

Systematic notes on Asian birds. 44. A preliminary review of the Corvidae

E.C. Dickinson, S. Eck & J. Martens

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Edward C. Dickinson, c/o The Trust for Oriental Ornithology, Flat 3, Bolsover Court, 19 Bolsover Road, Eastbourne, East Sussex, BN20 7JG, U.K. (e-mail: asiaorn@tiscali.co.uk).

Siegfried Eck, Staatliche Naturhistorische Sammlungen Dresden, Museum für Tierkunde, A.B. Meyer Bau, Königsbrücker Landstrasse 159, D-01109 Dresden, Germany. (e-mail: Siegfried.Eck@snsd.smwk.sachsen.de).

Jochen Martens, Institut für Zoologie, Johannes Gutenberg-Universität, Saarstr. 21, D-55099 Mainz, Germany. (e-mail: martens@uni-mainz.de).

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Certain Asian species of corvids, mainly those that have been reviewed since 1962, are discussed and attention is drawn to recommended changes in subspecific or specific status. Problem areas remain and research is suggested, some morphological, some molecular and some into voice. The rationale behind the ongoing revision of *Corvus macrorhynchos* is explained, but it is recommended that it be considered hypothetical and further developments awaited so that all relevant taxa can be assigned safely to species.

Introduction

Our preliminary reviews are arranged to coincide with parallel articles on types and are preparatory to a planned 'Synopsis of the Birds of Asia' (see Introduction to 'Systematic notes on Asian birds': Dickinson & Dekker, 2000). In Peters's Check-list of Birds of the World Blake & Vaurie (1962) dealt with the Corvidae. Prior work by Vaurie (1954a; 1954b; 1955; 1958; 1959) makes detail available on much of the thinking relevant to Asia. Blake dealt only with New World species. Vaurie's arrangement in 1962 is examined and more recent treatments are noted, especially the 'monographs' of Goodwin (1976) and Madge & Burn (1993). Goodwin's study benefitted from his great interest in behaviour for he had often previously published about corvids¹, sometimes based on his own aviary studies. We include here revisions from these and other sources that we would expect to be accepted in the planned synopsis. In this paper we retain the sequence of species used by Blake & Vaurie (1962), although Goodwin (1976) recommended changes and these should be re-examined when sufficient species have been sampled for molecular evidence.

The family is large with about 130-140 species attached to about 25 genera, but relationships within the assemblage called core corvidans by Cracraft et al. (2003) are not yet well defined. Molecular sampling has been limited and there are conflicts with earlier evidence from DNA hybridization. The family, as accepted by Blake & Vaurie

¹ In this paper the term 'corvid' is used for any member of the family Corvidae.

(1962), is worldwide in distribution, except for the Polar Regions. Generic limits are not all settled. The affinities of several species remain insufficiently understood and need focussed field studies to describe their behaviour. Others require serious revision, for which more acoustic evidence is needed. The recognised behaviour traits of the family were listed by Amadon (1944) as 'long-continued courtship feeding; nest building and feeding of young by both male and female; incubation and brooding by female only; burying or hiding of food; breaking of food with the bill while the food is held in the feet'; 'omnivorous and more or less predatory feeding habits; bold and inquisitive nature'. A few Asian species have not been studied to determine how well they fit this general pattern, which is not one in which all species share every trait. Corvids have loud and harsh voices with extensive call repertoires and there are also accounts of local dialects in crows (Goodwin, 1976) and it is also thought that there are often sexual differences in voice. Gathering and understanding the acoustic evidence will not be easy (Laiolo & Rolando, 2003).

Within the genus *Corvus*, where morphology is relatively less helpful than in most genera and size variations within currently recognised species seem to suggest over-lumping, Martens & Eck (1995) have provided evidence of the utility of vocalizations. Indeed this is a more general issue (Martens et al., 2003). Scattered, and still limited, voice samples of *Corvus* species, gathered by JM from Kashmir to the lower Ussuri show significant homogeneity and offer considerable hope that evidence will become available to complement that from other sources.

In their preliminary study of molecular evidence Cibois & Pasquet (1999) had samples from 15 species of 11 genera and although this dataset could be interpreted as supporting monophyly, they rightly noted that several key species were missing². They mentioned the Asian species *Platysmurus leucolophus* (Temminck, 1824) as problematic. Since then James et al. (2003) have shown that *Pseudopodoces* is not corvine. A further Asian species that may not be a corvid is *Platylophus galericulatus* (Cuvier, 1816) as discussed by Goodwin (1976) and below. Cibois & Pasquet noted that this species does not have the unspotted juvenile plumage found in corvids.

No new Asian taxon has been named since Blake & Vaurie (1962) except from Asia Minor.

Nomenclature

One generic name needs comment. Blake & Vaurie (1962) used the generic name *Cissa* Boie, 1826, for the green magpies. Some previous authors, including Amadon (1944) and Ripley (1961), used *Kitta* Temminck, 1826a, but as footnoted by Blake & Vaurie (1962: 242) this is founded on the bird he called *Kitta holosericea* and depicted in Pl. Col. 395, a picture not of a corvid, but of what we now call *Ptilonorhynchus violaceus* (Vieillot, 1816)³, a bowerbird.

The name of one species has needed change (see *Corvus pectoralis* Lesson, 1831, below).

² Jollie (1978) examined the phylogeny of the crows before current methodologies came into use.

³ Not an Asian name and not in our list of references.

Taxonomy above the species level

We have referred earlier to recommendations made and adopted by Goodwin (1976). Goodwin followed Amadon in treating the colourful Asian 'magpies' in one genus. By contrast Vaurie in Blake & Vaurie (1962: 240-244) split the species between *Urocissa* and *Cissa*. In Goodwin's view the degrees of difference displayed within *Urocissa* by *U. caerulea* Gould, 1863, and *U. whiteheadi* Ogilvie-Grant, 1899, argued for lumping all members of *Urocissa* in *Cissa*. Goodwin (1976: 204), also like Amadon (1944), submerged *Dendrocitta* and *Temnurus* in *Crypsirina*. While we see logic in submerging *Temnurus* in *Crypsirina* we are less convinced by the submergence of both. We are content to leave Vaurie's generic treatment in place until molecular evidence can be brought to bear.

As mentioned earlier *Pseudopodoces* will need to be removed from the Corvidae.

Taxonomy at and below species level

Platylophus galericulatus Cuvier, 1816

This crested tropical forest 'jay', which is usually found in small noisy flocks (Sheldon et al, 2001), was long treated as a relative of the shrikes (Amadon, 1944). Amadon accepted the very limited evidence of Bartels & Stresemann (1929) as sufficient for the transfer of this monotypic genus to the crows. He did not mention that Chasen (1935, 1939), who would have known the bird quite well in the field, did not accept this. Goodwin (1976: 343) noting the atypical juvenile plumage remarked 'it is not certain that it is now correctly considered a member of the Corvidae'. Smythies (2000) reported that Amadon had written about removing the species to the Prionopidae.

