known by summer records during Austin's review period but proven to nest only shortly afterwards, their long standing as Korean breeders is a more parsimonious explanation than a simultaneous joint colonisation around 1948. This is also the case for 19 Korean breeding species for which strong suspicions of Korean breeding come from only after 1948 (Appendix 1, Category 5). Ten species (footnote to Category 5) seem likely to have colonised Korea since Austin, but past data are too scanty to assess whether any species visually inconspicuous in the breeding season is a recent colonist or was simply overlooked. For a further 28 species (Appendix 1, Category 3), Austin was more balanced: although not accepting others' explicit views of Korean nesting, he did admit its possibility.

Austin was not prophetic in which species to reject as breeders and which to leave unresolved. It is still unclear whether 14 species about which Austin was open-minded do breed in Korea (Appendix 1, Category 6). In addition to the 43 species which Austin rejected as Korean breeders despite contemporary evidence (Category 4), he dismissed (explicitly or implicitly) 20 more (five with contemporary claims of breeding) for which true status remains unresolved (Category 7). Only two species where Austin directly and strongly rebutted another's authority of breeding in Korea, Merlin (Won and, not mentioned by Austin, Clark 1910) and Chestnut Bunting (Won) would, based on regional distribution, be very surprising as Korean breeders. Only if Austin's sources had falsely suggested numerous species breeding in Korea would his propensity to reject these sources be valid.

Austin was cautious of equating undoubted summer residency with breeding (Appendix 1, Category 2), although he approached his limit with Carrion Crow: 'while it seems ridiculous to question the fact that this species breeds in Korea, which all recent authorities accept, there is no proof of it whatever beyond the specimen collection dates'. (In fact there was, albeit unpublished: Bergman [in Duckworth and Frisk in prep.] documented nesting in 1935–1936.) This caution is preferable to his refusal to assign even the possibility of summer residency to the 43 species in Category 4, but seems excessive for the many species with many breeding-season records.

Table 1. Vaurie's assignment of breeding-season Korean status for 43 species erroneously rejected as breeders by Austin.

Species	Vaurie's assessment
MANDARIN DUCK <i>Aix galericulata</i>	Does not breed
MALLARD <i>Anas platyrhynchos</i>	Does not breed
HARLEQUIN DUCK <i>Histrionicus histrionicus</i>	Does not breed
RED-BREASTED MERGANSER <i>Mergus serrator</i>	Does not breed
HODGSON'S HAWK CUCKOO <i>Hierococcyx fugax</i>	May breed
COLLARED SCOPS OWL <i>Otus bakkamoena</i>	Does not breed
URAL OWL <i>Strix uralensis</i>	Breeds
NORTHERN HAWK OWL <i>Surnia ulula</i>	Does not breed
LITTLE OWL <i>Athene noctua</i>	Does not breed
COMMON SANDPIPER <i>Actitis hypoleucos</i>	Does not breed
LONG-BILLED PLOVER <i>Charadrius placidus</i>	May breed*
KENTISH PLOVER <i>C. alexandrinus</i>	Breeds
NORTHERN LAPWING <i>Vanellus vanellus</i>	Does not breed
OSPREY <i>Pandion haliaetus</i>	May breed**
BLACK KITE <i>Milvus migrans</i>	May breed
WHITE-TAILED SEA EAGLE <i>Haliaeetus albicilla</i>	Does not breed
NORTHERN GOSHAWK <i>Accipiter gentilis</i>	Does not breed
GREY-FACED BUZZARD <i>Butastur indicus</i>	May breed
COMMON BUZZARD <i>Buteo buteo</i>	Does not breed
COMMON KESTREL <i>Falco tinnunculus</i>	May breed
EURASIAN HOBBY <i>F. subbuteo</i>	Does not breed
PEREGRINE FALCON <i>F. peregrinus</i>	May breed
JAPANESE PARADISE-FLYCATCHER <i>Terpsiphone atrocaudata</i>	Does not breed
SCALY THRUSH <i>Zoothera dauma</i>	May breed
GREY-BACKED THRUSH <i>Turdus hortulorum</i>	May breed
PALE THRUSH <i>T. pallidus</i>	Does not breed
GREY-STREAKED FLYCATCHER <i>Muscicapa griseisticta</i>	Does not breed
DARK-SIDED FLYCATCHER <i>M. sibirica</i>	Breeds
ASIAN BROWN FLYCATCHER <i>M. dauurica</i>	Breeds
SIBERIAN RUBYTHROAT <i>Luscinia calliope</i>	Does not breed
ORANGE-FLANKED BUSH ROBIN <i>Tarsiger cyanurus</i>	Does not breed
WHITE-CHEEKED STARLING <i>Sturnus cineraceus</i>	Does not breed
EURASIAN TREECREEPER <i>Certhia familiaris</i>	Breeds
WINTER WREN <i>Troglodytes troglodytes</i>	Breeds
GOLDCREST <i>Regulus regulus</i>	May breed
BROWN-EARED BULBUL <i>Ixos amaurotis</i>	Does not breed
WHITE-BROWED CHINESE WARBLER <i>Rhopophilus pekinensis</i>	May breed
THICK-BILLED WARBLER <i>Acrocephalus aedon</i>	Does not breed
PALLAS'S LEAF WARBLER <i>Phylloscopus proregulus</i>	Does not breed
GREY WAGTAIL <i>Motacilla cinerea</i>	Breeds
COMMON ROSEFINCH <i>Carpodacus erythrinus</i>	Does not breed
PALLAS'S ROSEFINCH <i>C. roseus</i>	Does not breed
TRISTRAM'S BUNTING <i>Emberiza tristrami</i>	Does not breed

*recorded once during the summer'.

**'breeding records are lacking for Korea' (by implication of the text, it would be expected to breed there).

In total, Austin classed only 84 species as confirmed Korean breeders (Appendix 1, Category 1), totalling, with 17 species for which he saw summer residency as indicating Korean breeding (Category 2), 101 Korean breeding species. A further 42 species were left of uncertain summer status (Categories 3, 6). Austin's total range, of 101–143 breeding species, was at least a 30–50% underestimate: 62 further species are known or were likely to have been breeding in Korea during 1880–1948 (Categories 4, 5); further Korean breeders surely remain unfound (Categories 6–8 include 43 species with indications to date), while others may have disappeared before breeding was detected. By 1948, knowledge of the breeding avifauna remained significantly incomplete for most continental countries outside western Europe and North America, simply because large tracts of land remained un- or under-explored; but we know of no other country with its breeding avifauna so seriously underestimated through rejection and oversight of existing information.

