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Materials for the breeding avifauna of the Democratic People's Republic of Korea. Results of Expedition '83

[with 2 text-figs]

Materiały do lęgowej fauny ptaków Koreańskiej Republiki Ludowo-Demokratycznej. Rezultaty wyprawy '83

Abstract. A total of 88 bird species were observed during our stay in the Democratic People's Republic of Korea from 4 June to 16 July 1983. The most interesting observations concern the common occurrence of the species so far regarded as rare in Korean Peninsula (e. g., *Accipiter soloensis*, *Falco subbuteo*, *Cuculus saturatus*, *Dendrocopos kizuki* and *Phylloscopus tennelipes*) and confirm the occurrence in the breeding season of the species whose status in that country had not hitherto been elucidated (e. g., *Turdus chrysolaus*, *Turdus hortulorum*, *Muscicapa latirostris*, *Parus montanus*, *Carpadacus rosaeus*, *Zosterops erythropleura* and *Phylloscopus trochiloides*). Descriptions of nest sites are given for 6 bird species.

CONTENTS

I. INTRODUCTION

The specific composition and the abundance of particular species of birds living in the Democratic People's Republic of Korea is not, as yet, sufficiently well known, because few ornithologists have carried out investigation and collected materials in the territory of that country. Up to the time of the division of Korean Peninsula into two states materials for the study of the avifauna of North Korea had been provided by GIGIOLI and SALVADORI (1887), JANKOWSKI (1898), ANDREWS (1944), SHIMOKORYAMA (1917), YOSHIDA (1923), KURODA (1918), MORI (1933, 1935), ORII (YAMASHINA, 1932), BERGMAN (1935a, 1935b)

and Won (1934). Austin (1948) summed up the contribution of these investigators or collectors to the study of the bird fauna of Korea, however, without including Jankowski's observations, and presented the current state of knowledge in this respect at that time. In following years a team of local ornithologists directed by Won Hong Koo carried out investigation in the Democratic People's Republic of Korea (to the end of the sixties), but the results of their work, for the most part published in Korean, are virtually restricted exclusively to their internal use (e.g. Won, 1956, 1958, 1964, 1963—65; Ho Hon and Rim Chu Yon, 1975). The small-sized editions of those publications and their little known language caused the inaccessibility of information contained in them. As a result, except for the popular articles in the periodical "Korean Nature" there is only a small number of papers on the avifauna in the DPR of Korea in world literature (Bocheński et al., 1981; Mauersberger, 1981; Tomek 1984). The status of many bird species living in North Korea has not been elucidated yet (Vaurie, 1959, 1965; Gore and Won, 1971, Etchecopar and Hüe, 1978, 1983), neither is there any information concerning changes in the abundance of particular bird species in the last thirty years. The present paper aims at filling up the existing gaps to a certain even though slight degree. It has been written as a result of a study on the fauna of the Democratic People's Republic of Korea carried out by a group of workers of the Institute of Systematic and Experimental Zoology, Polish Academy of Sciences, in Cracow in 1983 under the scheme of long-term scientific collaboration of the Polish and Korean Academies of Sciences.

II. STUDY AREA AND METHODS

The materials collected from 4 June to 16 July 1983 come from three regions of the country: 1. the city of Pyongyang and its environs, 2. the region of Myohyang-san Mts. and 3. the region of Chongjin (Fig. 1). In the city of Pyongyang and its environs observations were made on 4 and 5 June, 22 to 26 June and on 13 and 15 July during 3 whole-day and 6 several-hour-long tours of the following environmental areas: urban park (Moranbong Park, boulevard on the River Tedong, Botanical Gardens), river banks uncovered at the time of low tide with a strip of thicket along the bank (banks of the Tedong in Pyongyang and banks of Rungrado Island in the Tedong in the city area), dam lakes, several km² in area, with flat, partly marshy shores, with small rice fields, about 1 hectare in area and a young pine wood in their neighbourhood (lakes Sokam and Taesong-ho).

During a 16-day-long stay (6 June — 21 June) in the Myohyang-san Mts. observations were made in the close vicinity of the hotel, in a park environment (surroundings of a group of old buddhaist temples, e.g. Pohyon, with an adjacent park) and during 4 whole-day and 13 several-hour-long walking-tours of various portions of the mountain range, namely, to the valley of the River Hyangsan-

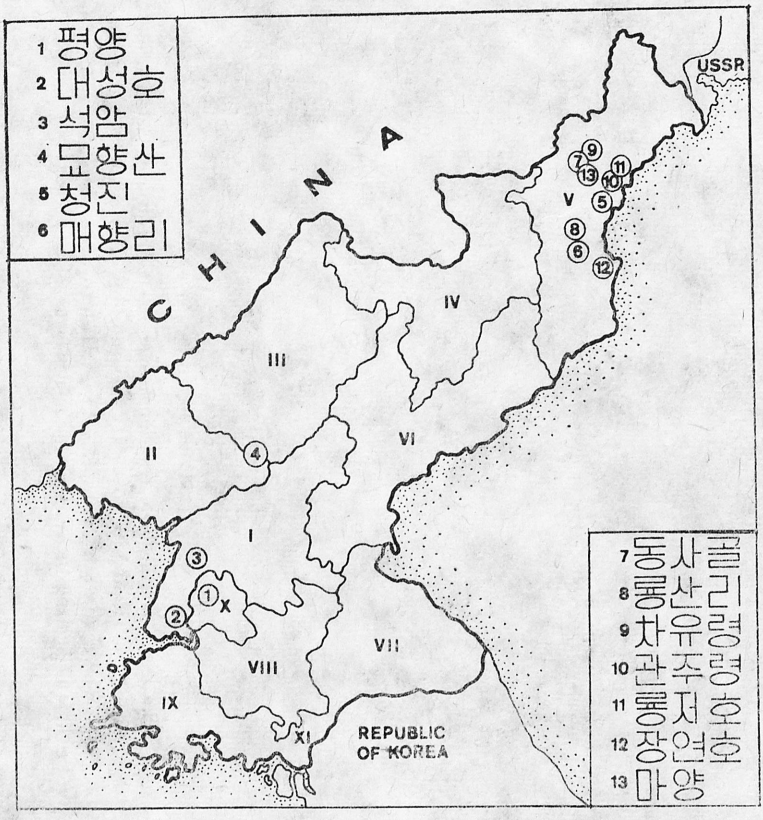

Fig. 1. People's Democratic Republic of Korea. The map shows the localities (Arabic numerals) and the division of the country into provinces (Roman numerals). 1 — Pyongyang (town), 2 — Taesong-ho Lake, 3 — Sokam Lake, 4 — Myohyang-san Mts., 5 — Chongjin (town), 6 — Machiang-ri, 7 — Dongsa-kol, 8 — Ryongsan-ri, 9 — Chayuryong, 10 — Koanjuryong, 11 — Ryongchae-ho Lake, 12 — Changyon-ho Lake, 13 — Mayang Lake. I. South Pyongan, II — North Pyongan, III — Chagang, IV — Ryanggang, V — North Hamgyong, VI — South Hamgyong, VII — Kangwon, VIII — North Hwanghae, IX — South Hwanghae, X — Pyongyang, XI — Kaesong

-chon (300—1000 m wide, limited by steep slopes grown over by mixed forest of many tree species and thick understorey) and to the valleys: Sangwon, Poyum, Nine-stage Falls, Hvajang-am, Habiro and Chontae (Fig. 2). In the Myohyang--san Mts. there are numerous post-buddhaist temples; the names of the valleys are for the most part derived from these temples and, in consequence, some valleys may have 2 and even 3 names. The valleys are similar in appearance: they have steep sides covered by mixed forest with lush understorey and a mountain brook runs among big stones along the valley bottom, forming waterfalls of various sizes and basins filled with water. In these mountains we observed birds also in higher-lying parts (Wonman-bong Massif, up to 1740 m a.s.l., with the upper forest zone, the zone of dwarf mountain pine and rhododendron and the rocky tier of alpine meadows, and the region of the Nungin Waterfalls, 1180 m a.s.l., with the upper forest zone). The Myohyang-san Mts. are now

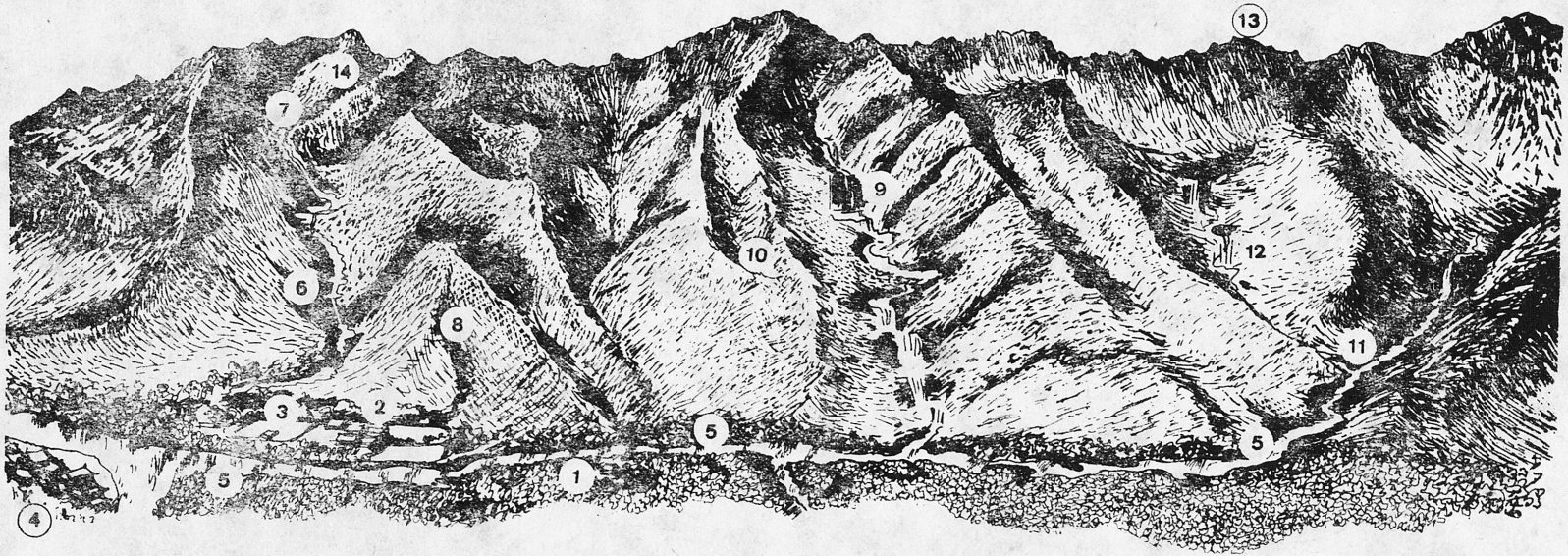

Fig. 2. The panorama of the studied part of the Myohyang-san Mts. The figures indicate the localities: 1 — Myohyangsan Hotel, 2 — old buddhaist temples Pohyon, 3 — park, 4 — Museum of the International Friendship, 5 — Hyangsan-chon River, 6 — Sangwon Valley, 7 — Chonsin Falls, 8 — Poyun Temple, 9 — Nine-stage Falls, 10 — Hvajang-am Temple, 11 — Habiro Temple, 12 — Chontae Falls, 13 — Wonman-bong Peak, 14 — Nungin Waterfalls

a recreation area tourist routes have been marked in many valleys, which are visited by numerous groups of tourists (the most people visit the part with the complex of the Pohyon monastery buildings).

