Systematic Notes on Asian Birds. 62.
A preliminary review of the Sittidae

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The Asian species of nuthatch have been reviewed several times in the last 50 years or so although the changes made have sometimes not appeared in the 'primary' literature, thus lack supporting explanations or sufficient detail. There continue to be puzzles over species limits, with a great need for molecular studies to inform on relationships as, morphologically, *Sitta* appears to be sufficiently varied to sustain two or more genera.

Introduction

This series of preliminary reviews continues with the Sittidae, including nuthatches and the wallcreeper. These were treated by Greenway (1967) in volume XII of Peters's Check-list of Birds of the World. His arrangement, not explained at the time, is examined and comments herein draw on more recent publications, including three associated papers in this issue of this journal.

The accompanying 'sister paper' on types (Dickinson et al., 2006: this issue) also covers tree-creepers (Certhiidae), which receive their own separate preliminary review (Martens & Tietze, 2006: this issue).

The Sittidae, about 26 species [1] in total, are essentially Holarctic in distribution, but also occur in the Indian subcontinent and South-east Asia. Vaurie (1957) provided a general background to the family, noting disagreements then current over whether the Australian sittellas belonged to the family Sittidae. Since then, molecular studies (cited by Schodde & Mason, 1999: 426-427), have led to the conclusion that similarities between the sittellas and the nuthatches are due to convergence. The true affinities of the sittellas, especially with other Australasian passerines, remain uncertain. The wide ranging species *Sitta europaea* Linnaeus, 1758, and a few associated, closely similar birds were reviewed by Voous & van Marle (1953), with whom Vaurie (1957) disagreed quite widely. The nature of these disagreements is discussed below, together with consideration of the alternative treatment given in Peters's Check-list by Greenway (1967). However, Greenway published no details of any independent studies that he had made which might support his decisions to disagree with Vaurie. The most recent major work on the nuthatches is that of Harrap (1996) who, as with the titmice, thoroughly discussed the rela-

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[1] The number depends, *inter alia*, on whether one accepts the split of *Sitta leucopsis* Gould, 1850, by Rasmussen & Anderton (2005) and the separation of *Sitta arctica* Buturlin, 1907, from *Sitta europaea* supported by Red'kin & Konovalova (2006, this issue).

tionships of the various species and depicted and described them well. While there has been much subsequent work on the titmice (Eck & Martens, 2006) study of the relationships among nuthatches has progressed rather little, and not much will be added here to what Harrap wrote.

Molecular sampling in the family is still limited to only a few taxa. It is possible, nevertheless, that some generic names not employed in the last 50 years will prove worth reintroducing.

Progress is also lacking in the collection and analysis of acoustic evidence. Vaurie (1957) wrote that Dr Löhrl had tape recordings that demonstrated the differences in their calls between *Sitta castanea* Lesson, 1830, and *Sitta europaea*; much later Harrap (1996) added that Löhrl published about *Sitta cashmirensis* Brooks, 1871, in 1969, and that Roberts (1992) had added to our knowledge of that taxon's calls. More evidence is still needed at the local level, especially in the Himalayas and China, to help resolve remaining concerns about species limits.

Taxonomy above the species level

There has long been general acceptance that the wallcreeper, *Tichodroma muraria* (Linnaeus, 1766), deserves its own genus and, indeed, subfamily. This is not further discussed below; no changes in taxonomy have been proposed recently.

The species-group of nuthatches that has *Sitta europaea* at its core comprises birds of dry-land, non-equatorial forests. While mainly Palaearctic they also occur on the southern slopes of the Himalayas and extend east through Burma and continental Thailand to Vietnam. They are largely limited to pines and deciduous forests. In more humid forests at low and middle elevations their place is taken by two southern species that are morphologically very distinct from the *europaea* assemblage. *Sitta frontalis* Swainson, 1820, and its relatives form three groups. Red bills characterise the birds occupying the bulk of collective range and these extend to the Greater Sunda islands and Palawan. Yellow-billed *Sitta solangiae* (Delacour & Jabouille, 1930) occupies southern China, southern Laos and most of Vietnam and, apart from Palawan where the red-billed population resembles Bornean relatives, yellow-billed populations inhabit the Philippines. For these Philippine birds, the oldest name available is *Sitta oenochlamys* (Sharpe, 1877). The interrelationship of these three groups requires analysis at molecular level. In the montane tropical rain forest the very distinct *Sitta azurea* Lesson, 1830, appears, limited to the highlands of western Malaysia, Sumatra and Java. No nuthatches occur in Sulawesi, the Moluccas or the Lesser Sundas.