The fate of the unjustified rejections

For dozens of species, Austin confused an absence of (to him, solid) breeding data with a genuine lack of a Korean breeding population. In effect, almost any species without proof of breeding was, by default, a visitor or straggler. Such an attitude suits well-surveyed avifaunas, e.g. Austin's own (in the U.S.A.), but not poorly researched ones. Subsequent readers have not critically distinguished the facts of Austin's data-set from the conclusions he drew from it. The latter have been repeated as factual, so that particularly for Common Sandpiper and Common Kestrel, twentieth-century breeding colonisation of Korea has, erroneously, become accepted wisdom, while the beleaguered Black Kite is stated to be only a very recent breeder. Moreover, Tomek (1999) evidently concluded that breeding Oriental Scops Owls colonised Korea only after Austin, even though the latter had not excluded the possibility of breeding (Appendix 1) and had quoted (without endorsing) Won's 1930s record of breeding and statement that it was common. Won was doubtless correct: Bergman (in Duckworth and Frisk in prep.) independently proved breeding in central Korea in the mid-1930s. Austin's conclusions had a strong impact on following ornithological publications: for the 43 species he rejected as breeders despite contemporary evidence, Vaurie (1959, 1965) did not question his conclusions for 25 species; he accepted only seven as breeding in Korea, and left 11 uncertain (Table 1). Even later, 'Austin (1948)' is widely quoted for Korean status in definitive sources such as *Birds of the Western Palearctic* (Cramp and Simmons 1977, and subsequent volumes). Most species that Austin assessed in error have been quietly absorbed into the perceived Korean breeding fauna, on the (usually implicit) assumption that they were there all along, but several are still contested as Korean breeders, e.g. Harlequin Duck, Northern Hawk Owl, Northern Goshawk and Goldcrest, as well as some species not even suspected by anyone, as far as we can tell, during Austin's review period to breed, e.g. Eurasian Bullfinch.

Austin's ability to inform himself

Austin's personal authority to draw Korea-wide conclusions about bird status, especially in the breeding season, was limited. He was based at Suwon, '30 miles

south of Seoul, in the heart of the coastal rice-producing belt', calling it 'one of the poorest collecting grounds in Korea, with but scant cover' (p. 25); and, moreover, he was only in Korea from November 1945 to 3 May 1946, thus arriving months after most species stop breeding and departing well before the breeding season is in full swing (and he knew this through the 'many dependable migration dates' of a light-house keeper; p. 20). Further, in Austin's time, travel within Korea was difficult and restricted (Fennell 1952), and there is no evidence that Austin ranged, still less collected, far from Suwon and a few major cities; he managed to collect only 90 species and saw several score more (p. 25). All this should have instilled Austin with considerable caution over rejecting others' statements, but his accounts, e.g. for Common Kestrel, show him extrapolating non-breeding status at Suwon to a national scale, overriding contradictory evidence. National-level inference from any single site is untenable; and Suwon, on Austin's description, seems a particularly inappropriate one from which to have done this.

Austin did not compensate for his limited field experience by comprehensively trawling specimens and literature, despite his text's implications. He claimed 'a review of all the literature available' (p. 3), but as well as not reading Bergman (1935a, 1935b), which he cited, he did not mention Sowerby (1923) or Yankovskii (1898). Explicitly, only 'museums and private collections in Korea, Japan and the United States' were covered, written sources (e.g. Campbell 1892) being used for European holdings. He knew of Bergman's and Anderson's (see Anderson 1907) collections (and, incidentally, massively overestimated the quantity of Korean peninsula bird specimens in the latter, at c.1000; only c.150 are listed in the NHM accessions register; M. Andrews *in litt.* 2005), both then undocumented. Anderson's collection contains breeding-season material only from Cheju (M. Andrews *in litt.* 2005), but Bergman's is one of the richest breeding-season collections ever made in peninsular Korea (Duckworth and Frisk *in prep.*). Austin was unaware of breeding-season collections such as Yankovskii's (1898), and more may yet surface.

Even his review of American holdings was not complete: as he himself stated (pp. 10–11), he covered only part of the large late-spring Hall collection from 1903. This makes his strong stances all the more puzzling, e.g. his dismissal (p. 113) concerning the inclusion of Korea within the range of Greater Sand Plover *Charadrius leschenaultii* as given in the *Hand-List of Japanese birds* with 'there is not a Korean specimen traceable in any collection today, or in any of the literature', when in fact Hall's two birds lay in AMNH (Sweet *et al.* 2007). Even for species genuinely lacking specimens, there should have been great caution in firmly concluding breeding-season absence at the national level. Most collectors spread effort unequally over the available habitats and altitudes, and even within the areas they cover, they may be highly selective for species. Delacour (1929) was unusual in making explicit that he did not collect common migrant species; most collections give no indication of the extent and types of selection exercised. By 1948, large tracts of Korea were known only from one, if any, extensive breeding-season collection, making assertions of absence a rash undertaking—as is shown here.

Austin's reactions to his sources

Austin worked with many status assessments that, neither containing nor citing primary data, were hard to evaluate. Chief among these was the multi-edition *Hand-list of Japanese birds* (Ornithological Society of Japan 1922, 1932, 1942); Japan, before 1945, occupied Korea. Austin's (p. 19) lengthy critique stated that it 'all too frequently makes cryptic, dogmatic statements for which no substantiation can be found'. Such sources seem to have sparked or intensified in him a mission to expunge everything for which he could find either no or (to him) merely questionable substantiation. This would have been helpful had he called past statements into question pending confirmatory data, rejecting them only where he documented that they stemmed from false data, such as misidentified specimens. Instead, he fell into a dismissive outlook not unusual among Europeans and Americans when confronted with the radically different knowledge systems that they found in Asia (see, e.g., Fan 2000). Austin's language, often heavy-handed (e.g. Hodgson's Hawk Cuckoo, above), shows him warming to his task as he became assured of carrying his readers with him, e.g. (p. 73) 'Won says [Eurasian Sparrowhawk is common and that it 'breeds deep in the mountains', which in itself is suspicious'. Quite why it is 'suspicious' is not revealed: on the contrary, given the documented heavy nest-raiding to which Goshawks were subjected (see above), remote areas were probably the most likely places for raptors to persist. Austin seems to have felt that assigning breeding status to a species was a pernicious temptation to be fought against, implicitly praising himself for not bending to it with White-cheeked Starling (see above), and seems to have seen in himself better mastery of such feelings than was possessed by most other people.