In the region of the town of Chongjin the observations made during 2 several--hour-, 10 all-day- and one three-day-long trips (between 26 June and 11 July) covered the following environments: wide river valleys (up to 1 km across), with a strip of thicket along the river channel and cultivated fields (chiefly root crops) occupying the valley bottom, and with narrow side valleys with steep rocky slopes overgrown by mixed forest of many tree species (Machiang-ri, Dongsa-kol and Ryongson-ri). Observations were made also in mixed forests with thick undergrowth (the region of the Chayuryong Pass, 914 m a.s.l., and Koanjuryong Pass, about 300 m a.s.l.) and on lakes, both natural water reservoirs (Ryongchae-ho and Changyon-ho) and a dam-lake (Mayang). The natural lakes are several to more than ten kilometres away from the sea-shore, have mostly flat shores, partly marshy, grown over by reeds. In the vicinity of these lakes there were cultivated fields (root crops and rice) and a young mixed forest. The dam-lake was situated in the mountains (about 800 m a.s.l.), its steeply rising shores being covered by coniferous forest with an admixture of deciduous trees. Some observations come also from the park at Onphori, health resort near Chongjin, and from the coast of the Sea of Japan (close surroundings of the hotel, situated in the neighbourhood of the port buildings in Chongjin, a row of dunes at the seaside near Chongjin, and at the estuary of the River Orang).

In addition to the above-mentioned habitats in three regions, observations of birds were also made from running cars and trains, but only fairly large and characteristic species could be identified in this way (routes: Pyongyang — Synuiju, Pyongyang — Myohyang-san, Hungnam — Chongjin and Chongjin — Mayang Res.).

Studies were carried out by the method of direct observation of birds with the help of 7×50 field-glasses, net catches (7 Polish nets were used) and by recognizing the voices of singing birds. Some voices were recorded on a magnetic tape and then determined by comparing with the voices of the Far-East and Siberian birds, the records of which are kept in the Phonotheca of Animal Voices, Institute of Biological Physics, Acad. Sci. of the USSR, Pushchino, Moscow Region. Field keys to the birds of the USSR (Flint et al., 1968), Europe (Dobrowolski et al., 1982) and South-east Asia (King et al., 1975) and an illustrated monograph of Korean birds (Gore and Won, 1971) were used in determining the species. Standard dimensions were measured in the birds caught: lengths of the folded wing, tarsometatarsus, beak (measured from the plumage) and tail, and the body was weighed using a Pesola-type spring balance. All the birds caught (except flying chicks) were put to sleep and prepared and are stored in the collection of the Institute of Systematic and Experimental Zoology, Polish Acad. of Sci., in Cracow. A total of 24 birds belonging to 17 species were caught.

III. SURVEY OF SPECIES OBSERVED

During this 6-week-long investigation 88 bird species were found to occur in the study area. Their systematic arrangement and nomenclature are based on VAURIE'S (1959, 1965) work. The list of species presented is not complete. Some birds could not be identified because of a long distance or poor visibility (e.g. fog or rain made it impossible to watch birds through field-glasses). The question mark (?) indicates the species the determination of which is unreliable.

Butorides striatus (SCHRENCK 1869), present in all the regions explored, wherever it could find a suitable biotope. It was observed: 1 specimen on the river Hyangsan-chon on 18 June, 5 birds near Lake Sokam on 24 June, 4 birds feeding in rice fields in the vicinity of Lake Changyon-ho on 4 July, 1 specimen at Ryongsan-ri on 5 July, 2 birds on Lake Changyon-ho on 9 July and 3 birds foraging in shallows near the shore of Lake Teasong-ho on 15 July.

Ardea cinerea LINNAEUS 1758 was seen twice: 2 birds flying over Lake Changyon-ho towards a nearby forest on 9 July and a bird feeding in rice fields by the Pyongyang-Sinuiju route on 16 July.

Anas peocilorhyncha (SWINHOE 1866) was observed in the north of the country, in the environs of the town of Chongjin: a bird flying over Lake Changyon-ho on 4 July, 2 birds swimming at the opposite end of this lake on 9 July and 2 birds flying over a river with grassy and rush-grown banks, about 50 km south of Chongjin on 4 July.

Aix galericulata LINNAEUS 1758. Three specimens flying over Lake Sokam and, later, a bird on the shore of the same lake at a distance of about 2 km were seen on 24 June.

Pernis ptilorhyncus (TEMMINCK 1821). Only 1 specimen, circling near the summit of Wonman-bong in the Myohyang Mts., was observed on 11 June.

Accipiter soloensis (HORSFIELD 1882). This species was met with most frequently of all the *Accipitres*. Nearly every day from 6 to 17 June a bird preying on insects over the river at dark could be seen in the neighbourhood of the Myohyang-san hotel. One bird was also encountered in the Poyun Valley in the Myohyang-san Mts. on 19 June. The Chinese Sparrow Hawk was besides observed: 2 birds, about 3 km apart, at Maehyang-ri on 27 June and one in each: near the Chayuryong Pass on 29 June, in the Ryongsan-ri Valley on 5 July and on Lake Taesong-ho on 15 July. The birds observed in the day-time showed no unrest, they were mostly perching in trees and, when startled, flew away several dozen metres and again alighted on a tree branch.

Buteo buteo (LINNAEUS 1758). One specimen circling above rice fields near the estuary of the River Orang on 9 July.

Falco subbuteo LINNAEUS 1758 was observed nearly as often as the Chinese Sparrow Hawk and may have been even more numerous than that hawk. Nearly every day from 6 to 16 June 1—2 birds preying on insects over the River Hayngsan-chon were seen in the vicinity of the Myohyang-san hotel and 4 birds of this species appeared on 17 June. Hobbies were also found near

Kil-ju by the Tanchon-Chongjin route 1 bird on 26 June, one at Maehyang-ri on 27 June, one near Dongsa-kol on 1 July and 2 birds feeding on a river, about 4 km north of Chongjin on 7 July.

Falco tinnunculus LINNAEUS 1758 was seen only twice: a female at Onphori on 27 June and 1 bird foraging near Lake Ryongchae-ho on 28 June.

Tetrastes bonasia (LINNAEUS 1758). In June and July Hazel Hens already led their young in Koera. Family flocks of chicks, over 10 days old, with the hen were met with at a distance of about 100 m from the hotel in the Myohyang--san Mts. several times between 7 and 19 June. This species was also observed: a cock, hen and chicks in the Hvajang-am Valley on 10 June, an adult bird in the Habiro Valley on 11 June, 2 flocks of chicks in the Chonsin Valley on 14 June, a family flock in the Hvajang-am Valley on 17 June, an adult bird and a flock of chicks in the valley of the River Hyangsan-chon on 20 June, a flock of chicks near the village of Ryongsan-ri on 5 July and 2 family flocks in the proximity of the Chayuryong Pass on 7 and 10 July.

According to the comprehensive surveys of the birds of Korea published so far, Hazel Hens appear at altitudes between 800 and 1000 m a.s.l. or higher (WON, 1963—1965; GORE and WON, 1971). Repeated observations of young birds at altitudes from 200 to 400 m a.s.l. (Myohyang-san, Ryongsan-ri) indicate that their vertical distribution is much wider and therefore the area of their possible occurrence in Korean Peninsula is larger.

Phasianus colchicus LINNAEUS 1758 was a frequently encountered gallinacean, living, above all, in the lowlands of that country. Its occurrence was recorded on the basis of observations of adult birds or recognition of their voices — on Rungrado Island on 5, 22 and 23 June, in the Botanical Gardens in Pyongyang on 25 June, in the region of Pyongyang: 24 June 4 cocks on Lake Sokam and a bird near Lake Taesong-ho on 24 June; in the region of the Myohyang-san Mts.: in the Habiro Valley on 6 June, in the valley of the River Hyangsanchon on 11 June and in the Hvajang-am Valley on 17 June; in the region of Chongjin: on Lake Ryongchae-ho, near Lake Changyon-ho (2 cocks) on 4 July and near the village of Ryongsan-ri on 5 July.

Gallinula chloropus (LINNAEUS 1758). Two birds, one adult and one in juvenile plumage were observed in a thicket on Lake Changyon-ho on 4 July. The Moorhen was a rare bird in Primorsk (PANOV, 1973) and in the southern part of Korea (GORE and WON, 1971). In the territory of the DPRK it has been recorded scarcely three times in the last forty years and than always from the south-east provinces (Hyongjae-san on 20 June 1956, Taedongkun Muntong on 28 June 1956 and Kaesong on 22 June 1957 — WON, 1963—1965). The present observation of nesting (juvenile) would be the first of this kind from the north--eastern part of that country.

Charadrius dubius SCOPOLI 1786. Little Ringed Plovers were observed: 2 pairs on Rungrado Island in Pyongyang on 22 June, a pair at the opposite bank of the island on 23 June, 2 pairs and a bird in its juvenile coat on a river emptying into Lake Sokam on 24 June and a specimen on Lake Taesong-ho

(in the same place where some birds of the same species were seen in the spring of 1980 — TOMEK, 1984) on 13 and 15 July.

Tringa hypoleucos LINNAEUS 1758. Three birds were met with during the present investigation: one specimen feeding on a bank of the River Tedong, uncovered at low tide, in Pyongyang on 4 June, another specimen on Rungrado Island (about 3 km away from the place of the previous observation) on 22 June. One Common Sandpiper was observed repeatedly on the River Hyangsan-chon in the Myohyang-san Mts. between 10 and 20 June. Although this bird was not shy, while approached by a man, it gave signs of unrest. The behaviour of all these birds and the time of their observation (June) indicate that they were breeders. The Common Sandpiper had been observed many times in the DPR of Korea (WON, 1963—1965). Having taken into consideration its frequency and places of observations, we may state that the Common Sandpiper was a nesting bird in the northern part of Korean Peninsula. This contributes to the explanation of its distribution, for although GORE and WON (1971) state that it is a "common passage migrant; also a rare summer visitor breeding in the central area from Kyongii-do northwards", in many studies on the distribution of Palaearctic birds it has not been mentioned from Korea at all (VAURIE, 1965; VOOUS, 1962; DEMENTIEV et al., 1951—1954; ETCHECOPAR and HÜE, 1978; CHENG Tso Hsin, 1976).

Larus crassirostris VIEILLOT 1818. During the present investigation Black-tailed Gulls were observed on the eastern coast of the DPR of Korea: from several to several dozen birds in the harbour of Chongjin every day from 26 June to 11 July, about 100 specimens (adults and birds in juvenile plumage) on shallows and sandbanks at the estuary of the River Orang on 9 July and single birds flying, along the shore several kilometres south of Chongjin on 11 July.

Sterna hirundo LINNAEUS 1758. Only one bird was seen on Lake Changyon-ho on 9 July. The status of the Common Tern both in Korea and in adjacent Primorsk has not been fully explained yet. It was considered to be a common bird of passage, but some observations made in the middle of breeding seasons (PANOV, 1973; GORE and WON, 1971; WON, 1963—1965) suggest the possibility of its nesting, but this suggestion has not been corroborated.

Streptopelia orientalis (LATHAM 1790). The Rufous Turtle Dove was a frequently encountered dove, both in urbanized areas and at a distance from human settlements. In the Myohyang-san Mts.: several birds were seen along the route between the Pohyon buddhist cloister and the hotel, in the valley of the River Hyangsan-chon every day from 7 to 18 June, a bird was observed in the Valley of everyday from 7 to 18 June, a bird was observed in the Valley of Nine-stage Falls on 9 June and 4 birds at 3 sites in the Habiro Valley on 11 June, whereas the voices of 2 males were heard simultaneously in the Hontae Valley. In the Pyongyang region: 3 birds were seen on Lake Sokam on 24 June, one bird in the Botanical Gardens and several specimens near Lake Taesong-ho on both 13 and 15 July. In the Chongjin region: 2 specimens were observed in the neigh-

bourhood of Lake Ryongchae-ho on 28 June, two near Lake Mayang on 29 June, one specimen on Lake Changyon-ho on 4 July, several specimens in the town of Chongjin on 5 and 6 July and single birds by the Chongjin-Chayuryong Pass route on 7 and 10 July.