I implied above that the genus *Sitta* may need to be split. On morphological grounds, especially the appearance of the head with its distinctive eye-ring and black frontal patch, the *Sitta frontalis* group is one candidate for elevation, and the rather aberrant *Sitta azurea*, in spite of a character trait (white edges to wing feathers) shared with *Sitta formosa* Blyth, 1843, must be a second candidate – although this might lead to a need to recognize a genus for *Sitta formosa* as well. Generic names have already been provided; indeed Greenway (1967: 125) listed 11 generic names that are available. Recognition should wait on sufficient molecular information and, ideally, that will be made available for each of the species now lumped in *Sitta*.

Not all Asian species require comment. For those that do, the sequence of accounts

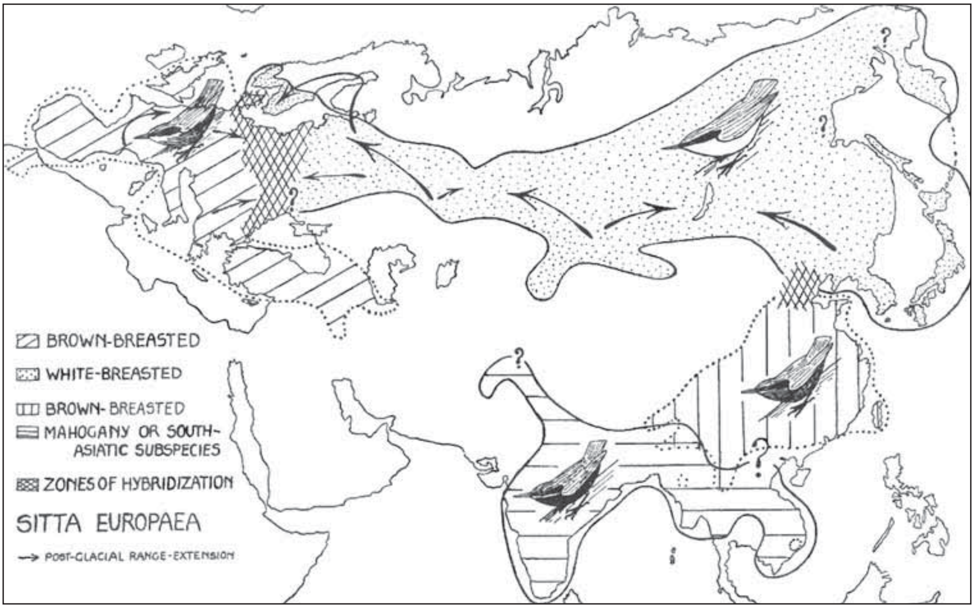

Fig. 1. Map of the distribution of *Sitta europaea* reproduced, with permission, from Voous & Van Marle (1953), Ardea 41, Extra nummer.

below reflects that in the accompanying paper (Dickinson et al., 2006) in which the following adjustments to Greenway (1967), have been made, without further comment therein: *Sitta cashmirensis* is placed between *S. nagaensis* Godwin-Austin, 1874, and *S. castanea*; *Sitta magna* Wardlaw Ramsay, 1876, followed by *S. formosa*, is placed before the more aberrant tropical species, and in this context, in view of the shared character trait mentioned above, it was felt desirable to place *Sitta azurea* next to *Sitta formosa*.

Taxonomy at and below species level [2]

Sitta europaea Linnaeus, 1758

This Eurasian species, with a range stretching from the coasts of the Atlantic to the coasts of the Pacific, is the type and most studied species of its genus.

Voous & van Marle (1953), who listed numerous previous studies, recognised 40 subspecies in their broad concept of *S. europaea*; of which 22 fall within our geographical scope. Their map (reproduced here as Fig. 1) sets the scene for an examination of species limits.

The 'species' is shown occurring around the deserts and high plateaux of central Asia [3], but it does not complete the circle because of inhospitable terrain in lowland

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[2] As usual in this series the views adopted here have been injected into the associate paper on the types (Dickinson et al., 2006).

[3] Including the loess areas of northern China where the land does not support forest growth.