The name applied to birds from the Malay Peninsula may need to change. The type of *ardesiacus* Bonaparte, 1850, may not be from mainland Asia. It is thought to match Sumatran birds, thus making it a synonym of *coronatus* Raffles, 1822, and the name *malaccensis* Cabanis, 1866, may have to be used instead.

There is some disagreement whether there are two valid forms in Borneo. Madge & Burn (1993) did not recognize *lemprieri* Nicholson, 1883. We follow Smythies (2000) who maintained two Bornean forms and noted an unstable intermediate situation in Sarawak.

Platysmurus leucopterus Temminck, 1824

Goodwin (1976: 206) thought this species likely to belong close to the genus *Crypsirina*. Vaurie's treatment suggests the species is an early or basal corvid and we do not feel that this view needs correction until molecular studies are available. In behaviour and in movements both on the ground and in the air its habits are not convincingly corvine, nor perhaps is the voice (see Smythies, 2000)⁴.

⁴ Sheldon et al. (2001) report participation in mixed feeding flocks.

Garrulus glandarius Linnaeus, 1758

In some areas, especially in Europe, northern forms of the jay are migratory or irruptive and the specimen record needs careful interpretation when determining the breeding ranges and whether apparent 'hybridisation'⁵ is between neighbouring forms or between residents and overstaying irruptive forms. Variation in Europe was examined by Voous (1953) who detailed the clines perceptible in the colour of the upperparts and underparts. There is also considerable individual variation (Voous, 1953), which may result from interbreeding with irruptive birds. Whatever the case may be in particular locations, there seems to be general agreement between reviewers that the entire complex across Eurasia should be treated as one species since the groups seem to be connected by intermediate populations.

Reviews of all or major parts of this species can be found in Kleinschmidt (1893), Hartert (1918), Kleiner (1940) reviewed by Stresemann (1940a), Voous (1945, 1953), Vaurie (1954b), Kuroda (1957), Keve (1973, 1974) and Roselaar (1994). Necessarily these authors generally focussed on breeding specimens.

In the case of species with such extensive ranges it is not unusual to be able to perceive groups of subspecies sharing common features. For *Garrulus glandarius* drawing on Kleiner, Stresemann (1940a) listed eight such groups: *glandarius*, *brandtii* [sic], *bispecularis*, *leucotis*, *japonicus*, *atricapillus*, *hyrcanus* and *cervicalis*⁶. Nor is it unusual that authors disagree and see differing group configurations. Vaurie (1954b: 3-10) accepted the groups of Kleiner/Stresemann, but dealt with only six groups: *glandarius*, *cervicalis*, *atricapillus*, *brandtii*, *bispecularis* and *japonicus*. The other two were not Palaearctic. However, Kuroda (1957), paralleled by Goodwin (1976: 222-223), accepted just five groups: *glandarius*, *brandtii*, *japonicus*, *bispecularis* and *leucotis*. Kuroda and Goodwin included both the *atricapillus* and *cervicalis* groups in their nominate group.

Four of these groups are represented in our region. The *brandtii* group is associated by Kuroda (1957) with the Manchurian refugium, the *japonicus* group with the Japanese refugium and the *bispecularis* group with the south China refugium. This third group extends into the eastern and central Himalayas where it co-exists with *G. lanceolatus* Vigors, 1831; but *lanceolatus* alone then occurs west as far as the Afghan border (Whistler, 1944) and into the oak forests of Nuristan (Paludan, 1959).

The fourth group, *leucotis*, which is found south of the other groups, has received less attention. Vaurie in Blake & Vaurie (1962: 233 footnote) wrote 'The populations of Burma and Assam belong to two types connected by intermediate forms. The pure types are *leucotis* (Hume, 1874) which is essentially uniformly black on center and posterior of crown, and white on forecrown, ear coverts, and throat; and *persaturatus* (Hartert, 1918) which is strongly vinous throughout and not black or streaked on crown.' He then listed three forms that he considered to be intermediate between these types and wrote that he had not seen specimens of *oatesi* Sharpe, 1896 (from the Chin Hills) or from the Lushai and Mishmi Hills and that these required further

⁵ Better termed intergradation to distinguish between inter-breeding between species.

⁶ Were these names used as subspecific names the authors and dates would be included according to our usual practice. In the discussion of subspecies groups the addition of such names and dates would make the text much more difficult to follow.

study, as did the distribution of the intermediate forms. Ali & Ripley (1948) did not obtain *Garrulus glandarius* in the Mishmi Hills and Ripley (1961, 1982) and Ali & Ripley (1972: 201) submerged *persaturatus* Hartert, 1918, and *azureitinctus* Koelz, 1951, in *interstinctus* Hartert, 1918. Abdulali (1980) had just one specimen from the Mishmi Hills and listed it as *interstinctus*. We tentatively accept the views of Ripley, but the examination of fuller series may eventually sustain the views of Hartert (1918) and show that there are constant differences between the birds north and south of the Brahmaputra.

In Japan Vaurie (1954b) wrote that *hiugaensis* Momiyama, 1927a, 'required confirmation' and he later listed it as a subspecies (Vaurie, 1959; Vaurie in Blake & Vaurie, 1962), but it was not accepted by the Ornithological Society of Japan (OSJ, 2000: 324), which we follow.

It is perhaps appropriate to discuss the type locality of *japonicus* Temminck & Schlegel, 1847. The OSJ (1958) cited the type locality as 'Japan', not mentioning earlier restrictions. Blakiston & Pryer (1878: 233) restricted it to 'south Japan to the Strait of Tsugaru'. This is no more than recognition that a quite different form occupies Hokkaido. The birds of northern Honshu were described and named *kakes* Momiyama, 1927b, at much the same time as Momiyama named those of southern Kyushu *hiugaensis*, but apparently he did not seek to determine whether the type material in Leiden matched either of these birds. Given that Decima, the small 'island' linked to Nagasaki, where von Siebold was based, is in southern Kyushu and thus must be a likely, but not certain, provenance for the type-specimens, this omission is of some importance. As it happens the three syntypes now present in Leiden are all labelled 'Kioe Sioe' [= Kyushu]. We consider it likely that these birds were obtained in the general vicinity of Nagasaki, but it has not yet been possible to make comparisons between the types and specimens known to be from northern and southern Kyushu. Once this has been done it will be possible to restrict the type locality of *Garrulax glandarius japonicus* Temminck & Schlegel, 1847, appropriately, placing one or the other of Momiyama's names in synonymy. Until then we recommend that *G. g. japonicus* should be treated as if it is from the same type locality as *hiugaensis* Momiyama, 1927. Pending evidence of this, and only if it is proposed to recognise past splits in *japonicus* and to recognise the birds of Honshu or at least northern Honshu we recommend that future workers would do better to resurrect *kakes* Momiyama, 1927b, from Iwate Prefecture. This name is available and is much less likely to find itself in synonymy once the true provenance of *G. g. japonicus* has been identified.