Cuculus fugax HORSFIELD 1821. The voices of Horsfield's Hawk Cuckoos were heard in the vicinity of the hotel in the Myohyang-san Mts. both in the daytime and at night between 6 and 21 June. Their voices were besides noted in the Valley of Nine-stage Falls on 9 June and in the valleys: Habiro on 11 June, Chonsin on 14 June and Hvajang-am on 17 June.

Horsfield's Hawk Cuckoos have occurred in the Myohyang Mts. at least for several years, for I heard their voices in the neighbourhood of the hotel in the days from 25 to 28 June 1980 — this species was omitted in the description of birds observed during the previous expedition (TOMEK, 1984), because I had not managed to determine its recorded voices by the time of writing that paper.

Cuculus micropterus GOULD 1838. As in 1980, the occurrence of the Indian Cuckoo was found only in the Myohyang-san Mts. Its calls were heard in the Habiro Valley on 6, 9 and 11 June, in the Valley of Nine-stage Falls on 9 June, near Chonsin Falls on 14 June and in the valleys: Hvajang-am on 17 June and Sangwon on 18 June. In addition, they could be heard through the window of the hotel room both in the daytime and after dark from 6 to 21 June. The Indian Cuckoo's voice is sonorous and audible at a long distance and so it was possible that the same bird was heard several times from different places. However, the size of the area in which this investigation was carried out suggests that in the Myohyang-san there were at least several specimens belonging to this species. The fact that in two breeding seasons (1980 and 1983) several Indian Cuckoos were found in the same region indicates that these birds settled down in the Myohyang-san Mts. Likewise, GORE and WON (1971) state that its voice frequently heard in summer makes them regard this species as "rare summer visitor". We are probably concerned here with the colonization of Korean Peninsula by the Indian Cuckoo in the latest years, for in earlier studies on the birds of Korea (AUSTIN, 1948; WON, 1963—1965) and on the distribution of Palaearctic birds (VAURIE, 1965; DEMENTIEV et al., 1951—1954) this species is not included among the birds breeding in the area under discussion.

Cuculus canorus LINNAEUS 1758. The Common Cuckoo was observed in two regions examined, Pyongyang and Chongjin. Their voices were heard or adult birds seen: in Moranbong Park on 5 June, on Rungrado Island on 22 June, in the Botanical Gardens (2 birds) in Pyongyang on 25 June, in the vicinity of Lake Sokam (voices of 2 males) on 24 June, in the region of Lake Ryongchae-ho on 28 June, near the village of Dongsa-kol (voices in three places several kilometres apart) on 30 June and 1 July, in the neighbourhood of Lake Changyon-ho 3 birds on 4 July and a bird on 9 July, at Ryongsan-ri on 5 July and in the region of Lake Taesong-ho on 13 and 15 July. The fact that no Common Cuckoos were found in the Myohyang-san Mts. is surprising, for they were birds frequently encountered there in 1980.

Cuculus saturatus BLYTH 1843. The voice of this cuckoo was heard mostly in mountainous regions, namely, in the Myohyang-san Mts.: in the Habiro Valley on 6 June, in the valley of the River Hyangsan-chon on 7 and 20 June, in the Valley of Nine-stage Falls on 9 June, on the way to Chonsin Falls (a male and somewhat further a male and a female) on 14 June, in the Sangwon Valley on 18 June and near Chontae Falls on 20 June. In the mountains near Chongjin the Oriental Cuckoo occurred: at the Koanjuryong Pass on 28 June, near Lake Mayang (2 sites about 3 km apart) on 29 June, in the vicinity of the village of Dongsa-kol on 1 and 2 July and at the Chayuryong Pass on 7 July. The number of observations of Oriental Cuckoos both during the present investigation and in the past (WON, 1963—1965; TOMEK, 1984) indicates that they live all over that country but occur more frequently in the mountainous areas of the northern provinces. The hesitation of many authors whether they should number this species among the breeders (AUSTIN, 1948; VAURIE, 1965; ETCHECOPAR and HÜE, 1978) is probably caused by scanty information about the birds inhabiting the northern provinces of Korean Peninsula. Also the southern part of the peninsula has most probably been colonized recently, for, according to GORE and WON (1971) and WON (1976), the Oriental Cuckoo is a "common summer visitor", whereas earlier investigations (AUSTIN, 1948) show that before 40 years it still belonged to birds rarely met with in the territory of the present Republic of Korea.

Otus scops (LINNAEUS 1758). The voice of the subspecies *Otus scops sticnonotus* (SHARPE 1875), distinguished by some authors as the separate species *Otus sunia* (HODGSON, 1836), was heard in the Myohyang-san Mts. During the period when investigation was being made in that region (i.e. 6—21 June) monotonous 3-syllabic calls of this owl were heard for many hours nearly each night.

Otus bakkamoena PENNAT 1769. A nest with a chick was found by a much frequented mountain path in the Hvajang-am Valley in the Myohyang-san Mts on 10 June. The chick's head and thorax were covered by greyish white down, the feathers, about 5 cm long, being present only on its wings (remiges). The iris of the bird was bright orange. The chick was in a tree-hole, the bottom of which was lined with a thick layer of pellets composed chiefly of animal hair with a small number of bones of small vertebrates. It has been determined on the basis of the well preserved bone fragments that the food of the owls included, among others, young and adult Northern Red-backed Voles *Pteromys rutilus*, an adult Korean Field Mouse *Apodemus peninsulae* and a small Woodpecker. The tree-hole, which arose owing to the mouldering of the tree, was small in size, its diameter was 17 cm and the depth from the edge of the entrance to the bottom also 17 cm. The hole had two openings; one of them was covered with cobweb and the other, which was the proper entrance, 10—13 cm in diameter, was situated not very high, 112 cm above the ground. At the next visit on 15 June the nest was empty and unfortunately I failed to observe the chick's parents. However, the size of the chick and the dimensions of the tree-hole in which it was reared and the descriptions of owls and their offspring

given by many authors (DEMENTIEV et al., 1951—1954; HARTERT, 1903—1922; BURTON, 1973; GROSSMAN and HAMLET, 1965; ETCHECOPAR and HÜE, 1978; NECHAEV, 1971 and others) indicate that the bird in question belonged to the species *Otus bakkamoena*.

Caprimulgus indicus LATHAM 1790. Voices of the Jungle Nightjar were heard in the Myohyang-san Mts. from 17 to 20 June and in the village of Dongsa--kol from 30 June to 2 July. These birds called repeatedly for a larger part of the night.

Eurystomus orientalis (LINNAEUS 1766). Two flying Broad-billed Rollers were seen in the valley of the River Hyangsan-chon on 7 June. One bird, flying in that valley and resting on the tops of trees could be seen nearly every day in the subsequent period up to 21 June. The presence of Broad-billed Rollers was also found: at Ryongson-ri (2 birds) on 5 July and on Lake Taesong-ho (also 2 birds) on 15 July.

Halcyon pileata (BODDEART 1783). The occurrence of the Blackcaped Kingfisher was found in the neighbourhood of the village of Maehyang-ri (2 birds sitting on electric wires about 2 km apart) on 27 June, on Lake Changyon-ho on 4 July and near Lake Taesong-ho on 13 July. A bird feeding in rice fields and another one sitting at the edge of a forest at a distance of some hundred metres were observed on Lake Changyon-ho. In proximity there were two sandy steep banks, several metres high, with 5 openings more than 10 cm in diameter. The size of these openings and the behaviour of the bird (when scared away, it returned to the same place in a dozen minutes or so), suggest that its nest was in that bank. All the openings were inaccessible, 1—1.5 m below the upper edge of the bank under overhanging turf. Two of the openings were soiled and so it is possible that one led to the breeding chamber of the nest of the previous year. This would indicate that the Black-caped Kingfisher nested on Lake Changyon-ho at least in two breeding seasons.

Alcedo atthis (LINNAEUS 1758). The Common Kingfisher was observed several times in the following localities: a pair of birds feeding on Lake Sokam and 1 km further a bird preying on fish near a steep shore of the lake on 24 June, a family flock of birds that had left the nest a short time before in the village of Dongsa-kol on 1 and 2 July and 1 bird feeding on the shore of Lake Taesong-ho on 15 July.

Upupa epops LINNAEUS 1758. It was a frequently seen bird, namely, in Pyongyang on Rungrado Island on 22 and 23 June and in the Botanical Gardens on 25 June, in a village on Lake Sokam on 24 June, in the park of the health resort of Onphori on 27 June, at two opposite ends of Lake Changyon-ho (1 bird each) on 4 and 9 July, twice by the Chongjin-Chayuryong route on 7 July, in the village of Pyong-song (about 30 km north-east of Pyongyang) on 12 July and a flock of 6—7 juveniles on Lake Taesong-ho on 13 and 15 July.

Picus canus GMELIN 1788. During the present investigation the occurrence of the Grey-headed Woodpecker was observed in the Pyongyang region and in the Myohyang-san Mts. This bird was seen in the valley of the River Hyangsan-chon

on 7 June, twice in the valley leading to Chonsin Falls on 14 June, in the Hvajang-am Valley (female) on 17 June, in the Sangwon Valley on 18 and 21 June (in one of these cases two unalarmed young birds), in the wood on Lake Sokam on 24 June and near Lake Taesong-ho on 13 July.

Dryocopus martius (LINNAEUS 1758). Only once was the voice of a Black Woodpecker heard in the Valley of Nine-stage Falls in the Myohyang-san Mts. on 9 June.

Dendrocopos major (LINNAEUS 1758) occurred in all the regions explored. in the Pyongyang region: on Rungrado Island and in the wood on Lake Sokam (4 flying young birds) on 23 June; in the region of the Myohyang-san Mts.: in the Habiro Valley on 6 June, in the valley of the River Hyangsan-chon on 10 and 12 June, in the Sangwon Valley on 13, 18 and 21 June (one of these observations included 3 birds) and in the neighbourhood of Chonsin Falls on 14 June; in the region of Chongjin: a family flock in the park of the health resort of Onphori on 27 June and flying juveniles near the Koanjuryong Pass on 6 July.

Dendrocopos leucotos (BECHSTEIN 1803). At the time of this investigation rhe White-backed Woodpeckers had already led the young out of the nests. Family flocks of these birds were seen in the Poyum Valley and in the valley of the River Hyangsan-chon on 19 June and near the village of Dongsa-kol in the north of the country on 1 July.

Dendrocopos kizuki (TEMMINCK 1835). This woodpecker was often encountered, especially in the Myohyang-san Mts., where it was observed: in the Habiro Valley (2 stands) on 6 June, in the valley of the River Hyangsan-chon on 7 June, in the neighbourhood of the Myohyang-san Hotel (2 pairs — one of them led a flock of young and the other carried food for their offspring) on 8 and 10 June, 2 family flocks in the Valley of Nine-stage Falls on 9 June, 3 family flocks and a foraging bird in the Hvajang-am Valley on 10 June and an adult bird in the Poyum Valley on 19 June. The Japanese Pygmy Woodpecker was also found to be present in a mountainous area near Chongjin: at Onphori on 27 June, at Dongsa-kol on 29 June and a family flock at the Koanjuryong Pass on 7 July.