Austin's feeling of superiority was partly nationalistic. As an American, he lamented the delay between the American P. L. Jouy's collection in Korea in 1883–1886, and Clark's (1907) naming of the new taxa within. Such phrases as 'and the first of Jouy's previously collected [potential] types was lost to America by Taczanoski's [1887] description of the Korean Crested Lark' (p. 9), and 'and the types of two more common Korean birds...went to the British Museum while Jouy's identical material collected almost ten years earlier still lay unattended in Washington [U.S.A.]' (p. 9) show how it irked him that these others were Polish and British, or, at any rate, not American. He also wrung his hands over the delayed attention to (the American) Roy Chapman Andrews's skins: 'and it contains adequate material of half a dozen or more valid subspecies which were described subsequently either by Europeans from material taken later in nearby Ussuria, or by the Japanese from the birds Orii collected in Hamgyong Pukto almost twenty years later!' (p. 13). This reflects patriotic competitiveness in 'race to the Pole'-style geographical exploration; Teddy Roosevelt said in 1909, on return to the U.S.A. from an overseas biological expedition, that 'I wanted to have Uncle Sam [= the U.S.A.] have a first-class collection, possibly a little better than anybody else' (Cutright 1956). It seems to have been but a small step further for Austin to assume that other nationalities writing of Korean birds might therefore bolster their findings through unwarranted extrapolations. He generally scorned Japanese endeavours, shown best by his occasional patronising praise of them: Yamashina's (1933, 1941) *Natural history*

of *Japanese birds* 'compares well with modern American and English treatises of a similar nature' (p. 17), while T. Momiyama 'described fourteen fancied new forms from Korea alone, none of which is recognizable, and most of which, to their credit be it said, were invalidated by other Japanese' (p. 19). Writing in the aftermath of the second world war, which had pitted Japan against America, such a bias is symbolised by Austin dedicating his book 'to American Military Government'; the latter underwrote his time in Korea. After training for the 'invasion and occupation of Japan', Austin was 'reassigned and shipped off to Korea...to learn about Koreans, and about Korean culture, customs and geography, "the hard way".' (p. 24). On the victor's side, he seems to have matched political rebirth with a self-set mandate to wipe the ornithological slate clean too, thereby swinging his objectivity of judgement. Austin's *Auk* obituary described him as 'an intense, provocative, man' of 'strong personality and opinion' (Clench and Hardy 1989), and these traits reduced the scientific authority of his first national avifauna.

Austin and Professor Won Hong Koo

Austin aimed a few broadsides at nineteenth-century Europeans' opinions, but his most pervasive suspicions attended the conclusions of Won Hong Koo, the first and foremost Korean ornithologist. Although Austin (pp. 20–21) felt 'forced to...acknowledge his accomplishments' this was qualified with 'as outstanding among his people'. He (p. 64) wrote that 'Won calls [*Gadwall* *Anas strepera*] common, but inasmuch as he calls the Wigeon [*A. penelope*] rare, which I found common, his field identification in this case may be questioned'. Austin wrote this on the basis of a few months in Korea, mostly at one site, and these species, not readily confusable, are both common in Korea (e.g. Fiebig 1993). He remarked that 'Won calls [*Fork-tailed Swift*] common in Pyongan Namdo, and says it nests there in an old castle near Anju. The species is known definitely to breed in Korea only on offshore islands...'; Won's account from his town of long-term residence clearly was not definitive in Austin's eyes. Various of Won's dates suggestive of breeding and included in Austin's lists of Korean records were not considered even worthy of specific rebuttal (e.g. Pale Thrush). Austin rejected no less than 16 of Won's breeding claims (Appendix 1, Categories 4, 7), and seriously queried 20 others (Appendix 1, Categories 3, 6); these figures do not include those species, if any, which Won called breeders for which Austin did not repeat the statement.

Austin never met Won, nor had access to his collection, yet still felt entitled to announce that 'Won seems to have been fired by a patriotic ambition (lamentably universal among enthusiasts of every nationality including the American) to compile as large a list of species and subspecies as possible...The number of forms he dogmatically states breed in Korea exceeds those that actually do, and as he makes other similar misstatements with no attempt at proof, it is difficult to know when to believe his more probable assumptions' (p. 22). This attribution of patriotic cause reflected Austin's own outlook. His easy dismissal of statements at variance with his own perceptions is typical of early westerners in the 'mysterious East', e.g. Sampson (1984 [reprint]) in the 1860s who labelled a Chinese text's statement of fruit size as 'doubtless an Oriental exaggeration'. The double irony here is that in most cases where Austin presented and

then dismissed Won's breeding claims, Won was correct (see above), and that Austin had no 'proof' for his own equally dogmatic pronouncements. Austin rationalised his untenable position with (p. 22) 'The Japanese, though guilty to a lesser degree of the same negligence [as Won], solved the problem by not believing him at all'.

Austin found 'the Korean scientists not only lacking in knowledge and ability, but regrettably ignorant of any conception of the meaning of truth' (p. 23). Anybody harbouring the prejudice oozing from his section on truth and 'the Oriental mind' (p. 23) would feel entitled to dismiss opinions or facts presented by any such mind. It is critically important to understand that Austin did just this for whatever sat inconveniently with his own preconceptions. His culturally-biased double-standards are best illustrated through Arctic Warbler. Despite his hard line on such distinctive species as Mandarin Duck, Austin accepted that Arctic Warbler was 'perhaps a not uncommon summer resident in the highlands' (p. 216), although all evidence of this is patently flawed (Duckworth 2007). Even though Austin (p. 276) expressed concern over the general reliability of the Canadian D. J. Cumming's (1933) work, and even though *Phylloscopus* presented some of the toughest species-level identification challenges in Korea (using Austin's species limits), Austin quoted Cumming at length on the genus, with no caveat; yet Cumming clearly had confounded Arctic Warbler with its congeners (Duckworth 2007).

Austin's influence on today's attitudes

Austin's assessment of Korea's pre-1948 avifauna is far more accessible to subsequent researchers than are many of his primary sources. As well as muddling the real historical status of Korean birds, his hectoring tone has left a further damaging legacy: subsequent reviewers have felt entitled widely to dismiss or question Won Hong Koo's conclusions. Well after the publication of Austin, *The birds of Korea* (Won Hong Koo 1963–1965) expanded the number of species stated to breed in Korea, reflecting continued collection by Won and colleagues. The next foreign-authored review of northern Korean birds (Tomek 1999, 2002) severely questioned Won's statements of eight species as Korean breeders (Harlequin Duck, Eurasian Curlew, Common Greenshank, 'Herring gull *Larus argentatus*', Cinereous Vulture, Narcissus Flycatcher, Eurasian Bullfinch and Rustic Bunting) further to repeating Austin's doubts on several others. This total is a minimum: Tomek (1999, 2002) did not cite Won's (1963) claims of Swan Goose breeding in Korea (BirdLife International 2001), and may have treated other species similarly. By contrast with Austin, Tomek usually strongly questioned, rather than rejected, the claims, and gave reasons: usually the distance to nearest known breeding grounds and/or the lack of specific data. Three of the eight (Harlequin Duck, 'Herring Gull' and Eurasian Bullfinch) do breed in Korea (Appendix 1), and some of the others may well yet be found to do so. Vaurie (1959, 1965) did not list any of these eight species as even possible Korean breeders.