Pakistan and in most of Iran and Arabia. The hatched range of the 'brown-breasted' European forms is shown meeting, in a cross-hatched area, the 'white-breasted' forms of the Siberia taiga. A further cross-hatching west of Korea and Bo Hai, once known as the Gulf of Chihli, also represents a meeting of the white-breasted forms with further brown-breasted ones, of China south and south-west to the Naga Hills of NE India. These two cross-hatched areas are called 'zones of hybridization' by Voous & van Marle (1953). The term hybridization used by them here refers not to a meeting of species, but to intergradation between well-marked subspecies [4]. To the south of China, and to the west of there in the Indian subcontinent, Voous & van Marle mapped the South Asian and South-east Asian range of 'mahogany' subspecies, which exhibit marked sexual dimorphism. The overlap between these – considered by Voous & van Marle in four groups, two with only a single taxon – and the brown-breasted Chinese forms, marked by the large query on their map, signals the difficulty in considering all 40 subspecies to belong to one species. The nature of the overlap, especially its altitudinal characteristics, required further elucidation, and is still insufficiently understood.

Vaurie (1957) recognised only 26 forms the last six of them making up the *castanea* group, of which he said "As this group is not Palearctic, it is not discussed here", but he did defend *koelzi* Vaurie, 1950, which Voous & van Marle had not accepted. Vaurie also insisted that *prateri* Whistler & Kinnear, 1932, recognised by Voous & van Marle, did not appear to be separable from [nominate] *castanea*, as propounded by him earlier (Vaurie, 1950). Excluding the *castanea* group, he accepted only ten subspecies for our region (see map in Editors' Foreword). For one of these he used the name *asiatica* Gould, 1835, the validity of which Voous & van Marle had rejected, although without giving reasons.

Ripley (1959) elevated *castanea* to species level, at that stage including *cashmirensis* but later (Ripley, 1961) he removed this to *S. europaea*. Greenway (1967) followed Ripley (1959) in recognising *castanea* as a species, with all the races accepted by Vaurie plus inclusion of *cashmirensis*, even though Ripley had later decided to return it to *europaea*. What remained of *S. europaea* Greenway split into two species (*europaea* and *nagaensis*). His species *nagaensis* was represented by two subspecies: nominate *nagaensis* – with *montium* la Touche, 1899, in synonymy – and *grisiventris* Kinnear, 1920. Otherwise, his narrower concept of the species *S. europaea* involved no reduction in the number of subspecies accepted in Asia, and only additional synonyms distinguish his list from Vaurie's (although he placed *kleinschmidti* Hartert & Steinbacher, 1933, in the synonymy of *amurensis* Swinhoe, 1871 [5], rather than omit it as an intermediate – or 'indeterminate' hybrid) [6].

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[4] However, the speculation in these cases is that the 'hybridization' has arisen due to secondary contact when forms spreading north from differing Ice Age refugia met (Voous & van Marle, 1953). The implication is that insufficient time was spent in isolation for complete reproductive isolation.

[5] Based on over 15 specimens including the type, Eck (1976) found *kleinschmidti* agreed in measurements with *amurensis* but was somewhat more intensively coloured, and he did not think it was an intergrade.

[6] Voous & van Marle (1953) placed the name *baicalensis* Taczanowski, 1882, in limbo by stating that it represented intergrades between *amurensis* Swinhoe, 1871, and *biedermanni* Reichenow, 1907. However, *baicalensis* is brought into use by Red'kin & Konovalova (2006), with the side benefit of resolving the awkwardness of a senior name being treated as indeterminate. Vaurie (1957) reassigned *biedermanni* to the synonymy of *asiatica* Gould, 1837, to which name it is junior.

Harrap (1996) followed Greenway in treating *castanea* and, with some reservations, *nagaensis* as species, but went further. He interpreted the treatment of Sibley & Monroe (1990) as allowing him to recognise *cashmirensis* as a species, although this proposal had never been made in a peer-reviewed journal[7]. Unlike Greenway, he recognised *montium* (type locality: Kuatun, Fujian), as had Vaurie, and following Stepanyan (1990: 584) restored recognition of *S. europaea sakhalinensis* Buturlin, 1916. Morioka (1994), not cited by Harrap (1996), considered Hokkaido to be occupied by *S. e. asiatica*, all Honshu plus Shikoku and northern Kyushu by *S. e. amurensis,* and that *S. e. roseilia* Bonaparte, 1850, occupied only southern Kyushu.