Hirundo rustica LINNAEUS 1758 was one of the commonest birds in the DPR of Korea. They were not encountered only in the wooded and mountain valleys devoid of human houses in the Myohyang-san Mts. Out of these mountains in the vicinity of the villages in which observations were made and in many others passed by, several birds of this species were seen in each. The number of birds observed was noticeably smaller than that recorded in 1980 (TOMEK, 1984). As the numbers of Swallows in villages were not evaluated exactly, it is difficult to determine the rate of decrease in their number. However, now these birds were fewer roughly by about 50% in the villages and over rice fields passed by. This may be due, among other things, to a decrease in the food bas caused by the intensive fight against insects, especially pests of rice crops, carried on in the DPR of Korea (using pesticides like DDT).

Motacilla cinerea TUNSTALL 1771 was a common bird, frequently seen in

the valleys of mountain rivers and streams. In the explored area of the Myohyang-san Mts. at least 12 pairs of the Grey Wagtail were observed (in the valleys: Habiro — 2 pairs, Nine-stage Falls — 4 pairs, Sangwon — 2 pairs, Hyangsan-chon — 4 pairs) and in the Hamgyong range at least 13 pairs (Maehyang-ri — 1 pair feeding their young, Onphori — 2 birds, near Lake Mayang — 1 pair, in the neighbourhood of the village of Dongsa-kol — 6 pairs, at Ryongsan-ri — 2 pairs and below the Chayuryong Pass — at least 2 pairs). In the lowlands several juveniles were come across only on Rungrado Island in Pyongyang on 22 June.

Motacilla alba LINNAEUS 1758 belonged to common birds in all the environments investigated. Both adult specimens and young ones that had already left the nests were observed. In the Pyongyang region the While Wagtail was seen: on the banks of the River Tedong (adult and juvenile) on 4 June, on Rungrado Island (juv.) on 23 June, on Lake Sokam (birds in juvenile coats in three places 2—3 km apart) on 24 June. In the Myohyang-san Mts. these birds were seen: 2 stands in the Habiro Valley on 6 June, 4 pairs in the valley of the River Hyangsan-chon on 8—19 June and 1 pair in the Sangwon Valley on 18 and 21 June, whereas in the north of the country 1 pair was observed at Maehiang-ri on 27 June, a bird on Lake Ryongchae-ho on 27 June, 2 stands by the Chongjin-Chayuryong Pass route on 7 and 8 July and 1 bird in a juvenile coat near Lake Changyon-ho on 9 July.

Lanius cristatus LINNAEUS 1758 was observed: 1 bird flying with food in the beak in the vicinity of Lake Ryongchae-ho on 28 June, 1 bird sitting on electric wire several kilometres south of Chongjin on 4 July and near Lake Taesong-ho probably one and the same bird on 13 and 15 July.

Oriolus chinensis LINNAEUS 1766 was a common bird observed in the neighbourhood of areas inhabited by people. It was not met with in mountain valleys, even those situated not very high above sea level, e.g. in villages at the foot of the Hamgyong range. The occurrence of Black-naped Orioles was recorded from Pyongyang and its region: several pairs in Moranbong Park on 5 June, 1 pair on Rungrado Island on 23 June, 2 pairs on Lake Sokam on 24 June and at least 2 pairs on Lake Taesong-ho on 13 and 15 July. In the Myohyang-san Mts. they were seen only in the Habiro Valley and in the valley of the River Hyangsan-chon (4 pairs) in the period from 6 to 20 June and in the north of the country a pair near Lake Ryongchae-ho on 28 June and 3 pairs in the vicinity of Lake Changyon-ho on 4 July.

Sturnus sturninus (PALLAS 1776). One bird was seen only once near the mouth of the River Orang into the Pacific on 9 July.

Sturnus cineraceus TEMMINCK 1835 occurred, especially, in park environments. It was found to be most numerous in Pyongyang: several birds (at least 2 pairs) feeding on the river banks and carrying food for their chicks were observed on the River Tedong on 4 June, 2 birds in Moranbong Park on 5 June, 1 pair gathering food and some dozen specimens flying among the trees on the embankment along the River Tedong on 23 June. Out of Pyongyang Grey

Starlings were found in the north of the country: several young specimens in the park at Onphori on 27 June, 1 pair carrying food on Lake Ryongchae-ho on 28 June and 6 birds near Lake Changyon-ho on 4 July. A dead bird with the following dimensions: wing — 133 mm, tarsometatarsus — 30 mm, beak — 27 mm, was found in Pyongyang on 23 June.

Garrulus glandarius (LINNAEUS 1758). Jays were encountered in mountainous areas, most frequently in the Myohyang-san Mts: a flock of juveniles in the Habiro Valley on 6 and 12 June, 1 bird in the valley of the River Hyangsan-chon on 7 June, a flock of still poorly flying young birds in the vicinity of the Myohyang-san Hotel on 8—10 June, 1 bird in the Valley of Nine-stage Falls on 9 June, 3 specimens in the Sangwon Valley on 13 June and 1 bird in each, the Hvajang--am Valley on 17 June and near Chontae Falls on 20 June. Jays were seen considerably more rarely, only 3 times, in the north of the country: at the Koanjuryong Pass on 6 July and near the Chayuryong Pass on 7 and 10 July.

Cyanopica cyanus (PALLAS 1776) was observed only twice: 2 birds in the region of the Myohyang-san Hotel on 7 June and 1 bird between the Chayuryong Pass and Lake Mayang on 29 June. The observations of these birds in several distant regions of the country at present and in 1980 (TOMEK, 1984) support WON'S (1963—1965) opinion that this is a breeding bird occurring all over the country. Moreover, both the observations of 3 Cracovian expeditions and WON'S data indicate that these birds occur more frequently in the northern provinces than in the south.

Pica pica (LINNAEUS 1758) belonged to the common breeding birds present in the whole territory of the country, especially in the proximity of buildings and in park environments. In Pyongyang and its environs Magpies were observed as follows: 3 birds feeding on the banks of the River Tedong on 4 June, 1 specimen in Moranbong Park on 5 June, 5 birds on Rungrado Island on 22 June, 12 birds at the opposite end of this island on 23 June and 3 specimens in the Botanical Gardens on 25 June. In the area investigated in the region of Lake Sokam altogether 15 birds were seen on 24 June and 7 birds (a family flock) on Lake Teasong-ho on 13 and 15 July. In the region of the Myohyang-san Mts. Magpies were met with: in the Habiro Valley on 6 and 11 June, 2 birds in the valley of the River Hyangsan-chon on 7 June, 4 specimens in 3 places, distant from each other, in the Sangwon Valley on 13 June and 1 bird on 18 June, and several birds right close to the hotel from 8 to 21 June. In Chongjin and its region Magpies were found: a nest in the close proximity of the hotel on 26 June, 4 birds at Onpho-ri on 27 June, 1 specimen in the region of Lake Ryongchae-ho on 28 June, 4 specimens on Lake Changyon-ho on 4 July, 2 stands at Ryongsan-ri on 5 July, a bird at the estuary of the River Orangon 9 July, 9 stands, including 2 nests, by the Chongjin-Chayuryong route from 29 June to 7 July and 3 nests and several birds on the Chongjin-Orang route on 9 July.

Nucifraga caryocatactes (LINNAEUS 1758) was observed only twice, in the Myohyang-san Mts. on 11 June: a bird in the Habiro Valley (at an altitude

of about 1200 m a.s.l.) and also one bird near the summit of Wonman-bong, at an altitude of about 1600 m a.s.l. At present the Nutcracker was the most rarely encountered bird of the family *Corvidae*. In the past it was recorded repeatedly from Korean Peninsula by various investigators (JANKOWSKI, 1898; AUSTIN, 1948; WON, 1963—1965; GORE and WON, 1971; HO HON and RIM CHU YON, 1975; BOCHEŃSKI et al., 1981; TOMEK, 1984). Although most of these observations come from the non-breeding period, it may be assumed after WON (1963—1965) and GORE and WON (1971) that it is a resident bird, nesting in the mountains of the whole peninsula.

Corvus dauuricus PALLAS 1776. (?). A bird in coloration resembling the Hooded Crow but considerably smaller, sat on the roof of a port building in Chongjin on 26 June and 4 specimens, also smaller than the crow, were seen in the village of Puryong (about 35 km north of Chongjin) on 29 June. Owing to the distance and fog which reduced visibility, these birds could not be determined exactly. Nevertheless, both their size and shape indicated that they were Daurian Jackdaws.

Corvus macrorhynchos WAGLER 1827. A flock of 6—8 of these birds was observed several times in the valley of the River Hyangsan-chon in the Myohyang-san Mts.: near the hotel on 8 June, about 2 km up the river on 17 June and another 2 km up-stream on 20 June. At that time of the year adult Jungle Crows stay together with their flying young (OMELKO, 1975); so it is probable that they were family flocks and it may well be that each time it was one and the same flock (then, in 1983 in the valley of the River Hyangsan-chon there would live one pair of these birds, which had brought up its offspring). Jungle Crows were also met with several times in the north of the country, namely: two specimens at Onpho-ri on 27 June, 2 at Dongsa-kol on 2 July, 2 in a forest about 30 km south of Chongjin and 1 bird near the Chayuryong Pass on 10 July.

Corvus corone orientalis EVERSMAN 1841. Crows were often seen, single or in flocks of several to about 20 specimens, both in the agricultural landscape and in mountain valleys, and so in the Myohyang-san Mts.: 1 specimens in the Habiro Valley on 6 June, 1 specimen in the Sangwon Valley on each, 13, 18 and 21 June, a flock of about 20 birds above Chonsin Falls on 14 June, in the valley of the River Hyangsan-chon on 16 June and in the Poyum Valley on 19 June; in the region of Pyongyang: 1 bird on Rungrado Island on 22 June and about 15 birds on Lake Sokam on 24 June; in the Chongjin region: about 10 birds at Maehyang-ri and Onpho-ri on 26 June, several specimens near the village of Dongsa-kol on 1 and 2 July, several in the vicinity of Lake Changyon-ho on 4 and 9 July, some dozen specimens by the Chongjin-Lake Mayang route on 29 June and also some dozen birds by the same route between Chongjin and Chayuryong on 7 July.

Cinclus pallasi TEMMINCK 1820 was observed only in the valleys of the Myohyang-san Mts.: 1 bird on the River Hyangsan-chon on 7 June, 1 bird on 17 June, 2 birds about 2 km below the previous site, one of them in a juvenile coat, and on the streams emptying into that river: in the Valley of Nine-stage

Falls, in the Sangwon Valley (1 pair and, somewhat further up-stream, 1 bird) on 13 June and 1 bird near Chontae Falls on 20 June. In each segment of a river or a stream explored these birds were seen every 2—3 km, and therefore they belonged to common birds in the Myohyang-san Mts. Lack of observations of Brown Dippers in the north of the country does not prove their absence. When observation was being done in the region of Chongjin, it was raining heavily and the mountain streems and rivers were swollen, which made it impossible to examine the areas adjacent to them.

Troglodytes troglodytes (LINNAEUS 1758) was encountered, like the preceding species, only in the Myohyang-san Mts. Two singing males were heard close to the timber line on Mt. Wonmanbong.

Cettia squameiceps (SWINHOE 1863) was observed twice, in both cases a family flock: in the Hvajang-am Valley in the Myohyang-san Mts. on 17 June and in a thicket on the bank of the River Songchon-su near the village of Dongsa--kol on 2 July.