A further damaging consequence of the apparent authority of Austin is that subsequent workers do not systematically seek and check pre-1948 sources. The most comprehensive recent assessment of birds in the southern provinces (Park Jin-Young 2002) listed over 160 references but included only four pre-dating Austin. For

the northern provinces, Tomek (1999, 2002) gave fresh interpretation to Giglioli and Salvadori (1887), Taczanowski (1887, 1888), Kuroda (1918) and, most significantly, Won Hong Koo, but not to Campbell (1892), Clark (1910), Yamashina (1932), Cumming (1933), Bergman (1935a, 1935b, 1938) or any Japanese-language sources.

In sum, the many species where primary data negate Austin's (and others') dismissal of Won Hong Koo's assessments lead us to recommend that the latter should be taken as plausible when evaluating the historical status of Korean birds, unless there is a specific, convincing, doubt (as with Arctic Warbler; Duckworth 2007), even though there are problems in the detail of some records. Won put in his account of Long-tailed Duck *Clangula hyemalis* many data Austin presented for Harlequin Duck (Tomek 1999: 71); and data for individual records often do not correspond between the specimens in the Academy of Sciences collection and Won's book, even though the latter was based on the former (T. Tomek *in litt.* 2004). At least partly this is because later collection staff re-copied specimen labels and destroyed the old ones. This practice always loses data (Rasmussen and Prys-Jones 2003) and retained earlier labels exposed copying errors (Tomek 1999: 108). Errors of detail are inevitable in any large-scale compilation of records: many may come from typists, editors and typesetters, followed by poor proof-reading, so do not invalidate conclusions. In most cases Won's conclusions will have reflected years of direct field experience of his team, not microscopic examination of pooled individual records.

Other problems with Austin's species accounts

This review covers only breeding status, but Austin's assertive statements about winter status also warrant attention. For example, both Coal and Varied Tits were called summer residents, wintering only in the far south. This certainly does not reflect today's situation (Tomek 2002) and probably not even that pre-1948: Bergman (in Duckworth and Frisk in prep.) found Coal Tits right through winter 1935–1936 in the harsh northern highlands. Various other factors urge caution with Austin's conclusions and even the data he presented, irrespective of season.

Firstly, while accepting most specimen identifications as given, Austin rejected various taxa morphologically similar to others and which he thought unlikely to occur in Korea, without necessarily having examined the specimens. He did this with (Western) Marsh Harrier *Circus (a.) aeruginosus*, by omission of Yamashina's (1932) record of three adult females at Manpo in autumn 1929, and with Ryukyu Minivet *Pericrocotus tegimae*, Water Pipit *Anthus spinoletta blakistoni* and Hoary Redpoll *Carduelis hornemanni* by openly refuting others' identifications. The Water Pipit was in fact correctly identified (Fennell 1959); the original specimens of the others may no longer exist. All three passerines have been suspected recently to occur in Korea (Moores and Moores 2003, 2005). Some of Austin's own sight records in Korea warrant scepticism, e.g. his run of April sightings of Japanese Cormorants on the large lake in Suwon, when that species is now known to be almost exclusively confined to rocky offshore islands and marine areas (Lethaby and Moores 1999), and to be back at breeding colonies by March and April (personal observations), and when he himself (p.35) noted

that Temminck's and Great Cormorants are 'easily confused'.

Secondly, abundances and Korean ranges as assessed by Austin may also be misleading, e.g. immediately after Austin referred to Little Heron's 'rarity' in Korea, Wolfe (1950) and Fennell (1952) assessed it respectively as 'common in suitable localities' and a 'common summer resident', from two widely-spaced areas of southern Korea. Many similar examples could be quoted: the issue particularly affects species of coastal and marine areas. Despite a significant loss and degradation of intertidal habitat in the decades following Austin, later survey efforts revealed large concentrations of many coastal waders in Korea (e.g. Gore and Won Pyong-Oh 1971, Long *et al.* 1988, Moores 1999a). Austin's description of estuarine species such as Marsh Sandpiper *Tringa stagnatilis* as 'a rare straggler' and Great Knot *Calidris tenuirostris* as 'a rare transient visitor' may well simply reflect lack of pre-1948 coverage of their habitats and the difficulties, then, of field identification; both are nowadays recorded regularly, but no actual status change should be inferred (Moores 2006).

Finally, Austin was often slack in compilation, transposing records between collecting sites on a given expedition (e.g. Orii's Marsh Tit records from Kimhwa in central Korea [Yamashina 1932] to the far northern highlands) or between species (e.g. a series of Olive-backed Pipits entered under 'Water Pipit *A. s. japonicus*'; Duckworth 2006), assigning localities when none existed other than 'Korea' (e.g. to several specimens in the Hall collection; Sweet *et al.* 2007), and listing impossible dates (e.g. 31 November and 31 April; pp. 198, 206, 271) without comment. Most such errors were repeated by Tomek (1999, 2002), who did however expose Austin's erroneous transposition of Orii's Rufous-bellied Woodpecker from the west coast lowlands to the Paekdu-san massif.

Astonishingly, Austin elsewhere made the sort of unsupported remarks on Korean bird status that he had so disparaged in his Korean avifauna. Austin and Kuroda (1953: 457) stated that a 'Korean population' of Marbled Murrelet *Brachyramphus marmoratus* 'winters south to the northern Ryukyus'. Yet Austin (1948) traced but one Korean record of the species. Neither Fennell and King (1963) nor Duckworth (2006) could trace the factual basis of the 1953 statement; there probably was none.

CONCLUSIONS

Fiebig (1995: 96) wrote that 'A critical checklist for the whole [Korean] Peninsula is inevitable. In this checklist the rather generalised statements should be reduced to really proved ones'. Central to such an endeavour must be to evaluate pre-1948 records and status independent of Austin's publication, by full recourse to written and surviving specimen sources. Austin's negative status assertions must be regarded particularly critically. All the subsequent major reviews of Korean birds have erroneously deduced that various species colonised Korea during the twentieth century, through coupling Austin's statements that they did not breed in Korea with recent evidence that they do. Because Austin's was the only English-language summation of Korean birds up to 1971, it has exerted the cultural equivalent of a genetic founder effect on thinking about Korean bird status. Given the

patchy past coverage of Korea's birds, absence of data does not necessarily suggest, let alone prove, a former absence of the species. The past status of many Korean species will have to remain unresolved.