The scope of this series does not include northern Siberia. Therefore *arctica* Buturlin, 1907, and *albifrons* Taczanowski, 1882, neither of which reach China or Japan, are not included here although discussed by Red'kin & Konovalova (2006; this issue), where the east Asian races of *S. europaea* are reviewed in a solicited complement to this paper. Their recommendations include recognition of subspecies *takatsukasai* Momiyama, 1931 from the Kurile Islands, *hondoensis* Buturlin, 1916, from much of Japan (contra Morioka, 1994) and *formosana* Buturlin, 1911, from Taiwan. They also strongly support the case made by Eck (1984) for the elevation of *S.* (*e.*) *arctica* (from north of our area) to full species rank.

***Sitta* (*europaea*) *nagaensis* Godwin-Austen, 1874**

Harrap (1996: 114) was in doubt as to whether this represents a species separate from *S. europaea* (as in Greenway, 1967). Such doubt seems reasonable; Ripley (1982) rejected Greenway's elevation of *nagaensis* and kept it within *S. europaea*, arguing that the taxa are geographically defined and "do not replace themselves altitudinally". Cheng (1976, 1987, 1994) also rejected a species *nagaensis*. Although these authors both took positions, no definitive study by either of the background to Greenway's decision is known to have been published. Molecular studies are needed, and more field observations from where relevant taxa come into contact.

The recognition of *nagaensis* as a distinct species by Greenway was no doubt predicated, in part, upon evidence discussed below suggesting that *montium* is a montane form that occurs alongside, and perhaps even overlaps in altitudinal range, lowland *S. e. sinensis* Verreaux, 1870[8]. Vaurie (1959: 526) had seen *nagaensis* as a subspecies within his "*sinensis* group" and gave its range as the Naga, Cachin and northern Chin hills. He recognized *montium* with a substantial range, apparently in two parts, given as "higher mountains of Fukien [= Fujian] and of probably other regions of southeastern China, and westward from the border of western Szechwan [= Sichuan] where it grades into *sinensis* (q.v.) through Sikang (= Hsikang) to Pome, Tsangpo Valley, and northern slopes of the Himalayas to the region of Molo, or about 94°E. Long., southward through Yunnan to south-eastern Yunnan and mountains and higher hills of eastern Burma south to Southern Shan States and higher mountains of northern Siam". Implicit in this

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[7] Sibley & Monroe's 'groups' often involved splits likely to prove valid, but for which justification had not been published.

[8] Dated 1871 (1870) by Greenway (1970: 131) but see Dickinson et al. (2006; this issue).

is a gap between the Fujian area and the 'border of western' Sichuan. Vaurie listed *sinensis* from "Hopeh (= Hubeh) south to the Yangtze Valley, Fukien, and Formosa".

It should be noted that la Touche (1921) had described *obscura*, renamed *nebulosa* by la Touche (1922), from southeastern Yunnan and that Vaurie (1957: 18-19) had submerged this in *montium*; also that if these two populations are not identical the name *nebulosa* may need to be resurrected for those of Yunnan and eastern Burma etc., and circumscribed to emphasize such differences as are discovered.

Greenway's (1967: 131) range statement for *sinensis* included "northern Kukien [sic = Fujian] (at lower altitudes)". In his range statement for *montium*, which he treated as a synonym of *nagaensis*, one finds "apparently isolated in mountains of northwestern Fukien". No mention was made of 'intergrades' which, given his recognition of a species *nagaensis*, would have had to be seen as hybrids.

Close examination of the map in Cheng (1987: 908) reveals the same isolation of the Fujian type locality of *montium* from the rest of the range ascribed to that taxon. Cheng, like Vaurie, did not accept *nagaensis* as a separate species and presumably did not accept altitudinal replacement of *sinensis* by *montium*. By mapping two populations of *montium*, with the Fujian one entirely surrounded by *sinensis*, he emphasized the confusion without resolving it.

The morphological difference between *sinensis* and *montium* is certainly considerable, as pointed out by la Touche (1899) and Thayer & Bangs (1912). Traylor (1967: 59) expected the two to meet around Kuan Hsien in Sichuan, but the only specimen he collected appeared to be typical *sinensis*. Harrap (1996: 117) implied that Traylor had said they met, but in fact Traylor only expected to find that they did.