Cettia diphone (KITTLITZ 1831). Singing male Bush Warblers were noted twice, on Rungrado Island in Pyongyang on 22 June and in the neighbourhood of Lake Changyon-ho on 4 July.

Arocephalus arundinaceus (LINNAEUS 1758). It was the most frequently observed species in water and water-marsh habitats. It inhabited even small water bodies partly grown over by reeds. The Great Reed Warbler was met with on Rungrado Island in Pyongyang on 5, 22 and 23 June. At least 2 males sang there in osier beds at the riverside. An ardently singing male was also heard in the Botanical Gardens on 25 June (this species was observed in the same gardens in 1980 by MAUERSBERGER, 1981). Outside Pyongyang these birds were found in the north of the country: on Lake Ryongchae-ho on 28 June and a male singing in an osier bed, about 30 ares in area, covering a swampy meadow and a small pond, was heard around 30 km north of Chongjin on 30 June. Another singing bird was heard among reeds, partly overgrowing a small pond, over 10 ares in area, 4 km north of Chongjin. These birds were most numerous on Lake Changyon-ho, where 3 males sang among reeds growing on the low and wet shore of the lake on 4 July. It was also there that a nest with 4 eggs in it was found. The nest was attached, about 0.5 m above water, to 5 reed stalks with grass wound round them. It was built of grass (stalks, blades and ears) and wool, lined with fine grass blades. Nest dimensions: outer diameter — 9.5×9.5 cm, inner diameter — 6×6 cm, height — 9 cm, cup depth — 5 cm. The eggs found in the nest were warm, it was the initial period of incubation (the embryos were little developed). Egg dimensions: 20.9×14.6, 21.8× ×14.9, 21.6×14.9, 22.0×14.9 mm and their weight, respectively, 2.4, 2.55, 2.6 and 2.6 g. The colour of the eggs was the same as in the European members of this species (MAKATSCH, 1976; GOTZMAN and JABŁOŃSKI, 1972). The measurements of this nest and eggs are like those of the subspecies *Acrocephalus arundinaceus orientalis* (TEMMINCK et SCHLEGEL 1847) nesting in Korea, China and

the Ussuriisk region (DEMENTEV et al., 1951—1954; PANOV, 1973, WON, 1963—1965; POLIVANOVA, 1971).

Phylloscopus fuscatus (BLYTH 1842) (?). Several birds of this species were observed in the Myohyang-san Mts. (close to the timber line on Mt Wonman-bong) on 11 June.

Phylloscopus schwarzi (RADDE, 1863) (?). An intensely singing male was observed in the massif of Mt Wonman-bong in the Myohyang-san Mts. on 11 June.

Phylloscopus proregulus (PALLAS 1811) (?). The Pallas' Warbler (2 stands several kilometres apart) was observed in the massif of Mt Wonman-bong in the Myohyang-san Mts. on 11 June. One of these stands was situated above 1200 m a.s.l.

Phylloscopus borealis (BLASIUS 1858 (?). The Arctic Warbler was found in the Myohyang-san Mts.: in the Habiro Valley on 6 June and in the Wonman-bong massif on 11 June.

Remark: the above-mentioned species of the genus *Phylloscopus* have been determined on the basis of the voices of singing males. In many cases the birds that inhabit Korean Peninsula sing a somewhat different dialect from that of the birds from the territories lying north of Korea (MAUERSBERGER, 1981), which may have caused mistakes in determination.

Phyloscopus trochiloides (SUNDEWALL, 1837). A male was caught near the village of Dongsa-kol on 30 June. Its dimensions: wing — 59 mm, tarsometatarus — 18.5 mm, beak — 10 mm, tail — 49 mm, testes — 3.5×4.5 mm, body weight — 9 g.

Phylloscopus tennelipes SWINHOE 1860. These birds were often found, especially in high-lying parts of forests. The number of the stands of these birds was fixed on the basis of the voices of singing males. And so in the Myohyang-san Mts. voice of the Pale-legged Willow Warbler was heard at 17 sites: in the Valley of Nine-stage Falls (two stands, nest of 1 pair) on 9 June, in the Habiro Valley (4 singing males) on 11 June, in the Sangwon Valley (1 bird) on 13 June, in the Chonsin Valley (4 males) on 14 June, in the valley of the River Hyangsan-chon (3 males) and in the Chontae Valley (also 3 singing males) on 20 June. The voices of these warblers were also heard in the north of the country: near Lake Mayang (1 bird) on 29 June, near the village of Dongsa-kol (4 singing males in a narrow valley resembling the valleys in the Myohyang-san Mts.) on 2 July and at Koanjuryong Pass (voice of a bird) of 7 July.

The nest found in the Myohyang-san Mts. on 9 June was placed in a crevice in rocks which formed the channel of a brook, about 1.5 m away from a small waterfall. The crevice, 10×6 cm in size, was situated 40 cm above the ground. The nest was built in it at a depth of about 15 cm, its main constituent being green moss. In the nest there were several 3—5-day-old chicks. Because of the inaccessiblity of the nest (too narrow crevice), it could not be measured, nor its constituent materials analysed. It was only found that it did not resemble

the nests of the European members of the genus *Phylloscopus* in respect of both materials used to build it (moss) and its shape, for it was not closed and its "roof" was formed by the walls of the crevice.

Phylloscopus coronatus (TEMMINCK et SCHLEGEL 1847). In the study area this was the most frequently occurring warbler. Birds of this species were seen or their voices heard: 1 bird in the Habiro Valley on 6 June and one in the valley of the River Hyangsan-chon on 7 June, 2 singing males in the Hvajang-am Valley on 10 June, 4 stands with a family flock in one in a thicket on the River Hyangsan-chon on 18—20 June, a bird in the Chontae Valley on 20 June and 2 pairs in the vicinity of the hotel between 6 and 21 June. In the north of the country the Crowned Willow Warbler was recorded: 2 singing males on the River Songchon-su near Lake Mayang on 29 June, at least 9 stands in the neighbourhood of the village of Dongsa-kol from 30 June to 2 July and at least 3 singing males below the Chayuryong Pass on 7, 8 and 10 July.

Ficedula zanthopygia (HAY 1845). The Korean Flycatcher was a common bird living in forests and park habitats. It was observed in Pyongyang: 2 pairs in Moranbong Park; in the Myohyang-san Mts.: a pair and, 0.5 km away, a singing male in the valley of the River Hyangsan-chon on 7 June, a singing male near the buddhist Pohyon cloister on 8 June, a singing male in the Sangwon Valley and a bird carrying food at the mouth of this valley, about 1 km away from the preceding site on 21 June; in the north of the country: an adult bird and, caught in a net, a flying juvenile (its dimensions: wing — 61 mm, tarsometatarsus — 16 mm, beak — 8 mm, tail — 37 mm) near the village of Dongsa--kol on 2 July, at the Koanyuryong Pass on 6 July and near Lake Changyon-ho on 9 July. The skin of a male caught on 20 June 1969 (gift of the Korean A. Sc.), is in the possession of the Institute of Systematic and Experimental Zoology, P.A.Sc. in Cracow. Its dimensions are: wing — 70 mm, tarsometatarsus — 17 mm, beak — 9.2 mm, tail — 46 mm (this skin does not bear its original label and, unfortunately, except for the country the place of its origin is not known).

Cyanoptila cyanomelana (TEMMINCK 1829) was the most frequently observed bird of high-lying mountainous areas. Males of the Blue and White Flycatcher sang very long and in July their song was one of the few species heard in the mountain valleys. Since the relatively most observations in such an environment were carried out in the Myohyang-san Mts., it was in these mountains that this bird was most often encountered. The dates and places of observations of Blue and White Flycatchers in the Myohyang-san Mts are as follows: altogether 4 singing males in the Habiro Valley on 6 and 11 June, a pair in the vicinity of the hotel on 8 and 15 June, 1 bird in the Valley of Nine-stage Falls on 9 June, in the Sangwon Valley a male and a nest-building female on 13 June, there was an egg in the nest on 18 June and the nest was destroyed by a predator on 21 June, 3 males near Chonsin Falls on 14 June, a bird flying with food in its beak and the voice of a singing male in another place in the Hvajang-am Valley on 17 June, 2 males in the neighbourhood of Chontae Falls and a singing

male in the valley of the River Hyangsan-chon on 20 June and 1 male in the Poyun Valley on 21 June. And so at least 16 stations of this bird were found in the area examined. In the north of the country the Blue and White Flycatchers were probably still more abundant, for 6 singing males were observed in only one several-kilometre-long valley near the village of Dongsa-kol on 2 July and at least 3 singing males in the region of the Chayuryong Pass on 7, 8 and 10 July. The nest found in the Myohyang-san Mts. on 13 June was placed, typically of this species (POLIVANOVA and KHODKOV, 1975), in a rocky niche between stones of a stream channel, about 1 m away from the water. It was built of sticks, pieces of bark, pine needles, pieces of leaves (base), dry green moss and fine rootlets (cup). Lining could not be distinguished in this nest and the cup was a depression in the thick layer of moss and rootlets. The nest was a massive structure, its dimensions being roughly: nest height — 18 cm, cup depth — 6 cm, outer diameter — 17×12 cm, cup diameter — 5×5 cm (the nest was measured after it had been damaged and the eggs destroyed by a predator).

Observations made by CUMMING (1933) and MAUERSBERGER (1981) and those presented in this paper show that in Korean Peninsula these birds can be met with much more frequently in higher parts of mountain valleys, situated farther from human settlements. In the south of Primorsk, being common and abundant, Blue and White Flycatchers inhabited valleys, avoiding fairly high hills and big rock massifs (PANOV, 1973; VOROBIEV, 1954). It may therefore be supposed that in Korea this species colonized the biotopes which suited it less, because its original biotope had been destroyed by the expansion of the agricultural acreage in river valleys. A similar phenomenon of the colonization of higher-lying regions of mountains was observed by JAHN (1942) in the Japanese Islands, where, as in Korea, the river valleys are used for intensive agriculture.

Muscicapa latirostris RAFFLES 1882. Two males of this species were caught in a net in the village of Dongsa-kol on 1 and 2 July. Their dimensions are, respectively; wing — 69 and 69 mm, tarsometatarsus — 13 and 13 mm, beak — 13 and 10 mm, tail — 48 and 48 mm, body weight — 10.5 and 10.5 g. The testes of these males were swollen (6.6×4.5 and 6.8×4.3 mm). The occurrence of sequally active males in the first decade of July is another corroboration of the nesting of these birds in Korean Peninsula and, although there are no direct proofs of reproduction, the Brown Flycatcher should be included in the breeding fauna of Korea.

Saxicola torquata (LINNAEUS 1766). The Stonechat was observed only 4 times and then exclusively in the north of the country, namely, about 3 km away from Lake Ryongchae-ho on 28 June, 2 males sitting on electric wires by the road from Chongjin to Lake Mayang on 29 June and a single male at the village of Ryongsan-ri on 5 July.

Monticola gularis (SWINHOE 1863). The voice of singing males of the White-breasted Rocktrush was heard in the Myohyang-san Mts. on 9 June, in the

Valley of Nine-stage Falls on 9 June and in the Habiro Valley (3 stands) on 11 June.