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Species	Category number							
	1	2	3	4	5	6	7	8
	Austin's view of historical Korean breeding							
	Breeds, no caveat	Breeds (?), but caveat	May or may not breed	Does not breed	Does not breed	May or may not breed	Does not breed	Does not breed
	Pre-1970 breeding-season records or opinions of breeding							
Many / some	Many / some	Many / some	Many / some	Few / none	Few / none	Few	None	
Revised view of historical Korean breeding								
	Breeder ¹	Breeder	Breeder	Breeder	Presumed breeder	Unclear	Unclear	Unclear
HODGSON'S HAWK CUCKOO <i>Hierococcyx fugax</i>				X*				
INDIAN CUCKOO <i>Cuculus micropterus</i>					X			
EURASIAN CUCKOO <i>C. canorus</i>		X						
ORIENTAL CUCKOO <i>C. saturatus</i>				X**				
LESSER CUCKOO <i>C. poliocephalus</i>				X**				
WHITE-THROATED NEEDLETAIL <i>Hirundapus caudacutus</i>				X**				
FORK-TAILED SWIFT <i>Apus pacificus</i>	X							
ORIENTAL SCOPS OWL <i>Otus sumia</i>				X**				
COLLARED SCOPS OWL <i>O. bakkamoena</i>				X**				
EURASIAN EAGLE OWL <i>Bubo bubo</i>	X							
TAWNY OWL <i>Strix aluco</i>	X							
URAL OWL <i>S. uralensis</i>				X**				
NORTHERN HAWK OWL <i>Surnia ulula</i>				X				
LITTLE OWL <i>Athene noctua</i>				X**				
BROWN HAWK OWL <i>Ninox scutulata</i>	X							
LONG-EARED OWL <i>Asio otus</i>							X**	
GREY NIGHTJAR <i>Caprimulgus indicus</i>		X						
ROCK PIGEON <i>Columba livia</i>								X ⁴
HILL PIGEON <i>C. rupestris</i>	X							
JAPANESE WOOD PIGEON <i>C. janthina</i>					X			
ORIENTAL TURTLE DOVE <i>Streptopelia orientalis</i>	X							
EURASIAN COLLARED DOVE <i>S. decaocto</i>	X ¹							
SWINHOE'S CRAKE <i>Coturnicops exquisitus</i>						X		
BAILLON'S CRAKE <i>Porzana pusilla</i>				X**				
RUDDY-BREASTED CRAKE <i>P. fusca</i>					X			
BAND-BELLIED CRAKE <i>P. paykullii</i>				X**				
WATERCOCK <i>Gallinago cinerea</i>	X							
COMMON COOT <i>Fulica atra</i>		X						
COMMON SNIPE <i>Gallinago gallinago</i>							X	
EURASIAN CURLEW <i>Numenius arquata</i>							X	
COMMON GREENSHANK <i>Tringa nebularia</i>							X	
COMMON SANDPIPER <i>Actitis hypoleucos</i>				X*				
GREATER PAINTED-SNIPE <i>Rostratula benghalensis</i>					X			
EURASIAN OYSTERCATCHER <i>Haematopus ostralegus</i>	X							
LONG-BILLED PLOVER <i>Charadrius placidus</i>				X				
LITTLE RINGED PLOVER <i>C. dubius</i>	X							
KENTISH PLOVER <i>C. alexandrinus</i>				X				
NORTHERN LAPWING <i>Vanellus vanellus</i>				X				
ORIENTAL PRATINCOLE <i>Glareola maldivarum</i>								X ⁵
BLACK-TAILED GULL <i>Larus crassirostris</i>	X							
YELLOW-LEGGED GULL <i>L. cachinnans</i>					X ³			

Species	Category number							
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	Austin's view of historical Korean breeding							
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	Pre-1970 breeding-season records or opinions of breeding							
	Many / some	Many / some	Many / some	Many / some	Few / none	Few / none	Few	None
	Revised view of historical Korean breeding							
Breeder ¹	Breeder	Breeder	Breeder	Presumed breeder	Unclear	Unclear	Unclear	
SAUNDERS'S GULL <i>L. saundersi</i>					X			
LITTLE TERN <i>Sterna albifrons</i>	X							
COMMON MURRE <i>Uria aalge</i>	X							
SPECTACLED GUILLEMOT <i>Cephus carbo</i>	X							
ANCIENT MURRELET <i>Synthliboramphus antiquus</i>	X							
JAPANESE MURRELET <i>S. wumizusume</i>					X ⁴			
RHINOCEROS AUKLET <i>Cerorhinca monocerata</i>	X							
OSPREY <i>Pandion haliaetus</i>				X				
ORIENTAL HONEY-BUZZARD <i>Pernis ptilorhyncus</i>						X		
BLACK KITE <i>Milvus migrans</i>				X**				
WHITE-TAILED EAGLE <i>Haliaeetus albicilla</i>				X				
STELLER'S SEA EAGLE <i>H. pelagicus</i>	X ¹							
CINEREOUS VULTURE <i>Aegypius monachus</i>						X		
EURASIAN MARSH HARRIER <i>Circus aeruginosus</i>						X** ¹		
HEN HARRIER <i>C. cyaneus</i>						X**		
PIED HARRIER <i>C. melanoleucus</i>		X						
CHINESE SPARROWHAWK <i>Accipiter soloensis</i>	X							
JAPANESE SPARROWHAWK <i>A. gularis</i>	X							
EURASIAN SPARROWHAWK <i>A. nisus</i>						X**		
NORTHERN GOSHAWK <i>A. gentilis</i>					X*			
GREY-FACED BUZZARD <i>Butastur indicus</i>					X*			
COMMON BUZZARD <i>Buteo buteo</i>					X**			
UPLAND BUZZARD <i>B. hemilasius</i>							X**	
GOLDEN EAGLE <i>Aquila chrysaetos</i>	X							
COMMON KESTREL <i>Falco tinnunculus</i>					X*			
AMUR FALCON <i>F. amurensis</i>					X			
MERLIN <i>F. columbarius</i>							X**	
EURASIAN HOBBY <i>F. subbuteo</i>					X			
SAKER FALCON <i>F. cherrug</i>							X	
PEREGRINE FALCON <i>F. peregrinus</i>					X**			
LITTLE GREBE <i>Tachybaptus ruficollis</i>		X						
GREAT CRESTED GREBE <i>Podiceps cristatus</i>								X ⁶
GREAT CORMORANT <i>Phalacrocorax carbo</i>					X			
JAPANESE CORMORANT <i>P. capillatus</i>					X*			
PELAGIC CORMORANT <i>P. pelagicus</i>						X ⁵		
CHINESE EGRET <i>Egretta eulophotes</i>	X							
PACIFIC REEF EGRET <i>E. sacra</i>								X
GREY HERON <i>Ardea cinerea</i>	X							
GREAT EGRET <i>Casmerodius albus</i>	X							
INTERMEDIATE EGRET <i>Mesophoyx intermedia</i>								X**
LITTLE HERON <i>Butorides striatus</i>		X						