***Garrulus lidthi* Bonaparte, 1850**

In view of our general introductory comments about a lack of information on voice in Asian corvid species, and the comments of Goodwin (1976), mention must be made of information on this species provided by Bruce (1979) on voice and behaviour when calling and foraging for food.

***Urocissa ornata* (Wagler, 1829)**

Ali & Ripley (1972: 203-212) were not comfortable with the treatment of the more colourful magpies in Blake & Vaurie (1962) and preferred to place them all in one

genus (*Cissa*) in which Delacour (1929) had included *U. ornata* but not the other species treated in *Urocissa* by Blake & Vaurie. Nor was Goodwin (1976: 188) who referred to the group as 'the blue, green and Whitehead's magpies'. He reasoned that *U. ornata* and *U. whiteheadi* Ogilvie-Grant, 1899, were almost as different from the type species (*erythrorhyncha* Boddaert, 1783) as they were from *Cissa* and that *Urocissa*, as employed by Blake & Vaurie (1962), was probably polyphyletic. He considered but rejected the idea of treating each of these two in monotypic genera⁷. As mentioned earlier we await molecular studies on the group. Goodwin (1976: 189) considered *Urocissa caerulea* Gould, 1863, part of a superspecies (*erythrorhyncha*).

Urocissa flavirostris (Blyth, 1846)

Roberts (1992: 420) has drawn attention to the fact that the key to subspecies in Ali & Ripley (1972: 206) is wrong. The Punjab race does not have the underparts 'almost pure white' but has them pale primrose in fresh plumage. Goodwin (1976) noted that some birds from Punjab 'have the pale head patch more extensive than usual' and that in this they match the type. This seems to be an individual trait. Ali & Ripley (1972: 208) suggest that *cucullata* Gould, 1861, has the upperparts and wings bluer than nominate *flavirostris*. Further study seems needed to clarify whether this is merely clinal along the Himalayas and to examine whether there are other constant distinctions.

Cissa hypoleuca Salvadori & Giglioli, 1885

Delacour (1929) treated *Cissa hypoleuca* as five species and admitted two subspecies of *hypoleuca*: the nominate in southern Annam and Cochinchina and *chauleti* Delacour, 1926, in central Annam. Both these have yellowish underparts while allopatric *C. concolor* Delacour & Jabouille, 1928, of northern Annam, with green underparts, occurred just to the north of *chauleti*. His other three species were insular endemics: *C. thalassina* (Temminck, 1826b) from Java, *C. jefferyi* Sharpe, 1888, from Borneo and *C. katsumatae* Rothschild, 1903, from Hainan. Of these five, two, *jefferyi* and *katsumatae* he considered highland birds and two, *concolor* and *hypoleuca* he reported from low altitudes. A further race *jini* Delacour, 1930a, was described from the Yaoshan Massif as a form of *concolor*.

Kuroda (1933: 32) united *chinensis* (Boddaert, 1783) and *thalassina* and included *minor* Cabanis, 1850, believing it to originate from Sumatra alone, as well as *jefferyi* from Mt. Kinabalu. It should be noted that Kuroda's information showed *thalassina* to be a montane form. Chasen (1935: 310) followed but added the Bornean lowlands to the range of *minor*. Judging from Smythies (2000)⁸, the two Bornean taxa overlap on Mt. Kinabalu where *minor* ranges from 300 m to 1220 m (once 1800 m) in mixed dipterocarp forest and lower montane forest, and *jefferyi* from 900 m to 2440 m keeping to montane forest.

⁷ One generic name is available: *Cissopica* Delacour, 1927, for *whiteheadi*, but no generic name has been proposed with *Urocissa ornata* as the type species. For this Wolters (1977) used a monotypic subgenus, of *Cissa* not of *Urocissa*, but did not name that.

⁸ Sheldon et al. (2001) give slightly narrower altitudinal ranges suggesting overlap largely confined to between 900 and 1000 m.

Delacour (1940) united *concolor* with *hypoleuca*. Later, disagreeing with Kuroda and with Chasen, Delacour (1947) united the Indochinese lowland forms, the Javan nominate form and the highland form of Mt. Kinabalu (*jefferyi*) in a broad species *Kitta thalassina*. This is not incompatible with sympatry with *chinensis* in Borneo and Indochina. As noted by Goodwin (1976) these taxa share a common character in differing from *chinensis* in the colour of the inner secondaries.

The logic of combining two highly disjunct montane forms from the Greater Sundas with lowland populations from Indochina is surprising and yet Vaurie in Blake & Vaurie (1962) accepted Delacour's treatment without apparent demur, as recently has Smythies (2000). However Goodwin (1976: 190), without discussing the relevance of altitudinal ranges (explained here and now admittedly better known), noted that the two insular montane forms differed from *hypoleuca* and felt that the Indochinese birds should not be combined with them. He treated *jefferyi* as a race of *thalassina*. We accept Goodwin's view for the moment, but few montane species from Mt. Kinabalu are represented by subspecies in Java. It is our expectation that careful comparison will show the Javan and the Bornean montane forms deserve to be treated as separate species, as suggested by Wolters (1977: 226).

Dendrocitta vagabunda (Latham, 1790)

Blake & Vaurie (1962: 284) added *bristoli* Paynter, 1961, in their Addenda. They did not mention the re-restriction by Paynter of the type locality of *D. v. pallida* (Blyth, 1846). The earlier restriction to Simla by Ticehurst (1922) did not fit with the bird described by Blyth. Blyth's bird was smaller and could have been a more southern specimen or a bird from further east in the Himalayas. Instead Ticehurst's restriction placed the type locality of *pallida* within the range of the larger of the two north Indian forms. Paynter (1961) suspected that Blyth's specimen was not from the Himalayas at all, but believed that, for the sake of nomenclatural stability (and in the absence of a type specimen), he should give Blyth the benefit of the doubt. Hence his re-restriction is to a location in the range of the smaller of the two northern forms. Ripley (1982) followed Paynter.

Dendrocitta formosae Swinhoe, 1863

Blake & Vaurie (1962) treated *occipitalis* (Müller, 1836) and *cinerascens* Sharpe, 1879, as conspecific and separated *formosae* with a footnote recording the view that it may be conspecific with them. Deignan (1963) preferred to take the line suggested by the footnote (although he did not state clearly that he brought in *cinerascens*). However, Deignan did not provide any information to rebut the treatment by Blake & Vaurie. Goodwin (1976: 205) considered that *occipitalis* and *cinerascens* should be treated as separate species and van Marle & Voous (1988) accepted *occipitalis* as a Sumatran endemic species. Eck (1996) recommended a superspecies *formosae* grouping this species with *occipitalis* and *leucogastra*. Smythies (2000) also treated *cinerascens* as an endemic.