Voous & van Marle (1953: 40-41) [9] made the following comments that relate to the question of where *sinensis* meets *montium* and what is found there. First, under *sinensis*, they stated that "through the subtropical lowlands of central China, along the Yangtse River to the Red Basin (Szechuan), the underparts are said to grow paler (Kleinschmidt & Weigold, 1922), but the differences are very gradual and seem to overlap largely along the middle Yangtse River". At first, this seems to suggest intergradation, but suddenly there is mention of 'overlap' – and it is the differences that are said to overlap, although perhaps the authors meant that the species overlap. Next, under *montium*, "the transition to *sinensis* seems to be very gradual and the extremes from both races cannot always be differentiated" again implying intergradation, but then we are told that the "hill range of *sinensis* is bordered by steep mountains" (implicitly occupied by *montium*). And Voous & van Marle reported that Weigold collected both *montium* and *itschangensis* Kleinschmidt & Weigold (1922), which Voous & van Marle treated as a synonym of *sinensis*, at the same localities in W. Szechuan". Reference to Kleinschmidt & Weigold (1922) shows this to apply to one locality "W. Kwanhsién" [10] and that, apparently, *montium* was collected there only in January.

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[9] Voous & van Marle (1953) were concerned mainly with the evolution of the present distribution, and failed to present detailed information on sample sizes by sex, age, season and elevation in support of their Chinese arrangement. In fact, their total sample size of 42 *sinensis* and 17 *montium* would probably have been inadequate for understanding the dynamics given the huge area(s) of China occupied by these two taxa, differences between the sexes and seasonal changes in colour due to wear.

[10] Weigold (1922) attached "am mittleren Minho" to explain this locality.

Vaurie (1957: 16) wrote "*Sinensis* is chiefly a lowland bird or a bird of moderate elevations, and at higher elevations in Fukien (and probably in other high regions of southeastern China) is replaced by *montium*. Thus two distinct races occur in Fukien, which has been the source of confusion." He then added comments about the seasonal differences in plumage of *montium* due to wear, arguing that in worn spring plumage at least it is always distinguishable from *sinensis*. He also added that *sinensis* is not uniform, varying "in size and coloration as its populations ascend from the lowlands". Vaurie was clearly persuaded that *montium* is a highland form and that *sinensis* also occurs in Fujian, but he made no mention of Weigold's findings and did not mention intergradation in either Sichuan or Fujian; indeed one might reasonably conclude that he believed changes in colour due to wear only made it appear that intergradation took place.

Weigold's evidence suggests that *montium* and *sinensis* do intergrade in Sichuan, and also that at least in Kwanhsien, where both were found, one was a resident form and the other perhaps only present due to post-breeding dispersal. What occurs when the two meet in Fujian is less clear, la Touche (1899: 403) considered "birds from the lower hills of North-west Fukien" to be *sinensis*, mentioning the localities Kienyeng, Pucheng and Wu Yi Shan, but all his birds from Kuatun to be his new *montium*. These conclusions obviously needs to be re-examined when a sufficient sample of specimens can be assembled and further explorations seem desirable, especially to determine where these birds meet in Fujian and whether they intergrade or not.

There is also a possibility that certain authors discussing *sinensis* have been misled; comparisons made with *montium* may not have been with true *sinensis* because the type series of *sinensis* had not yet been found to be composite. Recently Voisin et al. (2002) recognized that the type series of *S. e. sinensis* was composite and that it included a specimen from Moupin (now Baoxing Xian, at 30°23′N, 102°50′E [11]) that la Touche (1899: 404) had recognised as typical of his *montium*. This may have led to other specimens being considered to be *sinensis* which are potentially better identified as *montium*. Thus there now seems to be a need to re-examine all available specimens from Sichuan and indeed from eastern Burma and Yunnan north and east to Fujian. This may demonstrate that two taxa do occur in the breeding season in the same approximate geography but at different, if overlapping altitudes[12], or that there is genuine intergradation; also whether indeed there are two segregated populations that can be assigned to *montium* or if there are consistent morphological distinctions, however small.

Finally, it seems highly improbable that there can be any gene flow between birds on Mt. Victoria in southwest Burma and birds on the highlands of southern Vietnam, both of which have been treated as *grisiventris* Kinnear, 1920. No doubt there will be quite significant genetic differences despite apparent morphological identity (see Ap-

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[11] Source: Zhao & Adler (1993).

[12] Harrap (1996: 117) said "the mere fact of altitudinal replacement is not sufficient grounds" to place these two in separate species and mentioned the postulated replacement of *S. e. amurensis* by *S. e. asiatica* at higher elevations in Honshu. However, both Morioka (1994) and Red'kin & Konovalova (2006) considered the highland birds fitted within the range of individual variation of a single Honshu population (*amurensis* according to Morioka, but recognized as *hondoensis* by Red'kin & Konovalova).

pendix). Similar situations arising in some titmice are discussed by Eck & Martens (2006; this issue).