Species	Category number							
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	Austin's view of historical Korean breeding							
	Breeds, no caveat	Breeds (?), but caveat	May or may not breed	Does not breed	Does not breed	May or may not breed	Does not breed	Does not breed
	Pre-1970 breeding-season records or opinions of breeding							
Many / some	Many / some	Many / some	Many / some	Few / none	Few / none	Few	None	
Revised view of historical Korean breeding								
Breeder ¹	Breeder	Breeder	Breeder	Presumed breeder	Unclear	Unclear	Unclear	
YELLOW BITTERN <i>Ixobrychus sinensis</i>					X			
VON SCHRENCK'S BITTERN <i>I. eurhythmus</i>		X						
BLACK-FACED SPOONBILL <i>Platalea minor</i>	X							
BLACK STORK <i>Ciconia nigra</i>	X							
ORIENTAL STORK <i>C. boyciana</i>	X							
STREAKED SHEARWATER <i>Calonectris leucomelas</i>	X							
SHORT-TAILED ALBATROSS <i>Diomedea albatrus</i>						X*		
SWINHOE'S STORM-PETREL <i>Oceanodroma monorhis</i>	X							
FAIRY PITTA <i>Pitta nympha</i>					X			
TIGER SHRIKE <i>Lanius tigrinus</i>			X*					
BULL-HEADED SHRIKE <i>L. bucephalus</i>		X						
BROWN SHRIKE <i>L. cristatus</i>	X							
CHINESE GREY SHRIKE <i>L. sphenocercus</i>			X**1					
EURASIAN JAY <i>Garrulus glandarius</i>		X						
AZURE-WINGED MAGPIE <i>Cyanopica cyanus</i>	X							
BLACK-BILLED MAGPIE <i>Pica pica</i>	X							
SPOTTED NUTCRACKER <i>Nucifraga caryocatactes</i>			X**					
DAURIAN JACKDAW <i>Corvus dauuricus</i>			X**					
ROOK <i>C. frugilegus</i>							X	
CARRION CROW <i>C. corone</i>		X						
LARGE-BILLED CROW <i>C. macrorhynchos</i>		X						
COMMON RAVEN <i>C. corax</i>							X	
BLACK-NAPED ORIOLE <i>Oriolus chinensis</i>	X							
ASHY MINIVET <i>Pericrocotus divaricatus</i>			X**					
ASIAN PARADISE-FLYCATCHER <i>Terpsiphone paradisi</i>						X*2		
JAPANESE PARADISE-FLYCATCHER <i>T. atrocaudata</i>				X*				
BROWN DIPPER <i>Cinclus pallasii</i>		X						
WHITE-THROATED ROCK THRUSH <i>Monticola gularis</i>			X*					
BLUE ROCK THRUSH <i>M. solitarius</i>	X							
SIBERIAN THRUSH <i>Zoothera sibirica</i>							X	
SCALY THRUSH <i>Z. dauma</i>				X**				
GREY-BACKED THRUSH <i>Turdus hortulorum</i>				X*				
PALE THRUSH <i>T. pallidus</i>				X*				
BROWN-HEADED THRUSH <i>T. chrysolaus</i>							X	
DUSKY THRUSH <i>T. naumanni</i>						X		
GREY-STREAKED FLYCATCHER <i>Muscicapa griseisticta</i>				X				
DARK-SIDED FLYCATCHER <i>M. sibirica</i>				X*				
ASIAN BROWN FLYCATCHER <i>M. dauurica</i>				X**				
YELLOW-RUMPED FLYCATCHER <i>Ficedula zanthopygia</i>	X							
NARCISSUS FLYCATCHER <i>F. narcissina</i>							X	
MUGIMAKI FLYCATCHER <i>F. mugimaki</i>					X			

Species	Category number							
	1	2	3	4	5	6	7	8
	Austin's view of historical Korean breeding							
	Breeds, no caveat	Breeds (?), but caveat	May or may not breed	Does not breed	Does not breed	May or may not breed	Does not breed	Does not breed
	Pre-1970 breeding-season records or opinions of breeding							
	Many / some	Many / some	Many / some	Many / some	Few / none	Few / none	Few	None
	Revised view of historical Korean breeding							
Breeder ¹	Breeder	Breeder	Breeder	Presumed breeder	Unclear	Unclear	Unclear	
BLUE-AND-WHITE FLYCATCHER <i>Cyanoptila cyanomelana</i>	X							
RUFIOUS-TAILED ROBIN <i>Luscinia sibilans</i>					X ¹			
SIBERIAN RUBYTHROAT <i>L. calliope</i>				X*				
SIBERIAN BLUE ROBIN <i>L. cyane</i>	X							
ORANGE-FLANK. BUSH ROBIN <i>Tarsiger cyanurus</i>				X				
DAURIAN REDSTART <i>Phoenicurus aureus</i>	X							
COMMON STONECHAT <i>Saxicola torquata</i>		X						
PURPLE-BACKED STARLING <i>Sturnus sturninus</i>	X							
WHITE-CHEEKED STARLING <i>S. cineraceus</i>				X*				
EURASIAN NUTHATCH <i>Sitta europaea</i>	X							
CHINESE NUTHATCH <i>S. villosa</i>	X							
EURASIAN TREECREEPER <i>Certhia familiaris</i>				X*				
WINTER WREN <i>Troglodytes troglodytes</i>				X**				
MARSH TIT <i>Parus palustris</i>	X							
WILLOW TIT <i>P. montanus</i>					X			
COAL TIT <i>P. ater</i>	X							
GREAT TIT <i>P. major</i>	X							
VARIED TIT <i>P. varius</i>	X							
LONG-TAILED TIT <i>Aegithalos caudatus</i>	X							
SAND MARTIN <i>Riparia riparia</i>						X**		
BARN SWALLOW <i>Hirundo rustica</i>	X							
RED-RUMPED SWALLOW <i>H. daurica</i>	X							
ASIAN HOUSE MARTIN <i>Delichon dasytypus</i>			X*					
GOLDCREST <i>Regulus regulus</i>				X**				
BROWN-EARED BULBUL <i>Ixos amaurotis</i>				X*				
WHITE-BROWED CHINESE WARBLER <i>Rhopophilus pekinensis</i>				X**				
CHESTNUT-FLANKED WHITE-EYE <i>Zosterops erythropleurus</i>			X					
JAPANESE WHITE-EYE <i>Z. japonicus</i>			X*					
ASIAN STUBTAIL <i>Urosphena squameiceps</i>		X						
JAPANESE BUSH WARBLER <i>Cettia diphone</i>	X							
SPOTTED BUSH WARBLER <i>Bradypterus thoracicus</i>					X			
LANCEOLATED WARBLER <i>Locustella lanceolata</i>						X* ³		
RUSTY-RUMPED WARBLER <i>L. certhiola</i>						X*		
PLESKE'S WARBLER <i>L. pleskei</i>	X							
GRAY'S WARBLER <i>L. fasciolata</i>						X*		
BLACK-BROWED REED WARBLER <i>Acrocephalus bistrigiceps</i>			X*					
ORIENTAL REED WARBLER <i>A. orientalis</i>	X							
THICK-BILLED WARBLER <i>A. aedon</i>				X				
DUSKY WARBLER <i>Phylloscopus fuscatus</i>					X			
RADDE'S WARBLER <i>P. schwarzi</i>	X							
PALLAS'S LEAF WARBLER <i>P. proregulus</i>				X				