Phoenicurus auroreus (PALLAS 1776). The Daurian Redstart belonged to the birds that lived both close to and far from people's houses. Now these birds were observed: in the Myohyang-san Mts. — a pair feeding their chicks (in the nest placed in a cleft of the cornice under the eaves of the hotel building) and another pair in the Sangwon Valley on 18 June; in the Pyongyang region — only on Lake Sokam on 24 June; in the Chongjin region (most often and numerous) — 3 pairs at the village of Maehyang-ri on 27 June, on Lake Mayang on 29 June, at least 6 family flocks over a distance of 7 km in the thickets on the River Songchon-su near the village of Dongsa-kol from 30 June to 2 July, a bird at the Koanjuryong Pass on 6 July, 2 males and a pair near the Chayuryong Pass on 7 July and 2 pairs by the Chongjin-Chayuryong Pass route on 8 July. A decrease in the number of Daurian Redstarts in the Myohyang-san Mts. in relation to that in the breeding season of 1980 is striking. In 1980 during only 4 days of investigation covering a far smaller area 4 stands of this bird were found, whereas now scarcely 2 pairs in a several times as large area. This may have been due to an increase in the number of people visiting the Myohyang-san Mts.

Luscinia cyane (PALLAS 1776). It occupied the same habitats as *Cyanoptila cyanomelana* and therefore mostly in mountain valleys with steep slopes grown over by an old mixed forest. The most birds of this species were seen and their voices heard in the Myohyang-san Mts.: 2 singing males (one of them was caught in a net) in the nearest neighbourhood of the hotel from 9 to 12 June, 4 singing males in the Habiro Valley on 11 June, 1 male near Chonsin Falls on 14 June, 1 bird in the Poyun Valley on 19 June and one in the valley of the River Hyangsan-chon on 20 June. Outside the Myohyang-san region the Siberian Blue Robin was heard singing in a mountain valley near the village of Dongsa-kol on 2 July and an adult male was caught at the Chayuryong Pass. Dimensions of the birds caught (the first measurement belongs to the bird from the Myohyang-san Mts.): wing — 73.5 and 75.5 mm, tarsometatarsus — 22.5 and 25.7 mm, beak — 12.8 and 12.5 mm, tail — 52 and 59 mm, diameter of testes — 5.7×6.2 mm and 7×5 mm, body weight — 15.5 and 13.5 g. The measurements of the wings and tails of these birds indicate, according to SHULPIN (1928), that they belong to the subspecies *Luscinia cyane cyane* (PALLAS 1776), which would support the opinion expressed by WON (1963—1965), GORE and WON (1971) and ETCHECOPAR and HÜE (1983) that the nominative subspecies nests in Korean Peninsula. On the other hand, the colour of the plumage of these birds is identical with that of the members of the subspecies *Luscinia cyane bochaiensis* SHULPIN 1928 coming from Japan and southern Primorsk and kept in the collection of the British Museum at Tring and Moscow University Museum of Zoology. This comparison shows that the coloration of the plumage of adult males cannot be used to distinguish these subspecies, what agrees with the note of YAMASHINA et al. (1975).

Turdus pallidus GMELIN 1789. A female was caught in the vicinity of the Chayuryong Pass on 10 July. Its dimensions: wing — 117 mm, tarsometatarsus — 32 mm, beak — 18.5 mm, tail — 85 mm, body weight — 66 g. These measurements were somewhat smaller than those given by DEMENTEV et al. (1951—1954) for the birds of this species. The wing formula was also somewhat different (3 = 4>2>5>6). The measurements and wing formula of the female caught widen the range of variation observed in the birds belonging to this species.

Turdus chrysolaus TEMMINCK 1831 was found to occur in the Myohyang-san Mts. A singing male was observed in the Sangwon Valley on 14 June. The voice of this bird was besides heard in the Hvajang-am Valley on 17 June. The Red-bellied Trush had hitherto been observed hardly several times in Korea: WON (1963—1965) mentions a total of 4 observations made in April and May and AUSTIN (1948) five in April, May and June. The present observation would therefore be the second (after that by AUSTIN, 1948, in the Pyongan Pukto Province on 27 May) providing evidence of the nesting of the Red-bellied Trush in the DPR of Korea.

Turdus hortulorum SCLATER 1863. A female with the skin of the belly changed, bearing marks of the preceding hatching of eggs, was caught in the Myohyang-san Mts. on 7 June. Its dimensions: wing — 111 mm, tarsometatarsus — 31.5 mm, beak — 20.5 mm, tail — 80 mm. The Grey-backed Trush was a "scarce passage migrant also a rare and local summer visitor" (GORE and WON, 1971) in the southern part of the peninsula. It was also rarely observed in its northern part, where in the breeding season it was seen merely 4 times (on 27 May 1932 and 29 June 1933 at Anju, Pyongan Namdo Province, and on 17 June and 18 August 1958 at Okasan, Chaggang Province — WON, 1963—1965). If the observation at Kyonggi-do on 30 May 1965 (GORE and WON, 1971) is included, the present record is the sixth one indicating the nesting of the Grey-backed Trush in Korea.

Turdus cardis TEMMINCK 1831 (?). This species was determined on the basis of the voice of a singing male heard in the Hvajang-am Valley in the Myohyang-san Mts. on 17 June. Just as in the case of the previous species the Grey Trush had been reported from Korea only several times before (WON, 1963—1965; GORE and WON, 1971), the present observation being the first indicating its nesting.

Aegithalos caudatus LINNAEUS 1758. Family flocks of these birds were observed in the Myohyang-san Mts.: in the Habiro Valley on 6 June, in the neighbourhood of the hotel on 8 June, in the Hvajang-am Valley on 10 June, and also in the north of the country at the village of Dongsa-kol on 2 July at the Chayuryong on 10 July, where a bird was caught in a net. Its dimensions were as follows: wing — 63 mm, tarsometatarsus — 19 mm, beak — 7 mm, tail — 88 mm, body weight 18.5 g. This was a specimen in a juvenile coat with heavily damaged remiges and rectrices (broken tips) and for this reason it was impossible to elucidate its subspecific membership.

Parus palustris LINNAEUS 1758. Both single specimens and family flocks were observed many times; in the Myohyang-san Mts.: in the Habiro Valley on 6 June (family flock), in the vicinity of the hotel on 8 June (voice), in the Valley of Nine-stage Falls on 9 June (voice), on the premises of the Pohyon cloister on 13 June (family flock), in the Poyun Valley on 19 June (2 × voice), in the valley of the River Hyangsan-chon on 20 June (2 × juveniles), and in the north of the country: at the village of Dongsa-kol on 30 June (1 bird caught in a net), on 1 July (1 adult specimen) and on 2 July (1 bird and at a distance of about 1 km another 2 specimens). The dimensions of the bird caught on 30 June: wing — 70 mm, tarsometatarsus — 16 mm, beak — 8.5 mm, length of extreme rectrices — 64 mm (the bird was in the process of moult), body weight — 12.5 g. The feathering coloration and dimensions of the bird caught correspond with those given by VAURIE (1959) for the subspecies *Parus palustris brevirostris* (TACZANOWSKI, 1872).

Parus montanus (Conrad von BALDENSTEIN 1827) was much more rarely observed than the previous species. Willow Tits were seen only three times: in the Sangwon Valley (adult specimen) and Poyun Valley (flock of young birds) in the Myohyang-san Mts. on 21 June and also a flock of young birds near the village of Dongsa-kol on 2 July. The observations of family flocks indicate the justness of our earlier suppositions (BOCHEŃSKI et al., 1981) that this species belongs to the breeding birds of Korea. This can also be seen from the map in ETCHECOPAR and HÜE (1983) monograph.

Parus ater LINNAEUS 1758 was a bird frequently met with. Adult specimens and flocks of young Coal Tits were observed in the Myohyang-san Mts.: a bird in the Habiro Valley on 6 June, a flock of young birds in the Hvajang-am Valley on 10 June, anest with several-day-old chicks and a singing male in the Habiro Valley on 11 June, a bird and somewhat further a family flock in the neighbourhood of Chonsin Falls on 14 June, a flock of young birds in the valley of the River Hyangsan-chon on 16 June, 3 single birds on Lake Sokam on 24 June and in the north of the country: two birds on Lake Changyon-ho on 4 July, voices of 2 birds at the Koanjuryong Pass on 6 July and the voice of a singing male in a forest about 50 km away from Chongjin on 9 July.

The nest found in the Habiro Valley on 11 June was situated in a hole between stones of steps in a much frequented mountain path. The opening leading to the nest was 10 × 3 cm and the niche formed between the stones was 20 cm in length. The nest built of moss and animal hair was by the back wall of the niche. The cup diameter was about 6 cm. There were some not fully fledged chicks in the nest.

Parus varius TEMMINCK et SCHLEGEL 1848. As in 1980, now Varied Tits were observed in the Myohyang-san Mts. and they seemed to be more numerous in higher-lying parts of woods. Dates and places of observations: 2 birds twice in the Habiro Valley on 6 June, an adult bird with food in the beak in the valley of the River Hyangsan-chon on 7 June, 2 specimens in the Valley of Nine-stage Valley on 10 June, 1 bird near Chonsin Falls and at a distance of 1 km 2 adult

birds with food in the beaks on 14 June, and a family flock, about 3 km away from the birds observed on 7 June in the valley of River Hyangsan-chon on 20 June.

Parus major LINNAEUS 1758. These were the most frequently observed Tits in all the three regions investigated. In the Pyongyang region: flocks of young birds in the Botanical Gardens on 25 June and on Lake Taesong-ho on 13 and 15 July; in the Myohyang-san Mts: young birds in the valley of the River Hyangsan-chon on 7 June, a flock of young birds in the vicinity of the hotel on 8 June, a family flock on the premises of the Pohyon cloister and in the Sangwon Valley on 13 June, 4 stands (voice of adult birds) in the Sangwon Valley on 14 June, young birds in the Hvajang-am Valley on 17 June, 2 family flocks in the Sangwon Valley on 18 June, a voice heard in the valley of the River Hyangsan-chon on 20 June; in the Chongjin region: an adult specimen and a family flock at the village of Maehyang-ri and 3 adult birds at Onpho-ri on 27 June, at the Koanjuryong Pass on 28 June, family flocks in 4 sites distant from each other in the neighbourhood of the village of Dongsa-kol from 29 June to 2 July, 2 stands on Lake Changyon-ho on 4 July, more than ten birds at the opposite end of this lake on 9 July, at the village of Ryongsan-ri on 5 July, some dozen birds, 2 of which were caught and other two were feeding their chicks near the Chayuryong Pass on 7, 8 and 10 July and a voice heard in a wood about 50 km south of Chongjin. Dimensions of the birds caught, the male and the female, respectively: wing — 72 and 64 mm, tarsometatarsus — 19 and 18.5 mm, beak — 8.8 and 9.9 mm, tail — 67 and 62 mm, body weight 16 g either, diameter of male's testes — 4.8×5.5 mm; an enlarged yolk was found on the ovary of the female and therefore she was probably ending the egg-laying of the second brood. The plumage colouring and dimensions of the birds permitted their inclusion in the subspecies *Parus major minor* TEMMINCK et SCHLEGEL 1848. The nest of another pair found in the same region was placed in the roof of a small hut used for shelter by people who were pasturing cattle.

Sitta europea LINNAEUS 1758 was a common bird, particularly often encountered in the Myohyang-san Mts., namely, an adult and, in another place, a flock of young birds in the Valley of Nine-stage Falls on 9 June, a family flock in the Hvajang-am Valley on 10 June, an adult specimen and, in another place, a family flock in the Habiro Valley on 11 June, a bird, probably a young female, caught in the vicinity of the hotel on 16 June, in the Poyun Valley on 19 June, family flocks in the valley of the Hyangsan-chon and in the region of Chontae Falls on 20 June. Near that waterfall a dead bird, probably a young male, was found. Outside the Myohyang-san Mts., the Nuthatch was observed: 2 family flocks near the village of Dongsa-kol on 2 July, and another family flock at the Koanjuryong Pass on 6 July. Dimensions of the birds from the Myohyang-san Mts., the female and the male, respectively: wing — 80.5 and 72 mm, tarsometatarsus — 19 and 18 mm, beak — 14 and 13 mm, tail — 46 and 43 mm.