Sitta cashmirensis Brooks, 1871

This nuthatch of the northwestern Himalayas occurs at higher elevations than *Sitta castanea* and has been considered to be intermediate between that and *Sitta europaea*, with Vaurie and others believing it closer to the latter and not safely separable at specific level.

Support for treating this as a separate species comes from acoustic evidence. Löhrl & Thielcke (1969) found that the alarm calls in Afghanistan were very different from those of either *S. europaea* or *S. castanea*. However, an earlier report of theirs [13] was interpreted by Voous (1977) as suggesting the removal of *cashmirensis* from *europaea* and its placement in *castanea*. Later, Roberts (1992: 370), hearing *cashmirensis* in Pakistan, felt the opposite approach was indicated; although recognising (on p. 371) that treatment of *cashmirensis* as a monotypic species by Inskipp & Inskipp (1985) might prove justified. The acoustic evidence of Löhrl & Thielcke (1969) better supports that action than it does lumping.

Geographically, *S. cashmirensis* is spatially quite well separated from any taxon that is to be treated as a form of a narrow species *europaea*, i.e., once *castanea* has been removed and is considered a separate species. In the west, the nearest forms are on the far side of Iran. *S. cashmirensis* itself occurs east to Lake Rara in northwest Nepal (Ripley, 1982) and below it is *S. castanea almorae* Kinnear & Whistler, 1930, which Roberts (1992: 371) recorded from as far west as the Murree hills [14]. Within this zone of overlap, the two come close, perhaps even meeting in winter when *cashmirensis* drops down to lower elevations. Roberts implied that *cashmirensis* breeds probably not below 2000 m and *S. castanea* not above 1800 m. East of Nepal, along the Himalayan range, the nearest form of *S. europaea* or *S.* (*e*). *nagaensis* is *montium* which is found on the north side of the Tsangpo valley and may penetrate southwards along the valley into Arunachal Pradesh.

Although *Sitta cashmirensis* has been promoted to species level without a peer-reviewed proposal in the primary literature, it seems appropriate to recognise the force of the arguments put forward and to accept that ranking.

Sitta castanea Lesson, 1830

Of the three groups mentioned by Harrap (1996): a 'plains group' (nominate *castanea*), a 'foothills group' (*almorae*, *cinnamoventris* Blyth, 1842, *koelzi* and *tonkinensis* Kinnear, 1936), and the '*neglecta* Walden, 1870, group', judging by plumage pattern, the last is the poorest fit with the others (as Quinn's plate in Harrap, 1996, demonstrates). In addition to genetic sampling, further studies of voice and behaviour are required, especially in areas where two or more nuthatch populations are geographically in close

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[13] Voous (1977) referred to a paper published in 1968 in "Tiere und Wir (Berlin etc.: 160)" which I have not examined.

[14] Based not on Biddulph's specimens with disputed label data, but on Waite's skins.

proximity and perhaps separated altitudinally to an extent that might limit but not eliminate contact. Harrap wrote "Could *tonkinensis* be reproductively isolated from *neglecta*, thus meriting specific status [for *neglecta*]?" Another way to look at this is to ask whether separation of a monotypic species *neglecta* would require the then isolated *tonkinensis* to be treated as a species too? There are many cases among south-east Asian birds where large range gaps exist between forms that have been judged to be conspecific [15]. Nuthatches are relatively easy to find and to see and must be among the easier birds to study intensively, yet little is known about the Asian ones.

Fisher & Warr (2003: 159) have suggested that Latham (1790) described *Sitta longirostris* [16] from one or two paintings from the collection of Lady Impey, and they reproduced two, one of which was labelled 'Syam Chakar' suggesting to them that the origin of the specimen depicted (either a syntype or holotype of Latham's name) was probably Siam (Thailand). The artist, apparently called Shaikh Zayn-al-Din, may have been Persian or have learned his painting technique under Persian tuition and it may be no coincidence that the picture much more closely resembles south-west Iranian birds, which belong to *Sitta europaea persica* Witherby, 1903, than it does any from Thailand. There is a mausoleum to a 15th century sheikh of the artist's name at Taybad in Iran (www.archnet.org/library/images/sites/one-site/tcl). If he was the artist the paintings are probably of considerable historical importance, but they may be copies produced much later.