Species	Category number							
	1	2	3	4	5	6	7	8
	Austin's view of historical Korean breeding							
	Breeds, no caveat	Breeds (?), but caveat	May or may not breed	Does not breed	Does not breed	May or may not breed	Does not breed	Does not breed
	Pre-1970 breeding-season records or opinions of breeding							
Many / some	Many / some	Many / some	Many / some	Few / none	Few / none	Few	None	
Revised view of historical Korean breeding								
	Breeder ¹	Breeder	Breeder	Breeder	Presumed breeder	Unclear	Unclear	Unclear
YELLOW-BROWED WARBLER <i>P. inornatus</i>						X*		
ARCTIC WARBLER <i>P. borealis</i>						X** ⁴		
GREENISH WARBLER <i>P. trochiloides</i>			X*					
PALE-LEGGED LEAF WARBLER <i>P. tenellipes</i>			X**					
EASTERN CROWNED WARBLER <i>P. coronatus</i>			X*					
VINOUS-THROATED PARROTBILL <i>Paradoxornis webbianus</i>	X							
ASIAN SHORT-TOED LARK <i>Calandrella cheleensis</i>			X					
CRESTED LARK <i>Galerida cristata</i>	X							
EURASIAN SKYLARK <i>Alauda arvensis</i>	X							
RUSSET SPARROW <i>Passer rutilans</i>	X ¹							
EURASIAN TREE SPARROW <i>P. montanus</i>	X							
FOREST WAGTAIL <i>Dendronanthus indicus</i>	X							
WHITE WAGTAIL <i>Motacilla alba</i>	X							
JAPANESE WAGTAIL <i>M. grandis</i>					X			
GREY WAGTAIL <i>M. cinerea</i>				X*				
OLIVE-BACKED PIPIT <i>Anthus hodgsoni</i>			X**					
ALPINE ACCENTOR <i>Prunella collaris</i>			X*					
SIBERIAN ACCENTOR <i>P. montanella</i>							X	
GREY-CAPPED GREENFINCH <i>Carduelis sinica</i>	X							
LONG-TAILED ROSEFINCH <i>Uragus sibiricus</i>	X							
COMMON ROSEFINCH <i>Carpodacus erythrinus</i>				X				
PALLAS'S ROSEFINCH <i>C. roseus</i>				X				
RED CROSSBILL <i>Loxia curvirostra</i>					X ¹			
EURASIAN BULLFINCH <i>Pyrrhula pyrrhula</i>					X ⁶			
HAWFINCH <i>Coccothraustes coccothraustes</i>	X ¹							
YELLOW-BILLED GROSBEAK <i>Eophona migratoria</i>	X							
MEADOW BUNTING <i>Emberiza cioides</i>	X							
TRISTRAM'S BUNTING <i>E. tristrami</i>				X				
CHESTNUT-EARED BUNTING <i>E. fucata</i>		X						
RUSTIC BUNTING <i>E. rustica</i>							X	
YELLOW-THROATED BUNTING <i>E. elegans</i>	X							
YELLOW-BREADED BUNTING <i>E. aureola</i>	X ¹							
CHESTNUT BUNTING <i>E. rutila</i>							X**	
BLACK-FACED BUNTING <i>E. spodocephala</i>	X							
OCHRE-RUMPED BUNTING <i>E. yessoensis</i>							X ²	
Total	84	17	28	43	19	14	20	9

The appendix (with notes to Category 5) includes all species with internationally published pre-2003 records suggestive of breeding in Korea (*sensu* Austin 1948). Care is needed in extracting statements of Korean breeding from sources (particularly Gore and Won Pyong-Oh 1971) where information might refer only to Cheju and Ullung islands, areas excluded from Austin's (1948) and the present review.

Category number definitions:

1. Species accepted unequivocally by Austin as breeding in Korea, including those summer residents for which Austin neither gave evidence confirming breeding nor explicitly questioned that they bred.

¹ There seems to be no subsequent strong published evidence for Korean breeding by Eurasian Collared Dove, Steller's Sea Eagle, Russet Sparrow, Hawfinch or Yellow-breasted Bunting, and their historical status may warrant further review.

2. Species for which Austin was cautious of extrapolating from undoubted Korean summer residency to breeding. All species do indeed breed in Korea (Tomek 1999, 2002, Park Jin-Young 2002).

3. Species for which Austin was explicitly open-minded about Korean breeding status, which are proven or very likely Korean breeders (Tomek 1999, 2002, Park Jin-Young 2002).

* Austin quoted but dismissed or queried previous evidence or opinion (** by Won Hong Koo) of Korean breeding.

¹ Recently proven to breed in central Korea (Moores and Moores 2004).

4. Species assigned by Austin as only non-breeders in Korea, but (near-) contemporary evidence shows that they bred or over-summered (see species accounts).

* Austin quoted but dismissed or queried previous evidence or opinion (** by Won Hong Koo) of Korean breeding.