Certhia familiaris LINNAEUS 1758 was seen only once near the Poyun Temple in the Myohyang-san Mts. on 17 June.

Zosterops erythropleura SWINHOE 1863. The Chestnut-flanked White-eye was observed only in the north of the country: 1 specimen stayed in a thicket on the River Songchon-su near the village of Dongsa-kol on 30 June and about 2 km up the river also one bird of this species was seen on 2 July. In addition, an adult female (sexually inactive) was caught in the neighbourhood of the Chayuryong Pass on 10 July. Its dimensions: wing — 58 mm, tarsometatarsus — 16 mm, beak — 9.8 mm, tail — 38 mm, body weight — 10 g. The occurrence of several birds of the same species in a relatively small area (at a distance up to some dozen kilometres) at the height of the breeding season suggests that they bred in this area, although there are no direct evidences of their reproduction. The Chestnut-flanked White-eye is a common breeding bird in near Primorsk (PANOV, 1973). It also belongs to the birds nesting in the Chinese territory adjacent to Korea (CHENG Tso Hsin, 1976; ETCHECOPAR and HÜE, 1983) and was six times found in the northern part of Korean Peninsula (WON, 1963—1965). This shows that the southern range of its distribution crosses the territory of the DPR of Korea, for another species, *Zosterops japonica* TEMMINCK et SCHLEGEL 1847, nests in the southern part of the peninsula and *Zosterops erythropleura* is there met with only on passage (VAURIE, 1959; WON, 1963—1965; GORE and WON, 1971).

Passer montanus LINNAEUS 1758. Tree Sparrows were the most frequently and most numerously occurring birds in towns, villages, settlements and even in the vicinity of single buildings. The largest flocks, numbering above 100 specimens (mostly young birds leading a nomadic life) were encountered on the banks of the Tedong in Pyongyang. In addition, several to several dozen Tree Sparrows were seen in all the places investigated where there were buildings in proximity and in villages passed by. They were not observed only in mountain valleys or wooded areas situated far from human settlements (except several birds seen at the Koanjuryong Pass on 28 June). A dead bird was found by Lake Sokam on 24 June and another specimen was hit by a car on the Orang-Chongjin route. The dimensions of these birds were, respectively: wing — 66 and 65 mm, tarsometatarsus — 16.5 and 17.5 mm, beak — 11 and 10.5 mm, tail — 58 and 52 mm, body weight of the latter — 21 g. The first of them was a sexually active male (size of testes — 7.4 × 5.1 mm). The plumage colouring of these birds did not differ from that of the European forms and the length of beak lay within the range of this dimension in the nominative subspecies living in Poland (FERENS, 1971). And then the birds under discussion should be numbered in the nominative subspecies *Passer montanus montanus* LINNAEUS 1758, in which subspecies they are also classified by WON (1963—1965), whereas GORE and WON (1971) include Tree Sparrows inhabiting the southern part of Korea Peninsula in the subspecies *Passer montanus orientalis*, CLARK, 1910, VAURIE (1959) considers this last form to be synonymous with the subspecies

Passer m. saturatus living, among other places, "in southern Korea". Thus, the birds caught support the opinion held by VAURIE (1959) and ETCHECOPAR and HÜE (1983) that the boundary between the ranges of the subspecies *Passer montanus montanus* LINNAEUS 1758 and *Passer montanus saturatus* STEJNEGER 1885 runs across Korean Peninsula.

Carduelis sinica (LINNAEUS 1766). Like the previous species, the Oriental Greenfinch was a bird associated with the urban environment. These birds were met with: 6 specimens in the park surrounding the Pohyon Temple in the Myohyang-san Mts. on 18 June, in Pyongyang 1 bird on Rungrado Island on 23 June and one in the Botanical Gardens on 25 June, 1 bird at the village of Dongsa-kol on 29 June, 3 birds in a small village on Lake Changyon-ho on 4 July and 1 specimen on Lake Taesong-ho on 15 July.

Carpodacus rosaeus (PALLAS 1776). These birds were seen twice at the village of Dongsa-kol: in a thicket on the River Songchon-su on 29 June and about 0.5 km away from the place of the previous observation on 1 July. The well-seen silver-pink shade of the fore-head and chin leaves no room for doubt as to the specific membership of the birds observed. In the territory of Korean Peninsula the Pallas Rose Finch was considered to be a bird of passage and wintering there (WON, 1963—1965; GORE and WON, 1971; CHENG Tso Hsin, 1976; PANOV, 1973) and its breeding area lies, according to many authors (VAURIE, 1959; DEMENTEV et al., 1951—1954, HARRISON, 1982), further to the north of the region discussed, its boundary not being well known so far. The observations of these birds in the middle of their breeding season would indicate that they belong to the breeding fauna of the DPR of Korea, especially as they have already been reported from the same province in the breeding season before (WON, 1963—1965).

Uragus sibiricus (PALLAS 1773). A family flock was observed only once on Rungardo Island in Pyongyang on 22 June.

Eophona migratoria HARTERT 1903. These birds were observed three times, twice in Pyongyang (a flock of about ten specimens in Moran-bong Park on 5 June and 2 birds in the Botanical Gardens on 25 June) and once in the region of Lake Changyon-ho (a pair on 4 July).

Emberiza cioides BRANET 1843. During the present investigation Long-tailed Buntings were observed only in the north of the country: a singing male on Lake Mayang on 29 June, a family flock at the village of Dongsa-kol on 30 June and a pair at a distance of about 2 km from the place of the previous observation on 2 July. In the same village a female was caught (one yolk enlarged), its dimensions being: wing — 73 mm, tarsometatarsus — 18.5, beak — 11 mm, tail — 70 mm. The wing length and plumage colouring indicated that this bird belonged to the subspecies *Emberiza cioides castaneiceps* MOORE 1856. A pair of Long-tailed Buntings was also seen at the Chayuryong Pass on 7 July and a singing male on Lake Changyon-ho on 9 July.

Emberiza fucata PALLAS 1776. As in 1980, Grey-hooded Buntings were observed

in the proximity of water bodies: a pair on Lake Sokam on 24 June, 2 pairs and a male on Lake Changyon-ho on 4 July and a pair on Lake Taesong-ho on 15 July.

Emberiza elegans TEMMINCK 1835. Our previous studies (BOCHEŃSKI et al., 1981; TOMEK, 1984) and present observations show that this was the most frequently and numerously observed Bunting. In 1983 members of this species were encountered — in the Myohyang-san Mts.: 1 male, 1 female and 1 young bird in 3 different places in the Habiro Valley on 6 June, 2 males caught near the hotel on 8 and 9 June (in the hotel region there lived also 2 other pairs), 1 pair (the female carried food) in the Hvajang-am Valley on 10 June, a bird in juvenile plumage in the Sangwon Valley on 18 June; in the north of the country: 1 male at Maehyang-ri on 27 June, 1 pair at the Koanjuryong Pass on 28 June and about 200 m away a flock of young birds on 6 July, a female revealing signs of alarm in the region of Lake Mayang on 29 June, at least 6 pairs, of which one carrying food and another drawing back the chicks which prematurely left the nest (they could not fly yet) in the neighbourhood of the village of Dongsa-kol from 30 June to 2 July (a young male was caught in the same village on 2 July), a female at the Chayuryong Pass on 7 July and 1 male in a forest about 50 km south of Chongjin on 9 July. In the Pyongyang region Yellow-throated Buntings were seen only on Lake Taesong-ho on 13 and 15 July. The plumage colouring of the birds caught was identical with that of specimens caught in the Myohyang-san Mts. and Kymgang-san Mts. in 1980 and so they belonged to the nominative subspecies *Emberiza e. elegans*, TEMMINCK, 1835. Dimensions of the birds caught, old males from the Myohyang-san Mts. and a young male from Dongsa-kol, respectively: wing — 71, 69.7 and 75 mm, tarsometatarsus — 18, 19.5 and 21 mm, beak — 10, 10.8 and 10 mm, tail — 72, 68 and 75 mm, diameters of testes of old males — 8×6 and 8×6 mm and body weight of young bird — 17 g.

Emberiza spodocephala PALLAS 1776. Black-faced Buntings were observed: 3 family flocks on Rungrado Island in Pyongyang on 22 and 23 June, a pair at Onpho-ri on 27 June and at least 3 pairs, one of which was leading a flock of young birds at the village of Dongsa-kol on 1 and 2 July. On 1 July a bird (probably young female) was caught in the same village. Its dimensions: wing — 63 mm, tarsometatarsus — 18 mm, beak — 10.5 mm, tail — 56 mm, body weight — 15 g.

IV. REMARKS

In June and July all the birds except those leaving their nests very early, like the Nutcracker, stay in principle in their breeding territories. For this reason all the species observed in this study may be regarded as breeding in the regions in which their occurrence was found. Observation carried out for several days in one area (the Myohyang-san Mts. and the region of the village of Dongsa-kol) provided also approximate information concerning the abundance of some bird species in it.

In the light of observations presented in this paper it can be seen that many species of birds which AUSTIN (1948) considered to be rarely nesting in Korea (e.g. *Butorides striatus*, *Accipiter soloensis*, *Cuculus saturatus*, *Dendrocopos kizuki*, *Oriolus chinensis*, *Luscinia cyane* and *Phylloscopus tennelipes*) are frequently met with in some regions of the DPR of Korea at present. At the same time many species which up to the forties of this century were regarded as birds of passage or those wintering are considered nesting species (e.g. *Aix galericulata*, *Buteo buteo*, *Falco subbuteo*, *Falco tinnunculus*, *Tringa hypoleucos*, *Cuculus micropterus*, *Parus montanus*, *Troglodytes troglodytes*, *Turdus chrysolaus*, *Turdus hortulorum*, *Turdus cardis*, *Turdus pallidus*, *Muscicapa latirostris*, *Sturnus cineraceus*, *Zosterops erythropleura*, *Carpodacus rosaeus*, *Phylloscopus trochiloides*, *Phylloscopus proregulus*, *Phylloscopus fuscatus*, *Phylloscopus inornatus*). The number of the members of the genus *Phylloscopus* is besides strikingly large in comparison with earlier observations from the territory of the DPR of Korea (AUSTIN, 1948; MAUERSBERGER, 1981). Many of the species mentioned, especially those of the genus *Turdus* and *Phylloscopus*, nested in the northern part of Korean Peninsula as early as the sixties of this century (WON, 1963—1965). As has been mentioned in the introduction, the inaccessibility of the information gathered in the DPR of Korea by local ornithologists caused that much of it has not been utilized in the latest monograph of the birds of China, Manchuria and Korea (ETCHECOPAR and HÜE, 1983).

Another interesting phenomenon is that many species of birds nest in the DPR of Korea, whereas in the southern part of the peninsula they occur only in the seasons of migration or belong to wintering birds e.g. *Cuculus fugax*, *Hirundapus caudacutus*, *Certhia familiaris*, *Parus montanus*, *Monticola gularis*, *Turdus hortulorum*, *Turdus chrysolaus*, *Luscinia calliope*, *Phylloscopus trochiloides*, *Phylloscopus schwarzi*, *Phylloscopus proregulus*, *Phylloscopus borealis*, *Phylloscopus tennelipes*, *Muscicapa latirostris*, *Zosterops erythropleura*, *Uragus sibiricus*, *Carpodacus rosaeus*, *Emberiza spodocephala* and *Bradypterus thoracicus* (WON, 1976). The nesting of these species in the DPR of Korea indicates a great differentiation of the bird fauna within Korean Peninsula: much more Siberian taiga species occur in its northern, mountainous part than in the south. In addition, the fauna of the mountainous regions of the northern and central parts of the DPR of Korea (regions so far poorly known) calls for further studies in order to determine differences in the specific composition and numbers of birds living in the northern and southern parts of the peninsula more exactly.