Sitta villosa Verreaux, 1865

From a study of the cytochrome-*b* gene of mtDNA in ten nuthatch species, Pasquet (1998) demonstrated that this species seems to be more closely related to *Sitta whiteheadi* Sharpe, 1884, of Corsica, and less to North American *Sitta canadensis* Linnaeus, 1766.

The variation in the species is discussed by Nazarenko (2006; this issue) who concludes that birds from Ningxia should be attached to western *bangsi* Stresemann, 1929, and not to the nominate eastern form, and that *corea* Ogilvie-Grant, 1906, should be recognized pending more conclusive studies of this species in Ussuriland and Korea. Its presence on Sakhalin, whence there is one report mentioned by Harrap (1996), also needs to be investigated further.

Sitta leucopsis Gould, 1850

Martens & Eck (1995) speculated that, despite differences in their vocal repertoire, *leucopsis* might still be conspecific with *Sitta carolinensis* Latham, 1790. By contrast, Inskipp et al. (1996) mentioned a view that the two Asian subspecies were distinct enough to be treated as separate species. I have not traced a detailed proposal to this effect, al-

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[15] In this context see also the discussion above on *Sitta nagaensis grisiventris* which is found on Mt. Victoria in Burma and on peaks on the Langbian Plateau in Vietnam.

[16] This name is a *nomen dubium*. If firmly identified with the Iranian form of *Sitta europaea*, it will be necessary following the provisions of Article 23.9 of the Code (I.C.Z.N., 1999), to formally declare the name a *nomen oblitum*.

though Rasmussen & Anderton (2005: 537-539) treated *Sitta przewalskii* Berezowski & Bianchi, 1891, as a species separate from *leucopsis* and mentioned significant morphological and vocal differences, the latter shown in sonograms. It is to be hoped that the comparative morphological details will be published to sustain this position. It will, of course, also be desirable to conduct play-back experiments and assess the responses of each taxon to the calls of the other. As far as I am aware, this has not yet been done.

Sitta azurea Lesson, 1830

This is an unmistakable species, which forages and generally behaves just like *Sitta frontalis* (D.R. Wells pers. comm.). The pattern on its wings slightly resembles that of *Sitta formosa* which seems to link it to this genus, but in its overall blackish and white coloration it is very distinct from other Asian nuthatches. A comparison of its DNA should include a non-sittid sittella from Australasia.

Sitta frontalis Swainson, 1820

Although Greenway (1967: 142) lumped the entire population of the Indian subcontinent, including Sri Lanka, and of Yunnan and the Indo-Chinese countries in nominate *frontalis,* and included Java and Sumatra in this form, he accepted *saturatior* Hartert, 1902, from the Malay Peninsula and northern Sumatra. This left *frontalis* with two disjunct populations and *saturatior* interposed between the two. Mees (1986), with admittedly limited material, and none from the Malay Peninsula, disagreed. He found adult Javan birds to have greyish-lilac underparts that differed from the browner tone of the nominate form. He thus brought the name *velata* Temminck, 1821, into use for the Javan population. In placing all Sumatran birds with those of Sri-Lanka he implied that *saturatior* should be seen as a synonym of the nominate form. But van Marle & Voous (1988) retained the treatment of Greenway and perhaps did not see the conclusions of Mees in time to consider them. Wells (in press) considers birds of the Malay Peninsula are distinct, intergrading with nominate *frontalis* in the north of the Peninsula. But the situation in Sumatra also needs to be re-examined

Variation within the Indian subcontinent was much discussed by Vaurie (1950), and the latter's placement of *corallina* Hodgson, 1837, and *simplex* Koelz, 1939, in synonymy was accepted by Ripley (1961, 1982) as well as by Greenway.

It is uncertain where species limits lie. Many years ago I questioned whether *solangiae* was a species separate from *frontalis*. H.G. Deignan (in litt., 6 September 1965) replied: '*Sitta frontalis* and *Sitta solangiae* are certainly distinct, sympatric species! In Washington we have specimens of both shot out of the same flock on the same tree in the Lang Bian Highlands.' Robson et al. (1993), who taped the call of *solangiae* [17], could not quite corroborate this, reporting *Sitta frontalis* at 1350 m at Da Tan la just south of Da Lat and *Sitta solangiae* on Mt. Lang Bian and at Cong Troi, southern Annam at 1750 m

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[17] The difference from *S. frontalis* is described in Robson (2000) but Robson did not make clear whether there is altitudinal allopatry in Vietnam, giving 1450 m as the upper limit to the range of *frontalis* against a range for *solangiae* from 900-2500 m. Breeding ranges may not overlap.

which convinced him that the two were separate species though perhaps altitudinally allopatric.