As regards India, Biswas (1964) considered that the disjunct population *sarkari* Kinnear & Whistler, 1930, of the Eastern Ghats did not merit recognition.

***Dendrocitta frontalis* Horsfield, 1840**

The treatment of *Dendrocitta frontalis* as a monotypic species by Blake & Vaurie (1962) lumped the population of NE Tonkin with the Himalayan population. This species does not occur in northern Thailand (Deignan, 1963). Blake & Vaurie (1962: 249) did not list the species for China, but Cheng (1976: 504; 1987: 541) mentioned its occurrence in westernmost Yunnan on the border with Burma, citing 'Stanford et al.'. However, he gave no suggestion that the distribution of this taxon extends along the southern Yunnan border with Indochina and it seems pretty certain that the Tonkin population is an isolate. We have not traced a specific rebuttal of the validity of *kurodae* Delacour, 1927. It was not placed in synonymy by Delacour (1940), Delacour & Greenway (1941) or Delacour (1951). Ali & Ripley (1972) treated the Indian bird under the nominate trinomial suggesting they agreed that it was valid. We have made a superficial comparison of *kurodae* with the nominate form, but Tring has only three *kurodae*, all females. Derek Goodwin left a note with these saying that the race is a 'poor' one, but might just be valid. Without seeing more specimens, including males, this cannot be confirmed and it is probably better left in synonymy where Blake & Vaurie put it.

***Temnurus temnurus* (Temminck, 1825)**

This species was discovered in west central Thailand in May 1990 (P.C. Round, pers. comm.)⁹ where breeding has also been reported (Robson, 2001). We are not aware of any reported differences in these birds from Indochinese stock. Given the probability that the Thai population is small it may be best that no specimens are taken to explore this unless distinctions are observed.

The type locality originally provided was Cochinchine. It was not recorded from southern Annam by Blake & Vaurie (1962). There is no reason to suppose a population survives there, and indeed the attribution may not have been reliable, but then until recently no population was known from Thailand.

***Pica pica* (Linnaeus, 1758)**

It is often asked whether the Tibetan population *bottanensis* Delessert, 1840, is a different species. There is indeed a degree of difference, but it does not appear to be at specific level. Goodwin (1976: 11) suggested that the principal differences, relatively long wings and short tail, might be accounted for by the open habitat in Tibet requiring it to fly much longer distances than is usual for European magpies. He suggested that the short wings of European magpies confer an advantage in terms of manoeuvrability in dense cover. Recently, Eck (1997) compared measurements of *bottanensis* with Mongolian *leucoptera* Gould, 1862, which have equally long tails, but shorter wings.

⁹ And included by Robson (2000).

Pseudopodoces humilis (Hume, 1871)

The distinctness of this genus was discussed by Li & Cheng (1965). James et al. (2003), who noted two earlier anatomical studies that suggested that this species is not a crow, have recently presented molecular and osteological studies showing that this is a parid. They recommended the transfer of the genus *Pseudopodoces* to a position within the Paridae.

Nucifraga caryocatactes (Linnaeus, 1758)

Hartert (1897) accepted three 'species' of nutcracker in Eurasia (*caryocatactes*, *multi-punctata* Gould, 1849, and *hemispila* Vigors, 1831), and then described *japonica* as new. During revisions at the time that subspecies were becoming accepted Hartert (1903) united these in one species. However, Baker (1922: 67) treated *multi-punctata* as a separate species and suggested that the distribution of this taxon overlapped with *N. c. hemispila* 'in many places'. Meinertzhagen (1927) examined the details of his claim and rejected it, as recounted by Vaurie (1954b). Vaurie (1954b) examined the specimen record and found the Pir Panjal range consistently separated the two populations, except for one stray individual, and treated the two forms as subspecies.

In Europe the species is highly irruptive and until this was recognised the breeding distribution of European forms was not understood. Quite apart from the potential for confusion due to individual variation, which Meinertzhagen suspected, there would be further difficulties identifying vagrants of different origins due to varying conditions in the annual cone crop in their home ranges. Irruptive behaviour, incidentally, is not restricted to Europe. Blake & Vaurie (1962) mention irruptive migrant *macrorhynchos* Brehm, 1823, in Korea and northern China, and Morioka in OSJ (2000: 325) reiterated a 1923 record of *macrorhynchos* from as far south as Kyushu.

Madge & Burn (1993) recently suggested that there may be two species, but no fresh evidence was put forward and Inskipp et al. (1996) did not endorse it. Wolters (1977) agreed with Vaurie's treatment as, pending fresh information, do we.

Biswas (1950) advocated the subspecific recognition of *yunnanensis* Ingram, 1910, but he did not compare it with *macella* Thayer & Bangs, 1909, in the synonymy of which *yunnannensis* is now found.

Corvus enca (Horsfield, 1821)

Two species of Asian corvid seem to us to be particularly deserving of urgent field studies with the careful collection of acoustic evidence. This is one; the other is *Corvus macrorhynchos* Wagler, 1827.

Blake & Vaurie (1962) followed Meinertzhagen (1926) and listed a broad species taking in the birds of Malaysia (*enca*, and *compilator* Richmond, 1903), of Sulawesi and nearby islands (*celebensis* Stresemann, 1936, *unicolor* Rothschild & Hartert, 1900¹⁰, and *mangoli* Vaurie, 1958), the southern Moluccas (*violaceus* Bonaparte, 1850) and the Philippines (*pusillus* Tweeddale, 1878, *samarensis* Steere, 1890, and *sierramadrensis* Rand & Rabor, 1961). Vaurie (1958) gave details of the forms he united, but said little about why he rolled them all into one species. He considered them all to have very rounded

¹⁰ Described in the genus *Gazzola*.

wings¹¹ and a relatively short and slightly rounded tail (about half the length of the wing). They have the base of the culmen bare¹². Fig. 1 in Vaurie (1958), a photograph of the bills in five forms he treated as *C. enca*, makes clear that Vaurie regarded bill length, and probably depth, as of subspecific not specific value¹³. Vaurie also rejected size as a basis for specific separation in this group (p. 6). The taxa assembled are said to have in common black plumage with a purplish lustre¹⁴ (but not very glossy) with white or whitish bases to the feathers of the nape, breast and abdomen and to have 'somewhat' elongated throat feathers¹⁵, but not true hackles (of the kind seen in other species of *Corvus*). His table of measurements reveals that his sample sizes were modest to negligible and so they give no more than a rough idea of relative size. It should not be supposed that Vaurie neglected the issue of sample size. His other studies, especially that on the drongos (Vaurie, 1949), show that he was willing to measure large series. The correct conclusion is probably that past collectors simply neglected the collection of such obvious and apparently similar birds

Vaurie (1958) restated the evidence of a very distinctive voice reported by Heinrich for the allied species *C. typicus* (Bonaparte, 1853) that Stresemann (1940b) considered important enough to warrant generic separation. Apart from this Vaurie made no mention of voice differences.