The lack of water and water-marsh birds in Korea is striking, compared with the European part of the Palaearctic. These birds can be encountered there in winter or on passage (WON, 1963—1965; GORE and WON, 1971; WON, 1976; MAUERSBERGER, 1981), whereas in the breeding season, particularly larger water reservoirs are very poor in birds inhabiting them. At present, during our 7-day-long observation carried out on 5 lakes birds of the order *Anseriformes* were noted only 4 times and those of the order *Charadriiformes* 12 times.

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REFERENCES

ANDREWS R. C., 1944. Under a Lucky Star. New York. (after: AUSTIN, 1948).

AUSTIN O. L., 1948. The birds of Korea. Bull Mus. Comp. Zool. Harv. Univ., Cambridge, **101** (1): 1—301.

BERGMAN S. 1935a. Några korta brev från Korea. Fauna och Flora, **30**: 170—172.

BERGMAN S. 1935b. Glimtar fran djurlivet i en koreansk floddal. Fauna och Flora, **30**: 203—209.

BOCHEŃSKI Z., OLEŚ T., TOMEK T. 1981. Materials for the Avifauna of People's Democratic Republic of Korea. Acta zool. cracov., Kraków **25** (2): 13—32.

BURTON J. A. (ed). 1973. Owls of the World, their evolution, structure and ecology. Amsterdam.

CHENG Tso Hsin, 1976. Distributional list of Chinese birds (Revised Edition). Peking. (Chinese with English summary).

CUMMING D. J., 1933. Notes on Korean Birds. Trans. Korean Royal Asiat. Soc., **22**: 1—94 (after: AUSTIN, 1948).

DEMENTEV G. P. et al. 1951—1954. Дементьев Г. П. и др., 1951—1954. Птицы Советского Союза. Под общ. ред. Г. П. Дементьева и Н. А. Гладкова. Москва, **1—6.**

DOBROWOLSKI K. (ed.), 1982. Ptaki Europy. Warszawa.

Etchecopar R. D., Hüe, F., 1978. Les Oiseaux de Chine, de Mongolie et de Coree. Non passereaux. Papeete.

Etchecopar R. D., Hüe F., 1983. Les Oiseaux de Chine, de Mongolie et de Coree. Passereaux. Paris.

Ferens B. (Ed.). 1971. Klucze do oznaczania kręgowców Polski. Part IV B. Ptaki. Passeriformes. Warszawa—Kraków.

Flint V. E. et al., 1968. Флинт В. Е., Беме Р. К., Костин Ю. В., Кузнецов А. А. 1968. Птицы СССР. Москва.

Giglioli H. H., Salvadori T., 1887. Brief Notes on the Fauna of Corea the Adjoining Coast of Manchuria. Proc. Zool. Soc. London, **1887**: 580—596.

Grossman M. L., Hamlet J., Grossman S., 1965. Birds of Prey of the World. London.

Gore M. E. J., Won Pyong Oh, 1971. The birds of Korea. Seoul.

Gotzman J., Jabłoński B., 1972. Gniazda naszych ptaków. Warszawa.

Harrison C., 1982. An Atlas of the Birds of the Western Palearctic. London.

Hartert E., 1903—1922. Die Vögel der paläarktischen Fauna. Berlin, **1—3**.

Ho Hon, Rim Chu Jon, 1975. Studies on species of Birds and Mammals in the Region of Pektu-san. Publ. Acad. Sci., Pyongyang, 187—199 (in Korean).

Jahn H., 1942. Zur Oekologie und Biologie der Vögel Japans. Journ. Orn., Berlin, **90** (1/2): 1—302.

Jankowski A., 1898. Янковский А., 1898. Орнитологический дневник Александра Янковского с 7 мая по 5 ноября 1897 г. с прибавлением заметок о коллектировании чешуекрылых. Зап. Приамурского отд. ИРГО, Хабаровск, **3**(2): 111—157.

King B. F., Dickinson E. C., Woodcock M. 1975. A Field Guide to the Birds of South-East Asia. London.

Kuroda N., 1918. Notes on Corean and Manchurian Birds. Annot. Zool. Jap., Tokyo, **9** (4): 495—573.

Kuroda N., Mori T., 1927. A young Three-toed Woodpecker and other Birds collected in northern Korea. Tori, Tokyo, **5** (23): 290—292 (after: Austin, 1948).

Makatsch W. 1976. Die Eier der Vögel Europas. Leipzig. **2**.

Mauersberger G,. 1981. Anmerkungen zur Avifauna Nordkoreas. Mitt. zool. Mus., Berlin, **57** (Suppl.: Ann. Orn, **5**): 15—62.

Mori T., 1933. Black-cock occurs in Hamgyong Namdo. Journ. Chosen Nat. Hist. Soc., **1933** (15): 97—98 (after: Austin, 1948).

Mori T., 1935. On the Birds and Mammals collected by the Expedition of Kyoto University to Paekto-san in Winter. Journ. Chosen Nat. Hist. Soc. **1935** (20): 10—12 (after: Austin, 1948).

Nechaev W. A., 1971. Нечаев В. А., 1971. К распространению и биологии некоторых птиц Южного Приморья. Орнит. исследования на юге Дальнего Востока. Тр. биол. почв. инст. Новая серия. Владивосток, **6**: 183—200.

Omelko M. A., 1975. Омелько М. А., 1975. К биологии размножения полевого жаворонка — *Alauda arvensis intermedia* Swinh. и большеклювой вороны — *Corvus macrorhynchos mandshuricus* But. в Южном Приморье. Орн. исслед. на Дальнем Востоке. Тр. биол. почв. инст. Новая серия. Владивосток, **29**(132): 103—109.

Panov E. N., 1973. Панов Е. Н. 1973. Птицы Южного Приморья. Новосибирск.

Polivanova N. N., 1971. Поливанова Н. Н., 1971. К экологии дроздовидной камышевки — *Acrocephalus arundinaceus orientalis* (Temm. et Schleg.) на оз. Ханка. Орнит. исслед. на юге Дальнего Востока. Тр. биол. почв. инст. Новая серия. Владивосток, **6**: 113—122.

Polivanova N. N., Khodkov G. H., 1975. Поливанова Н. Н., Ходков Г. Н., 1975. О биологи синей мухоловки — *Nilatava cyanomelana* (Temm). Орнит. исслед. на Дальнем Востоке. Тр. биол. почв. инст. Новая серия. Владивосток, **29**(132): 83—92.

Shimokoriyama S. 1917. A List of the Bird Specimens in the Li Wong Museum, Seoul, pp.: 1—84 (after: Austin, 1948).

Shulpin L. M. 1927. Шульпин Л. М.,, 1927. Новые данные по распространению птиц в Южно-Уссурийском крае и описание новых форм. Ежег. Зоолог. Муз. Акад. Наук. СССР, Ленинград, 28; 1927 (3): 398—406.
Tomek T. 1984. Materials to the Breeding Avifauna of the People's Democratic Republic of Korea. Acta zool. cracov. Kraków, 27 (2): 19—46.
Vaurie C., 1959. The birds of the Palearctic fauna. *Passeriformes*. London.
Vaurie C. 1965. The birds of the Palearctic fauna. *Non Passeriformes*. London.
Voous K. H., 1962. Die Vogelwelt Europas und ihre Verbreitung. Hamburg—Berlin.
Vorobev K. A., 1954. Воробев К. А., 1954. Птицы Уссурийского Края. Москва.
Won Hong Koo, 1934. A Handlist of Korean Birds. Bull. Kogoshima Imp. Coll. Agr. und For., 1: 77—118 (after: Austin, 1948).
Won Hong Koo, 1956. The distribution of Korean birds and their economic significance. Pyongyang (in Korean).
Won Hong Koo, 1958. The descriptions of Korean birds with colour pictures. Passerines. Pyongyang. (in Korean).
Won Hong Koo, 1964. The descriptions of Korean birds with colour pictures. Non Passerines. Pyongyang (in Korean).
Won Hong Koo, 1963—1965. The Birds of Korea. Pyongyang. 1—3 (in Korean).
Won Pyong Oh, 1976. Checklist of the Birds of the Republic of Korea. Seoul.
Yamashina Y., 1932. On the Specimens of Korean Birds collected by Mr. Hyojiro Orii. Tori, Tokyo, 7: 213—242.
Yamashina Y. et al., 1975. Check-list of Japanese Birds. Tokyo.
Yoshida Y. 1923. The Birds of West Korea in Summer. Tori, Tokyo, 3 (15): 314—317.

STRESZCZENIE

Przedstawione w pracy materiały zostały zebrane w czerwcu i lipcu 1983 podczas 6-tygodniowego pobytu w Koreańskiej Republice Ludowo-Demokratycznej. Były one gromadzone w trzech regionach kraju — Phenianie i jego okolicy (w dniach 4—6. VI., 25—29. VI., 12—16. VII), w górach Myohyang-san (6—21. VI) i w okolicy miasta Chongjin (26. VI—11. VII) — Fig. 1 i 2. Penetrowano głównie następujące środowiska: doliny górskie porośnięte wielogatunkowym lasem mieszanym, jeziora zaporowe i naturalne z otaczającymi je lasami i polami uprawnymi oraz parki miejskie. Listę obserwowanych gatunków sporządzono w oparciu o obserwacje wizualne ptaków, odłowy sieciowe oraz oznaczanie nagranych głosów śpiewających samców. Łącznie zebrane materiały dotyczą 88 gatunków ptaków. W rozdziale poświęconym przeglądowi gatunków podane są daty i miejsca stwierdzenia danego gatunku, a także okoliczności, w jakich był obserwowany, mówiące o prawdopodobieństwie gnieżdżenia się (np. zbieranie pokarmu, wodzenie piskląt itp.). Przy omawianiu poszczególnych gatunków zamieszczono też dane biometryczne złapanych ptaków (należących do 14 gatunków), oraz opisy usytuowania znalezionych gniazd (6 gatunków).

Wśród często obserwowanych ptaków jest wiele gatunków, które od lat 40 naszego stulecia uważane były za rzadko występujące na Półwyspie Koreańskim. Należą do nich m. in. *Butorides striatus*, *Accipiter soloensis*, *Cuculus saturatus*,

Dendrocopos kizuki, *Oriolus chinensis*, *Luscinia cyane*, *Phylloscopus tennelipes*. Również znaczna liczba omawianych gatunków to takie, które na Półwyspie Koreańskim były dotychczas stwierdzone tylko w okresie przelotów lub w zimie, a zatem uważane były za ptaki nielęgowe. Pora prowadzonych obserwacji (czerwiec i lipiec), zachowanie się ptaków lub ich stan fizjologiczny (rozwój gonad) oraz liczba stwierdzeń każe wszystkie obserwowane gatunki zaliczać do fauny lęgowej Półwyspu Koreańskiego.

Spośród wymienionych w pracy gatunków m. in. *Gallinula chloropus*, *Sterna hirundo*, *Pernis ptilorhyncus*, *Turdus chrysolaus*, *Turdus cardis*, *Turdus hortulorum* i *Zosterops erythropleura* należą do rzadkości faunistycznych, które dotychczas były stwierdzone zaledwie kilkakrotnie na terenie Korei.

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