5. Species known or strongly suspected to breed in Korea which Austin classified as not breeding in Korea, which apparently lack strong pre-1970s breeding-related data or opinions, but for which there are no grounds to invoke post-1948 colonisation. Breeding evidence, except where footnoted, is based on detail in Gore and Won Pyong-Oh (1971), Tomek (1999, 2002), and Park Jin-Young (2002). Historical breeding-season records, often from the 1950s or even pre-1948, imply that most species were overlooked previously, but the evidence is too weak for listing in Category 4. Of the species without historical breeding-season records, Scaly-sided Merganser and Greater Painted-snipe are readily overlooked and Japanese Murrelet and Pelagic Cormorant apparently breed in Korea only on small islands. Brown-headed Thrush, Richard's Pipit *Anthus richardi* and Japanese Grosbeak *Eophona personata*, suspected by Tomek (2002) to breed in Korea, and which might indeed do so, are excluded because they lack specific information genuinely suggestive of Korean breeding (Duckworth 2006). The various other species for which distribution in neighbouring countries suggests the possibility of Korean breeding are also not listed here. Ten species not listed here (with breeding evidence in Gore and Won Pyong-Oh 1971, Lee Jong-Nam *et al.* 1999, Tomek 1999, 2002, Park Jin-Young 2002, Moores 2007) seem to be post-1948 colonists of Korea: White-breasted Waterhen *Amaurornis phoenicurus*, Common Moorhen *Gallinula chloropus*, Black-winged Stilt *Himantopus himantopus*, Little Egret *Egretta garzetta*, Cattle Egret *Bubulcus ibis*, Chinese Pond Heron *Ardeola bacchus*, Black-crowned Night Heron *Nycticorax nycticorax*, Eurasian Blackbird *Turdus merula*, Light-vented Bulbul *Pycnonotus sinensis* and Zitting Cisticola *Cisticola juncidis*. All of these are visually and/or vocally conspicuous and inhabit urban and/or agricultural habitats, so are not readily overlooked, yet no historical records indicate breeding. Note that a Korean breeding record of Pheasant-tailed Jacana *Hydrophasianus chirurgus* in Moores (2006) comes from Cheju island, outside the present review's geographical scope; breeding was also attempted at three different southern mainland sites in 2007 (Birds Korea data).

¹ Although multiple records indicate summer residence, evidence of nesting in Korea is inconclusive. All other species are proven, or reasonably assumed, to be breeding in Korea.

² A likely Korean breeder (Tomek 1999), with almost conclusive evidence of Korean breeding in MKN and KUT (1987: 44–47).

³ Adjudged (as '*L. argentatus*') in need of confirmation as a Korean breeder by Tomek (1999), despite multiple breeding-season records, including several from before 1948, and explicit statements of breeding by Won and various others. Large white-headed gulls were recently confirmed breeding by Chong Jong-Ryol *et al.* (1996); also, NM has been shown video footage and still photographs of breeding birds (adult plumage, for which species identification is challenging) from one or more Korean West Sea islands, and has seen breeding birds in Incheon (in 2008). These are attributed to *L. c. mongolicus* by Wetlands International (2006), the taxon which appears (including many fresh juveniles, for which identification is relatively straightforward) along the mainland west coast from July onwards (personal observations).

⁴ Breeding was proven at Taegukul Island, near Gageo Island, in the early 1980s (Park Jin-Young 2002).

⁵ Breeds on Paengnyong Island (Park Jin-Young 2002) and elsewhere in the West Sea (e.g. on Socheong Island [37°45'N 124°44'E] at least in 2006–2007: personal observations).

⁶ Adjudged an unlikely breeder in Korea by Tomek (2002), but present throughout summers 2002–2003 in the high-altitude spruce forests of the Myohyang mountains, the site of earlier midsummer records; the through-summer presence of many birds make breeding a safe assumption (personal observations).

6. Species for which Austin was explicitly open-minded concerning Korean breeding status, and for which it remains unclear whether they breed in Korea.

* Austin quoted but dismissed or queried previous evidence or opinion (** by Won Hong Koo) of Korean breeding.

¹ Tomek (1999) considered breeding in Korea to be probable but gave no evidence other than opinion and two dates, one of which, at 21 April, could be of a passage bird. More solid evidence than the remaining single date (8 July 1897) is desirable.

² Tomek (2002) concluded that the species bred in Korea but gave no evidence other than dates; these are not even weakly indicative of Korean breeding, and no additional relevant evidence can be traced (Duckworth and Frisk in prep.).

³ Tomek (2002) considered breeding in northern Korea to be probable, but gave only opinion and a single date which, at 19 June, is not unduly late for passage for this species.

⁴ Published statements of breeding lack supporting data and may well be in error (Duckworth 2007).

7. Species rejected (explicitly or implicitly) by Austin as Korean breeders, for which true summer status in Korea remains unresolved, even though there were summer records or opinion of breeding during or shortly after Austin's review period (Austin 1948, Tomek 1999, 2002, Park Jin-Young 2002). The records are sufficiently few that they might simply involve occasional over-summering non-breeders, early or late migrant individuals, or data errors (see Tomek 1999: 3, 108; 2002: 135), but breeding status in neighbouring countries suggests Korean breeding is possible for most species. Swan Goose, Common Greenshank, Merlin, Saker, Dusky Thrush, Siberian Accentor, Rustic Bunting and Chestnut Bunting seem, based on known breeding ranges (e.g. Vaurie 1959, 1965, Cheng 1987), fairly unlikely to breed in Korea. Species in which non-breeding individuals habitually over-summer well outside the breeding range are not included in this table, if they have only 1–2 breeding-season Korean records.

* Austin quoted but dismissed or queried previous evidence or opinion (** by Won Hong Koo) of Korean breeding.

¹ BirdLife International (2001: 367) gave secondary citation to potential breeding in Korea.

² See Kuroda (1918); Austin used this source, but did not incorporate the second-hand indication of breeding-season presence.

8. Species not stated by Austin or any of his sources to breed in Korea, with no historical breeding-season records, and with subsequent records inconclusive of established breeding in Korea. Data from outside Austin (1948), Tomek (1999, 2002), Park Jin-Young (2002) are specifically noted to source.

¹ Moores (1999b) raised the possibility of Korean breeding.

² The species breeds in central Korea at least intermittently: in the late 1990s, NM was shown photographs of adults with ducklings, and there are recent records of breeding in Kangwon province (per B. Heinrich *in litt.* 2008). It is unclear whether it breeds regularly, and if so, whether it is a historically overlooked breeder, or a recent colonist: construction of reservoirs and replanting of forests has created suitable habitat, and the species has greatly expanded its southerly breeding distribution at the western edge of its Eurasian range (Gibbons *et al.* 1993).

³ Despite none being from the breeding season, the Korean records (all from pre-1950) seem as likely to reflect local dispersal from Korean breeding areas as winter immigration from elsewhere.

⁴ Free-flying birds are now common in parts of Korea (both northern and southern), with truly feral populations (not just free-ranging domestic birds) widespread in the southern (but not the northern) provinces (personal observations). It is unclear whether the paucity of specific mention in the published record reflects lack of birds or lack of interest.

⁵ Moores (2006) referred to an instance of likely breeding in 2004 near to Seosan city.

⁶ Proven to breed in the southern provinces in 1996 (Park Jin-Young 2002) and in e.g. 2007 (when 12 adults had four separate broods in June on Wasong Reservoir, Uiwang, Kyonggi province: T. Edelsten verbally 2008); possibly an overlooked historical breeder (Category 6), but the known breeding sites are artificially modified wetlands. Twentieth-century habitat engineering and Palaeartic grebes' propensity to breed sporadically outside their range (e.g. Gibbons *et al.* 1993) suggests it may be a recent colonist or merely sporadic breeder.