More recent information on voice needs to be collected. McGregor (1910) had noted that in the Philippines the Palawan form (*pusillus*) and the Samar form (*samarensis*) had 'entirely different' voices. This was repeated by Goodwin (1976: 68) who could find no suggestions of differences in voice between *compilator*, nominate *enca* and *violaceus*. Smythies (2000: 632-633) provides the fullest comparative information on the voices of *C. enca* and *C. macrorhynchos*.

The Slender-billed Crow is not typically a bird of open country. Chasen (1939) wrote, of the Malay Peninsula, that it replaced *C. macrorhynchos* 'in the less open country and in the inland districts' and that it was 'a bird of the forest rather than the coasts, but it does nevertheless visit the mangrove belt where this is backed by forest'. In Borneo Smythies (1960) said 'I have met with it usually in small flocks along the rivers and forest edges', and yet *Corvus macrorhynchos* was almost unknown. More recently Smythies (2000) suspected it was now only scarce and was perhaps increasing, and reported that *C. enca* was adapting to open secondary growth. In Sulawesi, however, *C. macrorhynchos* is absent and *C. enca* is more evident. Raven in Riley (1924) noted that *C. enca* seemed to prefer coconut groves. Subsequent writers of privately published

¹¹ Oortwijn (1987) added that the outer primary is relatively short.

¹² This refers to a lack of the nasal bristles that normally conceal the culmen in the *C. coronoides* group (Meinertzhagen, 1926), which includes *Corvus macrorhynchos*. This was the grouping proposed by Stresemann (1916).

¹³ Of course the species is known as the Slender-billed Crow and the bill is proportionately more slender than that of *C. macrorhynchos*.

¹⁴ Meinertzhagen (1926) mentioned 'a distinct violet tinge on the under-parts, which is invariably absent in the *C. coronoides*-group' (a group including *C. macrorhynchos*).

¹⁵ Meinertzhagen (1926:70) referred to the throat feathers as less lanceolated. It will be remembered that full adult crows generally have relatively more lanceolated and elongated throat feathers than younger birds (Meinertzhagen, 1926: 80).

reports agree that *C. enca* is reasonably common around the villages. In the Philippines the birds of Luzon (Dickinson, pers. obs.), Mindoro (Ripley & Rabor, 1958: 54) and Samar (McGregor, 1910; Rand & Rabor, 1960: 413) are definitely forest birds. In Palawan, where *C. macrorhynchos* is reportedly absent¹⁶, *C. enca pusillus* seems to be widespread.

There have been three reviews since Blake & Vaurie (1962). Goodwin (1976: 68-69), like Rand & Rabor (1961), rejected the separation of *violaceus* in Dorst (1947) where the Philippine forms were associated with it, and retained the treatment of Blake & Vaurie, except that he perceived a relationship between *unicolor* and *typicus*, both having grey bases to the feathers not white. Goodwin thus detached *unicolor* from *C. enca* and suggested it be seen as forming a superspecies with *typicus*. We tentatively accept this treatment, as did Wolters (1977) and White & Bruce (1986).

Oortwijn (1987), whose material was limited to that in collections in Amsterdam and Leiden and did not permit him to study Philippine populations, had more specimens from the Malay Peninsula, Sumatra, Java, Bali and Sulawesi than Vaurie (1958) and concluded that birds from Sulawesi seemed insufficiently different from the nominate form to deserve separation. Although Eck (1975) had confirmed that Taliabu birds should be placed with *mangoli* and recognised that form (still on limited material), Oortwijn, with another small sample from the Sula Islands also submerged this race in nominate *enca*. And with ten specimens from Borneo, no doubt from Kalimantan, he concluded that their affinities lay with *compiler*. We accept the latter finding as regards Borneo, but as the Wallacean forms have been retained by White & Bruce (1986: 321) we prefer to retain them too. Like Oortwijn we keep an open mind on whether *violaceus* is a separate species and whether Philippine forms are any part of that. It seems more probable to us that if *violaceus* is accepted as a distinct species then the Philippine forms will deserve separation into one, possibly two other species.

Amadon (1944: 15) emphasised the ability of the genus *Corvus* to 'exploit many secondary habitats produced by human activities'. Rand & Rabor (1961) suggested that the absence of *enca* from parts of the Philippines might be 'due to ecological factors'. This, taken in conjunction with the loss of forest habitat, makes sense. Equally the relative absence, at least historically, of *macrorhynchos* from Borneo, Palawan and Sulawesi seems likely to have been due to the high proportion of original forest cover within which only *enca* could survive. White & Bruce (1986: 25) noted that deforestation had left much of the Lesser Sundas covered with grassy hills and little forest and it is perhaps unsurprising that only *C. macrorhynchos* is present.

Corvus corone Linnaeus, 1758

This species, or species complex, is mainly Palaearctic. The debate on whether this is best treated as one, two or three species continues; see Eck (2001) and Knox et al. (2002).

¹⁶ Its absence from Palawan now may or may not be true. Neither Rand's 1970 MS note that it appeared to be absent, nor the footnote by McGregor (1910: 722) triggered a cautionary word in Dickinson et al. (1991) or in Kennedy et al. (2000) as either should have.

Corvus macrorhynchos Wagler, 1827

The problems here are even more complex than those discussed under *Corvus enca*. Here we have a 'species' in the eyes of virtually all authors from 1930 to 1995 where two populations are now known to overlap in the Himalayas; apparently secondary contact among populations that evolved in isolation. The taxonomic issues involved have been particularly apparent since Martens & Eck (1995) detailed the altitudinal ranges of what they labelled *Corvus japonensis intermedius* Adams, 1859, and *Corvus levaillantii* Lesson, 1831. This contrasted with the traditional view in Ripley (1961, 1982) and reflected in Grimmett et al. (1998), that a broad species *macrorhynchos* is represented by four subspecies of which these are two. But Grimmett et al. well portrayed the experience of those who have travelled from the Indian lowlands into the Himalayas and have noted the considerable size difference - the large Himalayan bird seeming raven like, even to the extent of having a wedge-shaped tail - and the distinctness of their calls, which are higher pitched in the lowlands. The situation was known before 1995. Sibley & Monroe (1990) flagged it by treating *levaillantii* as an allospecies, but as the appropriate placements of all the subspecies in *macrorhynchos* was not explained readers either assumed that *levaillantii* consisted of just that form or remained confused.