***Sitta* (*frontalis*) *oenochlamys* (Sharpe, 1877)**

The Palawan taxon, *palawana* Hartert, 1905, is very similar to Bornean *corallipes* (Sharpe, 1888), and has the bright red bill that places it with *S. frontalis*. Curiously, all the other populations in the Philippines have yellow bills. Although the main dispersal route of birds from Asia into the Philippines has come through Borneo (Dickinson et al., 1991) some species seem to have arrived from China either through Taiwan or perhaps earlier and more directly [18]. It is not impossible that the root stock of *solangiae* and these forms is the same. Yet it is equally possible that they arrived through Palawan at a time before the present red-billed population had reached there. To determine this and to settle whether *oenochlamys* should be treated as an endemic Philippine species or a species that includes *solangiae* from Vietnam and Hainan a molecular study is essential. It also remains possible that it is neither but is closer to *S. frontalis*.

***Sitta solangiae* (Delacour & Jabouille, 1930)**

Cheng et al. (1964) described *chiengfengensis* from Hainan as a race of *Sitta frontalis,* including a colour plate in which they showed the bill as yellow. Cheng (1976, 1987) sustained this view but, subsequent to the comments of Mees (1986), (Cheng, 1994) removed it to *solangiae*.

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[18] See comments in Eck & Martens (2006) on the evidence from the DNA of *Parus venustulus* and *Parus amabilis*. See also discussion in Dickinson et al. (1990: 40-44).

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[19] Sauer (1982) established that the first 27 parts had 20 plates each. He implied that these would have been numbered consecutively, therefore Pt. 12 would have contained pls. 221-240. The name *asiatica* was dated 1837 by Greenway (1967: 127).

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[20] Both Wardlaw and Ramsay are surnames. They relate to two different sides of the family; after the marriage which brought them together, some branches of the family used Wardlaw-Ramsay with a hyphen while others omitted the hyphen. Often just cited as Ramsay.

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Appendix

Some comments on *Sitta nagaensis grisiventris* Kinnear, 1920

Harrap (1996: 116) briefly discussed the two populations and remarked that the "birds from Vietnam average slightly darker dirty blue-grey on the underparts than those from Mt. Victoria". In his description of this species, based not on the nominate form but on *montium* he described the "rear flanks" of the male as "deep brick-red" and those of the female as "rufous". In *grisiventris* the two sexes present in the same way. He also gave the colour of the male underparts as purer grey than in nominate *nagaensis*, and thus essentially without buffy tones although, as he says, these are present in the female. The overall impression is of very slight difference. He did not give separate ranges of measurements for Burmese and Vietnamese populations and separate data sets for the two populations would be interesting. Unfortunately, too few specimens are reliably sexed to facilitate this.

The Tring collection (BMNH) holds 19 specimens, including the holotype, from Mt. Victoria collected by Lt. Col. Rippon between March 10 and May 2, 1904. The labels show that these were taken from 4500 ft. up to 8000 ft., very few being sexed at the time. The colour of the rear flanks suggests that 9 of the 18 paratypes are males and 8 are females, but in some specimens calling the sex on this character is a doubtful exercise as individual variation seems almost to close the gap. In the same collection there are 10 specimens from Djiring or Dalat, south-central Vietnam, collected between 1918 and 1939 (three from 1918 by Kloss – 2 males and 1 female, the rest from three different expeditions led by Delacour). The sexing of Delacour's birds seems doubtful, two are unsexed and the others all said to be males. The most reliable female (BMNH 1919.12.20.433) has much lighter rufous rear flanks than any bird from Mt. Victoria, but this could not be corrobated as general. Of the two unsexed birds, both from March 1927, one (BMNH 1927.6.5.1268) is a male by its flank colour and the other may be a female on the same character but the rufous is not quite so pale as in BMNH 1919.12.20.433. Two other characters suggest constant differences. First, the extent of brick-red or rufous on the flanks seems to be greater on Mt. Victoria birds than on those from the Langbian plateau; second, the Mt. Victoria birds are a paler, bluer grey above than those from Vietnam.

It does not seem appropriate to name the Vietnamese population on this limited evidence, but it will be good to examine the DNA of the two populations.