Martens & Eck (1995) noted that *intermedius* seemed to occur in the range 1850-4200 m and that *levaillantii* was found from the lowland up to 2660 m. They provided sonagrams of numerous vocalizations (their Fig. 116) of '*C. japonensis*' (including some of *C. j. intermedius*) and of *levaillantii* (their Fig. 117). The calls of the former were characterised as 'harsh and coarse' and those of the latter as 'brighter and clearer'. They noted that the difference in voice had already been observed by Biswas (1964)¹⁷. Significantly, they did not associate the name *macrorhynchos* with either species. The signal here is that they did not consider *macrorhynchos* to be conspecific with either of the two taxa discussed. The only direct comment was to suggest that Vaurie (1954b) had lumped *levaillantii* with *macrorhynchos* 'without particular reason'. But importantly they pointed to Hartert (1929) and buried in his paper about types in the Tring Museum one finds a review that does indeed seem to have escaped Vaurie and other post-war writers.

Hartert (1929) provided a useful historical perspective, drawing on his initial problems with Australian corvids. He noted the paper by Stresemann ('1914' = 1916)¹⁸ that to him had seemed satisfactory in '1921 to 1923', and the critique of this, and of the views of Mathews¹⁹, by Meinertzhagen (1926). He concluded that Meinertzhagen had posed useful questions, but had been wrong to place the many forms of 'raven' or crow listed by Mathews in just two subspecies of one very broad species *coronoides* Vigors & Horsfield, 1827, namely in *bennetti* North, 1901, and nominate *coronoides*. Hartert also felt that Meinertzhagen had undervalued the distinction between white bases to the feathers and grey bases. Hartert thought that there were two species, a

¹⁷ Citing it as 1963, which is the volume date (see Pittie, 2003).

¹⁸ Hartert (1929) correctly referred to 1916 at other points in his paper.

¹⁹ Various works on Australian birds from 1911 to 1920: for details see Meinertzhagen (1926).

crow and a raven, as Mathews had said, differing in size and that there were 'no intermediates' and that neither of these two species could include *bennetti*. The crow had white feather bases, except, he wrote, in young birds, and the 'raven' grey; *bennetti* also had white feather bases. As far as this went we would now say that Hartert was right (however, two other ravens with restricted ranges were not then picked out, no doubt due to his limited material)²⁰. Leaving *bennetti* aside Hartert placed the crow in a broad species *macrorhynchos* and the 'raven' in a restricted species *coronoides*, the latter being of no concern to us in the context of Asia.

Hartert then assembled the large crows with white bases to the neck feathers in a species *macrorhynchos*, including the races *philippinus* (Bonaparte, 1853), *mengtszensis* La Touche, 1923, *orru* Bonaparte, 1850 and three other regional forms that for us are extralimital. Of these forms, all of which Hartert claimed had snowy white bases to the feathers, *mengtszensis* is a distant outlier surrounded by populations that Hartert assigned to *C. levaillantii*²¹. In *levaillantii* he placed *japonensis* Bonaparte, 1850, *mandshuricus* [sic]²² Buturlin, 1913, *hassi* Reichenow, 1907, *colonorum* Swinhoe, 1864, *hainanus* Stresemann, 1916, *connectens* Stresemann, 1916, and *intermedius* apparently accepting the views of Stresemann (1916) and Meinertzhagen (1926) both of whom accepted a separate monotypic species in Sri Lanka (*anthracinus* Madarász, 1911).

This treatment came too late to influence Baker (1922). However, Baker (1930) acknowledged Hartert's review and removed all Indian forms from *coronoides* and placed them in *levaillantii* (including *macrorhynchos* despite its prior name). It came too late for Robinson (1927, 1928) as well²³. Change to Robinson's nomenclature either escaped the attention of Chasen (1939), although he had used the name *macrorhynchos* in 1935, or, more likely, was deliberately left alone to minimise confusion with what was in the prior volumes by Robinson. But *Corvus macrorhynchos* was used by Delacour (1930b) who discussed *colonorum* from Indochina and wrote '... but the Jungle-Crows of Asia cannot be divided into two species according to white or grey feather-bases. There are only races of one and the same bird and also intermediates ...'. So while Baker (1930) tried to reunite everything South Asian as *levaillantii*, Delacour began to reunite eastern populations, correctly using the older name *macrorhynchos*.

Having read Hartert (1929), Whistler & Kinnear (1932) wondered whether the jungle crows might not be forms of *Corvus corone*. They re-examined the arrangement of Indian races and accepted just three forms of *coronoides* from the sub-continent:

²⁰ A comment based on the treatment by Schodde & Mason (1999). However it should be noted that the Australian raven that Hartert (1929) called *C. macrorhynchos ceciliae* Mathews, 1912, was separated along with *orru* and other forms by Stresemann (1943).

²¹ There are also unresolved problems here both as regards to the colour of the bases of the neck feathers and as to whether the name was applied to 'hybrids' (see Mayr, 1940) - the reason, presumably, why there is a '?' before this entry in Blake & Vaurie (1962). Vaurie (1954b) had not seen specimens (the 'cotypes' are at the MCZ, Harvard).

²² Often emended to *mandschuricus* as it was by Hartert (1929).

²³ Robinson used *Corvus coronoides macrorhynchos*. Rather earlier Kloss (1921) had reviewed the treatment of Stresemann (1916) and clearly believed that Stresemann, when visiting Malaya, had mistaken the open country *macrorhynchos* for *C. enca* and seemed to suspect that Stresemann had muddled his specimens too. Kloss set out the evidence available from the Malayan collection.

intermedius across the west and central Himalayas, *culminatus* in the peninsula (treating Sri Lankan birds as this too, sinking the endemic *anthracinus*), and *macrorhynchos* in the east, both high in the Himalayas and down through Assam to the sea. The name *levaillantii* disappeared into the synonymy of nominate *macrorhynchos*.

Mayr (1940) did not agree. In examining collections from northern Burma, and stating that these belonged to an undescribed form²⁴, he assembled enough material to make some judgements about the birds found from Bengal and Assam south to the Malay Peninsula, as well as those in the Andamans. His comparative southernmost population, restricted to Java and islands to the east of it, he called *macrorhynchos*, thus removing this name from contention in the sub-continent. His remaining four forms were from: 1) Bengal and Assam, which has been taken to be *levaillantii* back out of synonymy; 2) a lowland form in Burma and northern Tenasserim, 3) a slightly different form in peninsular Thailand and the Malay Peninsula, and 4) the Andamans birds which differed from all the others in having the 'nape white'. In the years that followed Deignan (1945) considered that northern Thai birds belonged to population 2 (but rather than create a subspecific name employed *levaillantii* for it) and retained this 'label' when he applied *macrorhynchos* to form 3 from Prachuab south (Deignan, 1963), here following the lead of both pre-war authors on Malaya and of Gibson-Hill (1949).

In Indochina, where Delacour's treatment was repeated (Delacour, 1940) and remained unchanged (Delacour, 1951), the only oddity appears when considering the juxtaposition between nominate *macrorhynchos* 'sensu' Delacour, stretching through most of Indochina, and its absence in neighbouring Thailand until around Prachuab in the north of the peninsula, replaced through northern, eastern and central Thailand by *levaillantii* 'sensu' Deignan (in fact Mayr's 'population 2'). Presumably this is evidence of gradual intergradency between birds of Bengal in the west and those of the whole of mainland South-East Asia except where the south Chinese form *colonorum* occupies north-east Laos and northern Vietnam (Delacour, 1940). When account is taken of the reported extent of individual variation, the irrelevance of first year birds to an evaluation, and the modest and scattered collections of specimens it is not surprising that no real attempt has been made to examine in more detail the populations listed by Mayr (1940) and the eastward extension of them into Indochina.

Ali & Ripley (1948) resurrected the name *tibetosinensis* Kleinschmidt & Weigold (1922), which Meinertzhagen (1926) had put in synonymy, using this for the birds with 'large raven-like bills' quite different from those of *intermedius*, that they found in the Mishmi Hills and that Mayr (1940) had reported from North Burma and had considered were unnamed²⁵. Ripley (apparently just he, for the pronoun 'I' is used) stated that this was pending the direct examination of the type and other specimens of *tibetosinensis* from SE Tibet. Vaurie (1954b) endorsed this view, but did not actually examine Himalayan specimens east of Simla and did not mention whether he had examined the type or not²⁶. Ripley (1961) united Andamans birds²⁷ with those of Bengal

²⁴ 'They are large, are very black and glossy, have dusky bases to napes, and medium long, heavy bills.' (Mayr, 1940: 694).

²⁵ Vaurie (1959: 168) says they are glossy whereas *intermedius* is duller.

²⁶ The holotype of *tibetosinensis* has been lost (see Dickinson et al., 2004; this issue). There is a paratype in Budapest with which comparisons could be made.

under the name *levaillantii*. We have not attempted to determine whether this treated Andamans birds correctly, but it would appear to bring together birds with different basal colours to their neck feathers. Further study is probably warranted.

Although Stresemann (1943) gave the Philippine form specific rank, stating that it shared with *C. m. macrorhynchos* brown eyes, and feather bases that were 'schmutziger weiss' [= dirtier white], but had a more slender bill and a significantly different wing-tail index²⁸, Delacour & Mayr (1946) treated *philippinus* as a race of *macrorhynchos* and Blake & Vaurie (1962) and Goodwin (1976) both maintained subspecific treatment. So too did Dickinson et al. (1991) and Kennedy et al. (2000), but the paper by Stresemann (1943) was unknown to them as was the evidence from parasitic mallophaga (Klockenhoff, 1969 a, b). No one has doubted that the birds of the Lesser Sundas are nominate *macrorhynchos*.

To the north-east, in China and Japan, Hartert (1929) had listed one form (*mengtszensis*) in his species *macrorhynchos* and six forms in his species *levaillantii*, two Japanese (*japonensis* and *connectens*) and four Chinese (*mandshuricus* [sic]²⁹, *hassi*, *colonorum* and *hainanus*).

In Japan, in a book that did not include Tsushima or the Ryukyus, Austin & Kuroda (1953) listed *C. levaillantii japonensis* alone. Two forms named by Momiyama (1927c), one from Honshu and one from Kyushu, were treated as synonyms. Due to the scope of the book the presence of *mandshuricus* in Tsushima³⁰, and of the two smaller forms, *connectens* and *osai* Ogawa, 1905³¹, in the Ryukyus was not mentioned, but these were included by OSJ (1958), where the name *levaillantii* was still employed, although this changed to *macrorhynchos* in later check-lists. Cheng (1958) listed *macrorhynchos* with four Chinese races: *tibetosinensis*, *mandshuricus* [sic], *colonorum* and *hainanus*. He did not include *intermedius*; perhaps Chinese territory did not then include its range, but this was added later (Cheng, 1976, 1987), by which time he had placed *hainanus* in the synonymy of *colonorum*, and had moved *hassi* from the synonymy of *mandshuricus* to that of *colonorum*, where *mengtszensis* had figured all along. Cheng, who probably never saw the types and may not have questioned the colour of the feather bases, presumably accepted Greenway's view as given by Mayr (1940).

Vaurie (1954b) said that he had not examined the types of *mengtszensis* and Vaurie (1959: 168-170) omitted all mention of it. The basis upon which he determined to list it as a separate form in Blake & Vaurie (1962) seems to be based on his speculation in 1954 that it 'probably represents the end of a cline of decreasing size from *tibetosinensis*'. Although it is evident that the syntypes of *mengtszensis* need to be re-examined, above all to re-examine the colour of the bases to the feathers, we feel that we should follow Cheng in treating this as a synonym of *colonorum*. Obviously if the

²⁷ Delacour (1930b) reported examining those in the British Museum (Nat. Hist.) and finding white bases to the feathers, which led him to submerge *andamanensis* in nominate *macrorhynchos*.

²⁸ A wing-tail index of 64.3-64.7 in *philippinus* versus 55.1-57.2 in nominate *macrorhynchos* (no other subspecies cited).

²⁹ Because the spelling is as used here by Hartert but not in the original.

³⁰ Brazil (1991) thought that the population of Tsushima might actually be *japonensis*. OSJ (2000) treated it as *mandshuricus*.

³¹ Not included in Hartert (1929).

feather bases differ from those found in *colonorum* there will need to be further consideration of the suggestion that the name *mengtszensis* was given to hybrids.

With this background set down it is helpful to sketch Hartert's arrangement on a map. Several observations can be drawn from it. The first is that *levaillantii* as Hartert defined it was a species of south and east Asia, with one disjunct oddity – *mengtszensis*. This, of course, would not be odd if it has feather bases that are not white as he thought (but although he may not have seen the types at the MCZ he must be presumed to have seen Yunnanese birds with such colouring). Secondly, if *mengtszensis* is put aside, the populations with grey or brownish bases to the neck feathers of adults evidently meet nominate *macrorhynchos*. This reaches north to Prachuab (Deignan, 1963) or up into all of mainland South-East Asia, except for northernmost Burma and northern Indochina, if, when dealing with Mayr's intermediate populations, you adopt Delacour's nomenclature³². Thirdly, there remains the issue of the Andamans with conflicting claims about the colour of the basal feathers, Delacour (1930) found them white, but Hartert (1929) grouping *andamanensis* with *levaillantii* no doubt influenced Ripley (1961, 1982) to place the former name in synonymy.

We must now return to the specific name *Corvus japonensis* used by Martens & Eck (1995). This is fundamentally a signal, initiated by Wolters (1977)³³, that the species is overlumped, not just because of overlapping forms with great differences in the Himalayas, but also because there is a case to re-examine over the combination of the southern forms with the northern. The oldest names in the broad species are *macrorhynchos* 1827, *levaillantii* 1831, *culminatus* 1832, *japonensis* 1850, and *philippinus*, 1853. The first and last belong with the southern birds, the second and third are clearly attached to smaller lowland birds of the Indian subcontinent. What is needed is the oldest name for a northern species overlapping with *levaillantii* and it must include the large Himalayan forms and those of China and Japan. So for this assemblage the binomial *japonensis* was the correct name to use.

The case however remains hypothetical. There are several questions to be answered. What does acoustic evidence tell us about the various populations that might be contained in such a species? After all as proposed it must include both large highland forms (*intermedius*, *tibetosinensis*) and lowland forms (e.g. *colonorum*), and it may not be appropriate to include the two forms from the Ryukyus which Brazil (1991) described as 'very small and very small-billed'. Once the north is settled there will remain the need to reassess the status of *andamanensis* and of *philippinus*.

Martens et al. (2000) noted that acoustic evidence 'clearly separates' *levaillantii*, *japonensis* and *splendens* in the Himalayas and they proposed a 'complex' (superspecies) allowing a four way split, of *Corvus macrorhynchos* s.l., in which 1) all Himalayan,

³² Logically the distinctions should be clear: white basal feathers in *macrorhynchos* and grey in *levaillantii*. One might have expected this to be discussed by Robinson & Kloss (1924), but this part of their paper appeared before Meinertzhagen (1926) and Hartert (1929) and the colour of the bases of the feathers is not mentioned. However, Riley (1938) is also silent on the subject. Sadly he wrote two years before Mayr raised awareness of the need for study. Tellingly, and as an example of an underlying problem, according to Riley, Hugh Smith apparently had no crows at all in his 6459 bird skins from Thailand!

³³ As explained by Martens et al. (2000) six forms were identified by Wolters (1977) that he considered appropriate for a hypothetical species *C. japonensis*.

Chinese and Japanese birds are united in a species *C. japonensis*; 2) *C. levaillantii* engulfs the lowland forms of the subcontinent, Burma and most of Thailand; 3) *C. macrorhynchos* of the Greater and Lesser Sundas³⁴ is seen as reaching further north than Prachuab and east through south-east Thailand into Indochina, and 4) *C. philippinus* – a rather more tentative split in their text than in their map (for understandable reasons), mainly dependant on the striking but incomplete mallophagan evidence of Klockenhoff (1969a, b) for support. This hypothesis needs refining, with inputs from specimens, acoustic evidence and molecular studies.

Enough adult specimens from Burma, Thailand and Indochina should be re-examined to determine where *macrorhynchos* becomes *levaillantii*. The map in Martens et al. (2000) is based on standard works whose authors, without recorded close re-examination, chose different conventions to label the populations discussed but not named by Mayr (1940). It should be noted too that Mayr saw at least his lowland forms as intergrading and he did not envisage that this intergrading ceased where nominate *macrorhynchos* was met³⁵ - unless it was south of the Malay Peninsula. If there is intergradancy then it is particularly important that species definitions explain where this occurs and why specific range borders are chosen that cut across this. The situation in Sakhalin is instructive. Here Nechaev (1991) reported widespread overlap between *mandshuricus* and *japonensis* with no apparent hybridisation.

A molecular study by Isawa et al. (2002) provided support for the separation of *japonensis* but the forms in the Ryukyus seem not to belong with *japonensis*. More of the forms in this whole complex require molecular evaluation.

As yet the amount of acoustic evidence that has been collected is limited. Several taxa require such study, not least the small birds in the Ryukyus and the Philippine isolate. Probably Sri Lankan birds should be reassessed too.

Here we defer the break up envisaged in Martens & Eck (1995) and by Martens et al. (2000), although we have suggested that in the accompanying paper on types the races be sequenced in accordance with the four groups suggested. This deferment is not because such action is unwarranted. Clearly some action is, and we suggest that separating the Philippine form may be a relatively simple first step if voice recordings can be obtained there. This, of course, will be just a step along the way. As regards mainland Asia there remain too many loose ends. Martens et al. (2000) wrote 'supplementary analyses of their vocalizations may help to reveal additional species delimitations that we suspect exist within the *macrorhynchos* complex'. It is thus just a matter

³⁴ Not actually absent from Borneo as their map suggests although admittedly still uncommon.

³⁵ Martens et al. (2000) suggested that Deignan (1963) considered that 'two very different' forms encounter one another in southern Thailand. If this were so then implicitly the Mekong would represent the boundary between the same two forms around the edge of eastern Thailand and their map except for cutting corners assumes this. In ECD's view Deignan simply listed two allopatric subspecies, with no indication that he saw them as very different and the treatment of Mayr (1940) suggests that intergradation should be expected and not hybridization. Intergradation would presumably more easily pass unnoticed against the background of individual variation. The mosaic pattern of mallophagan parasite speciation does tend to suggest that there is some interdigitation or sympatry and of two distinct species, right up into northern Thailand, but this needs to be supported by voucher specimens of the birds as well as the parasites.

of time. We anticipate however that from three to seven species should be expected; the mallophagan evidence suggests more still might be expected.

Corvus pectoralis Gould, 1836

Blake & Vaurie (1962) and Wolters (1977) missed the comment by Kleinschmidt (1940) to the effect that *Corvus torquatus* Bechstein, 1791, is a prior name to *Corvus torquatus* Lesson, 1831, and is not applicable to this species. Eck (1984: 26-27) has provided a reminder.

Goodwin (1976: 66) suggested that *torquatus* Lesson [= *pectoralis*] was probably the geographical representative of *Corvus corone* but that some overlap in breeding range may exist. Maps 412 and 413 in Cheng (1987: 556-557) suggest that the two probably breed allopatrically.

Corvus ruficollis Lesson, 1831

There are, or have been, mixed views about whether this is a species distinct from *Corvus corax* Linnaeus, 1758. Vaurie (1954b) wrote, 'the two are sharply differentiated morphologically and ecologically' and sustained this treatment in later works (Vaurie, 1959; Blake & Vaurie, 1962). Ripley (1961) did not accept this but changed his mind at some point after 1972 (Ali & Ripley, 1971; Ripley, 1982).

Goodwin (1976) felt that specimens from Quetta and Kandahar might be specimens of *subcorax* that had been misidentified especially if missexed or possibly even examples of interbreeding with *C. corax*. These may still require reassessment.

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³⁷ Endre Kleiner in Hungarian, Andreas Kleiner in German. Later changed his name to Keve.

³⁸ Hungarian pp. 141-190 and German pp. 191-262. For date of publication see Stresemann (1940).

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³⁹ This series is compiled largely from 'unconfirmed reports' and the compiler adds a caution to that effect.

⁴⁰ On sale April, 2000.

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